



Ministry of Road Transport and Highways
(GOVERNMENT OF INDIA)

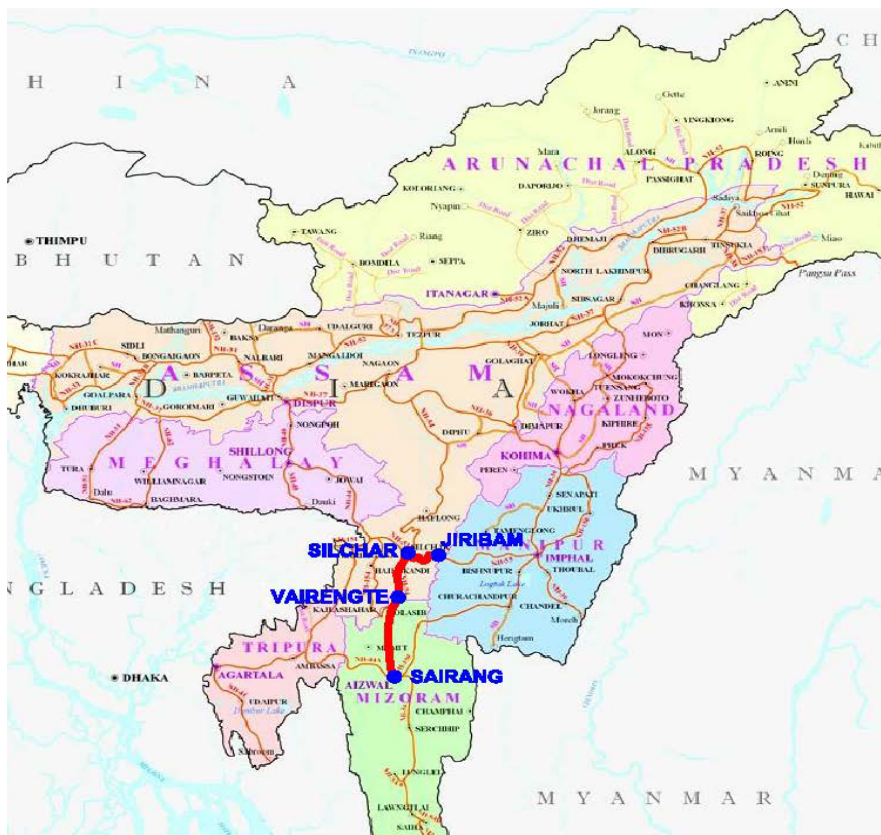


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Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).



Draft Detailed Project Report
Section - Silchar to Vairengte (From Km 0+000 to Km 49+360)
Environmental Impact Assessment and Social Impact Assessment Report

January 2023



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Section: Silchar to Vairengte (Package-2, mod. Km 20+000 to Km 49+360)

DRAFT DETAILED PROJECT REPORT

VOLUME : I	MAIN REPORT	
	APPENDICES TO MAIN REPORT	
VOLUME : II	DESIGN REPORT	
VOLUME :III	MATERIALS REPORT	
VOLUME : IV	ENVIRONMENTAL ASSESSMENT REPORT INCLUDING ENVIRONMENTAL MANAGEMENT PLAN(EMP) AND RESETTLEMENT ACTION PLAN(RAP)	√
VOLUME : V	TECHNICAL SCHEDULE	
VOLUME : VI, VII & VIII	RATE ANALYSIS, COST ESTIMATE, BILL OF QUANTITIES	
VOLUME : IX	DRAWINGS (ROAD & STRUCTURES)	



Environmental Impact Assessment

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte(49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km))



Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Chapter 1- Introduction

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 1: Introduction</p>	
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1 Chapter 1 – Introduction

1.1 General

Recognising the need for improvement of capacity of road network in tune with intensity of traffic, the Ministry of Road Transport and Highways (MoRT&H) acting through the National Highways Infrastructure Development Corporation Ltd. (NHIDCL) has decided to take up the development of various National Highways stretches/Corridors of 10,000 kms out of 50,000 kms under proposed Bharatmala Pariyojna.

The project roads under Lot-1/ Package-3 comprise of following three stretches which are part of four Economic Corridors.

- 1) Silchar to Vairengte (Part of Silchar-Aizawl Economic Corridor NER) in the state of Assam and Mizoram.
- 2) Vairengte to Sairang (Part of Silchar-Aizawl Economic Corridor NER) in the state of Mizoram.
- 3) Silchar to Jiribam (Part of Silchar-Imphal Economic Corridor NER) in the state of Assam and Manipur.

Whereas project road in Assam State starts from Silchar town at the junction of NH-27 & NH-37 called as Clock Tower, existing km 263+800 of NH-37 up to existing km 257+500 of NH-37 and then proposed to be developed existing partially constructed Silchar bypass from junction of NH-37 & partially constructed Silchar bypass up to cross-junction of NH-306 and continued till end of the package that ends. However, from Km 7+950 of NH-306 till end of package that ends at Vairengte (existing km 43+000 = Des. Ch. 49+360), the border of Assam and Mizoram State. Total design length of the project road is 49.360km. The Project Road rests on one (01) district viz. Cachar. The project road encounters number of habitations. Major Builtup areas on route are Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. Aggregate length of built-up areas along the Stretch is 48% of total length of project road.

The Project Road further navigates via Kolasib & Aizawl districts in Mizoram State as well till Sairang to connect Aizawl city with 4-lane divided carriageway.

Project Road from Silchar to Sairang further divided in to 8 packages based on assessment done in view of construction aspect. The packages are as under,

Table 1.1 Package Distribution

Sl. No.	Construction Packages	Design Chainage			Existing Chainage			State
		From	To	Length (km)	From	To	Length (km)	
1	Package-1	0+000	20+000	20.000	263+800 (Of NH-37)	12+920 of NH-306	31.260	Assam
2	Package -2	20+000	*49+360	29.360	12+920	43+000	17.500	Assam
3	Package-3	46+000	**60+850	14.850	43+000	59+700	16.700	Mizoram
4	Package -4	61+000	77+500	16.500	59+700	86+000	26.300	Mizoram
5	Package -5	77+500	95+500	18.000	86+000	107+850	21.850	Mizoram
6	Package -6	95+500	111+850	16.350	107+850	126+315	18.465	Mizoram
7	Package -7	111+850	125+500	13.650	126+315	142+060	15.745	Mizoram
8	Package -8	125+500	136+400	10.900	142+060	158+900	16.840	Mizoram
	Total D. Length			139.610	Total E. Length	164.800		

* EQ (km 49+360 = km 46+000) ** EQ (km 60+850 = km 61+000)



This Report mainly deals with section from Silchar to Vairengte viz. Pkg: P1 & Pkg: P2 fall under Assam State.

1.2 Purpose of the Report

The purpose of this Environmental Impact Assessment (EIA) is to incorporate environmental concerns at the project level. EIA has been carried out at the project planning and design stage as part of Preliminary report to ensure that the project is environmentally feasible. The general objectives of EIA study are as follows:

- (i) To provide information about the general environmental settings of the project area as baseline data;
- (ii) To provide information on potential impacts of the project and the characteristic of the impacts, magnitude, distribution, the affected group and their duration;
- (iii) To provide information on potential mitigation measures to minimize the impact including mitigation costs;
- (iv) To assess the best alternative project at most benefits and least costs in terms of financial, social and environment; and
- (v) To provide basic information for formulating management and monitoring plan.



The EIA has been prepared as the projects are likely to have moderate to minor impacts. This EIA is structured in accordance with the requirements of the ADB/ World Bank.

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1.3 Scope of EIA Study

The scope of the EIA includes the following:

- To carry out Environment Impact Study including Environmental Impact Assessment (EIA) in accordance with ADB/ World Bank and Government of India Guidelines and State Government of Mizoram guidelines;
- To carry out the preliminary environmental screening to assess the direct and induced impacts due to the project works;
- To assess and document baseline conditions relevant to the project with the objective to establish the benchmarks;
- To assess the potential positive and negative significant impacts due to the project and identify the cost-effective mitigation measures to address these impacts adequately in the Environmental Monitoring and Management Plan (EMMP);
- To do the analysis of alternatives incorporating environmental concerns and the associated costs in the economic analysis.
- To give special attention to the environmental enhancement measures in the projects for the following:
 - Tree plantation along the project road;
 - Cultural property enhancement along the project roads;
 - Bus bays including a review of their location;
 - Traffic safety provisions like Guard post, Road Delineators, Metal Beam Crash Barrier along the Project roads, depending upon the site requirements
 - Re-development of borrow/ quarry areas located on public land.
- To prepare EIA report adequate public consultation and the recommendations arising thereon.
- To identify all mitigation measures in the EIA and EMMP.
- To prepare the bill-of-quantities (BOQ) and technical specifications for all items of work because environmental enhancement measures in such a way that these may be readily integrated to the construction contracts.
- To provide additional inputs in the areas of performance indicators and monitoring mechanisms for environmental components during construction and operational phase of the project.
- To provide the cost of mitigation measures and to ensure that environmental related staffing, training and institutional requirements are budgeted in project cost.

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The objective of this EIA study is to identify potential environmental impacts of the project road NH-306 and formulate strategies to avoid / mitigate the same. The scope of work to accomplish the above objective, comprise the following.

- Understanding the baseline environmental conditions of the project area,
- Identifying the potential environmental impacts of the project proposal,
- Recommendation of appropriate mitigation measures to avoid / minimize the environmental impacts, and
- Preparing an environmental management plan for the Project Road.

1.4 Methodology

The methodology used for this study is based on the procedures described in ADB Environmental Assessment Guidelines of 2003, ADB Environmental Policy 2002 and MoEFCC's Environmental Impact Assessment Notification dated 14th September 2006 and amendments therein.

The Environmental Impact Assessment has been carried out using current ADB and Government of India guidelines, specifically:

- World Bank Guidelines;
- ADB Environmental Assessment Guidelines 2003;
- Project Terms of Reference (TOR);
- Environmental Impact Assessment Notification dated 14th September 2006, Ministry of Environment and Forest (MoEFCC) and amendment, Government of India;
- The Environmental (Protection) Act, 1986 of Government of India;
- Environmental guidelines for Road/Rail/Highway Projects, 1989, Government of India;
- Handbook of environmental procedures and guidelines, 1994, Government of India; and
- Guidelines for Environmental Impact Assessment of Highway Projects (IRC: 104-1988).
- The methodology adopted includes the following work plan:

Activity 1: Submission of Inception Report with methodology

- Technical Consultant including Environmental Specialist had a field visit, in Aug 2016, to get the team members apprised of the project background, present status, approach and methodology to be followed and sources of secondary data / reports.

Activity 2: Collection and Review of Relevant Documents

- The environmental team collected and reviewed project parameters, including technical information, and design specification provided by engineering team.

Activity 3: Field Investigation

- The environmental team undertook a rapid reconnaissance and field visit for all the Sub-project roads. It has followed by field environmental survey. Various environmental features of the project corridors have been observed and studied.

Activity 4: Public Consultation

- During field environmental survey, public consultations have been conducted to obtain the view of local people, project affected persons and local administrative representatives. Focused Group Discussion has been adopted as tool for this public consultation along with social team. The photographs are provided in the Photo plates
- Based on collected data and information, potential adverse environmental impacts have been identified and examined using standard "Checklist Method". Thereafter possible mitigation measures have been identified and based on findings of impact appraisal comprising the key elements embodied in this EIA, an Environmental Management Plan (EMP) has been developed. Continued discussions undertaken with the executive agency and technical team of the consultant for integrating environmental management measures into the project.

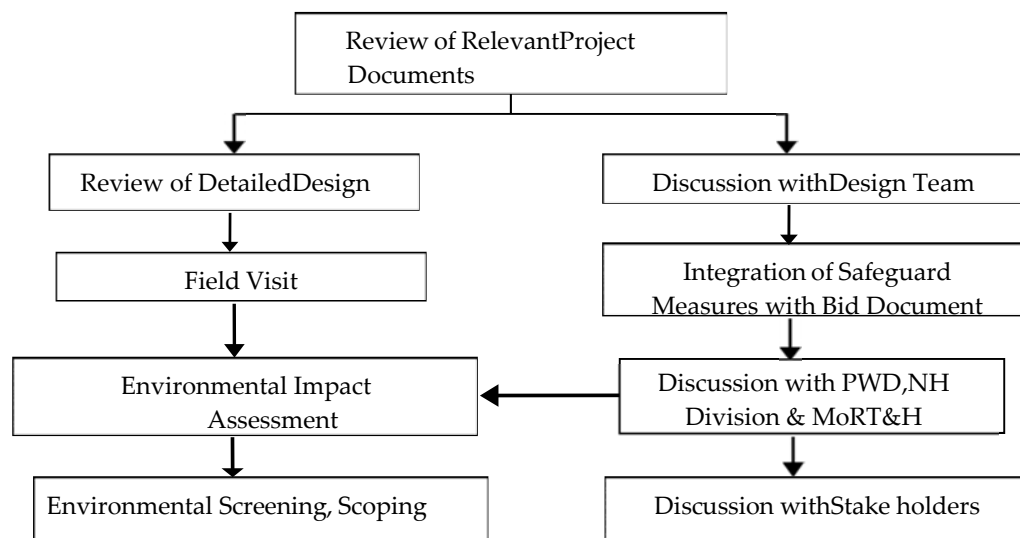




Fig 1.1 Project Influence Area

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 1: Introduction</p>	
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1.5 EIA Team

Consultant has prepared this EIA report with the following Team:

Mr. Zohmangaiha, Environmental Specialist.

Dr. Lalmuansangi, Environmental Specialist.

Mr. Vidya Sagar



Ms. Rojaleen Das

1.6 Data Collection

Data was collected on various environmental components such as soil, meteorology, geology, hydrology, water quality, flora and fauna, habitat, demography, land use, cultural properties etc., to establish the baseline environmental setup. Secondary data on environment for the project corridor was collected both from published and other relevant sources e.g., the State Department of Forest, Mizoram State Pollution Control Board, State Statistical Department etc. The data collection from the field was completed with the help of field surveyors and enumerators/investigators. The interviewers/surveyors were trained for taking the samples and filling up the Questionnaires at site. To ensure the accuracy of the data it was collected under the supervision of the Environmental Specialist.

2

Chapter 2- Project Description and Existing Scenario

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 2: Project Description and Existing Scenario</p>	
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2 Project Description and Existing Scenario

2.1 Importance of Project Road

The Northeast, strategically important yet economically underdeveloped, has been witnessing sprays of roads building activities since independence. The need to established connection with the rest of India following partition, the Chinese aggression, economic development, and trans-border connectivity are some of the main drivers which have been impelling the central government to construct roads in the region since independence. However, impediment such as terrain and climatic conditions, insurgency, and mismanagement of resources have also put brakes on the development of the road network in the region.



Roads are the nucleus of economic development, more so in the northeast. Road transportation is an important mode of travel in Plain, Rolling and hilly areas as other modes are either too expensive or difficult to construct. However, road infrastructure is relatively deficient in the area. It is only now after announcement of India's "Look East" policy, that due importance has been given to the development of the area.

2.2 Location of Project Road

After reconnaissance survey, it has been learnt that from Km 0+000 to Km 7+950, the project road traverses through heavily built-up with narrow ROW up to km 7+950 (Sonabarighat village). Since, said stretch couldn't warrant for 4-lane development in line with geometrics, land acquisition, environment & social perspective hence, the start point has been shifted to Clock Tower (Junction of NH-37 and NH-27) at existing km 263+800 of NH-37 and continued traversing along NH-37 up to km 257+450 via Rongpur, Arkatipur and Kashipur.

However, at the same time it has also been found that Silchar bypass (partly constructed 2-Lane, on hold) exist on RHS of project road and intersects at km 7+950 of NH-306 hence, DPR consultant has proposed to utilize partial section of Silchar bypass for the length of 7.5 Km from the junction of NH 37 at Km 257+450 and terminates at Km 7+950 of NH 306 near Sonabarighat continuing towards Vairengte up to Km 43+000 of NH-306 (old NH-54) at Lailapur /vairengte border. Hence, considering above existing scenarios, project road starts at km 263+800 of NH-37 with junction of NH-27 (Guwahati-Silchar Road).

Further, as we all know that there is dispute over border between Assam and Mizoram states. Govt. of Mizoram has put massive effort to resolve the long pending state border dispute with Union minister of home affairs (HMA) to intervene and review the state boundary based on Bengal Eastern Frontier Regulation 1873 and the inner line of the Lushai Hills Notification, 1993. The matter is still pending.

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 2: Project Description and Existing Scenario</p>	
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However, information obtained from different sources like Local bodies, applicable maps, and Border check-post administrative, 3 locations on existing NH-306 road have been identified viz. at existing Km 40+150, Km 42+250 and km 43+900 respectively. So, considering the existing circumstances and facts, we have fixed end chainage of “Silchar-Vairengte Section” at existing Km 43+000 of NH-306. The same may be revised once the matter resolved.

Hence, DPR consultant has considered the start point as existing Km 263+800 of NH-37 (Old NH-53) with Design Ch. 0+000 and end point at Km 43+000 with Design Ch. 49+360 at Lailapur-Vairengte state border leading towards Aizawl.

Therefore, the total existing length of chosen route (along portion of NH-37 + portion of Silchar bypass + NH-306) is 49.360 kms.

The project road lies between Latitude 24°50'1.50"N to 24°30'58.93"N and Longitude 92°51'40.91"E to 92°46'39.72"E. The alignment mostly passes through agricultural area, semi built-up, built-up areas and few stretches lying on hill cum forest area. The physiography of the project districts and physiographical map of Assam state (Figure 1) showing project area is as follows:

2.3 The Project area

The project road lies in Assam State and it traverse through major area like Kasipur, Sonabarighat, Nutan Datapur, Katakhal, Dhola, Baga Bazar and Lailapur. The other important built-up areas are Rongpur, Clever House, Narshingpur, Saidpur, Sadagram and Hawaithang. Entire stretch road lies in Cachar district. Some portion of the project road runs through forest with constraints for geometric improvement of the alignment however, forest proposal was uploaded on PARIVESH portal dated 18.12.2021, based on instruction given by NHIDCL-HQ on 09.12.2021 but soon after proposal submission, forest department has denied the proposal on various reasons and suggested to follow option-3 i.e., improvement along existing road by providing individual bypasses at needed built-up / major settlement areas.

Later, on obvious reasons as explained in Vol-I Main Report, Chapter-0 under executive summary, it has been suggested by NHIDCL to modify / reroute the portion of “DPR approved alignment” in line with MoM issued by DC-Cachar dated 26.02.2022. DPR consultant has accordingly modified the alignment however, last section i.e., D. Ch 47+260 to 49+360 (L=2.1 km) encounters with IRF Cachar that requires forest clearance. DPR consultant is in process of applying FC through portal “PARIVAESH 2.0”.

Since the DPR approved alignment is common and had no objection up to existing km 12+920 (Des. Ch.20+000) hence, DPR package has been modified in consultation with ED(P)-RO Guwahati during VC meeting held on 13.06.2022 the revise DPR package is as mentioned below,



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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1. Package: P1 (Des. Ch. 0+000 to Des. Ch. 20+000) - as per earlier DPR approved Alignment.
2. Package: P2 (Des. Ch. 20+000 to Des. Ch. 49+360) - as per modified Alignment

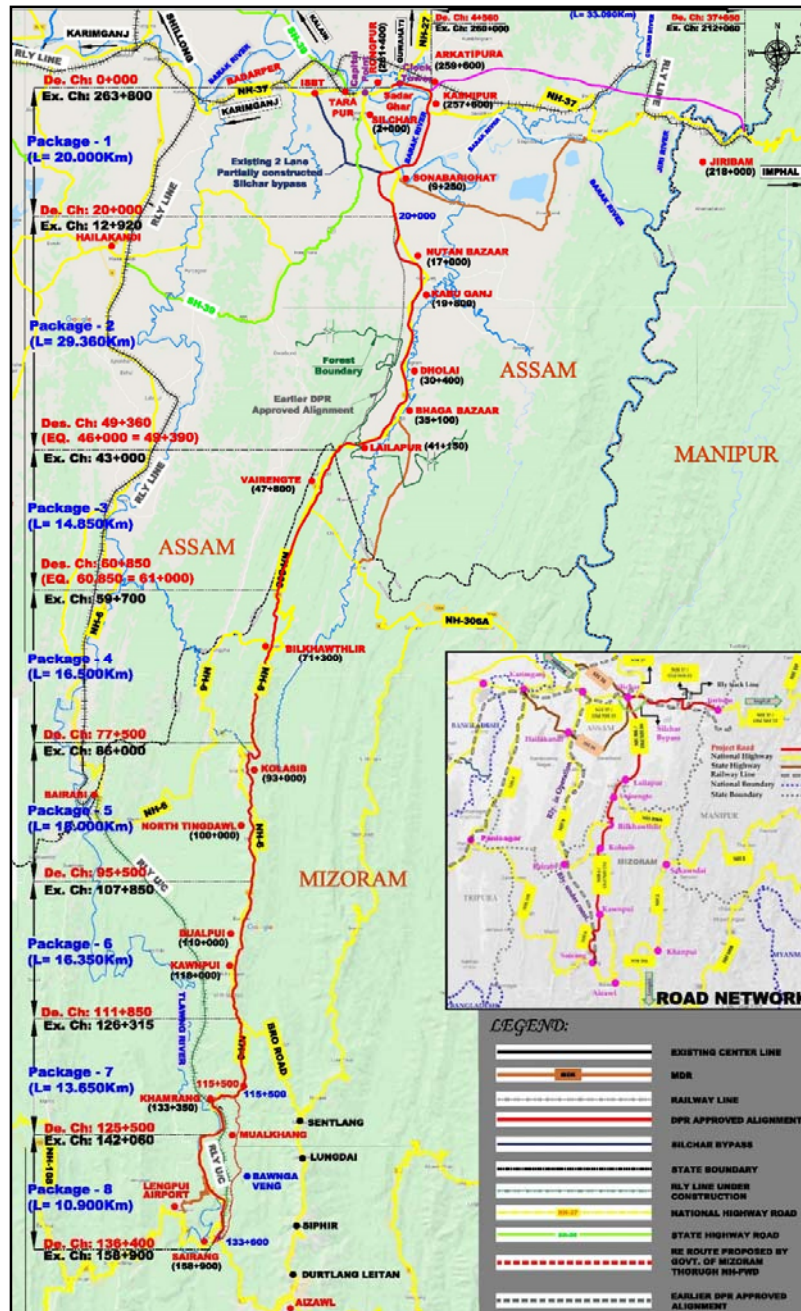


Fig 2.1 Key Plan for Proposed Construction Packages



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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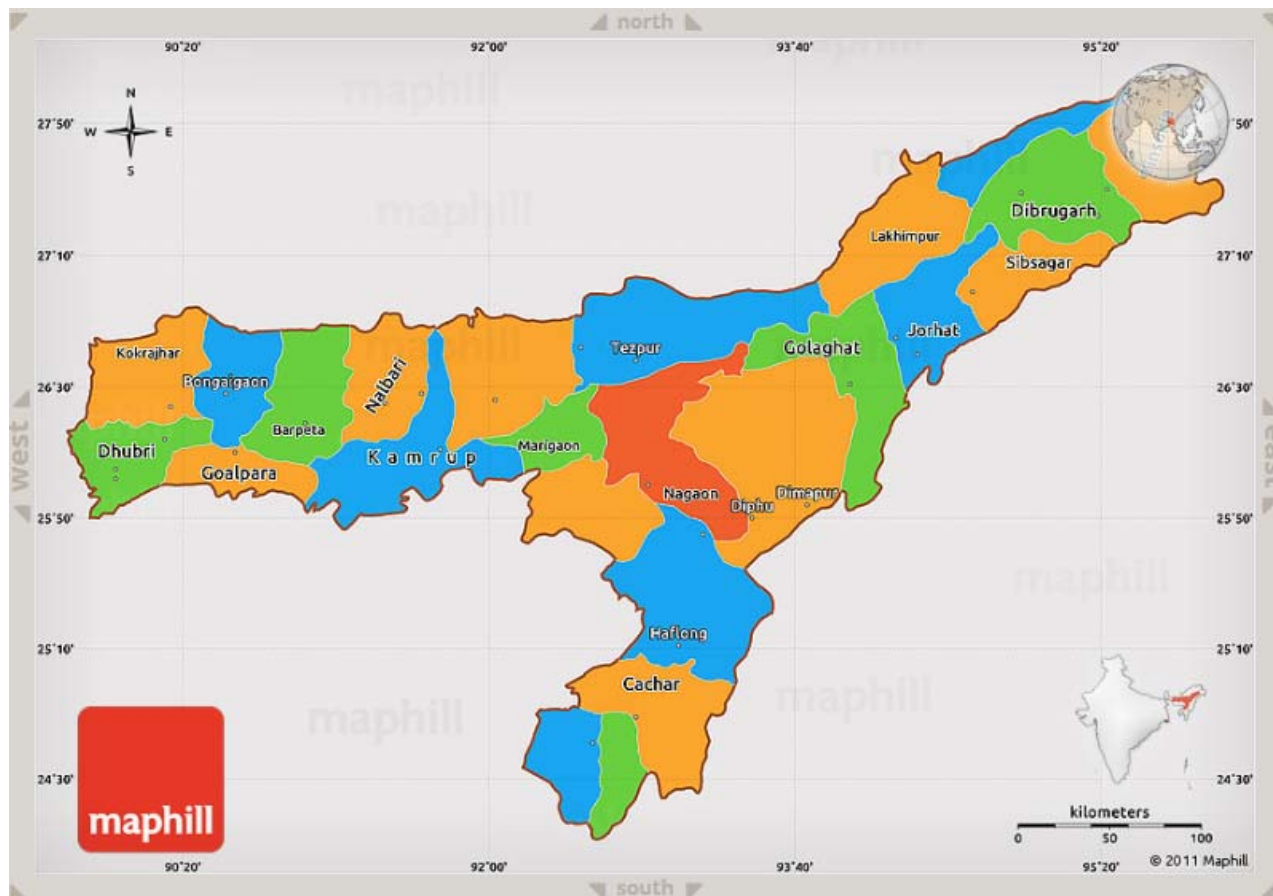


Fig 2.2 Physiographical map of Assam state showing project area

2.4 Existing Chainage System

In order to identify reference point during construction, existing chainage place important hoverer during reconnaissance survey, it was unveiled that KM stone hardly available along project road. In such circumstances DPR consultant had made best effort to synchronize between available KM stone and physical measurement of existing road from start to end and outcome of same had been presented in the report. Further, Design chainages have also been reflected against existing chainages wherever applicable for better appreciation. The Design chainage at present shown, is the final design chainage extracted during design from MX-Road software and hence the total design length works out to 136.400 km from Silchar in Assam to Sairang in Mizoram as an against 158.900 km along existing road.

Hence, for an obvious reason please accord these existing chainages for references purpose “as tentative chainage” only.

Based on above record and clarification, DPR consultant has considered the start point as existing Km 263+800 of NH-37 (Old NH-53) with Design Ch. 0+000 and end point at Km 43+000 with Design Ch. 49+360 in Assam at Lailapur-Vairengte state border further leading towards Aizawl.

However, this report mainly deals with Package-2 that starts at existing Km 12+920 (D. Chainage 20+000) and ends at Existing Km 43+000 and (D. Chainage 49+360) however, for better comprehension DPR consultant has furnished the details from Sichar to Vairengte state border.

2.5 Land use and Settlements along Project Road

The alignment mostly passes through agricultural area, semi built-up, built-up areas and few stretches lying on hill cum forest area. The land use pattern along the existing project road is as tabulated below.

Table 2.1 Summary of land use along project road:

Sl.No.	Land use description	Existing length (Km)	% of Length
1	Built up Area	27.750	57.00
2	Semi Built up Area	5.500	11.00
3	Agricultural Land	13.650	28.00
4	Hill Cum Forest Area	2.000	04.00
	Total length	48.900	100 %

Settlements:

The existing road from Km 7+950 passes through a number of habitations. Major Builtup areas on route are Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. Aggregate length of built-up areas along the Stretch is 48% of total length of project road.



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Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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The major built – up areas mentioned above are clustered with commercial, residential and industrial activities on both sides of existing road. Besides the above, the appreciable movement of pedestrians crisscrossing the road is observed at these locations. Numbers of Brick factories are observed along the project road. Existing horizontal geometrics are not as per NH standard at many locations, which are required to be upgraded. The Existing ROW along the project road varies from 9m to 20 on NH-37 & NH-306 and 50 m on existing partially constructed Silchar bypass as per PWD records. As the project road is 4- Lane, improving the geometry is not possible within the available ROW wherever there is reduced EROW and it would entail for the demolition of structures within the immediate vicinity of the existing road, more over this does not ensure the safety of the designed facility as it would be passing through the built up and congested sections.

Initially to avoid excessive demolition of permanent buildings, shops etc. and to reduce traffic congestion in town/built-up areas and to ensure free and un-interrupted flow for through traffic, three options were studied. **Option A:** Utilise by upgrading the existing NH, under-construction Silchar bypass and proposal of new bypass. **Option B:** Improvement of existing road with bypass options at Major built up, and **Option C:** Green filed alignment.

The details of the same are given below with existing Chainges;

Option A: Utilise by upgrading existing NH, the under-construction Silchar bypass and proposal of new bypass

Utilize partial section of Silchar bypass for the existing length of 7.50 Km from the junction of NH 37 at Km 257+450 to Km 7+950 of NH-306. The same was agreed by concern delegates during PPT discussions and approved thereafter. PWD has also accepted the proposal and in the process of formal procedure for transferring the said stretch to NHIDCL.

Option B: Improvement of existing road with bypass options at Major Built up

- | | |
|-------------------------|----------------------------------------------------|
| a) Sonabarighat Bypass: | Km 7+950 to Km 12+500 |
| b) Nutan Bazar Bypass: | Km 14+620 to Km 21+270 |
| c) Katakhal Bypass: | Km 22+720 to Km 25+900 |
| d) Dholai Bypass: | Km 28+150 to Km 30+120 |
| e) Baga Bazar Bypass: | Km 30+860 to Km 32+350 &
Km 32+960 to Km 38+110 |

From all above bypasses, only the bypass to Sonabarighat was agreed by concern delegates during the presentation and remaining bypasses were overruled by opting Green field alignment option.

Off late, on obvious reasons as explained in Chapter-0 under executive summary, it has been suggested by NHIDCL to modify / reroute the portion of “DPR approved



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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alignment" falls under forest, greenfield (under option-c) in line with MoM issued by DC-Cachar dated 26.02.2022 and follow option-B "Improvement of existing road with bypass options such as Nutan Bazar, Katakhal, Dholai and Bagha Bazar considered as Major Built up".

Option C: Option of Partial Green Field Alignment: Km 12+920 to Km 43+000 (now proposed to be revised)

The detailed discussion about individual bypass under option (A), Option (B) and Option (C) is discussed in following paragraphs.

Altogether, there are total 29 villages/towns fall along existing project road. Out of 29 nos. of villages, 22 nos. of villages/towns proposed under Bypass in this project. The remaining stretches, proposed alignment follows the existing road with geometrics improvement/ Realignment. In some small villages, where existing alignment has been followed neither much of roadside activities nor any heavy local traffic coupled with pedestrian traffic exists. Following table gives list of villages along the project road.

Table 2.2 Land Use pattern and Villages/towns along projects road:

Sl. No.	Existing Chainage		Length (m)	Land Use	Side	Village Name	Remarks
	From	To					
1	263+800	259+950	3850	Built up	BHS	Rongpur	Via NH-37 Package-1 (263+800 to 12+920)
2	259+950	257+450	2500	Built up	BHS	Kashipur	
3	20+000	18+100	1900	Agricultural	BHS	Kashipur	Via Silchar Bypass Package-1 (263+800 to 12+920)
4	18+100	17+400	700	Built up	BHS	Badripar	
5	17+400	15+300	2100	Agricultural	BHS	Badripar	
6	15+300	14+500	800	Agricultural	BHS	Bagpur	
7	14+500	13+000	1500	Agricultural	BHS	Neairgram	
8	13+000	12+500	500	Built up	BHS	Sabashpur	
9	7+950	9+000	1050	Built up	BHS	Saidpur	Via NH-306 Package-1 (263+800 to 12+920)
10	9+000	10+700	1700	Built up	BHS	Sonabarighat	
11	10+700	11+500	800	Built up	BHS	Saidpur	
12	11+500	12+000	500	Built up	BHS	Dhanehari	
13	12+000	12+920	920	Semi Built up	BHS	Dhanehari	Via NH-306 Package-2 (12+920 to 43+000)
14	12+920	14+000	1080	Semi Built up	BHS	Dhanehari	
15	14+000	16+300	2300	Agricultural	BHS	Kajidahar	
16	16+300	17+000	700	Built up	BHS	Nutan Bazar	



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).





Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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Sl. No.	Existing Chainage		Length (m)	Land Use	Side	Village Name	Remarks
	From	To					
17	17+000	18+200	1200	Built up	BHS	Berabak	Via NH-306 Package-2 (12+920 to 43+000)
18	18+200	19+700	1500	Semi Built up	BHS	Nagdirgram	
19	19+700	21+700	2000	Built up	BHS	Kabuganj	
20	21+700	24+000	2300	Agricultural	BHS	Narsingpur Pt I	
21	24+000	25+000	1000	Built up	BHS	Jalenga	
22	25+000	25+500	500	Agricultural	BHS	Jalenga	
23	25+500	26+000	500	Built up	BHS	Jalenga	
24	26+000	28+000	2000	Semi Built up	BHS	Jalenga	
25	28+000	29+000	1000	Built up	BHS	Ramprasadpur	
26	29+000	29+750	750	Built up	BHS	Ramprasadpur	
27	29+750	31+000	1250	Built up	BHS	Rajanikhal	
28	31+000	32+000	1000	Agricultural	BHS	Sadagram	
29	32+000	33+500	1500	Built up	BHS	Arjanpur	
30	33+500	34+500	1000	Built up	BHS	Saptagram	
31	34+500	35+000	500	Built up	BHS	Loknathpu	
32	35+000	36+000	1000	Built up	BHS	Islamabad	
33	36+000	36+500	500	Agricultural	BHS	Bhaga	
34	36+500	38+000	1500	Built up	BHS	Rajghat	
35	38+000	38+500	500	Built up	BHS	Rajghat	
36	38+500	39+500	1000	Agricultural	BHS	Howaitang	
37	39+500	41+000	1500	Built up	BHS	Joydhanpur	
38	41+000	43+000	2000	Hill cum Forest	BHS	Lailapur	

2.6 Forest Area

The Project Road passes through hill cum thickly vegetated / forest (Inner line reserve forest) from Km 41+000 to Km 43+000 for an approximate 2.00 km. The Project Highway is lying with moderate number of trees on both sides after Lailapur town from Km 41+000 to Km 43+000.

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 2: Project Description and Existing Scenario</p>	
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2.7 Terrain & Climate

Terrain is classified by the general slope of the country across the highway alignment as per IRC: 73 and with these criteria the entire length of the project passes through in plain and hilly terrain.

The climate of the districts can be termed as mild to severe, with mild winters and warm summers. Monsoon will experience heavy rainfall and high humidity. The summer season in Assam starts from the month of March and extends till the end of June with average temperature between 35 and 38 ° C. The winter season in Assam is basically characterized by scanty rainfall and misty mornings and afternoons. It starts in November and continues till the month of February. The mercury reading at this time of the year is around 6 to 8° C. In Assam, spring (March- April) and autumn (September- October) present pleasant seasons, with moderate temperature and rainfall. The rainy season, as in rest of Assam begins in late June and continues up to late September. October and November constitute the post-monsoon period. The climate of the Barak Valley districts is characterised by abundant rainfall, moderate temperatures and high humidity.



Existing carriageway configuration

The project road has 10.0m wide carriageway for 30.70 Km, 7.0 m carriageway for 8.3 Km, and 7.5km is under construction flying along silchar bypass.

The project road (NH-306) from Km 0+000 to Km 6+000 passes through heavy built-up section of Silchar town. The carriageway (flexible) width along existing road in Silchar town is 10 m with Drain of 1.5m width on both sides. From Km 2+600 type of existing carriageway changes from flexible to Paver blocks which continues up to km 5+600 for a length of 3kms. From Km 6+000 to Km 7+950, the project road passes through minor built up like Uttar Krishnapur and Aulia. The type of carriage way is flexible with width of 10 m. At Km 7+950 of NH 306 project road intersects proposed Silchar bypass.

In general, Silchar town is completely habituated with utilities, religious structures, educational institutions and commercial activities on both side of project road. The local traffic in Silchar town is also high. Since the project road is main link between Aizawl and Silchar there is huge movement of commercial vehicle carrying different commodities to Aizawl. In addition, there is new railway construction is under progress from Bhairabhi to Sairang section. Hence considering future development there is a need for upgradation of existing road along Silchar town. During the preliminary survey it has been explored that a new bypass is already proposed to Silchar town which is under construction.

Hence DPR consultant has proposed to utilize partial section of bypass instead of using said stretch of NH-306 from km 0+00 to km 7+950, dense surrounded habitation of

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 2: Project Description and Existing Scenario</p>	
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existing alignment. Utilisation of Silchar bypass is from the junction of NH 37 at Km 257+450 and terminates at Km 7+950 of NH 306 near Sonabarighat continuing towards Vairengte up to Km 43+000 of NH-306 (old NH-54) at Lailapur/Vairengte, stateborder.

From Km 7+950 to Km 9+500, the project road passes through minor built up like Saidpur and Sonabhari ghat. The type of carriage way is flexible with width of 10 m. From Km 9+500 to Km 20+000, the project road passes through villages like Saidpur (Km 10+000), Nutan bazar (Km 16+000), Narsingpur (Km 18+000) and Kabuganj (Km 19+800). The carriageway width is 10 m with condition varying from poor to fair. The width of earthen shoulder varies from 1.5 m to 2.0 m.

From Km 20+000 to Km 41+000, the project road passes through villages / towns like Katakai (Km 24+000), Panibhora (Km 26+500 or Km 27+000 of NH-54), Dolhai (Km 30+400), Saptagram (km 31+800), Islamabad (km 33+700), Bagabazar (km 35+100) and lailapur (39+500). The carriageway width varies from 9.5m to 10m and earthen shoulder varying from 1.5m to 2.0m. The embankment height along these stretches varies from 1.5 m to 2.0 m. From Km 26+000 to Km 36+000 Barak / Rukini river is flowing parallel to existing road and at Km 35+400 River flows even near to road edge (8m to 10m). At Km 39+900 the project road passes through Lailapur Military check post.

From Km 41+000 project road runs in hill terrain which continues up to end point of project at Km 43+000. The carriageway width from Km 41+000 to Km 43+000 varies from 6.8m to 7.4m. The condition of road varies from fair to poor. The width of earthen shoulder towards valley side varies from 0.5m to 1.0m.

2.8 Existing Alignment

Initially during the alignment study stage many options such as widening, strengthening and improving of riding quality along with realignments, bypass and green field option were studied for the project highway. In order to avoid demolition of built up and for geometric improvements three options were studied and the details of the same is given below

The Project road proposed for Realignment and Bypass through various ancient Villages, Towns and a green field alignment also proposed for obligatory constrain along the existing road.

The details of locations are mentioned below. **(Existing Chainage)**

- A. Utilise by upgrading the under-construction bypass and proposal of new bypass**
 - a) Silchar Bypass
- B. Improvement of existing road with Bypasses**
 - a) Sonabarighat Bypass: Km 7+950 to Km 12+500
 - b) Nutan Bazar Bypass: Km 14+620 to Km 21+270



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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- c) Katakhal Bypass: Km 22+720 to Km 25+900
- d) Dholai Bypass: Km 28+150 to Km 30+120
- e) Baga Bazar Bypass: Km 30+860 to Km 32+350 &
Km 32+960 to Km 38+110

C. Proposal of Green field Alignment

- a) Green Field Alignment Option-II Km 12+920 to Km 43+000

A. Improvement of Existing road with Bypasses options

a) Silchar Bypass

Silchar town is completely habituated with utilities, religious structures, educational institutions and commercial activities on both side of project road. The local traffic in Silchar town is also comparatively high. However, at the same time it has also been extracted that Silchar bypass (partly constructed 2-Lane –on hold) exist on RHS of project road and intersects at km 7+950 of NH-306 (old NH-54). Hence, DPR consultant has proposed to utilize partial section of bypass for the existing length of 7.500 Km from the junction of NH 37 at Km 257+450 to junction of NH-306 near Sonabarighat at Km 7+950.

B. Improvement of Existing road with Bypasses options

a) Sonabarighat Bypass (Km 7+950 to Km 12+500)



The existing Project Road runs through heavy built-up section of Sonabarighat and villages like Saidpur (Km 10+000) from Km 9+000 to Km 14+000. It has also been observed that there are many religious structures which are very near to road edge like kali temple on LHS at Km 10+800, Darga at km 11+600 on LHS, etc. along both side of project road and the improvement of the existing road to NH standards will lead to demolition of buildings. Hence the bypass options were studied for Sonabarighat built a proposed length of 5.350 Km, as against existing length of 4.550 Kms.

b) Nutan Bazar Bypass (Km 14+620 to Km 21+270)

From Km 14+620 to Km 21+270, the project road passes through built up locations like Nutan Bazar (Km 16+000), Narsingpur (Km 18+000) and Kabuganj (Km 19+800). There are also government offices, educational institutions and residential buildings on both side throughout the major built up locations like Nutan bazar, Kabuganj etc. Thus, to avoid the habitation in Nuthan Bazar and Kabuganj, the bypass options was studied with a proposed length of 6.950Km, as against existing length of 6.650 Kms.

c) Katakhal Bypass (Km 22+720 to Km 25+900)

Project road enters Katakhal village from Km 23+400. The Katakhal village has built up on either side of the project road. The existing road has poor geometry with curve and pattern of development of built up is linear. To improve the existing road to 4-

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 2: Project Description and Existing Scenario</p>	
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Lane standards would require acquisition of built up area for entire length. Hence to improve the existing geometry as per NH 4-lane standards a bypass option was studied. The bypass option is having a length of 3.250 Kms, as against existing length of 3.180 Kms.

d) Dholai Bypass (Km 28+150 to Km 30+120)

The existing road passes through Dholai built up from Km 28+150 to Km 30+120, which has a habitation on either side of the existing road. Improving of the existing road to NH standards will lead to demolition of the greater number of buildings, so bypass options have been studied with a length of 2.000 Kms, as against existing length of 1.970 Kms



e) Baga Bazar Bypass (Km 30+860 to Km 32+350 & Km 32+960 Km 38+110)

Existing Project road traverse through Saptagram, Islamabad, Bagabazar and lailapur built up from Km 31+500 to Km 39+450. The existing road geometry is poor with substandard curves and the built up is linear on either side of the existing road, so to improving the existing alignment to 4-Lane standards will lead to demolition of buildings. . Thus, by considering above facts and future growth of town, a bypass option was studied with a design length of 6.200 Km, as against existing length of 6.640 Kms

C. Proposal of Green field Alignment (now proposed to be changed from Km 12+920 (D. Ch. 20+000) to Km 43+000 (Design Ch. 46+000) due to portion of alignment from D. Ch. 33+000 to D. Ch 46+000)

The proposed alignment traverses from Km.12+920 on RHS of existing alignment and passes through green field/agricultural field/forest land and terminates at Km 43+000, covering existing road length of 30.080Km as against design length of 26.000 Km. Less numbers of buildings are affected compared to other options moreover there is more scope for future widening. The portion of proposed alignment passes through hill from km 31+000 (D. Ch) to existing km 43+000 (D. Ch. 46+000). The section of proposed alignment also encounters reserve forest.

Off late, portion of approved DPR alignment i.e., from existing km 13+200 (D. Ch. 21+000) onwards was suggested to re-route the proposed alignment as the alignment between D.Ch. 33+000 (existing km 26+750) till end of the package was proposed to be navigated through forest land keeping technical (4-lane development), social and financial viability in mind but denied by forest department at later stage with various reasons (explained in chapter - 0 under "executive summary") placed as per MoEF norms. Hence, project alignment mainly follows existing road bypassing major settlement, mentioned under option-B (Improvement of Existing Road with Bypasses options).

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2.9 Existing Right-of-way

As per the records available with PWD, NH division, the ROW in town/built-up areas varies from 9 to 15m and in rural areas, ROW vary from 20 to 25m along the entire stretch of NH-306 & NH-37 however, in partially constructed Silchar it is 50 m.

2.10 Road Junctions

There are 8 major road junctions with National highway, State Highways and MDR and 91 minor junctions with village roads and State highways.

2.11 Culverts & Bridges

The inventory data for the existing cross drainage structures, culverts and bridges, are given with details in Chapter 3: Analysis & Interpretation of Engineering Surveys and Investigations.

2.12 Traffic Flow Conditions

There is mixed traffic plying on the Project Highway comprising of trucks, buses, cars, two wheelers, non-motorised vehicles, etc. Five homogeneous sections tabulated below have been considered to know the traffic flow conditions as shown in the traffic report. There is mixed traffic observed on the existing ring road comprising of trucks, buses, cars, two wheelers, non-motorized vehicles, etc. Approximate average speed of motorized vehicle travelling on the ring road is 30 kmph. The Traffic intensity is varying along the different sections of the existing ring road, and the same variation is expected on the proposed bypass also. Congestion of traffic is observed in some section especially in the section between NH-6 and NH-306. This is due to settlements close to the carriageway, commercial establishments, stopping of buses, pedestrian crossing, slow moving vehicles etc.

2.13 Petrol Pumps

There are 4 Nos. of petrol / diesel pump stations present along the project road from Silchar to Vairengte. These stations are being used by vehicular traffic regularly.



2.14 Hospitals and Schools

There are number of schools, colleges and hospitals present along the project road.

2.15 Constraints

There are number of constraints for widening the existing project road. Some of them are:

- Bypass to Silchar town is already proposed by PWD, NH Division Silchar. The map of the Silchar bypass is given in below figure.
- Barak River is running parallel to LHS of existing road from Km 0+000 to Km 9+000. Sonai and rukuni River is also following parallel to the LHS of existing road to continuous length.

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	<p>EIA: Chapter 2: Project Description and Existing Scenario</p>	

- Commercial traffic carrying different commodities from Guwahati and Karimganj (NH-27) uses the project road (NH-37) and SH-39 to reach various parts of Assam and Mizoram state. Improvement of existing road may boost to tourism sector. Improvement of existing road may boost to tourism sector.
- Inadequate existing ROW width at built-up areas,
- Settlements close to project road involving rehabilitation and resettlement action plan,
- Presence of religious structures along the project road – there are approx. 19 nos. of temples, 17 nos of masjid, 3 nos of darga and 06 nos Church along the existing project road.
- Presence of utility service lines like water pipes, electricity lines, telephone and OFC line on both sides of highway,
- Presence of number of matured trees along the project road within EROW.
- Some stretches are flying in hilly area with plantation.
- The existing alignment is also facing so numerous blackspots, which details are provided below.

2.16 Utilities

Utilities like telephone cables, O.F.C. lines and electric lines present along and across the Project Highway. Some of these utilities will be affected by the road widening, thus requiring them to be shifted.



2.17 Environmentally Sensitive Areas

The project road is in operation and likely to be improved / upgraded to 4-lane with bypasses as discussed above. Since, the portions of alignment (2.1 km) falls under forest areas hence, there would be ecological and environmental impact however; necessary measures and precaution will be ensured during construction.

2.18 Government/Private Agencies to be consulted

Following Government departments need to be consulted to seek their consent / guidance form Improvement of Project Road.

- Department of Land Survey & revenue for land/buildings records and acquisition,
- Electricity Department for relocation of LT lines, HT lines, Transformers etc.
- Irrigation, RWS and Town Panchayat for relocation of canal, water supply, sewer lines if any, along the project road
- District Forest Officer of respective district.
- Geological and Mining Department of respective district.
- NH / SH Public Works Departments.
- Industrial Area Development Board,

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2.19 Recommendations concerning the alignment

Along the existing road

The project road follows the existing road for a length of 6.35 Km of NH-37 and 7.5km of existing 2-lane Silchar bypass where following suggestions are made.

- Symmetrical widening i.e. widening on both sides of existing highway for a symmetrical width has been adopted/ preferred. This would avoid acquisition of land/ buildings on a large scale as compared to eccentric widening of existing highway.
- Realignment due to curve improvement.
- Bypasses for major built-up section

Bypass/Realignments/Geometric Improvements

The project road which is presently 2-lane shall be developed to 4-lane divided configuration in open area and built-up areas.

3

Chapter 3- Legal Framework

3 Legal Framework



3.1 Project Categorization

Site reconnaissance survey undertaken for screening and scoping of this project road on environmental considerations followed by environmental field survey and investigation resulted in following key findings:

- This road passes from mining area and agricultural field mostly;
- The project does not entail the encroachment of precious ecology and historical or cultural areas;
- The project does not involve alteration of surface water hydrology but some siltation and erosion anticipated during construction;
- The project does not require dislocation or involuntary resettlement of people. Few temporary commercial and residential structures located within formation width will be shifted. This has been addressed as per the principles of the Resettlement Framework in social volume; and
- Most of the anticipated potential adverse impacts are limited in spatial and temporal extent i.e. short-term (during construction) and mitigative.
- As per Environmental Assessment Guidelines 2003, the project road falls under **Category B project**. As such, an Initial Environmental Examination (IEE) is required, as no significant adverse impact has been envisaged, as mentioned above.
- Projects are classified into the following four categories:

Environment

- **Category A:** A proposed project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment (EIA), including an environmental management plan (EMP), is required.
- **Category B:** The proposed project's potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category "A" projects. An initial environmental examination (IEE), including an EMP, is required.
- **Category C:** The proposed project is likely to have minimal or no adverse environmental impacts. An EIA or EIA is not required, although environmental implications need to be reviewed.

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- Category FI. The proposed project involves the investment of funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities have minimal or no environmental impacts or risks.

Involuntary Resettlement

The involuntary resettlement impacts of supported project are considered significant if 200 or more persons will be physically displaced from home or lose 10% or more of their productive or income-generating assets. For those involving involuntary resettlement, a resettlement plan is prepared that is commensurate with the extent and degree of the impacts: the scope of physical and economic displacement and the vulnerability of the affected persons.



Projects are classified into the following four categories:

- Category A. Proposed project is likely to have significant involuntary resettlement impacts. A resettlement plan, which includes assessment of social impacts, is required.
- Category B. Proposed project includes involuntary resettlement impacts that are not deemed significant. A resettlement plan, which includes assessment of social impacts, is required.
- Category C. Proposed project has no involuntary resettlement impacts. No further action is required.
- Category FI. Proposed project involves the investment of funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all the financial intermediary's business activities are unlikely to generate involuntary impacts.

Indigenous Peoples

The impacts of the developmental work supported project on indigenous peoples is determined by assessing the magnitude of impact in terms of,

- Customary rights of use and access to land and natural resources;
- Socio-economic status;
- Cultural and communal integrity;
- Health, education, livelihood, and social security status; and
- The recognition of indigenous knowledge; and
- The level of vulnerability of the affected Indigenous Peoples community. Projects are classified into the following four categories:

 <p>महामार्ग विभाग M.O.R.T.H. Govt. of India</p>	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 3: Legal Framework</p>	 <p>NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION</p>
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- Category A: A proposed project is likely to have significant impacts on indigenous peoples. An indigenous people plan (IPP), including assessment of social impacts, is required.
- Category B: A proposed project is likely to have limited impacts on indigenous peoples. An IPP, including assessment of social impacts, is required.
- Category C: A proposed project is not expected to have impacts on indigenous peoples. No further action is required.
- Category FI. A proposed project involves the investment of funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all the financial intermediary's business activities unlikely to have impacts on indigenous peoples.

Project Categorization as per Government of India Requirements

The project is Up gradation, Rehabilitation and Strengthening of existing Roads (ODR / SH) within the existing formation width as available on ground. The land acquisition requirement will be prepared by the concern authorities. The project roads do not fall within:



- (a) notified wildlife protected area;
- (b) notified critically polluted area;
- (c) notified environmentally sensitive area and
- (d) Inter-state or international boundary.

Accordingly, as per EIA Notification dated 14th September 2006 and addendum of the Ministry of Environment and Forests, Government of India, this project does not fall under Category A or Category B. Therefore, the project does not require any environmental studies to be undertaken and no environmental clearance required under EIA Notification.

The present report i.e. EIA has been prepared as per ADB's requirement of Category B project, although no environmental assessment is required as per MoEFCC, EIA Notification.

3.2 Proposed Schedule for Implementation

Project implementation duration is considered as two years tentatively starting in October 2018. This excludes project preparation and other pre-construction stage activities. The project is expected to start operation early in 2021.



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3.3 Applicable Statutory Environmental Clearances



The applicability of environmental and other relevant rules and acts has been assessed. The Table 1.4 shows the clearances required during different stages of road works.

Table 3.1 Clearance Requirements

Sl. No.	Type of Clearance / Permission	Statutory Authority	Applicability	Project stage
1.	Consent to Establish under the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974	MPCB	For establishment of construction camp, construction plant, crusher, batching plant etc.	Pre-construction
2.	Consent to Operate under the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974	MPCB	For operating construction plant, crusher, batching plant etc.	Construction stage (Prior to initiation of any work)
3.	Permission to withdraw water for construction from surface water sources such as Rivers/Ponds	Mizoram Irrigation Department	Use of surface water for construction	Construction stage (Prior to initiation of any work)
4	Permission for storage, handling and transport of hazardous materials	MPCB	Manufacture storage and Import of Hazardous Chemical	Construction stage (Prior to initiation of any work)
5	Explosive License	MPCB	For storing fuel oil, lubricants, diesel etc. at construction camp	Construction stage (Prior to initiation of any work)
6	Quarry Lease Deed and Quarry License from State Department of Mines and Geology	Dept. of Mining; Concerned District Administration; SEIAA	Quarry operation (for new quarry) Environmental Clearance from SEIAA and CTE/CTO from MPCB	Construction stage (Prior to initiation of any work)
7	PUC for vehicles for construction under Central Motor and Vehicle Act 1988	Motor Vehicle Department of Mizoram	For all construction vehicles	Construction stage (Prior to initiation of any work)
8	The Bio-Medical Waste (Management and Handling) Rules and amendments.	1998	Due to its contamination and hazardous nature the Bio-Medical Wastes to be handled and treated In compliance to the rules.	MoEFCC, CPCB, And MPCB.

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EIA: Chapter 3: Legal Framework		



Sl. No.	Type of Clearance / Permission	Statutory Authority	Applicability	Project stage
9	E-waste (Management and Handling) Rules,	2011	Due to widespread use of Electronic gadgets and equipments for industries and office complexes.	MoEFCC, CPCB, and MPPCB.
10	Fly Ash notification.	2007	Fly ash in construction activities, Responsibilities of Thermal Power Plants and Specifications for use of ash-based products/ responsibility of other agencies,	MoEFCC, CPCB, and MPCB.
11	Public Liability Insurance Act.	1991	The main objective of the Public Liability Insurance Act 1991 is to provide for damages to victims of an accident which occurs as a result of handling any hazardous substance. The Act applies to all owners associated with the production or handling of any hazardous chemicals.	MoEFCC, CPCB, and MPPCB.
12	The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules,	1996	This rule ensures the preparedness for the emergencies caused by chemical hazards.	MoEF&CC, CPCB, and MPCB.
13	Building and Other Construction Workers (Regulation of Employment and conditions of Service) Act.,	1996	To regulate the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measure and for other matter connected therewith or incidental.	Ministry of Labor and Employment.
14	The Land Acquisition Act.	2013	Set out procedures for acquisition of land by government.	Land and Land Revenue Department.

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
EIA: Chapter 3: Legal Framework		

Sl. No.	Type of Clearance / Permission	Statutory Authority	Applicability	Project stage
15	Central Motor Vehicle Act Central Motor Vehicle Rules.	1988 1989	To control vehicular air and noise pollution. To regulate development of the transport sector, check and control vehicular air and noise Pollution.	Motor Vehicle Department.
16	Ancient Monuments and Archaeological sites and Remains Act.	1958	Conservation of Cultural and historical remains found in India.	Archaeological Dept. GOI, Indian Heritage Society and Indian National Trust for Art and Culture Heritage (INTACH).

4

Chapter 4- Analysis of Alternatives

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
<p>EIA: Chapter 4: Analysis of Alternatives</p>		

4 Analysis of Alternatives

Table 4.1 Analysis of Alternatives

Sl. No.	Factors	Without Project Impacts		With Project Impacts					
		Positive	Negative	No bypasses /re-alignment		Only small Re-alignment at critical sections		With Bypasses	
				Positive	Negative	Positive	Negative	Positive	Negative
1	All weather Accessibility	-	No Access will be present to all remote areas.	-	-	-	-	Road will be accessible all along the year	-
2	Road Safety/ Accident rate	-	-	-	-	-	-	Cachar is congested areas this proposed Bypass will reduce Accident rates & hence increases Safety.	-
3	Transportation/ vehicle maintenance /Operating cost.	-	-	-	-	-	-	Less wear & tear cost, more riding comfort	-



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).



Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 4: Analysis of Alternatives

Sl. No.	Factors	Without Project Impacts		With Project Impacts					
		Positive	Negative	No bypasses /re-alignment		Only small Re-alignment at critical sections		With Bypasses	
				Positive	Negative	Positive	Negative	Positive	Negative
4	Travel time/ increase d speed.	-	-	-	-	-	-	Reduction in travel Time and increased speed.	-
5	Change in Land use pattern.	No Change in Land use pattern	-	-	-	-	-		Change in Land use pattern.
6	Loss of Property and livelihood	No Loss of Property and livelihood.	-	-	-	-	-		Minor Loss of property & significant loss of livelihood due to traffic diversion on bypass.
7	Change in Environmental quality during construction.	No Change in Environmental quality during construction.	-	-	-	-	-	-	Temporary degradation of environmental quality because of vehicular traffic during construction.



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Section : Silchar to Vairengte (Km 0+000 to Km 49+360)



EIA: Chapter 4: Analysis of Alternatives

Sl. No.	Factors	Without Project Impacts		With Project Impacts					
		Positive	Negative	No bypasses /re-alignment		Only small Re-alignment at critical sections		With Bypasses	
				Positive	Negative	Positive	Negative	Positive	Negative
8	Change in Environmental quality after construction.	No Change in Environmental quality after	-	-	-	-	-	Noise pollution because of Proposed Bypass.	Increase in Air pollution due to Increased vehicular traffic.
9	Loss of vegetative cover.	-	-	-	-	-	-	-	Loss vegetative cover along the roadside will be less. But significant loss of Agricultural land due to bypass.
10	Access to basic facilities such as Markets, Schools, Hospitals etc.	-	No Access will be present to all remote areas.	-	-	-	-	Easily accessible.	-



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)



EIA: Chapter 4: Analysis of Alternatives

Sl. No.	Factors	Without Project Impacts		With Project Impacts					
		Positive	Negative	No bypasses /re-alignment		Only small Re-alignment at critical sections		With Bypasses	
				Positive	Negative	Positive	Negative	Positive	Negative
11	Employ men opportunities & local economy growth.	-	-	-	-	-	-	Faster transportation of agricultural l/ commercial / perishable goods to prospectus markets. And local employment generation.	-
12	Others.	-	-	-	-	-	-	Tourism will flourish Improved riding quality & smooth traffic flow. Will reduce accidents in congested Areas.	Loss of business opportunity in the congested populated area.

5

Chapter 5- Environmental and Social baseline settings



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting



5 Environmental and Social baseline settings

5.1 Environmental Profile

5.1.1 Introduction

Project road in Assam State starts from Silchar town at the junction of NH-27 & NH-37 called as Clock Tower, existing km 263+800 of NH-37 up to existing km 257+500 of NH-37 and then proposed to be developed existing partially constructed Silchar bypass from junction of NH-37 & partially constructed Silchar bypass up to cross-junction of NH-306 and continued till end of the package at Vairengte (existing km 43+000 = Des. Ch. 49+360), the border of Assam and Mizoram State. Total design length of the project road is 49.360km. The Project Road rests on one (01) district viz. Cachar. The project road encounters number of habitations. Major Builtup areas on route are Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. Aggregate length of built-up areas along the Stretch is 48% of total length of project road.

The Project Road further navigates via Kolasib & Aizawl districts in Mizoram State as well till Sairang to connect Aizawl city with 4-lane divided carriageway.

5.1.2 Geology and Soil

Assam, which is shaped roughly like a Y laid on its side, is a land of plains and river valleys. Studded with low, isolated hills and ridges that rise abruptly from the plain, the valley is rarely wide and is surrounded on all sides, except on the west, by mountains. Numerous streams and rivulets that flow from the neighbouring hills empty into the Brahmaputra. Although only a small portion of the Barak River valley lies within Assam's borders. Geologically, the Brahmaputra and Barak valleys lie on ancient alluvial sediments, which themselves cover a variety of deposits, are hard sandstone, soft and loose sand, conglomerates, coal seams, shales, sandy clays, and limestone.

The project area falls under cachar district, where the major geomorphic features observed in the area are both structural and topographic „highs“ and „flats“ and are in accordance with the normal first order structural elements suggesting comparatively recent organic movement in the area and immature topography.

The „highs“ comprise areas of Barak, Sonai and Katakhal reserve forests. The total area occupied by the hills is 750 sq. km and the maximum height attained by the anticlinal hills is 512 meters above mean sea level in the Barak reserve forest. It is observed that the central part of these hill ranges which have a north-south trend show the highest elevation. The „flats“ essentially form the central portion of the area and can be called Silchar- Dhalai and Hailakandi- Lala synclinal valleys. The total area occupied by these flat valleys is 900 sq. km. The average elevation of the plains is 30m above mean sea



level. The valleys are broad and flat with low to moderate Bed Relief index (Mathur and Evans, 1964).

The southern foot of E-W running Barail ranges forms the low-lying hilly terrain to the north of Barak River. It is intervened by broad valleys like Dalu and Madhura.

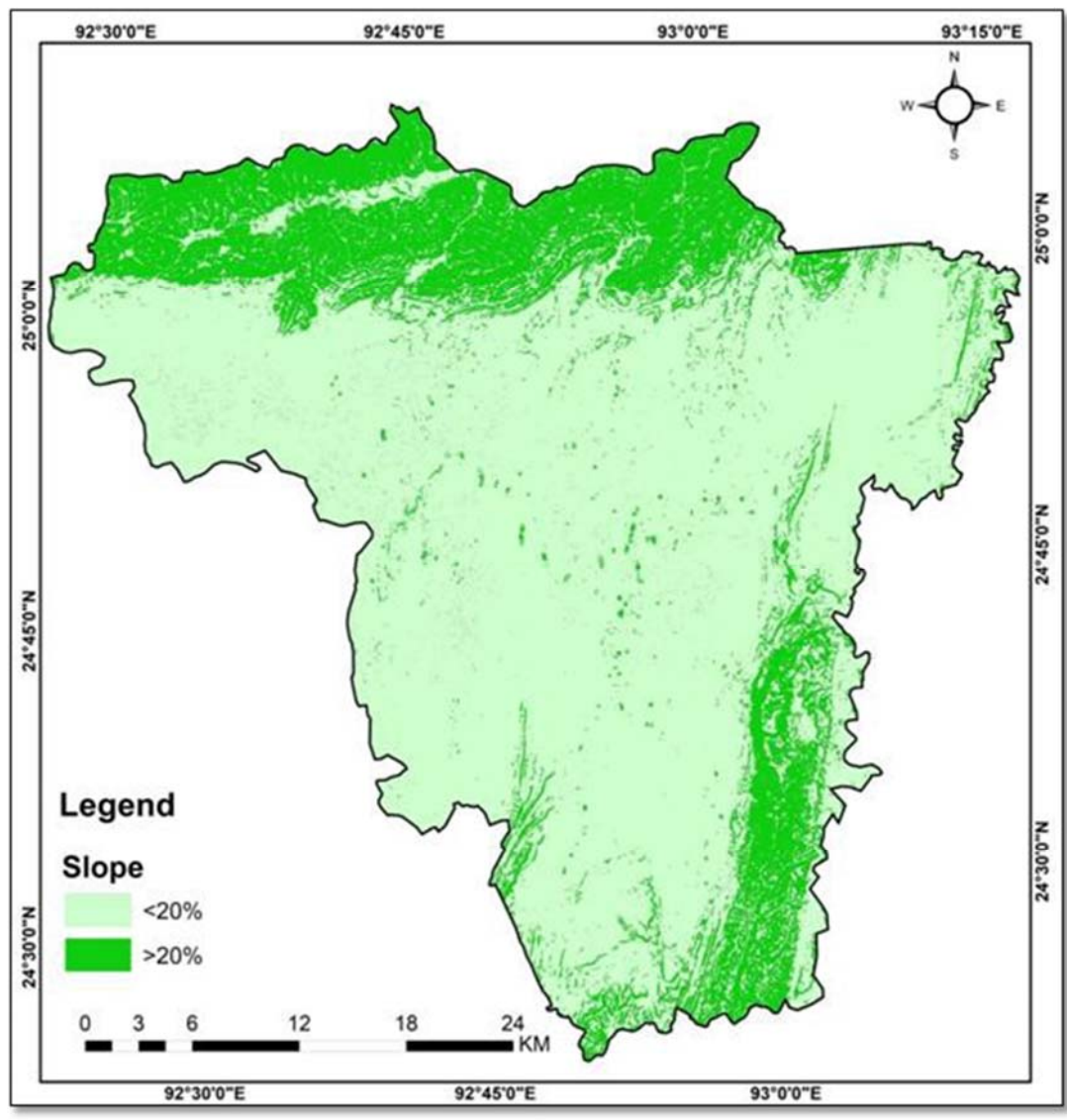


Fig 5.1 Slope Map, Cachar, District, Assam.

One salt spring at Noonkhuli near Lalmati area, Srikona is reported from the area. Gas seepages are associated with the spring and are found within the Bhuban Formation of Surma Group and along the fault line.



According to the slope map prepared using DEM data, around 3012Km² area of the district has less than 20% slope while around 896 Km² area of the district has more than 20% slope. Those area having less than 20% slope are considered ground water recharge worthy area as per GEC 2015 norms.

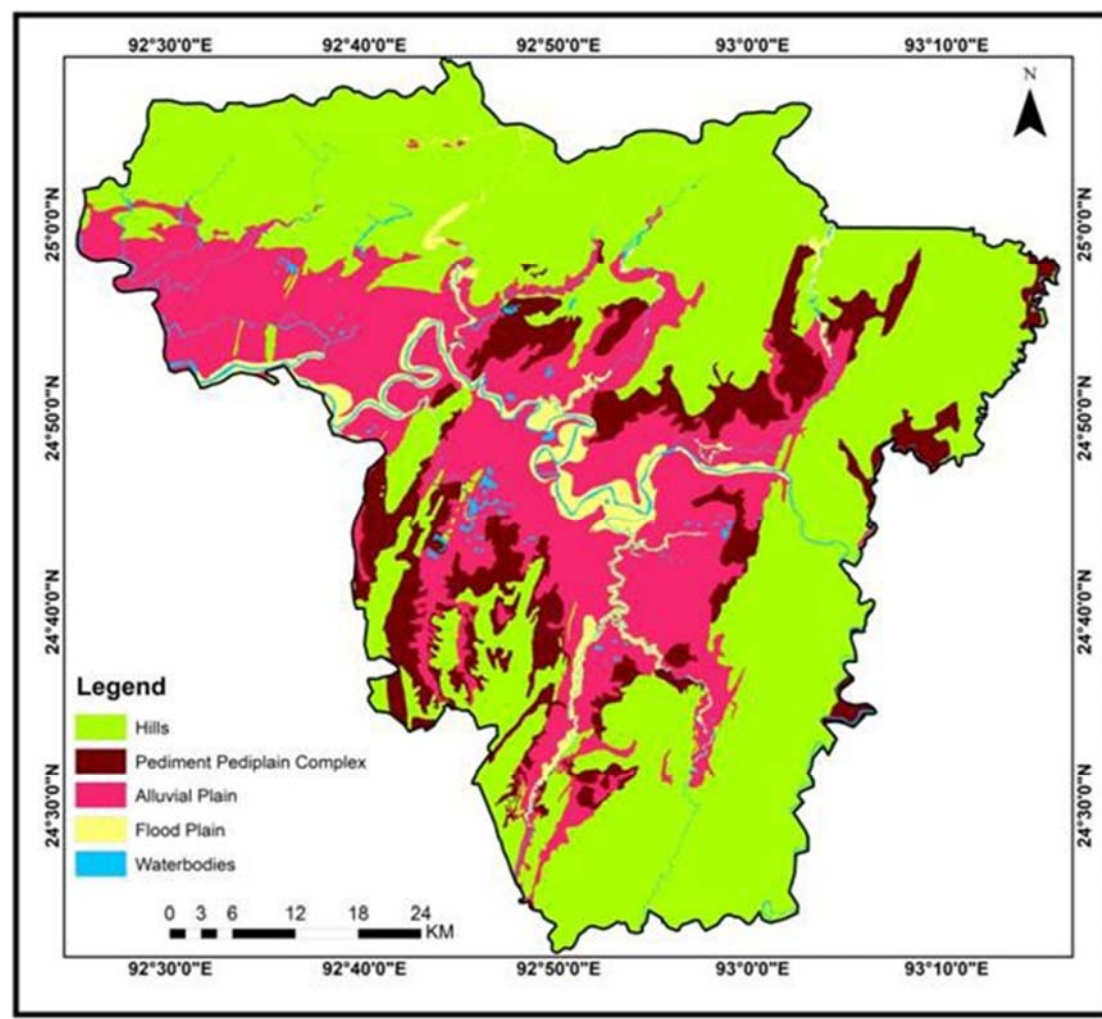


Fig 5.2 Geomorphological Map, Cachar District

Soil:

In Assam state the diversified geological conditions, topographical characteristics, climatic situations, and vegetation types have favour the formation of different types of soil. The soils of Assam can broadly be divided into four main groups, viz. alluvial soils, piedmont soils, hill soils and lateritic soils.

The alluvial soils are extensively distributed over the Brahmaputra and Barak plain and are very fertile. The alluvial soils can further be divided into two main sub types- young alluvial and old alluvial soils. The young alluvial soils are characterized by



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting



modern alluvium deposits. The colour of these soils is generally gray to molted gray. On the other hand, the old alluvial soils occur in some patches of Kokrajgar, Barpeta, Nalbari, Kamrup, darrang, Sonitpur, Lakhimpur and Dhemaji district. Generally, the old alluvial soils are very deep with fine loams to coarse loams in texture. The piedmont soils are confined to the northern narrow zone along the piedmont zone of the Himalayan foothills. The soils are very deep and fine to coarse loamy in texture. The hill soils are generally found in the southern hill regions of the state. These soils are deep, dark greyish brown in colour and fine to coarse loamy in texture. The lateritic soils are extensively occurring in N.C. Hills district and in some parts of the southern Karbi Plateau. These soils are dark and finely textured with heavy loams.

Assam state soils are divided in below categories.

1) Alluvial soils

The alluvial soils are extensively distributed over the Brahmaputra and Barak plain. These soils are very fertile as they formed from the alluvium deposits, deposited by the rivers Brahmaputra, Barak, and their tributaries. The alluvial soils of Assam can be further be divided into two sub-types of based on some micro differences in character such as younger alluvium and old alluvium.

The younger alluvial soil occurs in an extensive belt of the north-bank and south-bank plains including the active flood plains of the Brahmaputra and the Barak rivers. This soil characterized by recent deposition of alluvium, moderately deep to very deep with grey to moulted grey colour. It is mostly composed of sandy to silty loams and slightly acidic in nature. On the riverbanks it is less acidic and sometimes neutral or slightly alkaline. The soil lack in prefile development and is deficient in phosphoric acid, nitrogen and humus.

The old alluvial soil occurs in some patches of Kokrajhar, Barpeta, Nalbari, Kamrup, Darrang, Sonitpur, Lakhimpur and dhemaji districts between the northern piedmont soil belt and the southern new alluvial soils of the Brahmaputra valley. In the south bank districts of the valley, it occurs in a narrow belt bounded between the southern hill soils and northern new alluvial soils. In the Kopili plain covering Nagaon district the old alluvium finds wider extension. The Barak plain, on the other hand, has some elongated patches of old alluvial soil confined between the new alluvial soils of the active floodplain and the hill soils bordering Mizoram. Generally, the old alluvial soil is very deep, brownish to yellowish brown with texture of fine loams to coarse loams and is slightly to moderately acidic.

2) Piedmont Soils:

The piedmont soils are confined to the northern narrow zone along the piedmont zone of the Himalayan foothills. These soils comprise the Bhabar soil and the Tarai soil, covering respectively the Bhabar and the Tarai belt of the Brahmaputra valley. The Bhabar soil occurs in the narrow belt along the Assam-Arunachal boarder extending



east up to the river Subansiri is characterized by unassorted detritus of boulders, pebbles, cobbles, sand and silts. This soil is deep and fine to clay loamy in texture. The Tarai soil occurring just south of the Bhabar soil extends up to Dihang river in some discontinuous narrow patches. This soil varies from sandy to silty loams that remain saturated and support tall grasses in a series of swamps.

3) Hill Soils:



The hill soils are generally found in the southern hilly terrains of the state. The fertility of these soils defers greatly in different regions. These soils are rich in nitrogen and organic matters. On the basis of the physical texture and chemical composition, the hill soils may be divided into red sandy soils and red loamy soils. The red sandy soils are distributed covering as narrow belt along the Assam- Meghalaya border, the Karbi Plateau, southern part of Barail range of the N.C.Hill district and some parts of the foothills along the eastern border of the Cachar district. This soil is very deep and well drained, brownish to yellowish in colour, strongly to moderately acidic with high organic content. The red loamy soils, on the other hand, occurs in the narrow southern foothill belt running along the Assams boarder with Arunachal and Nagaland and also in the southern fringes of the Karbi Plateau and the Barail hills of N.C.Hills district. These soils are very deep, dark grayish brown to yellowish red and fine to coarse loamy. Red loamy soils are slightly to moderately acidic and these lack in nitrogen, phosphoric acid, humus and lime.

4) Lateritic Soils:

The lateritic soils in the state extensively occurs almost entirely over the N.C.Hills district covering some parts of southern Karbi Plateau while few patches are confined to eastern margin of the Hamren sub-division of KarbeAnglong district, southern border of Golaghat district and the northern part of the Barak plain along the foothills of the Barail range. These soils are dark and finely texture with heavy loams and deficient in nitrogen, potash, phosphoric acid and lime.

Table 5.1 Land capability Class

Sl. no	Land capability class	Brief description
1	Ile	Good arable land on gentle slopes, susceptible to slight water erosion, very deep soil, suitable for agricultural development.
2	IIIe	Moderately good land on strongly sloping to steep, susceptible to severe water erosion, deep to very deep soil, suitable for agricultural and horticultural development.
3	IVe	Fairly good land on steep to very steep slopes and hill ridge, highly susceptible to water erosion, deep to very deep soil, suitable for agro-horticultural, sericulture and silvipastoral development.

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Sl. no	Land capability class	Brief description
4	VIe	Land with moderate limitations on very steep, highly susceptible to water erosion, deep to very deep soil, suitable for horticultural plantation and forestry.
5	VIIe	Land with severe limitations on very steep slopes, subject to severe erosion. Unsuitable for cultivation but suitable for social forestry and grazing.

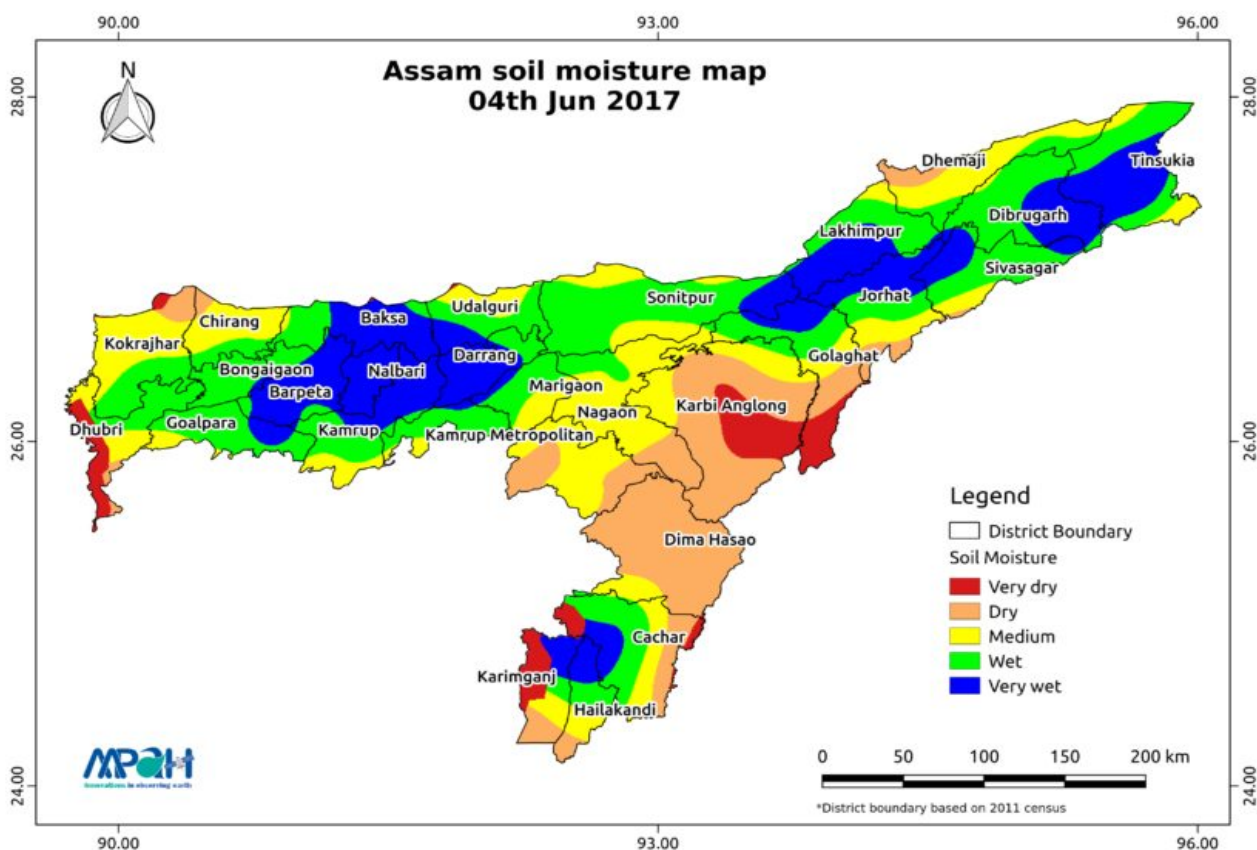


Fig 5.3 ASSAM Soil Map

The physical analysis of soil in Cachar district indicates presence of thick clay deposits of grey colour. There are five ecological situations prevailing in the region are like (a) Beel & Hawar situation (wet land), (b) Alluvial flood prone situation, (c) Plantation crop grown situation, (d) Alluvial flood free situation, (e) Hills and forest situation. The district has different soil textures namely salty-clay-loam, sandy-clay-loam & clay.

Both residual and transported soils are found in the study area. The residual soils on the hills are loamy sands and support dense vegetation with bamboos, bananas and



grass vegetation. Tea is exclusively grown on the hill slopes. The transported soils mostly comprise clay, silts and sands are found in plains. Due to predominance of clay, the soil in the area has low water absorption capacity and as such pools of water are seen accumulated in low lying areas. Due to enormous amount of surface run off

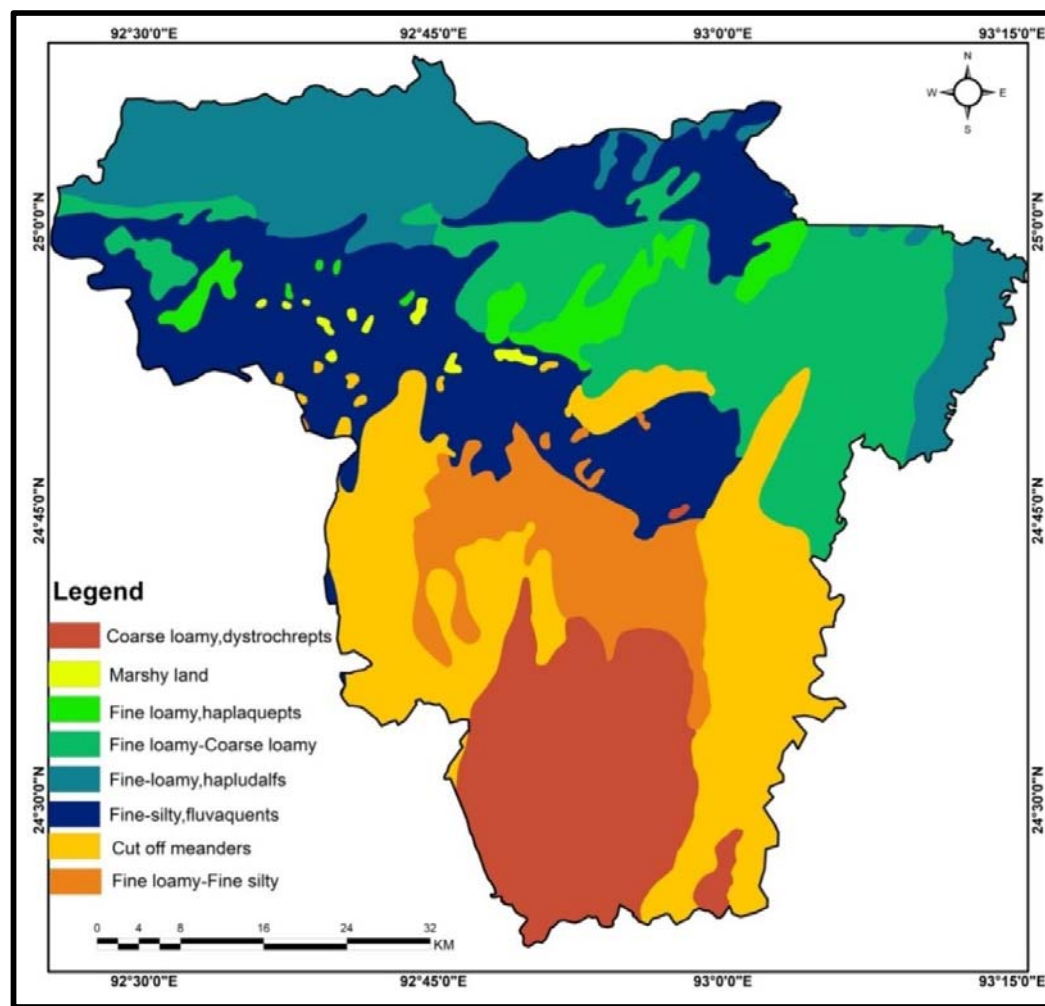




Fig 5.4 Soil Map, Cachar District

during the rainy season the flood plains are enriched every year with the suspended silt and clay brought by the rivers, thus contributing towards annual replenishment of the fertility of the soils where rice, jute and sugarcane are extensively grown. Due to clayey nature of the soil moisture retention capacity is high.

The study area is situated in the Barak Valley of Assam. It is occupied by the folded sedimentary formations of Surma, Tipam, Dupitila, Alluvium groups ranging in age from Lower Miocene (Tertiary) to Holocene (Quaternary). The regional strike of the

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	<p>EIA: Chapter 5: Environmental and Social baseline setting</p>	

folded geosynclinal facies sequences is NNE-SSW. The geological succession of the area is shown below.

Table 5.2 Geological Succession, Cachar district, Assam.

SYSTEM	SERIES	GROUP	FORMATION	LITHOLOGY
Quaternary	Holocene to Pleistocene	Recent	Alluvium	Alluvium, represented by unconsolidated pale to dirty grey silt, sand, clay, silty clay, sandy clay, yellowish brown coarse river sand, gravel and concretions.
				UNCONFORMITY
Upper Tertiary	Miocene to Pliocene	Dupitila	Dupitila	Sandstone, mottled clay, grit, conglomerate, poorly consolidated sand with layers and packets of pebbles, clayey sandstone with ferruginous material and laterites.
				UNCONFORMITY
	Miocene	Tipam Group	Tipam	Fairly bedded fine to medium grained sub arkosic sandstone with sandy shale and siltstone
				UNCONFORMITY
	Miocene	Surma Group	Bokabil	Shale, sandy shale, siltstone, mudstone and lenticular coarse ferruginous sandstone.
			Bhuban	Alternation of sandstone, sandy shale, thin conglomerate shaly in the middle part
			UNCONFORMITY	
	Oligocene	Barail Group	Renji Formation	Massive, bedded sandstone
			Jenam Formation	Shale, Sandy shale and carbonaceous shale with interbedded hard sandstone.
			Laisong Formation	Well bedded compact flaggy sandstone and subordinate shale.

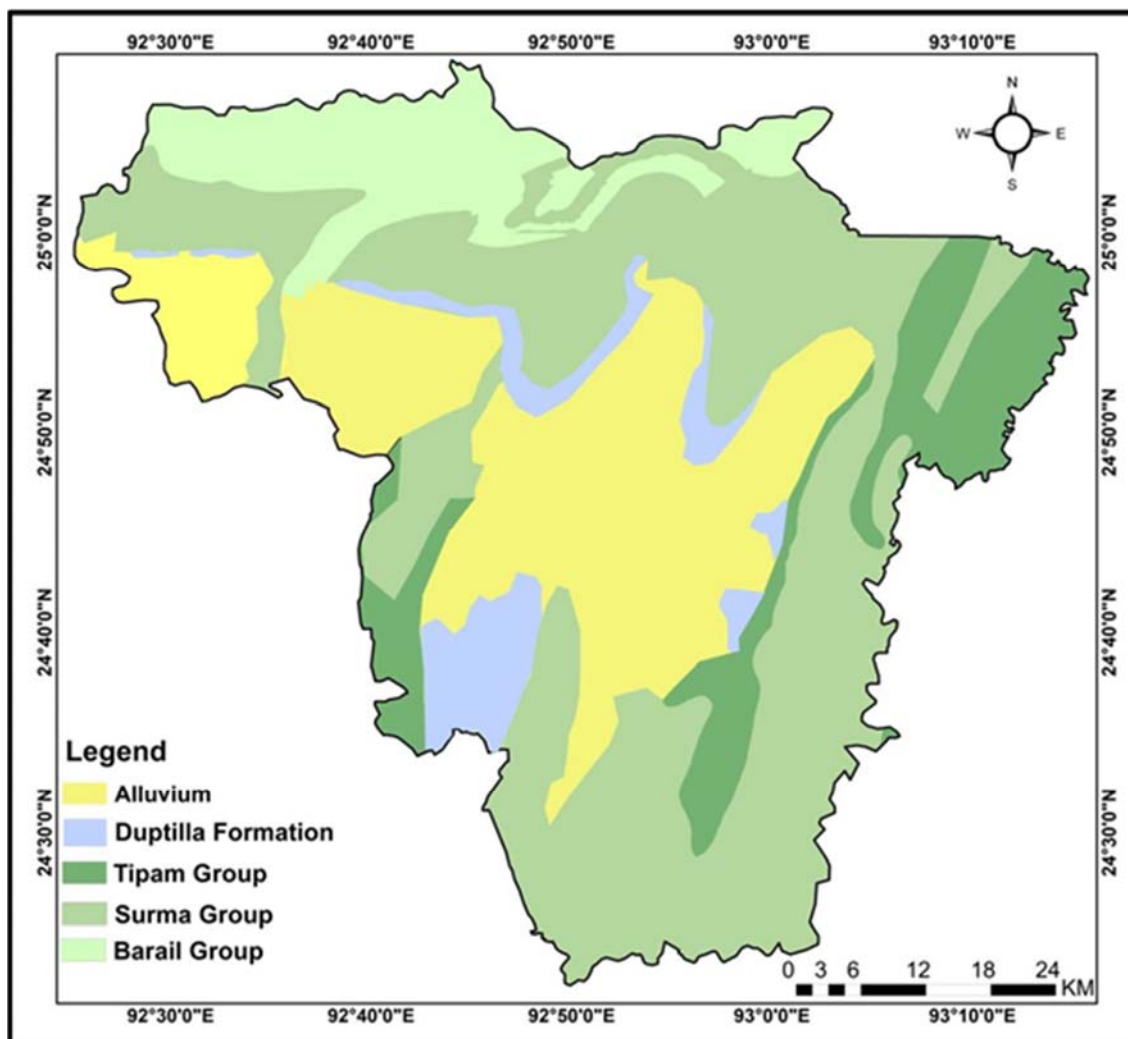


Fig 5.5 Geology Map Cachar District

5.1.3 Environmental Settings

Physical Environmental Settings:

Seismicity:

Assam is a multi-hazard State prone to floods, earthquake, storms and landslide besides manmade disasters. Also, the State faces acute flood & erosion problem. Assam has a history of disasters ranging from large earthquakes to severe floods

Earthquake most probably occurs due to movements along the faults that have evolved through geological and tectonic processes. Northeast India is considered one of the six most seismically active regions of the world. As per the plate tectonics, Assam is in the eastern-most projection of the Indian Plate, where the plate is thrusting underneath the Eurasian



Plate creating a subduction zone and the Himalayas. This led the state of Assam fall under the **seismic zone V** making the entire State prone to earthquake of moderate to very high intensity. The State has experienced two major earthquakes in the year 1897 and 1950. The intensities of these two earthquakes were 8.7 and 8.5 on the Richter scales respectively.

Combined with this hazard, is the vulnerability profile of the towns and cities where the growth is haphazard and uncontrolled. Huge urban population combined with poor quality and ill-maintained infrastructure, low quality building stock, and lower resilience of the high-density society increases the risks to earthquakes in the urban centres. Moreover, urban infrastructure is often designed and constructed without satisfying minimum safety standards.

Silchar Town: Cachar district is vulnerable to the natural disaster like floods, cyclones, earthquakes, Hailstorm etc. The Silchar city is the gate way of three districts of Barak valley as well as Tripura, Mizoram and Manipur. Considering the high Social and economic importance of Silchar town it is evident that any disaster here will have implications not only on the District and State but on the region as well. Hence to improve upon our capabilities with respect to Mitigation, Preparedness, Response and Recovery of any disaster situation it is important to have a City Disaster Management Plan (CDMP) in place.

Hazard, Risk, Vulnerability & Capacity Analysis of Silchar District:

Table 5.3 Disaster Specific History of the District.

Disaster Specific History of the District		
Sl. No.	Disastrous Events	Year of Occurrence
1	Flood	1998,2004,2007,2010,2022
2	Earthquake	1984,2009
3	Landslide	-----
4	Drought	2009
5	Storms	2004, 2010
6	Fire Accidents	2009, 2010
7	River Erosion	2004,2007,2010

Table 5.4 Types of Disaster

Sl. No	Type of Disasters	Time of Occurrence	Potential Impact / Probable Damages	Vulnerable Areas
1	FLOOD	April – Sept	Loss of life, livestock, crop and infrastructure.	Kalibari Char, Tarapur, Ghoniwala, Topobor areas, Itkhola, Koratigram.

Sl. No	Type of Disasters	Time of Occurrence	Potential Impact / Probable Damages	Vulnerable Areas
2	EARTHQUAKE	Jan – Dec	Loss of human life, paddy, infrastructure, communication network, houses, etc.	Entire town.
3	LANDSLIDE	Apr – Sept	Loss of human life, livestock's, paddy, infrastructure, communication network, houses, etc.	Meherpur, College Road.
4	DROUGHT	May – Aug	Damages to houses, injuries, etc.	Entire town.
5	STORM	Mar – June	Damage crops	Entire town.
6	RIVER EROSION	April – Sept	Loss of life and properties.	Kalibari, Char, Tarapur, Goniala, Itkhola, Koratigram.

Landslide

Continued deforestation and demand for more and more agricultural land has also led to the destabilization of hill slopes which during the monsoons come down as landslides.

In the recent past Guwahati city has witnessed a number of devastating landslides in its hilly belt. This is mainly because of inadequate urban land-use planning and the demand for land becomes such that communities build houses in areas which are environmentally unstable with risks of landslides.

Silchar district has found no landslides record in recent years as per above table under **“Disaster Specific History of the District”**

Climate and Meteorology

The climate of Assam is typically ‘tropical monsoon rainfall’ type, with high levels of humidity and heavy rainfall. People here enjoy a moderate climate all throughout the year, with warm summers and mild winters. In the monsoon season, the whole state comes alive with the beauty of nature. Climatic variations can be seen regionally. While the plains of Assam have a tropical climate with high humidity, the hills have a sub-alpine type of climate. There are four distinct seasons in Assam - summer, monsoon, autumn and winter. The best time to visit the place is the winter season i.e., from October to April, which is also the festive season of Assam. Let us gather some more information on the weather and climate of Assam



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The summer season in Assam starts from the month of March and extends till the end of June. The season is characterized by extreme humidity and frequent showers. The average temperature during this time of the year is between 35 and 38 degrees Celsius. In fact, the mercury level never rises more than 38 degrees, even in the hottest month of the year. So, light cotton clothes are the best option during summers.

This season brings relief from the scorching heat of the summers. The neighbouring areas of Cherapunji and Mawsynram have the highest rainfall in the world. The average annual rainfall in the state is around 70 inches in the west and around 120 inches in the east. In the afternoons, thunderstorms known as Bordoicila are very common. The season covers the entire state with a green blanket.

The winter season in Assam is basically characterized by scanty rainfall and misty mornings and afternoons. It starts in November and continues till the month of February. The mercury reading at this time of the year is around 6 to 8 degrees Celsius or 43- 46-degree Fahrenheit. This is the best time to visit the north-eastern state of Assam.

In Assam, spring (March- April) and autumn (September- October) present pleasant seasons, with moderate temperature and rainfall. These are amongst the popular months for tourist rush. As it is neither too cold nor too hot, you don't have to carry any special type of garment for these seasons. Therefore, if you are planning a trip to Assam, spring and autumn may be your choice.

In the project district, Cachar enjoys tropical climate with temperature varying from 35°C in summer to 15°C in winter. The humidity varies from 32% to maximum of 80% during July and October. The average annual rainfall is 3000mm, 80% of which is precipitated during the period from April to October. The period from December to March is practically dry. The hydrometeorological details have been furnished in below table and the graphical illustration of the rainfall data is shown below respectively.

There are 3 rainfall stations in the district at Silchar, Kumbhirgram and Silkuri. The coefficient of variation and standard deviation of those rainfall station located in the district are 16.1%, 12.6%, 14.8% and 524mm, 428mm, 454mm respectively.

Table 5.5 Hydro meteorological data, Cachar district, Assam

Parameter	Details
Average annual rainfall	3291 mm
Maximum rainfall	March (1202 mm)
Minimum rainfall	December (0mm)
Average annual temperature	26 ° C
Maximum temperature	October (33.4 °C)
Minimum temperature	January (13.2°C)

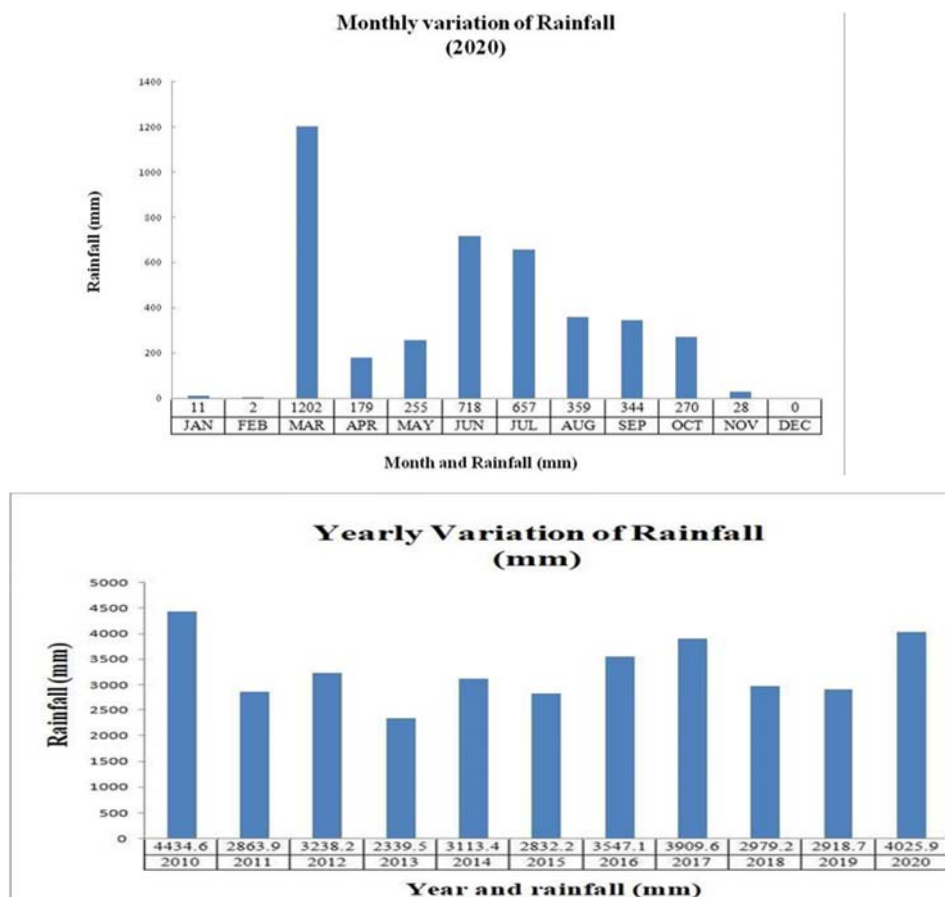


Fig 5.6 Graphical illustration of Average monthly rainfall and yearly rainfall variations

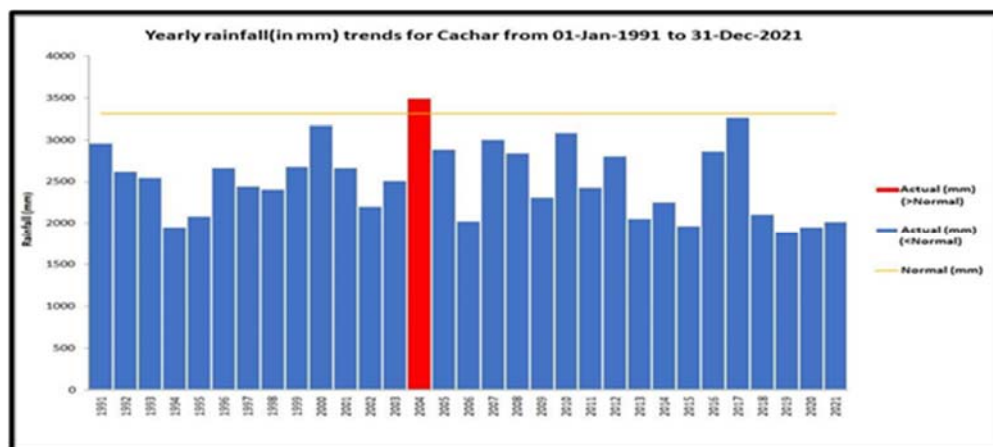


Fig 5.7 Graph showing yearly average rainfall in Cachar district from 1991-2021

Table 5.6 Annual variation of Temperature, Cachar district, Assam

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEPT	OCT	NOV	DEC
MIN TEMP °C	13.2	14.1	25.2	20.1	23.6	25.8	26	26.4	26	25.6	18.1	14.1
MAX TEMP °C	24.1	27	32.4	33.2	32.1	31.9	32.4	30.2	33.1	33.4	29.8	26
AVG TEMP °C	18.65	20.55	28.8	26.65	27.85	28.85	29.2	28.3	29.55	29.5	23.95	20.05

Water Resources

The study area is rich in surface water resources. Such water resources include the rivers streams, backwaters, irrigation tanks, ponds, etc. The nearby large water body in this area are Brahmaputra River and Barak River. Many people depend on these water resources especially during dry seasons these water resources serves an important domestically purposes and economic resources.

Water quality: the water samples were taken supply water of five different locality. To understand the chemical quality of groundwater in the study area and its suitability for domestic, drinking and agricultural utilization, pre monsoon and post monsoon water samples were collected from the existing 18 GWMS under NHNS, newly established 39 Key wells under NAQUIM and additional 30 wells under special studies for Arsenic concentration in ground water. The samples collected were for analysed for base, iron, heavy metals, arsenic and uranium.

Ground water occurs in phreatic condition in shallow aquifer and in semi-confined condition in deeper aquifer. Flow of ground water is from the North to South in northern parts and from South to North in southern parts of the Cachar district. The area mostly represents a waterlogged area. The pre-monsoon water level is 1.05 m bgl while the post-monsoon water level is 1.62 m bgl. There is no significant decline observed in long term trends. The water level fluctuation in general is less than 1.00 m. However, in fringe areas of Mohanpur, Srikona, Rangpur, Kashipur and Rajabazar, it ranges from 4.41 to 6.96 m.

From quality point of view, the ground water in Cachar district is suitable for domestic, irrigation and industrial uses except for some isolated areas where high concentration of iron is observed. The estimated Annual replenishable ground water resources are 2239.21 mcm against net annual ground water draft of 32.65 mcm. The projected demand for domestic and industrial use of ground water upto 2025 is only 52.46 mcm. The stage of ground water development in the district is only 2%. The present ground water utilization is mainly for domestic uses. As per record, only 1 scheme with ground



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water is operated which irrigates 12 ha of land in Rabi and 10 ha land in Kharif season. Public Health Engineering Department, Govt. of Assam has constructed so many shallow and medium tubewells in the district for rural water supply.

Status of Ground Water Development It has been observed that the ground water development in Cachar district is only 2% against the availability of ground water resources in the tune of 2,239 mcm. There is almost no deep tube well scheme for irrigation purposes. The only utilization of ground water is through shallow tube well (50 m depth) and deep tube wells for water supply in the district. The alluvial deposit comprising sand, clay, silt with occasional gravel has a good thickness in the central part of the district. The deep tube wells constructed by C.G.W.B. reveal medium thick aquifer zones intercalated with clay bands down to depth of 300 m. These tube wells have medium yields up to 8 m³/hr. Because of fine nature of the aquifer materials, sand rushing to the well screen reduces the ultimate yield of the tube well. Shallow tube wells down to 50 m depth are feasible in the fringe areas where the alluvial patch thins out and area is dominated by semi-consolidated Dupitila and Tipam rocks. The maximum discharge of such tube wells is up to 8 m³/hr. Such tube wells tapping clean aquifer zones are feasible in the low lying mounds and hills dominated by young Tertiary rocks. Dug wells are less feasible in the alluvial plains of the district. The silty and clayey nature of the shallow aquifer zones tapped by dug wells can not yield much and as a result, heavy drawdown resulting complete dryness of the zone. The dug wells are however, feasible in low mounds and hills of Tertiary rocks surrounding the plain and in fractures of the hard rocks. At the base of Tipam hills, such dug wells maintain constant water level throughout the year as observed in field. The district is represented by depressions in its western and central parts resulting water logged conditions. Some of such structures are permanent water bodies known as 'beel'. Because of clayey nature of the superficial layers and seepages from the surrounding hills, the surface sustains the water and prevents percolation to underground aquifers. The frequent flood in the district spoils the quality of soil resulting water logging. Presently, this problem of water logging in the district creates hazards for irrigation of land during cultivation.

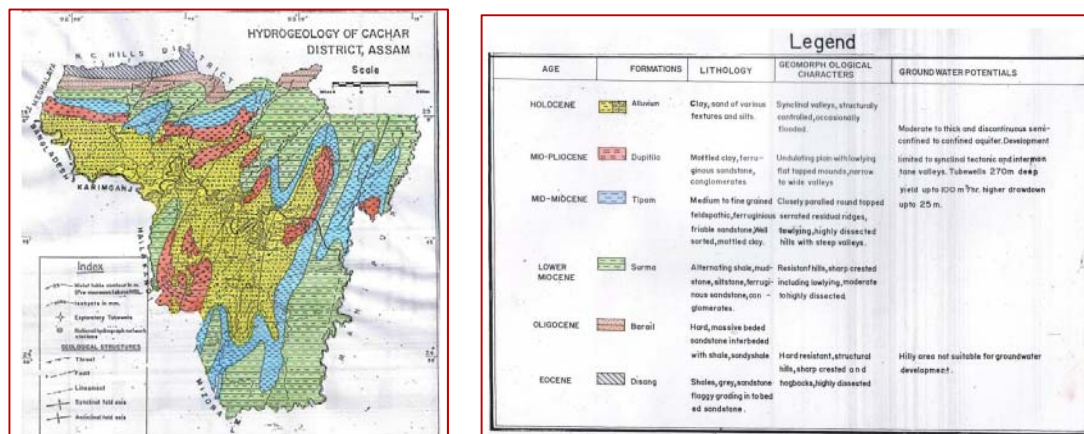


Fig 5.8 Water Quality of the project area

Brahmaputra River

The river originates from the Kailash ranges of Himalayas at an elevation of 5300 M. After flowing through Tibet, it enters India through Arunachal Pradesh and flows through Assam and Bangladesh before it joins Bay of Bengal. The significance of the Brahmaputra (a male river, also known as a Red River) arises as a result of its spatial positioning and perennial nature. Being one of the largest river systems on earth, it defines socio-cultural life in Assam, other North-eastern states and neighbouring countries like China and Bangladesh. The Brahmaputra makes one of its most interesting journeys in Assam. The river divides the state into two halves, also creating a distinct north and south bank. The tributaries of the north bank descend from high mountains, and travel through rocky terrain, over boulders and pebbles. On the south, it has a flatter trail with deep meandering turns. The Brahmaputra also flows through and is instrumental in the creation of over six wildlife havens in the state. Life along an ever-changing river poses as many challenges as blessings. Brahmaputra rises during the monsoon and submerges more than two-thirds of life around it every year, including the famous Kaziranga National Park (pictured above). In Kaziranga animals like rhinos cross over to the higher grounds of Karbi-Anglong to escape the floods, but a national highway and tea estates along the route get in the way. Several unable to cross over perish in the floods. In the Brahmaputra River system, 126 species of fish have been recorded out of which 41 species are commercially important. Freshwater fish like catfish (pictured above), and carp are mostly commercially traded. There is also the case of unchecked fishing where stray incidents of fishing on canals and streams have been observed. In 2017, rising water pollution followed by increasing muddiness, or turbidity, resulted in the decline of the number of fish caught in Guwahati. Other human-induced threats such as construction of dams and use of motorboats for transportation further affect the health of the river. Fishing continues to be the main activity of this riparian tribe. Over the years, they have moved on from using traditional tools of fishing such as chaloni — a type of handmade bamboo sieve



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used to capture fish — to readymade hand and fishing nets. “They often catch the fish between their toes and fish it out with their hands. They spend hours immersed in water to fish,” says Mukherjee.

Barak River

The Barak River rises from the Manipur hills, south of Mao in Senapati district of Manipur at an elevation of 2,331 m. It flows then along Nagaland-Manipur border through hilly terrains and enters Assam. The main tributaries of the river Barak are Katakhal, Jiri, Chiri, Modhura, Longan, Sonai, Rukni, and Singla. Throughout the Barak valley, the Barak river's channel position has varied significantly, with a considerable northward trend to the west of Silchar. The Barak valley consists of three administrative districts of Assam - namely Cachar, Karimganj, and Hailakandi. The Barak is the second largest river system in the Northeast India as well as in Assam. Fishing in the upstream of Barak is an important source of income for the people living in the catchment areas. Angling, throwing nets, laying traps, throwing spears, using fish stupefying leaves and barks are some of the traditional methods practised by the tribal communities. Tea is the important economic activity and Barak Valley have also its proportional share of tea garden in comparison to Brahmaputra valley to sustains its economy from time to time. There are plenty of oil and natural gas under the surface of Barak valley as well to run the economy as a separate state. The Barak is among the richest rivers in the world as to aquatic biodiversity, as it contains more than 2,000 species of fish.

Drainage

Barak river and its tributaries control the entire drainage system in the area and inundate large area annually. The Barak River originates in the southern slopes of the mountain ranges north of Manipur and after flowing to north again touching the northern top of Mizoram and then it flows westward through Cachar district and joins the Kushiara river, ultimately meeting the Surma and forms the Meghna in Bangladesh. The upper reaches of Barak are marked by steep banks and several falls, and the river is highly meandering with many oxbow lakes. The total length of the river up to its out fall in Meghna is 900km of which 560 km is within the Indian Territory. The catchment area of Barak River up to Badarpur is 25900 sq km.

The anticlinal hill ranges from the watershed from which various drainage channel emerged. The common drainage pattern is sub parallel to parallel and dendritic. In general, drainage pattern of the area is in conformity with the topography, which area structurally controlled.

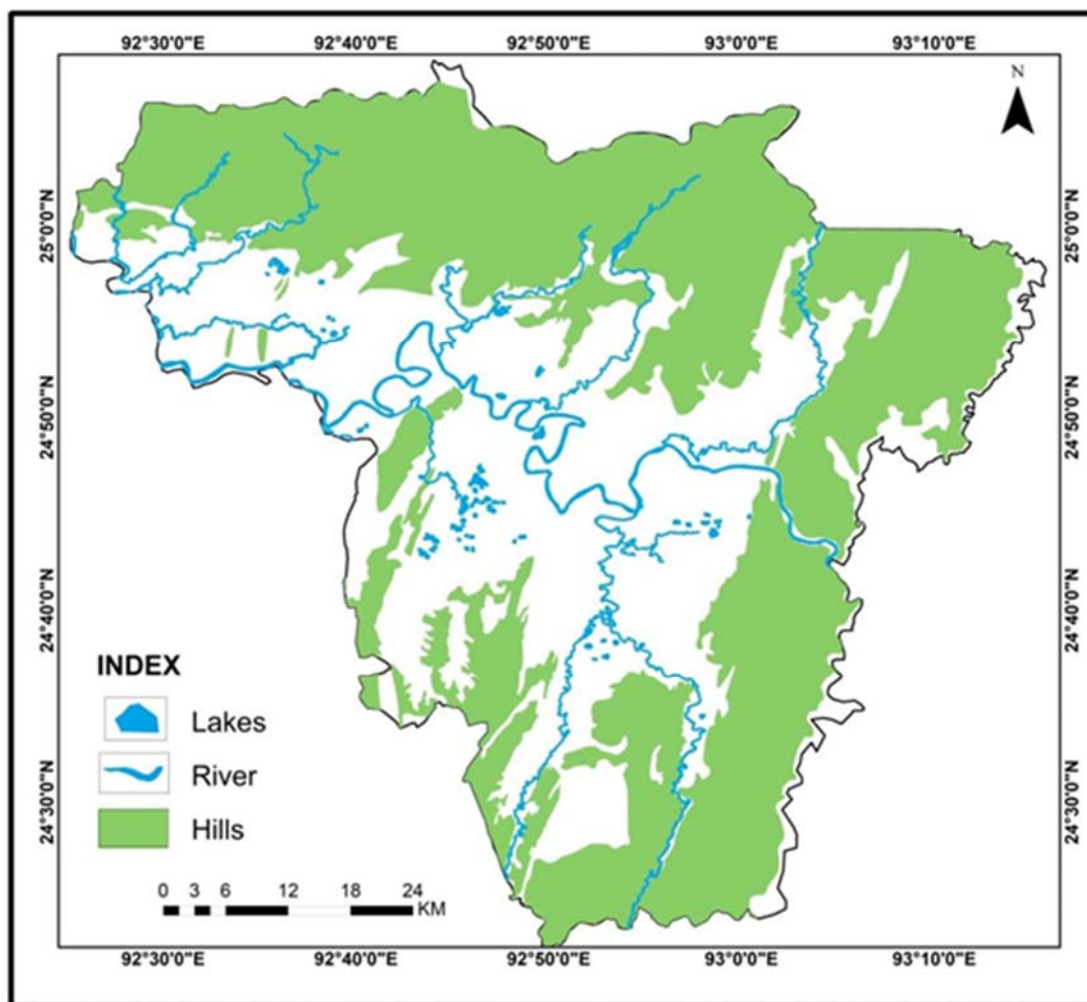


Fig 5.9 Drainage Map, Cachar District, Assam

Crops

Among the 15 agro-climatic regions of the country, categorized/identified on the basis of homogeneity in agro characteristics, Cachar falls in the Barak Valley zone. The agro climatic conditions of the district are conducive for various agricultural activities like development of the plantation crops viz., tea, rubber, cashew, coffee, areca nut, coconut and also aromatic plant like Patchouli. The types of land available in the district are classified as: medium land 69048 Ha, high land 11642 hectares, low land 19512 hectares, very low land 10792 hectares and beel area 4735 hectares.

Crops cannot be grown in more than 20 percent of geographical areas of the district during April to September due to water stagnation. On the other hand, due to lack of rain from November to April, most of the cultivable land remains fallow during the period. The district falls under Barak River basin. The district has a total forest cover of



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2225 sq.km area which is 58.77 percent of its total geographical area as per the estimates of Forest Survey of India. The dense forest cover in the district is 45 percent while 55 percent of the forest cover is under open forest. The district is a heterogeneous plain composed of both lowlands and high hills and level plains. Actually, the whole of the district lies at the foothills of the nearby states of Manipur and Mizoram and that of the Dima Hasao district of Assam.

Majority of the population depend on cultivation. In the study area, agriculture is rain fed and paddy is the principal crop. The pre monsoon rain (February-April) helps for growing Autumn Paddy and Kharif vegetable, normal monsoon (May – September) helps for growing winter paddy and in case of excess rainfall it causes damage to crops and livestock. The post monsoon (October – November) shower helps in panicle initiation stage of paddy crop. If sufficient shower is not received, then it causes little dry spell condition in October on the other hand excess shower sometimes delays the cultivation of Rabi crops. Winter months (December – January) remains generally dry with scanty rainfall. Double cropping pattern is not observed in all the parts mainly due to lack of irrigation facility. Some of the important crops are Paddy, Black Gram, Green Gram, Pea, French, Bean, Arhar, Rape & Mustard, Linseed Sesamum, Kharif Vegetable, Rabi Vegetable, Sweet Potato, Potato, Chilli, Turmeric, Zinger, Black Pepper, Areca nut, Coconut, Pineapple, Litchi, Banana, Mango, Guava, Jack fruit, Assam Lemon, Orange, Papaya, Cashew nut, Other Indigenous fruit crops. Cropped area details are as follows:

Total geogr aphic	Cultivable Area (Ha)	Net cropped area (Ha)	Gross cropped Area (Ha)	Cropping intensity	Autumn Paddy (Ha)	Winter paddy (Ha)	Summer Paddy (Ha)
378600	146219	125000	188765	150.94%	8346	93845	8865

The surface and sub- soil being highly porous, it's retentively of water is low. Consequently, the district faces the unique paradoxical problem of scarcity of water in the midst of plenty. The cropping intensity is only 150.94%, net irrigated area is 3913 ha and Gross irrigated area is 19101 ha. Average Paddy Productivity is 4.32 mt per ha

The district holding total farmers are 207930 nos, where landless farmers 69726 nos, marginal farmers 78315 nos, small farmers 45304 nos, medium farmers 12292 nos and large farmers are 2293 nos.

The cropping intensity is to be increased to attain self-sufficiency in food production. According to the Agriculture.

The Cachar District has classified as five Agro Ecological Situation (AES) as details below.

Table 5.7 Classification on Agro Ecological Situation (AES)

Sl.No.	Name of Agro Ecological Situation	Characteristics of each Agro Ecological Situation
I	Alluvial Flood Free	Physiology is broad mender plains, narrow valley in undulating plains, gentle slope. Soil-Old Mountain alluvium, sandy/fine loamy, upland, medium lands and lowlands, rice as mono crop or double crop, or rice in sequence with vegetable/potato/mustard/pulse in upland and medium lands. Sali rice as mono crop or in sequence with ahu in lowlands.
II	Alluvial Flood Prone	Physiography is broad mender plains, flood plains, very gentle slope, Soil-old riverine alluvium and old mountain alluvium, sand fine loamy, medium to low land inundated during monsoon, ahu rice followed by late Sali /vegetable/potato/oilseeds, late sali and vegetable as mono crop.
III	Beels and haors	Physiography is low lying water bodies, soil –peat soil-organic soils, fine loamy, perennially waterlogged situation, water level recedes during winter, Boro rice as mono crop, natural fisheries.
IV	Piedmonts and plantation crop growing	Physiography is dissected foothills, low hills, undulating topography with tillahs and narrow valleys, gentle to moderate slope. Soil-mostly non laterized red soils, old mountain alluvium, fine silty /fine loamy. High lands, hillocks detraital valleys, tillahs with narrow valleys. Main crops are Tea, sugarcane, pineapple, fruit trees and vegetable are the main crops.
V	Hills and forest	Physiography is high hills and dissected foot hill regions, undulating lower hills and hillocks, steep slope. Soil mostly non-laterized red soils, laterite red soils, sandy /loamy /coarse loamy, fine silty/fine loamy. Lower foothills/hillocks to high hills, reserved forests and mixed rain forests, jhooming in southern hills, mixed cropping in forest villages, sal teak and bamboo are natural vegetations.



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Following table shows Area and Production of various crops in Cachar District.

Table 5.8 Area and Production of various crops

Sl. No.	Major field crops	Area ('000 ha)								
		Kharif			Rabi			Summer		
		Irrigate	Rainfe	Tota	Irrigate	Rainfe	Tota	Irrigate	Rainfe	Tota
1	Rice		87.53	87.5		10.61	10.6		14.70	14.7
2	Maize					0.094	0.09			
3	Wheat					0.083	0.08		0.083	0.08
4	Sugarcane								0.232	0.23
5	Jute		0.075	0.07						
6	Black gram		0.125	0.12						
7	Gram					0.052	0.05			
8	Mung		0.031	0.03						
9	Pea					0.564	0.56			
10	Lentil					0.019	0.01			
11	Lathyrus					0.934	0.93			
12	Other rabi					4.00	4.00			
13	Rapeseed &					1.98	1.98			
14	Sesumum					0.184	0.18			
15	Linseed					0.043	0.08			
16	Nizer					0.029	0.02			

Table 5.9 Area and Production of Horticultural crops

1.7b	Horticulture crops - Fruits	Area ('000 ha)		
			Irrigated	Rainfed
	Banana	2.80		2.8
	Pineapple	1.41		1.4
	Popaya	0.35		0.3
	Orange	0.052		0.05
	Assam lemon	0.626		0.62
	Guava	0.365		0.36
	Litchi	0.292		0.29
	Jackfruit	1.09		1.0
	Mango	1.25		1.2
	Other fruits	0.0667		0.06

*Source: District Horticultural Department, Cachar.

5.1.4 Biodiversity:

a) Forest covers:

The State of Assam; criss-crossed by mountains, valleys and an intricate river system; is located in the eastern most part of India. Topographically the state can be divided in to three parts viz the Brahmaputra valley, the Surma valley and the mountainous Assam Ranges. The recorded forest area of Assam is 26,832 sq km accounting for 34.21% of its geographical area. According to their legal status, Reserved Forests constitute 66.58% and Unclassed Forests 33.42% of the total forest area. The protected

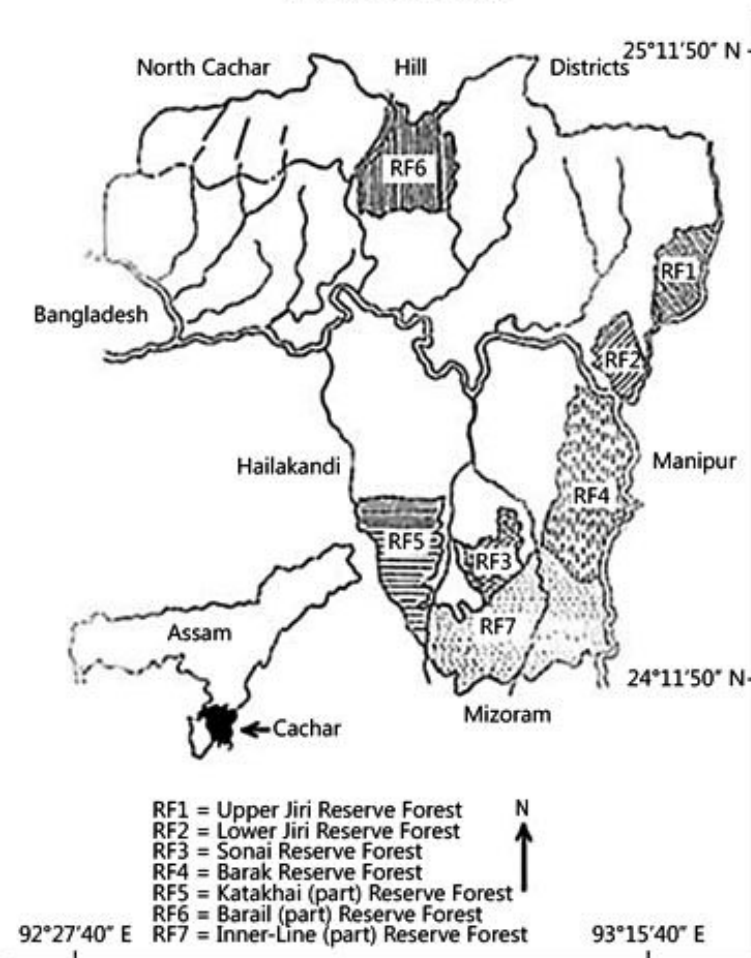


area network of Assam includes 7 National Parks and 18 wildlife sanctuaries covering an area of 4938.53 km².

Forest type mapping using satellite data has been undertaken by the Forest Survey of India with reference to Champion and Seth Classification. As per this assessment, the state has 18 forest types belonging to five forest type groups viz Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous, Tropical Dry Deciduous and Sub Tropical Pine Forests.

Cachar district is located in the southernmost part of Assam. It is bounded on the north by Barail and Jayantia hill ranges, on the south by the State of Mizoram and on the west by the districts of Hailakandi and Karimganj. The district is mostly made up of plains, but there are a number of hills spread across the district.

Map of Cachar district showing different reserve forests
Scale: 1 cm = 4 km





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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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The district has a total forest cover of 2225 sq.km area which is 58.77 percent of its total geographical area as per the estimates of Forest Survey of India. The dense forest cover in the district is 45 percent while 55 percent of the forest cover is under open forest. The District is a heterogeneous plain composed of both low lands and high hills and level plains. Actually, the whole of the District lies at the foot hills of the nearby states of Manipur and Mizoram and that of the Dima Hasao district of Assam. The district of Cachar is the home of a large number of Tea Gardens of the State. Lakhimpur is the richest pine - apple growing area in the country, again on the bank of Barak.

Table 5.10 Forests cover of Cachar District



District	Geographical area (GA)	Very Dense Forest	Moderately Dense Forest	Open Forest	Total	Percent of GA
Assam	78.438	2,794.86	10,278.91	15,252.74	28,326.51	36.11
Cachar	3.786	93.00	1,077.58	1,051.76	2,222.34	58.70

Project Alignment: project road in Assam State starts from Silchar town at the junction of NH-27 & NH-37 called as Clock Tower, existing km 263+800 of NH-37 up to existing km 257+500 of NH-37 and then proposed to be developed existing partially constructed Silchar bypass from junction of NH-37 & partially constructed Silchar bypass up to cross-junction of NH-306 and continued till end of the package that ends. However, from Km 7+950 of NH-306 till end of package that ends at Vairengte (existing km 43+000 = Des. Ch. 49+360), the border of Assam and Mizoram State. Total design length of the project road is 49.360km. The Project Road rests on one (01) district viz. Cachar. The project road encounters number of habitations. Major Builtup areas on route are Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. Aggregate length of built-up areas along the Stretch is 48% of total length of project road.

However, portion of project alignment encounters forest land i.e., from existing km 40+500 (D. Ch. 47+260) to km 43+000 (D. Ch. 49+360) for a design length of 2.1 km, **area of 13.885 ha.**

Justification of Project Alignment in forest area:

Portion of project alignment, technically not feasible for widening of existing 2-lane road to 4-lane. Apparently, the equal portion of existing NH-306 is also runs on same reserve forest and has extremely poor geometrics. The existing road has several sharp and substandard horizontal curves and steep vertical gradient varying from flat ground (OGL=36 m at start of forest boundary near Lailapur village) to very high elevation (OGL=156m end point of forest boundary near Vairengte). Hence, proposed alignment has been re-routed on right hand side of existing NH-306 for short span of

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2.1 km to match with smooth curvatures & gentle gradient in view of safety and traffic flow apprehension in view of 4-lane development.

Moreover, The project alignment has also been approved by Competent Authority subsequently, accepted by all stakeholders like Hon'ble MP, respective MLAs & MLCs, DFO, GMPs and all other concern Govt. agencies during proceeding meeting arranged by DC-Cachar on 16.02.2022 and 26.02.2022 (MoM attached) considering all the parameters in terms of technical feasibilities, safety aspects and prevailing site circumstances in line with possibilities for construction of 4-lane economic corridor development under Bharatmala Pariyojana.

However, alignment passing through forest has been taking into consideration of minimum ecological affect as per following aspects,

- i. Minimum forest area
- ii. Minimum tree felling
- iii. Minimum number of crossings over water channels and canals
- iv. Minimum demolition of private, government and religious structures
- v. Geometrics improvement as per IRC specification keeping into account of safety and future growth.

Accordingly, Proposal has been uploaded with all drawings and documents on PARIVESH portal for necessary clearances.

Following drawings and documents are required for forest clearance,

- Topo sheets (1:50000 scale) showing project alignment
- Geo reference sheet (1: 25000 scale) showing project alignment
- Alignment on Google Map
- Undertakings
- Cost Analysis
- KML file showing project alignment
- Alternative alignment.

The project alignment falls under forest land has been superimposed on SOI map and shown below for ready reference.



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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TOPOSHEET MAP SHOWING THE PROPOSED 13,885 HECTARE AREA OF FOREST LAND FOR FOUR LANEING OF SILCHAR-VAIRENGTE SECTION (PACKAGE-2, DESIGN CHAINAGE KM 20+000 TO KM 49+360) OF NH-306 IN THE STATE OF ASSAM UNDER BHARATMALA PARIYOJNA

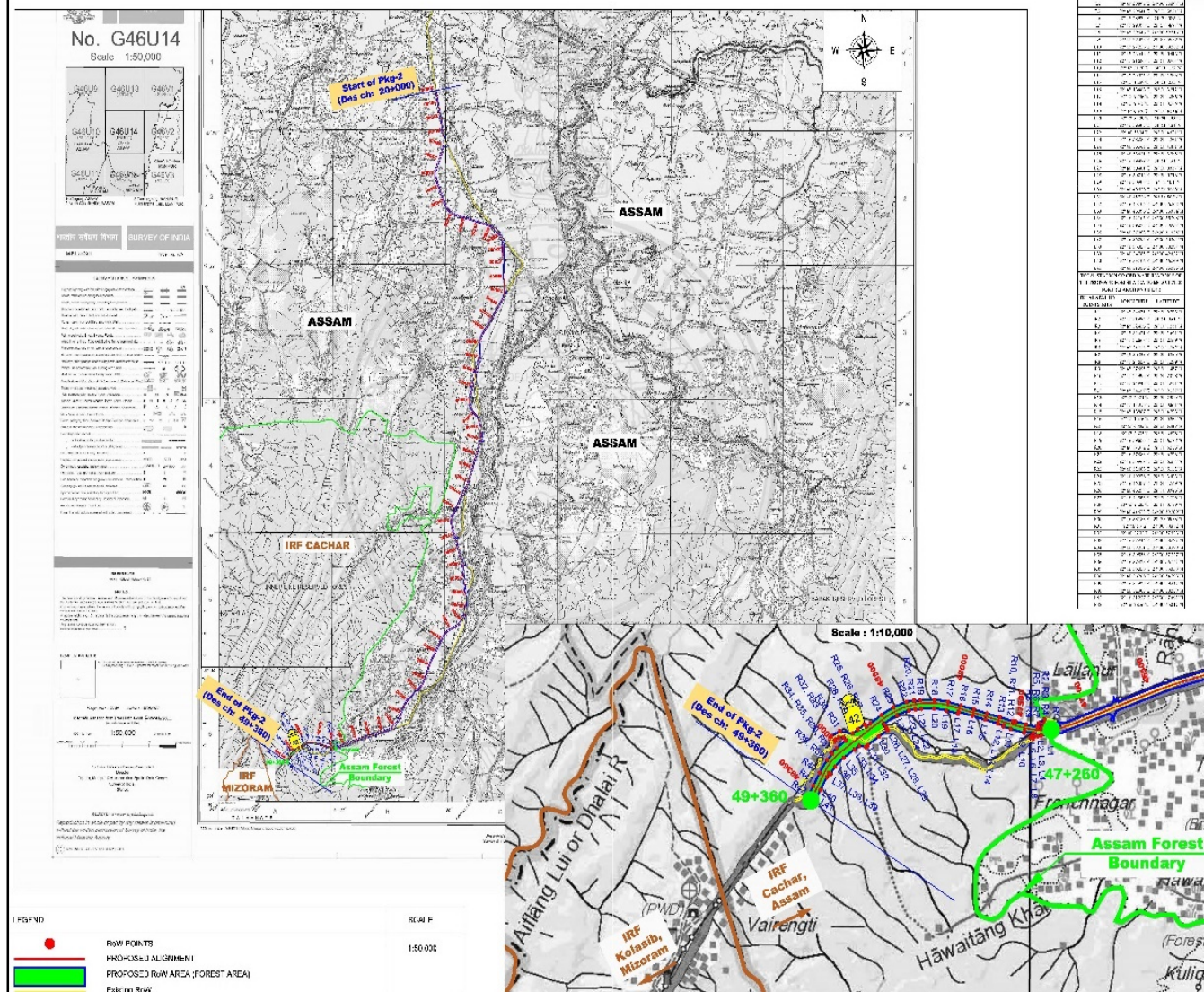


Fig 5.10 Alignment on Topo sheet (1:50000 scale)



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Georeferenced Topo Map

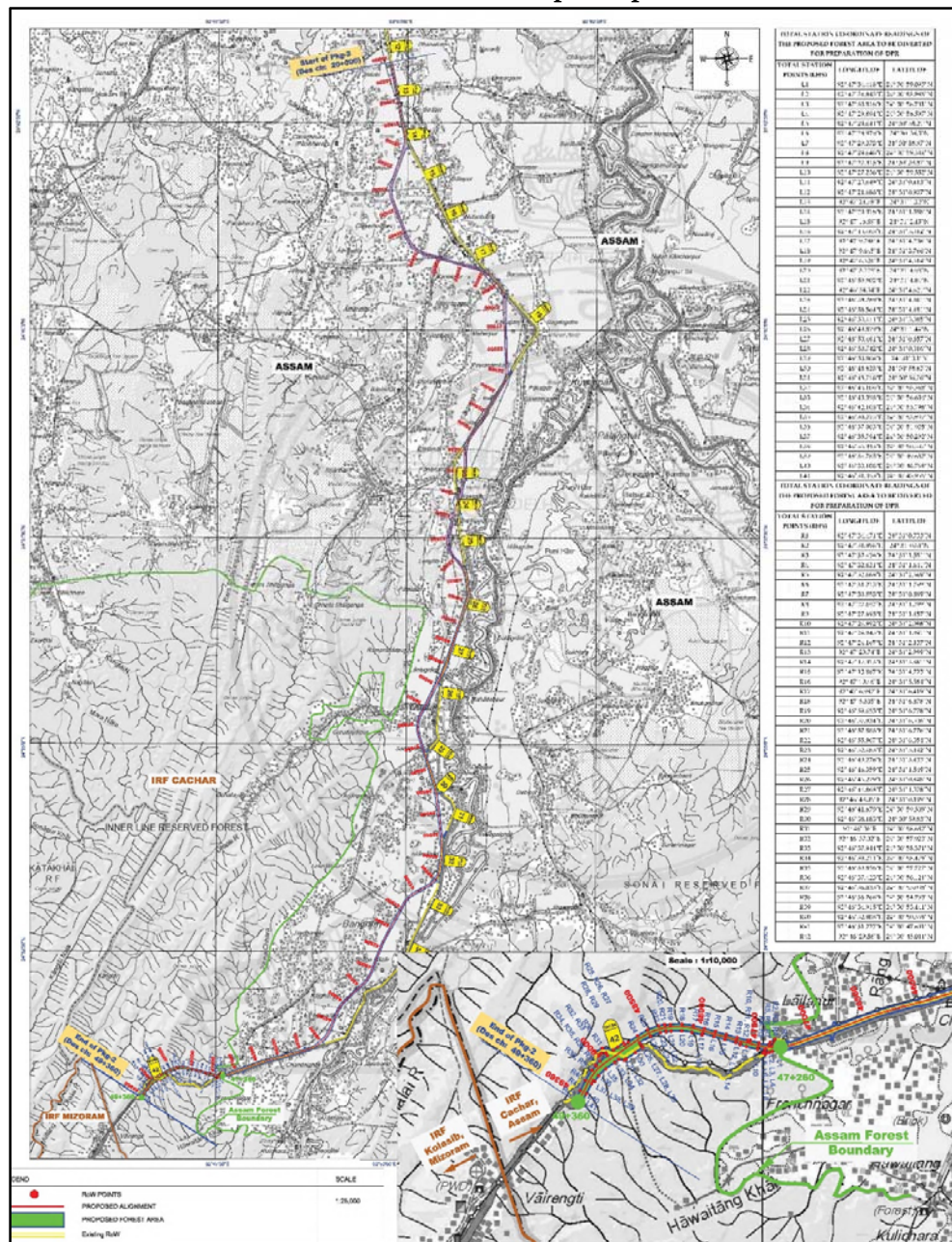


Fig 5.11 Alignment on Topo Sheet (1:25000 Scale)



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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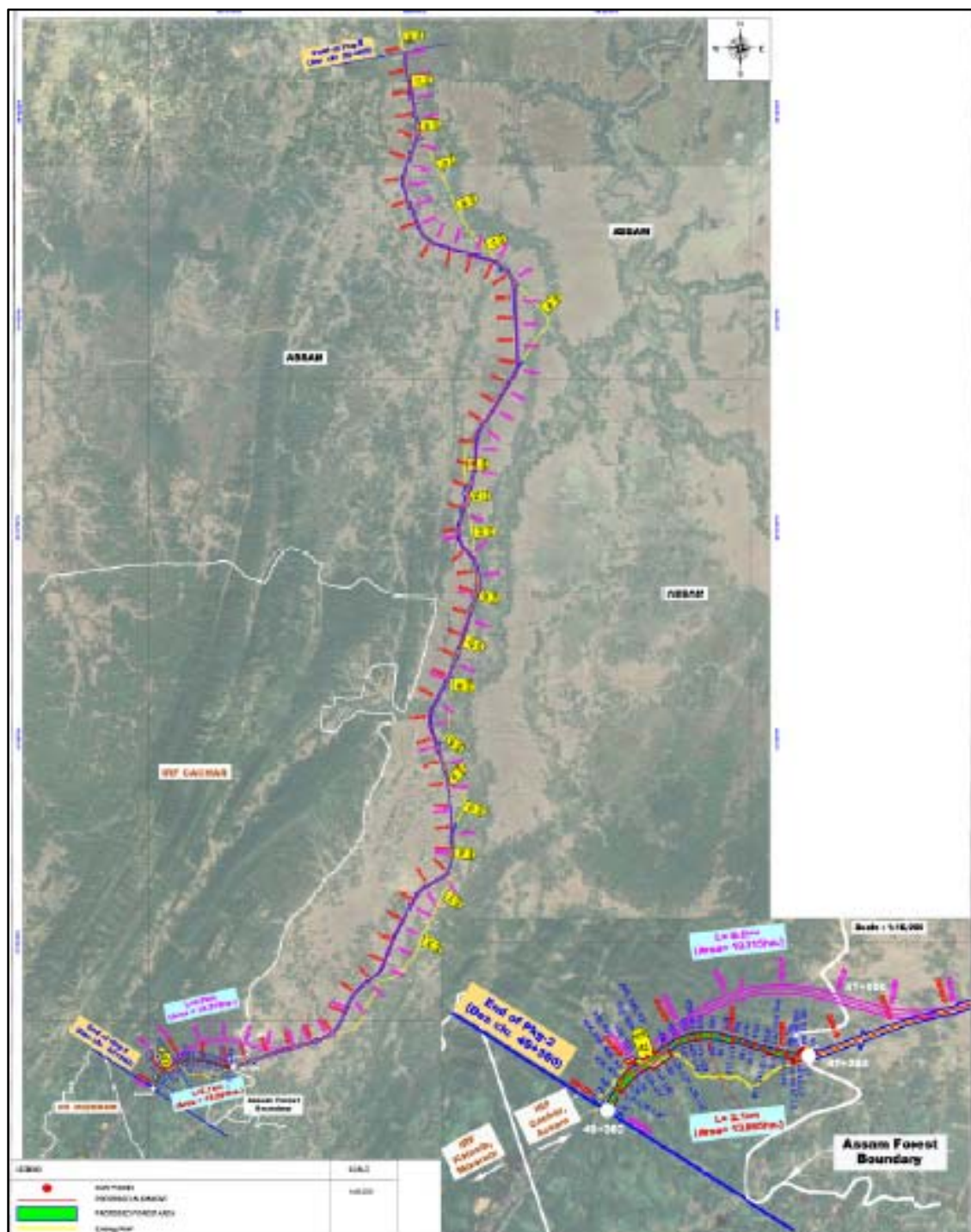
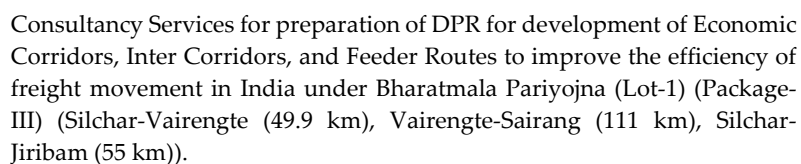


Fig 5.12 Alternate Alignment options in Forest Area



Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting

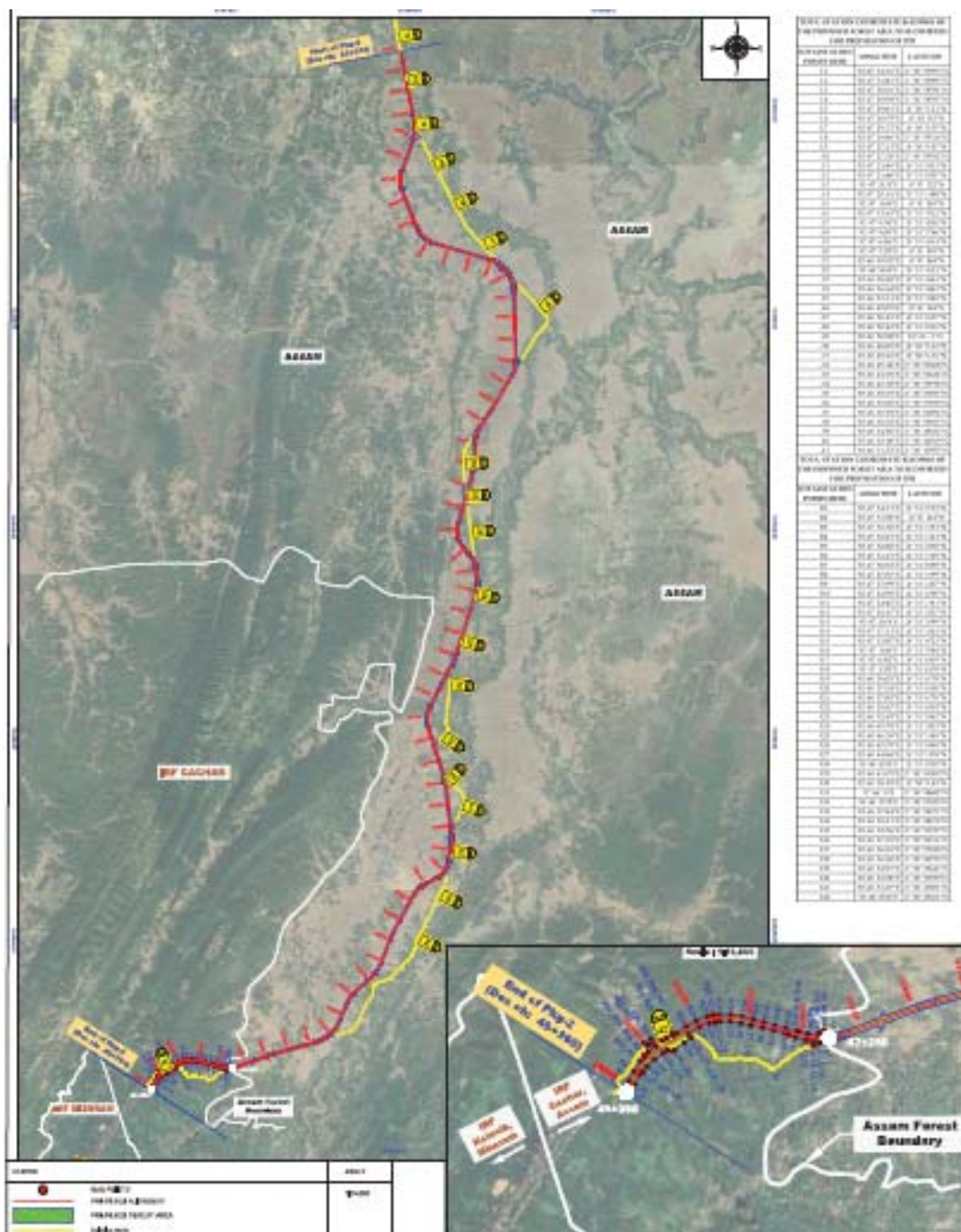


Fig 5.13 Forest Area Falling on Project area showing on Google Map





	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 5: Environmental and Social baseline setting</p>	
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Table 5.11 Tentative Cost Analysis:

TABLE – A



Sl. No.	Particulars	Applicability	Amount (Rs. Crores)
1	All category of proposals involving land less than 5 ha in Hills and less than 20 ha in Plain	Not Applicable	
2	Proposal for defence installation purposes and oil processing (Prospecting only)	Not Applicable	
3	Habitation, establishment of Industrial units tourist lodges/complex and other buildings constructions	Not Applicable	
4	All other proposals involving forest land more than 5 ha in Hills and more than 20 ha in Plain including roads, transmission lines, minor, medium, and major irrigation projects, hydel projects, mining activities, railway lines, locations specific installations micro-wave stations, auto repeater controls, towers, etc.	Applicable (Roads)	Diversion of 13.885 Ha of Forest Land for Construction of 4- lane road from D.Ch.20+000 to D.Ch. 49+360 (Dhaneri -Vairengte) Section of NH-306
5	Total cost (Investment Incurred)		
(a)	Civil Construction Cost of Project		Rs 755.09 Cr
(b)	N.P.V. cost of 49.556 ha. Amount to be disposed @ 9.39 lakh/Hectare		NPV cost for dense forest Class II - 14.37 lacs/ha x 13.885 ha= Rs.2.00 Crores
(c)	Loss of value of timber, fuel wood and minor forest produce on an annual basis including loss of man hours per annum of people who derived livelihood and wages from the harvest of these commodities		Nos. of trees to be affected shall be accounted during joint inspection with Forest Dept. and Cost Benefit Analysis shall be updated accordingly. However, since the forest area is classified as moderately dense forest, for estimation of loss at this stage of project, canopy density of 0.2 no. /sq. m has been considered as affected due to proposed development. Therefore, total values of trees @ average INR 1500 per tree = INR 1500x 0.20 x 13.885 = 4.17 crores

 <p>म. र. त. ह. M.O.R.T.H. Govt. of India</p>	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
<p>EIA: Chapter 5: Environmental and Social baseline setting</p>		

Sl. No.	Particulars	Applicability	Amount (Rs. Crores)
6	Benefits (Construction of Four Lane Road)		<p>Due to high demand, the proposed up-gradation of the project will result in smooth flow of traffic, reduction in traffic congestion, reduction in fuel consumption, low vehicle maintenance cost, improvement of transport facilities, control of air and noise pollution, reduction in road accidents, improvement in tourism sector.</p> <p>The project road will also provide access to Aizawl (capital of Mizoram State), Seling, Zorinpui, and Paletwa to Sittwe port being developed by GOI on Kaladan river in Myanmar.</p> <p>Most importantly the project road connectivity would promote cross border trade and commerce and help safeguard India's international borders.</p> <p>This would lead to the further formation of a more integrated and economically consolidated South and Southeast Asia.</p>

TABLE – B

S. No.	Parameters	Remarks
1	Ecosystem services losses due to proposed Forest Diversion	1. Diversion of Forest Land of 13.885 ha.
		2. Economic value of loss of ecosystem services due to diversion of forest land = NPV of the forest land being diverted as Rs 2.00 Crore.
		3. Loss of value of timber = 4.17 crores
2	Loss of Animals husbandry productivity including loss of fodder	NIL
3	Cost of human resettlement	NIL
		There will be no displacement due to the project, so resettlement is not required.

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S. No.	Parameters	Remarks
4	Loss of public facilities and administrative infrastructure (Roads, Buildings, Schools, Dispensaries, Electric Lines, Railways etc.) on which would require forest land if these facilities were diverted due to the project.	No loss of public facilities and administrative interest occurs.
5	Possession value of forest land of Diverted Forest Land	Possession value of forest land will be 30 % of NPV as per circular issued by MOEFCC vide no 7-69/2011-FC (pt) dated 01/08/2017, Hence, it will be 30% of 2.00 crores = 0.60 cr.
6	Suffering to Ousters	Nil
7	Habitant fragmentation Cost	Nil
8	Environmental losses (Compensatory of afforestation, Soil erosion, effect on hydrological cycle, wildlife habitat, microclimate upsetting of ecological balance)	<p>The total area of forest land along the project road required for the proposed up-gradation is 13.89 ha. The loss for density 1.0 is 14.37 Lacs per ha. As per Forest Conservation Act, 1980 for 50 years considering the density of the forest as 0.3, the total cost of environment losses per ha is Rs 43.11 lacss for 50 years.</p> <p>i.e., 13.885 ha x 43.11 lacs =5.99 crores</p>

b) Flora:

The flora is mainly Tropical evergreen as well as there are huge tracts of the Rainforests within northern as well as southern parts in the district that are home of Tigers, Hoolock Gibbons, Asian elephants, Gaurs etc. These Cachar forests were once enriched with wildlife however now vanishing because of human attack. Unusual species found include Pig-tailed Macaques, Hoolock Gibbons, Phayre's leaf Monkeys, Masked Finfoots, Stump-tailed Macaques, and White-armed Wood Ducks etc. The Asian elephants are already vanished. Its southern division was known as the Dhaleswari Wildlife Sanctuary. The Barail is lone wildlife sanctuary in this district and in the Barak valley area. It was started by renowned Naturalist named Dr. Anwaruddin Choudhury during early 1980s. The sanctuary was eventually notified in the year 2004.

c) Fauna:

As the project area lies along roadside and does not goes through dense forest, wild animals may not dwell near the area. But from the survey report, common animals are wild pig and deer. It has also been reported that some seasonal and migratory birds use to visit some of the area. There is no record on threatened or rare species fauna in the project area. Mrs Hume's Pheasant (State bird), Blyth's Tragopan, Green Peafowl,

White-cheeked Partridge, Blyth's Kingfisher, Blue Pitta, Moustached, Striped, Rufous-vented, Brown-capped and Spot-breasted Laughingthrushes, Crested Finchbill, Olive and Flavescent Bulbuls, Oriental Hobby, Wedge-billed Wren-babbler and Purple-throated Sunbird are just some of the bird species that can be found in the area.

d) Water Resources:

Cachar district of Assam is located in the central parts of the Barak valley on southern parts of Assam. It covers an area of 3,786 sq. km. and it is divided into five circles. As per 2011 census, the population of the district is 17,36,319, and the density of population is 459 persons per sq.km. The percentage of literacy is 67.82. As per land record, the district has a total net sown area 1,153.86 sq. km, and current fallow is 68.51 sq. km. The district is much occupied by marshy land. Physiographically, the area consists of hilly terrain surrounded by the border on all sides with bowl shaped synclinal valley elongated towards the south. The main river system is Barak River with its tributaries in the North and South. Other tributaries are Madhera, Chiri, Jatinga, Kalain and Seema. (Source: CGWB)

Table 5.12 Table 17: Details of embankments along different rivers and its construction year in Cachar district

River name	Embankment Length (in km)
Barak	122.29
Sonai	56.23
Rukni	41.46
Ghagra	16.61
Amjur	16.26
Larsing	14.57
Harang	11.67
Madhura R	7.27
Boaliya N	7.07
Rangirkhal N	4.76
Gowali Khal N	4.34
Badri N	4.11
Badri N	1.73



Table 5.13 River level chart for Cachar district

Rivers	WL (m)	DL (m)
Sonai	20.35	21.36
Sonai	25.96	26.96
Barak	18.82	19.82
Barak	22.88	23.88
Rukni	23.58	24.58
Dhaleshwari	27.05	28.05
Katakhal	19.27	20.27
Kushiyara	13.94	14.94

Table 5.14 LULC area in Cachar district

Class	Area (sq.km)
Agriculturae	798.28
Forest	1217.91
Built up	32.07
Water	152.41

Above table shows the details of embankments along different rivers and its construction year; Table 18 shows river level chart indicating different warning and danger levels, Table 19 shows the areas of different LULC classes and Table 20 shows the list of rivers flowing in the district along with length and source of origin (the river length shown in the table is from entry point in Assam to its first major confluence either directly with Brahmaputra/Barak or highest order tributary). Similarly, below figures show the river district map with all the important features the land use and land cover with 1km buffer on either side of river and also origin of all the rivers entering the district.

Table 5.15 List of rivers in Cachar district along with length and source of origin

Rivers	Source	Length (km)
Amjur River	Chotomonda TE, Cachar, Assam	46.15
Badri Nala	Bandhu Cha Bagicha, Cachar, Assam	28.07
Baitakhal Nala	Chalita Kandi, Cachar, Assam	17.39
Barak River	Liyai Khullen village, Senapati District, Manipur	162.82
Bhuban Khal	Assam-Manipur Boundary	12.06
Boaljur Nala	Ambicapur Pt XI, Cachar, Assam	18.95
Boleswar River	Assam-Meghalaya Boundary	31.58



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Rivers	Source	Length (km)
Chandpur Khal	Nagdirgram Pt-II	14.00
Chiri	Cachar-Dima Hasao Boundary	63.90
Chiru Nadi	Ngente, Dima Hasao, Assam	64.73
Dalu River	Katlir Punji, Cachar, Assam	36.10
Englai River	Nagdirgram Pt-III, Cachar, Assam	13.00
Gargarikhel Nala	Kachudaram Pt IV, Cachar, Assam	11.91
Ghagra	Gopinathpur TE, Cachar, Assm	95.68
Gowali Khal	Ganganagar Pt XIII, Cachar, Assam	23.85
Gumrah River	Malidahar Mikir Punjee, Cachar, Assam	51.40
Harang River	Kashipur, Cachar, Assam	8.08
Hiara Khal Nadi	Kashipur, Cachar, Assam	42.96
Jatinga	Jatinga Khasia, Dima Hasao, Assam	45.22
Jiri River	Semkhor, Dima Hasao, Assam	74.62
Kharil T.E Nala	Indragram Pt II, Cachar, Assam	14.89
Kuli Cherra Khal	Garultolaekth FV, Cachar, Assam	13.57
Lakhi Cherra Nala	USDiglichur Punji, Cachar, Assam	0.74
Mach Khal	Machkhal Pt-II	19.01
Mahadevpur Khal	Chandipur, Cachar, Assam	7.56
Mohan Khal	Assam-Manipur Boundary	9.08
Naga Khal	Nagakhal, Cachar, Assam	3.58
Pecha Nala	Gua Bari, Cachar, Assam	12.45
Punir Khal	Satkarakandi, Cachar, Assam	6.33
Purkai Nala	Kumbhirgram, Cachar, Assam	7.29
Rak Khal	Chotomonda TE, Cachar, Assam	5.91
Rangirkhan Nadi	Ambikapatty, Cachar, Assam	10.02
Rukni Nala	Sonitnagar FV, Cachar, Assam	34.78
Sona Cherra Nala	Sonachera Pt III, Cachar, Assam	25.50
Sonai River	Sunhluchhip, Mizoram	54.01
Tikal Nala	Sungjang Punji, Cachar, Assam	32.96



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting

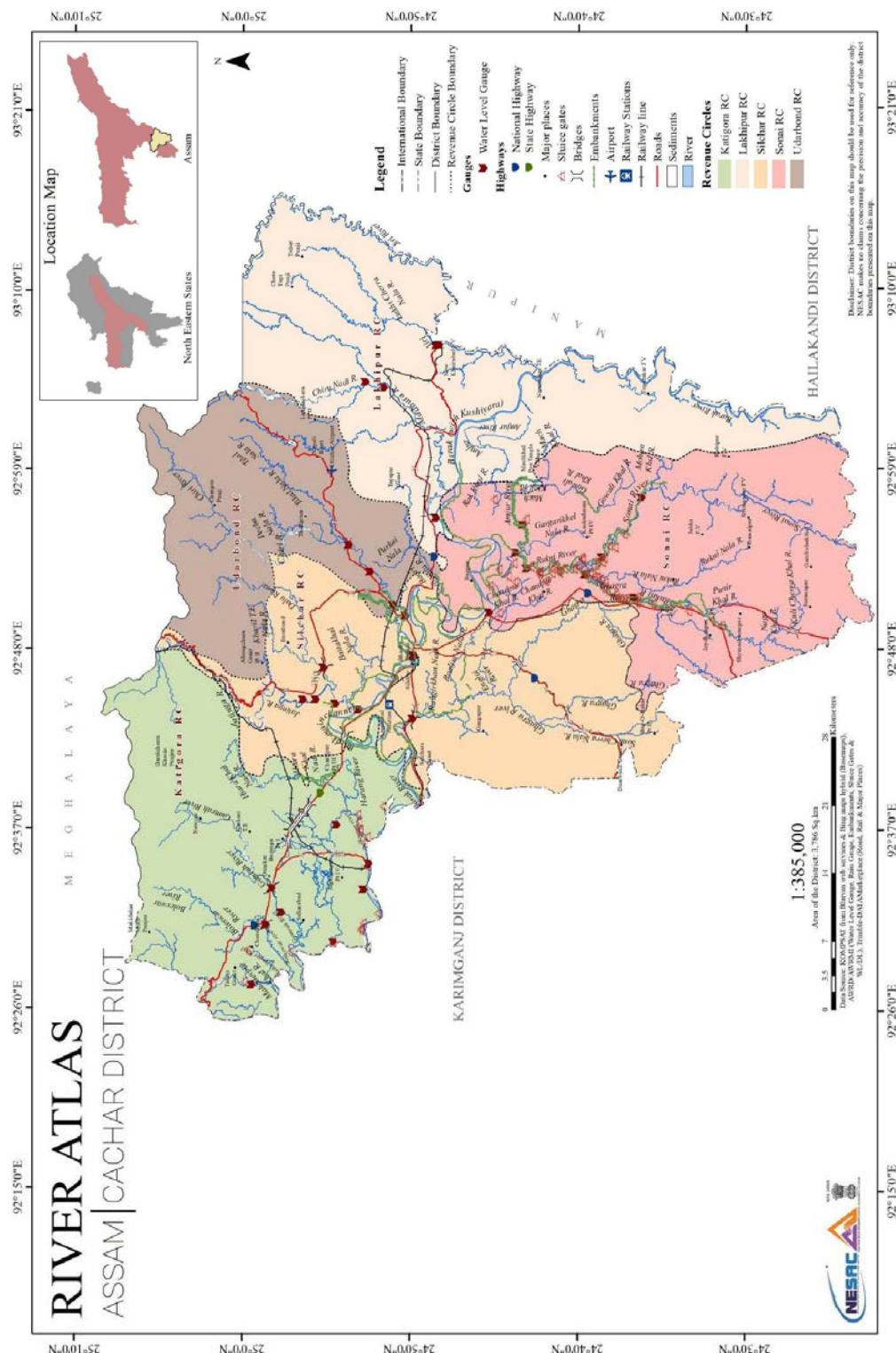


Fig 5.14 River district map (revenue circle in the background) with all important features for Cachar



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EIA: Chapter 5: Environmental and Social baseline setting

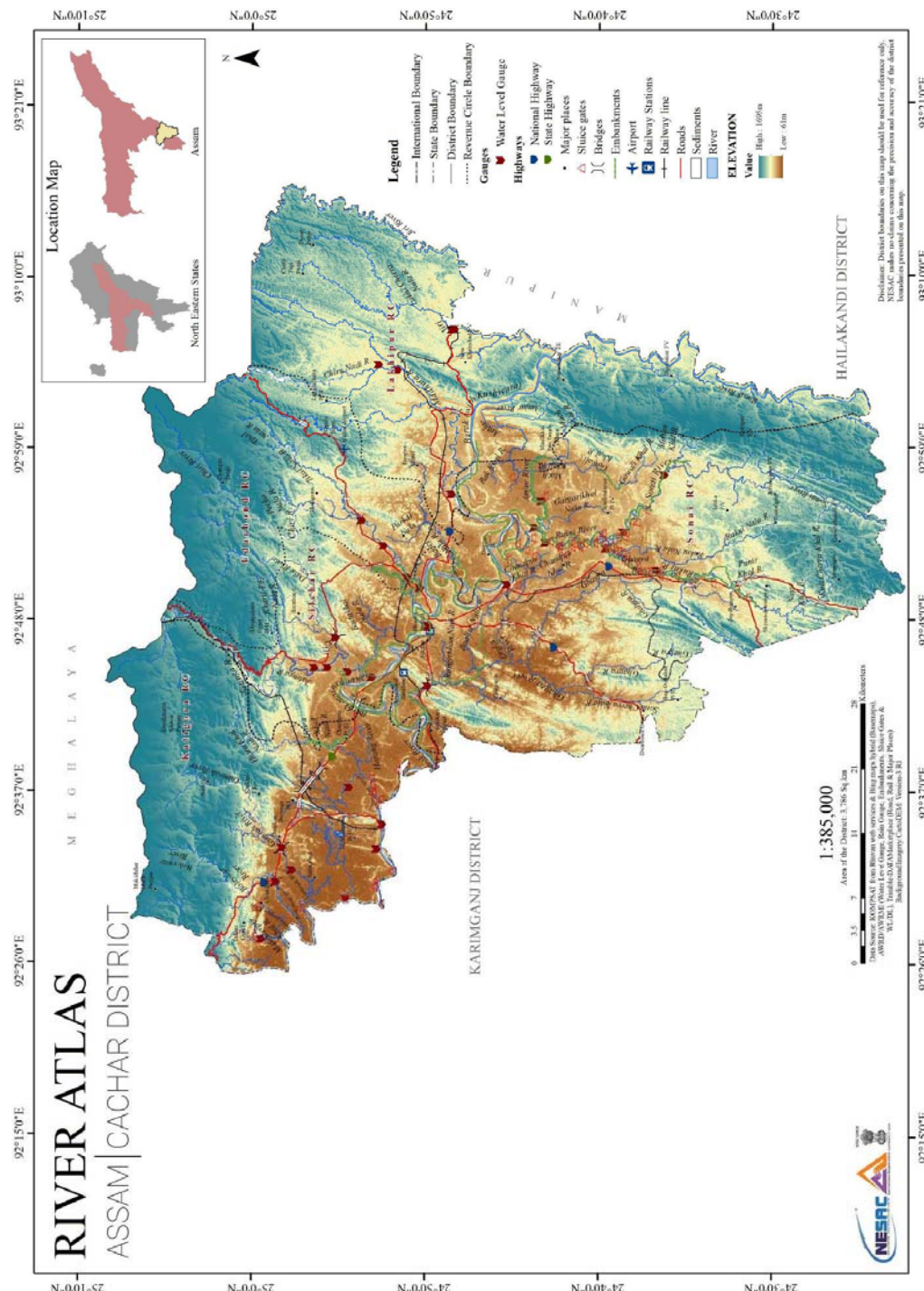


Fig 5.15 River district map (DEM in the background) with all important features for Cachar



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EIA: Chapter 5: Environmental and Social baseline setting

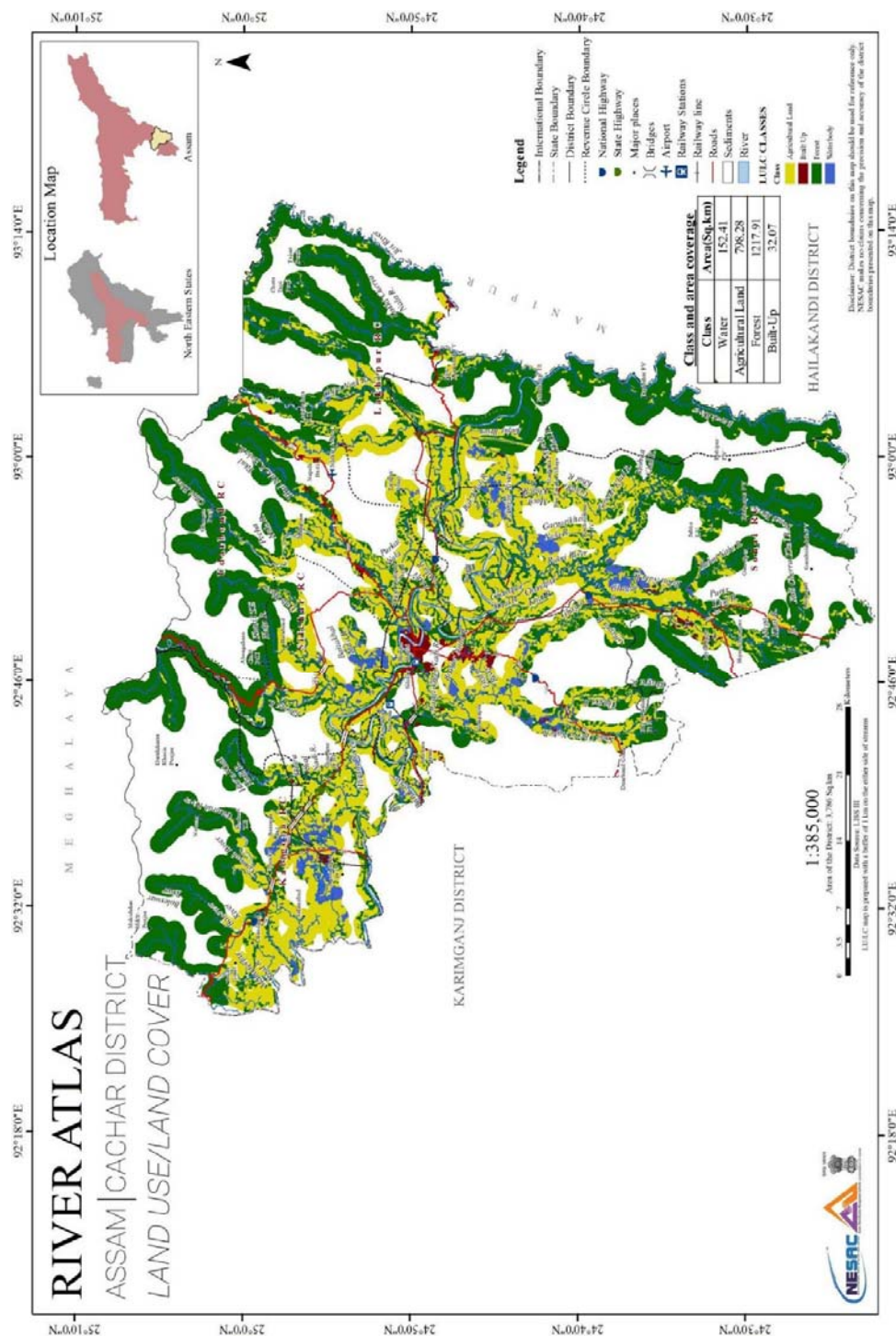


Fig 5.16 Land use land cover map with 1 km buffer on either side of rivers for Cachar



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting

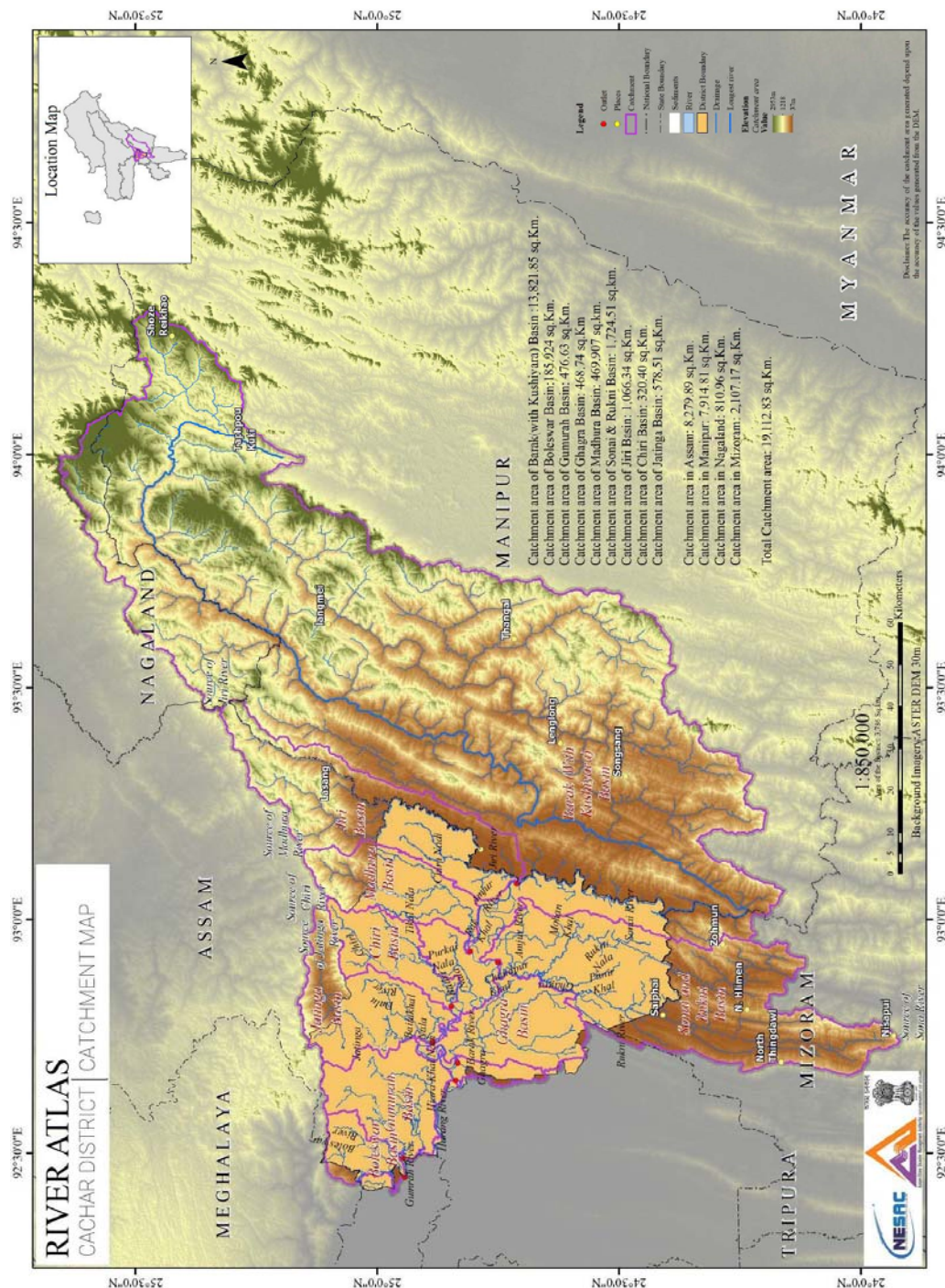


Fig 5.17 Catchment map showing the origin of all the rivers for Cachar

e) Roadside Plantation and forest trees:

There are numbers of roadside plantation along the project area planted by Department of EF&CC and some NGOs. Michelia champaca, Bischofia javanica, Mesua ferrae, Delonix regia, Langerstromia speciosa, Cassia javanica are the common species. There are approximately more than 8500 roadside tree plantation private trees and forest trees are observed along project alignment.

f) Eco sensitive zone/Wildlife Sanctuary

Project Road does not pass through or fall within 10 Km radius of any notified eco-sensitive zone or Wildlife Sanctuary.

5.1.5 Air quality:

Various anthropogenic activities along with the industrial activities has an irreversible impact on the air quality. It is dynamic in character and change in air quality in certain place have impacts on places far away falling in direction of prevailing air passage. Air pollution adversely affects the biological species in affected areas including human beings causing may diseases. The problem of pollution and its adverse ecological impact get aggravated due to increasing industrial and anthropogenic activities. Monitoring of air quality on specific points relating to the source of air pollution is an essential exercise of the board. In order to have better understanding on air environment, base level information on environmental status with respect to air environment is very important. The pollution control board (PCB), Assam has been monitoring air pollution in non-polluted (ambient) areas to acquire base line data for the state, so that difference in status could give us information regarding pollution created by industries. Govt. of India has enacted Air (Prevention & Control of Pollution) Act in 1981. The responsibility has been emphasized under Environmental (Protection) Act, 1986.

National Ambient Air Quality Standard:

The national Ambient Air Quality Standard (NAAQS) for assessment and interpretation of air quality against the parameters observed are given below in table based on year 2009,

Sl. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air ($\mu\text{g}/\text{m}^3$)	
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)
1.	Sulphur Dioxide (SO_2), $\mu\text{g}/\text{m}^3$	Annual*	50	20
		Average**	80	80
2.	Nitrogen Dioxide (NO_2), $\mu\text{g}/\text{m}^3$	Annual*	40	30
		Average**	80	80
3.	Suspended Particulate Matter, $\mu\text{g}/\text{m}^3$	Annual*	140	70
		Average**	200	100
4.	Particulate Matter (size less than $10\text{ }\mu\text{m}$) or PM_{10} , $\mu\text{g}/\text{m}^3$	Annual*	60	60
		Average**	100	100
Note	*	Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.		
	**	24 hourly/ 8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days. Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week at uniform interval.		



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Chapter 5: Environmental and Social baseline setting

The Major air pollution, their source and effects are presented below,

Pollutant	Possible Sources		Effects	
	Natural	Anthropogenic	Human/flora/fauna	Environment & property
Sulphur dioxide (SO₂) SO ₂ is the chemical compound produced by volcanoes and in various industrial processes and are also a precursor to particulates in the atmosphere.	<ul style="list-style-type: none"> Volcanos (67%) 	<ul style="list-style-type: none"> Combustion of fossil fuel (coal, heavy fuel oil in thermal power plants, office, factories) Paper industry Extraction & distribution of fossil fuels Smelting of metals (sulfide ores to produce copper, lead and zinc) Petroleum refining Combustion process in diesel, petrol, natural gas driven vehicles 	Respiratory illness Visibility impairment Aggravate existing heart and lung diseases	<ul style="list-style-type: none"> Acid rain Aesthetic damage
Oxide of Nitrogen (NO_x) Oxides of nitrogen are a generic term for a group of highly reactive gases that contain nitrogen and oxygen in varying amounts. NO _x are emitted as nitrogen oxide (NO) which is rapidly oxidized to more toxic nitrogen dioxide (NO ₂). Nitrogen dioxide (NO ₂) is a reddish brown toxic gas with a characteristic sharp, biting odor and is a prominent air pollutant.	<ul style="list-style-type: none"> Lightning Forest fires Bacterial activity of soil 	<ul style="list-style-type: none"> High temperature combustion (internal combustion engines, fossil fuel-fired power stations, industrial) Burning of Bio-mass and Fossil Fuels 	Irritates the nose and throat Increase susceptibility to respiratory infections	<ul style="list-style-type: none"> Precursor of ozone formed in the troposphere Form atmospheric fine particulate matter burden as a result of oxidation to form nitrate aerosol
Respirable Suspended Particulate Matter (PM₁₀ size ≤ 10µm, coarse fraction PM_{10-2.5} – PM_{2.5}), called thoracic fraction. Particulate Matter (PM) is a complex mixture of suspended solid and liquid particle in semi equilibrium with surrounding gases. The major constituents of RSPM are organic and elemental carbon, metals/elements like silicon, magnesium, iron ions like sulphates, nitrates, ammonium etc. PM ₁₀ can settle in the bronchi and lungs and cause health problems	<ul style="list-style-type: none"> Coarse particles are produced by the mechanical break up of larger solid particles Wind blown dust such as road dust, fly ash, soot, agricultural processes Physical processes of crushing, grinding and abrasion of surfaces Photochemically produced particles, such as those found in urban haze Pollen grains, mould spores, and plant and insect parts Non combustible materials released when burning fossil fuels. 	<ul style="list-style-type: none"> Road traffic emission particularly from diesel vehicles. Industrial combustion plants some public power generation Commercial processes (e.g. quarrying) Agricultural activities. 	Cardio pulmonary problems Asthma, bronchitis and pneumonia in older people	<ul style="list-style-type: none"> Visibility reduction



Air Quality Assessment:

The air quality of different cities/towns has been compared with the respective NAAQS. The air quality has been categorized in to four broad categories based on an Exceedance Factor (the ratio of annual mean concentration of a pollutant with that of respective standard)

The Exceedance Factor (EF) is calculated as follows:

$$\text{Exceedance Factor} = \frac{\text{Observed annual mean concentration of criteria pollutant}}{\text{Annual standard for the respective pollutant and area class}}$$

The four air quality categories are:

- Critical pollution (C) : when EF is more than 1.5;
- High pollution (H) : when the EF is between 1.0 - 1.5;
- Moderate pollution (M) : when the EF between 0.5 - 1.0; and
- Low pollution (L): when the EF is less than 0.5.

Table No. 4: Pollution Level Classification*

Pollution level*	Annual Mean Concentration Range ($\mu\text{g}/\text{m}^3$)				
	Industrial (I)			Residential (R)	
	SO ₂ & NO ₂	RSPM	SPM	* SO ₂ , NO ₂ , & RSPM	SPM
Low (L)	0-40	0-60	0-180	0-30	0-70
Moderate (M)	41-80	61-120	181-360	31-60	71-140
High (H)	81-120	121-180	361-540	61-90	141-210
Critical (C)	>120	>180	>540	>90	>210

Source: Central Pollution Control Board.

As per above parameter, Silchar district falls under moderate pollution (varying between 70 to 90 SPM) level in residential areas..

Air quality test was taken from five station near the town/village along the project area by Environmental Team and found to be between 70 & 82 SPM level.



Pic 5.1 Environment Expert Team taking Air sample



5.1.6 Noise Quality:

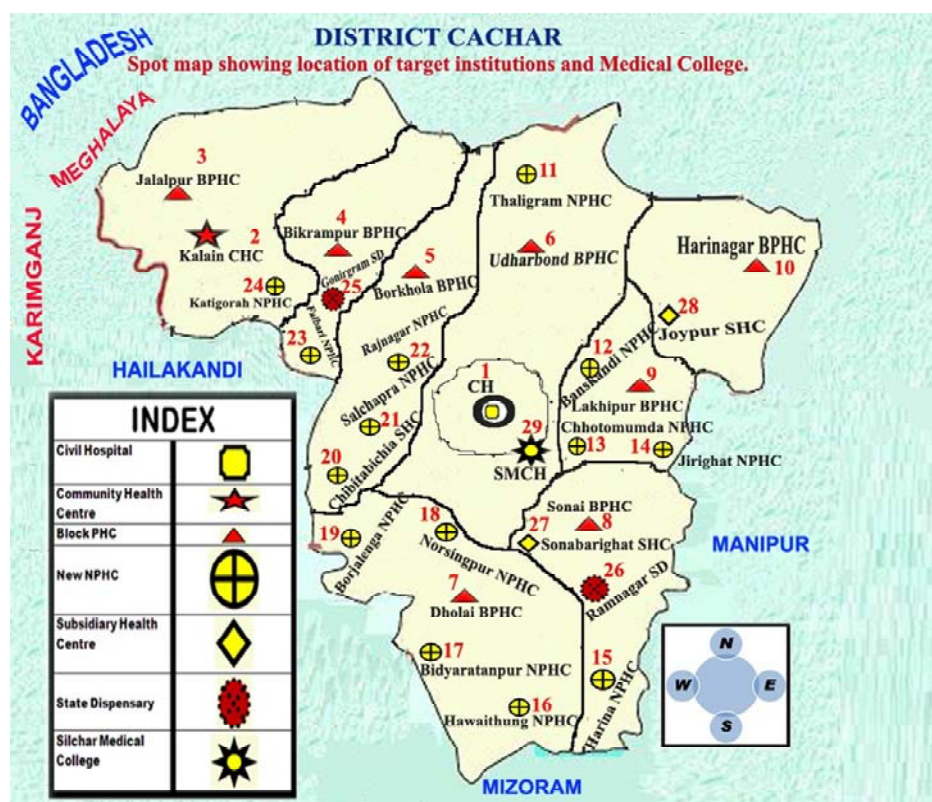
Noise pollution is increasing alarmingly in Silchar town. A decade back, Pollution Control Board (PCB) used to regularly monitor the pollution level at different traffic islands and congested areas, particularly around hospitals and nursing homes. The survey reports were submitted to the Deputy Commissioner of Cachar for preventive measures.

Apart from all other factors, blowing of honking horns with loud sound by all sorts of vehicles has been adding to the level of ever-increasing pollution. This is a common sight in the whole town where the number of vehicles and population have been on the rise. The problem has become more acute due to traffic jam and congestion.

Permissible noise level in India

In industrial areas, the permissible limit is 75 dB for daytime and 70 dB at night. In commercial areas, it is 65 dB and 55 dB, while in residential areas it is 55 dB and 45 dB during daytime and night respectively

Noise Sample was taken in three replicates from six different localities. The sampling sites were selected in crowded area and along roadside.



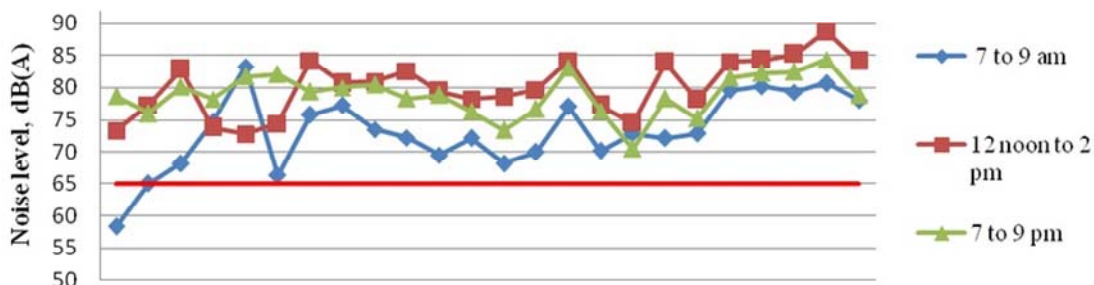


Fig 5.18 Noise Pollution Level



Pic 5.2 Environmental Expert Team Analysing Noise Quality

5.1.7 Soil quality:

Chemical properties of soil in the project area were given in the table below. Soil samples were taken from available site in the project area near each town/village.

Table 5.16 Soil quality of the project area

Parameter	Silchar - Vairengte Section
pH	5.66
Bulk Denity gcm-3	1.31
Moisture Content%	38.91
Organic Carbon%	0.81

Parameter	Silchar - Vairengte Section
Total Nitrogen (Mgkg-1)	21.66
Available Phosphorus (Mgkg-1)	25.78
Extractable Potassium (Mgkg-1)	376.41



5.1.8 Valued Environmental component screening:

List of valued environmental component were given in the table below.

The environmental expert conducted the environmental screening to identify the hot spots along the project road. Special care will be needed for the sensitive stretches during designing and construction phase as well. Formulation of specific mitigation measures has to be done for adverse impacts in those sections during the detailed environmental assessment study.

Table 5.17 Findings of Environmental Screening

S. No.	Valued Environment Components (VECs)		Along Project Road
A	Physical environment		
a)	Land use		Rural livelihood and agricultural land
b)	Rivers and other Surface water bodies		Crosses various surface water bodies including rivers, canals, backwaters, lakes, nallah etc. Barak and Rukni rivers are the large rivers near the project areas.
c)	Soil erosion		Mainly at riverbank during monsoon
d)	Natural hazards such as Landslide/ earthquakes		Prone to landslide and earthquakes
e)	Air/Water/Noise pollution		Relatively clean environment. Pollution levels is low.
B	Bio-Environment		
a)	Number of trees		Approximately 8500 including private trees.
b)	Coastal Regulation Zone		Nil
c)	Wildlife/nesting places/migratory routes and other habitats		Nil
d)	Ecologically areas	sensitive	Project Road does not pass through or fall within 10 Km of any ecologically notified eco-sensitive zone or

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	<p>EIA: Chapter 5: Environmental and Social baseline setting</p>	

S. No.	Valued Environment Components (VECs)	Along Project Road
e)	Biosphere Reserve, National Parks and Wildlife Sanctuaries	Project Road does not pass through or fall within 10 Km of any Biosphere Reserve, National Parks and Wildlife Sanctuaries
f)	Protected Forests and Reserved Forests	Portion of project road does pass through reserved forest
g)	Unprotected and Community Forests	NIL
C	Socio-Economic Environment	
a)	Drinking water sources	Mainly through government PHE water supply which was added by fountain spring water and perennial tributaries during dry season.
b)	Schools/hospitals/college (declared silence zones)	26 nos of Schools
c)	Cultural and Religious properties	Nil
d)	Archeological and monuments properties	No archeological site listed under Archeological Survey of India, has been identified in close vicinity of the project road.
e)	Medical Facilities	Few medical facilities are located near the project road
f)	Common property Resources	Nil
g)	Settlement Built up	40 nos of villages/towns along the project road
h)	Tourism Location	Nil

5.2 Socio-Economic status

5.2.1 Demographic pattern

Cachar District

The project road is situated mainly in Cachar district. The demographic details of the district are listed in below table;

Table 5.18 Demographic details of Cachar district

Description	Year 2011
Actual Population	1,736,617
Male	886,284
Female	850,333
Population Growth	20.19%
Area Sq. Km	3,786
Density/km2	459
Proportion to Mizoram Population	5.57%
Sex Ratio (Per 1000)	959
Child Sex Ratio (0-6 Age)	954
Average Literacy	79.34
Male Literacy	84.78
Female Literacy	73.68
Total Child Population (0-6 Age)	256,774
Male Population (0-6 Age)	131,417
Female Population (0-6 Age)	125,357
Literates	1,174,128
Male Literates	639,946
Female Literates	534,182
Child Proportion (0-6 Age)	14.79%
Boys Proportion (0-6 Age)	14.83%
Girls Proportion (0-6 Age)	14.74%

According to the 2011 census, the total population of the district is 1736617 (886284 males and 850333 females) and contributing 5.57 percent of the state population spreading over 3786 square kilometres area of the district. Out of total population of Cachar, 1736617 in the district, 17% are in urban area and 73% are in rural area. Out of the total population of 1927645 of the districts, 56.6 percent resides in the rural and 43.4 percent resides in the urban areas. The district has a density of 459/square kilometres and sex ratio is 959. There are three official languages of the state viz. Bengali, Hindi,



and English. The Duhlian dialect, which is also known as Lusei, is the first language of the state. Average Literacy rate of Cachar district is 80.36%.

Table 5.19 Sex Ratio of Cachar District

Particulars	Total	Male	Female
Total No. of Houses	379955	-	-
Population	1736617	886284	850333
Child (0-6)	256,774	131,417	125,357
Schedule Caste	264,897	136,051	128,846
Schedule Tribe	17,569	8,736	8,833
Literacy	79.34%	72.21%	62.82%
Main Workers	471,259	395,681	75,578
Cultivators	104,295	95,599	8,696
Agriculture Labourer	37,204	31,159	6,045
Household Industries	11,226	6,707	4,519
Other Workers	318,534	262,216	56,318
Marginal Worker	136,803	74,071	62,732
Non-Working	1,128,555	416,532	712,023

5.2.2 Culture and Religion

Diverse tribes like Bodo, Kachari, Karbi, Miri, Mishimi, Rabha, etc co-exist in Assam; most tribes have their own languages though Assamese is the principal language of the state. A majority of the Assamese are Vaishnavas (a sect of Hinduism). In Assam, the caste system, although it exists, is not as prominent as in other parts of India. Other religions such as Buddhism, Christianity, Hinduism, Islam etc. are also practiced in Assam. Assam is the meeting ground of diverse cultures. The people of the enchanting state of Assam are an intermixture of various racial stocks such as Mongoloid, Indo-Burmese, Indo-Iranian and Aryan. The Assamese culture is a rich and exotic tapestry of all these races evolved through a long assimilative process. The natives of the state of Assam are known as "Asomiya" (Assamese), which is also the state language of Assam. The state has a large number of tribes, each unique in its tradition, culture, dress and exotic way of life.

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5.2.3 Agriculture

The agricultural sector of Assam has immense potentialities. Especially because of the presence of Brahmaputra and Barak River, this possibility is quite high. These two rivers keep the glebe fertile throughout the year. Assam's climate is suitable for maximum cereals production, such as tea, rice, jute, rubber, sugarcane, wheat, potato, cotton, pulse, oil, and various fruits. Tea is the main commercial crop of this state. Even, the land is world-famous for this green grain. Every year Assam alone produces more than 57% of whole India's tea production and supplies it to different states and countries around the globe. Depending upon Assam's tea production, India upgraded its rank into number 2nd position after China. (2019 report). Along with tea, it exports rice, jute, areca nuts, and more other crops to other places. There are still so many possibilities for rice, tea and jute cultivation in Assam.

Agriculture is the principal occupation of the people of Cachar district.

Table 5.20 Land use pattern, Cachar district, Assam

Sl. No	Land put to different uses	Area in Ha
1	Total geographical area	377610
2	Forest area	138409
3	Land not available for cultivation	89148
a	Land put to nonagricultural uses	61447
b	Barren and un- cultural land	27701
4	Other non cultivated land excluding fallow land	21745
a	Permanent pastures and other grazing land	2600
b	Land under misc trees, groves etc not included in net area	17108

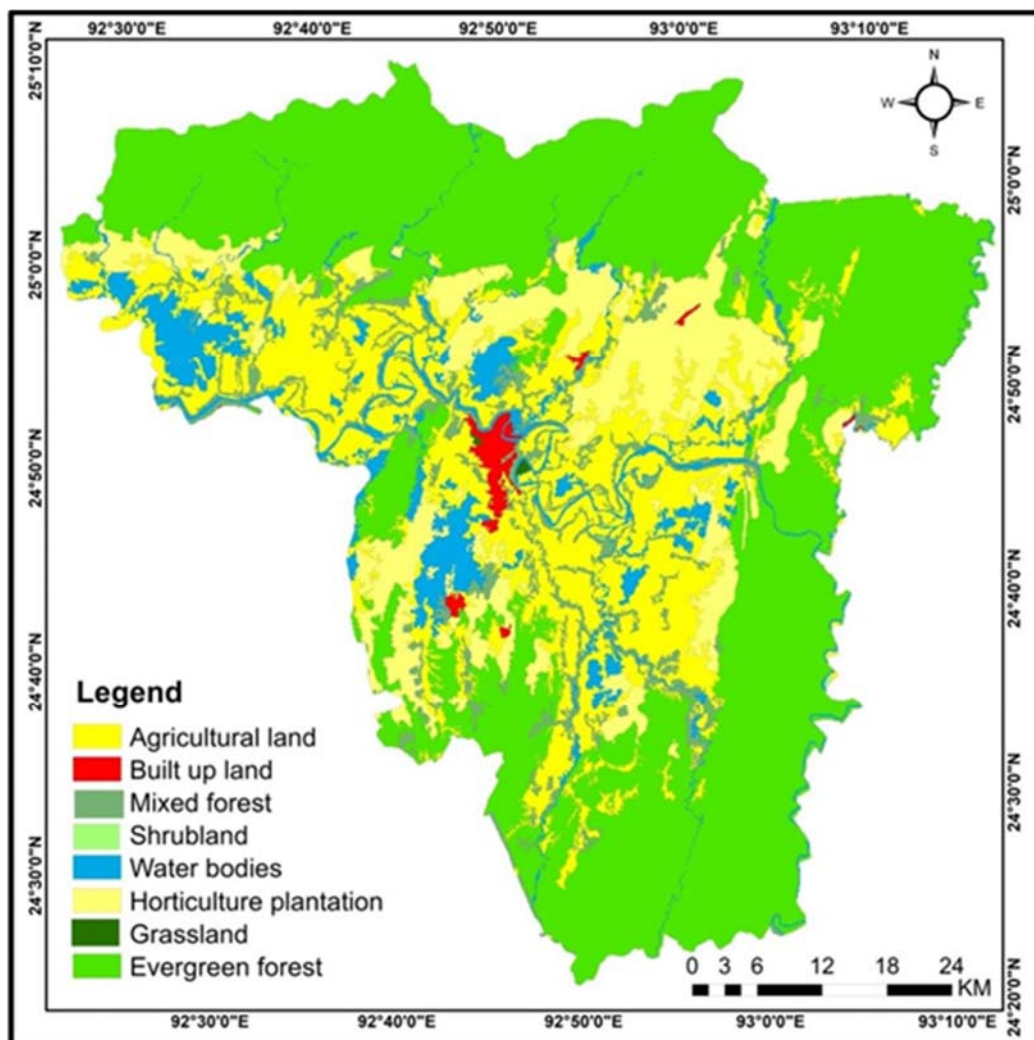


Fig 5.19 Land use land cover map, Cachar District, Assam

5.2.4 Roads

Roads are considered the most important component of infrastructure, to which national economy either directly or indirectly connected. Assam is mainly dependent on roadways for transportation. Therefore, for the overall progress of the state it is essential to provide good road network with increased connectivity. National highways in Assam connect the state with the rest of the country. Some of the national and State highways in Cachar, Assam are as below,



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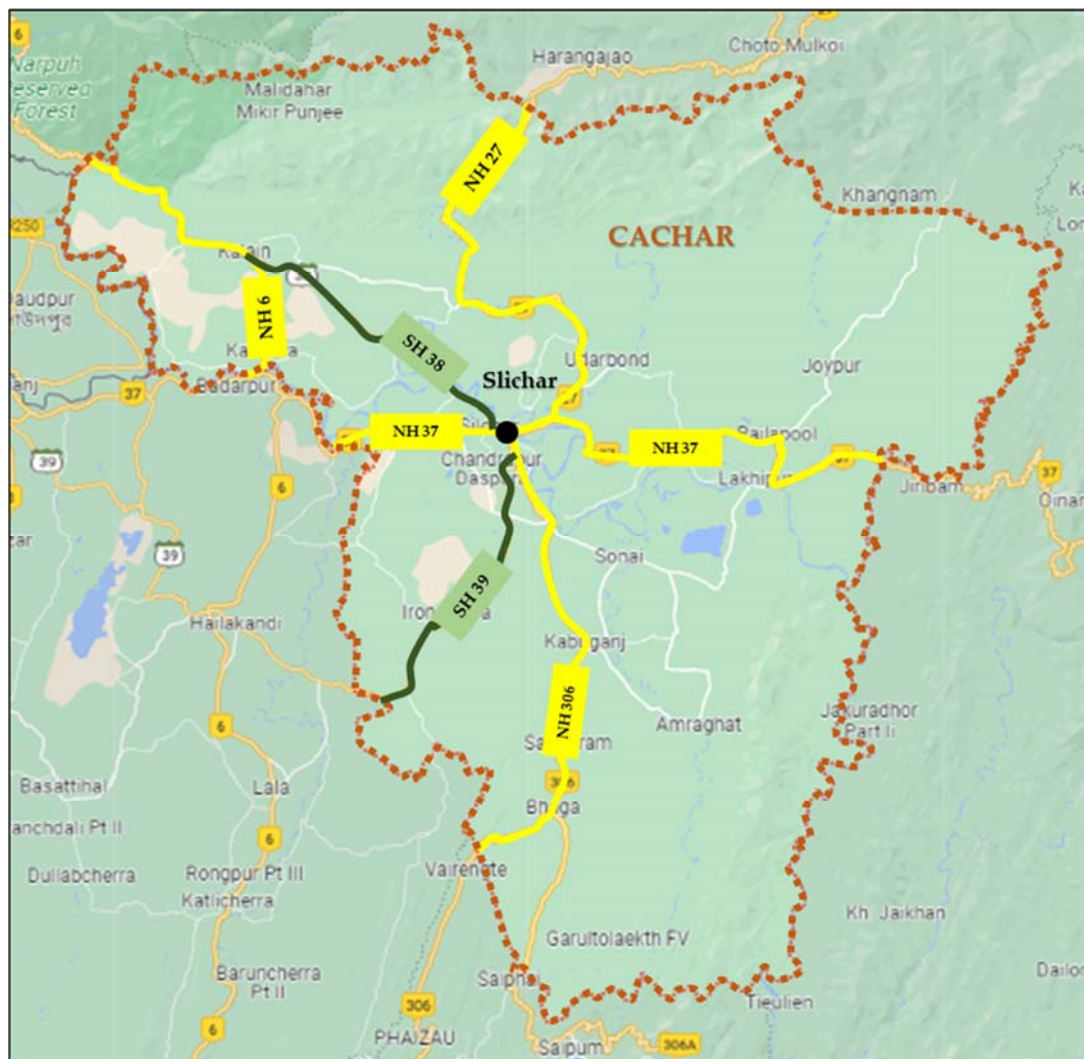


Fig 5.20 Major Roads in Cachar District, Assam



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Table 5.21 Major Roads in Cachar District, Assam

National Highways	Description
NH-306	Mizoram Road is a National Highway, Start from Silchar and ends at Lailapur in the border of Assam and Mizoram in Cachar district
NH-37	Karimganj-Silchar Road is a National Highway, Start from Salchapra and ends at Jirighat in the border of Assam and Manipur in Cachar district
NH-27	Lumding-Silchar Road is a National Highway, Start from Silchar and ends at Khasia Village in Cachar district
NH-6	The national highway starts from Katigara and ends at Lakhicherra Khasia Punjee border of Assam and Meghalaya in Cachar District.
SH-38	Kalain Road is a State highway, Starts from Lakhipur and ends at Silchar in the district of Cachar.
SH-39	Hailakandi Road is a State highway, Starts from Silchar and ends at Duarbond Grant in the district of Cachar.

With constant projects focusing inter-state connectivity, requirement of roads for connecting villages in various districts has also become crucial.

5.2.5 Industry

The viable industries in the district based on local resources like cane, bamboo, pineapple & other agro based and fruit processing industries have potential for growth. The total industrial area in the district is spread across 38.68 acres of land. The district has 1984 SSI units of which 295 have been registered after the announcement of N.E. Industrial Policy in 1997. The major manufacturing units in the district comprise of food products and beverages and non-metallic mineral products.



However, the project area does not run through industrial area.

5.2.6 Social Stratification of PAH

Social category of project affected households were Schedule Tribe constitute majority (100%) of the total project affected households.

6

Chapter 6- Potential environmental impacts and mitigation measures

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Chapter 6: Potential environmental impacts and mitigation measures</p>	
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6 Potential environmental impacts and mitigation measures

6.1 Introduction

This section identifies and assesses the potential impacts on different environmental parameters due to planning and designing, construction and the operation of the proposed road development. After studying the existing baseline environmental scenario, analysing project activities, initial field surveys, reviewing the process and related statutory norms, the anticipated potential adverse impacts have been identified and assessed for design, construction and the operation phases. Potential positive impacts or improvements have also been reviewed. The appropriate mitigation measures have been formulated to limiting the anticipated potential adverse impacts to acceptable levels for each stage of the project. The potential impacts and their suitable mitigation measures are described here.

6.1.1 Project Influence Area

Direct Corridor of Impact (COI) is within toe lines, except for noise sensitive receptors such as education and health institutes which is considered up to 100 m on either side. General corridor of impact is up to 300 m on either side of the project road, wherein ecologically sensitive areas such as national park, wildlife sanctuary, reserve and protected forests, major water bodies (including downstream water quality of flowing water bodies) etc. have been observed. Ancillary sites such as borrow area, quarry site, waste disposal sites and construction camp sites.

6.1.2 Impacts Identification Positive Impacts



Rehabilitation and strengthening of existing project road will have following positive environmental impacts:

- Reduction of travel time for traffic along major route.
- Reduction of vehicle operating cost including fuel cost and saving national economy.
- Improved drainage condition, and reducing flooding at submergence section; and
- Stimulating economic development by providing better accessibility between remote part of the State and the State capital.

6.1.3 Adverse Environmental Impacts

Road up-gradation related adverse impacts occur at three stages of the project:

- Planning and Design phase.
- Construction phase.
- Operation phase.

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Planning and Design covers the road alignment, drainage provision, materials of construction, roadside amenities etc. that ultimately decides the impact during later phases. Most of the anticipated impacts are expected during construction and operation phase. While some of the construction phase impacts will be temporary, some are expected to be of longer term or permanent. Operation phase impacts will be continuous in nature or long term.

Environmental impacts were identified and screened during screening stage of this project. Using the ADB's REA Checklist (Refer Annexure 1) of environmental parameters for road sector project, "non-significant impacts" have been screened out from those with significant adverse impacts (if any).

Various environmental impacts identified for this sub-project are mentioned below:

Physical Environment

- Impact on land use.
- Impact due to collection of construction material.
- Impact due to soil erosion and sedimentation.
- Impact on drainage and water logging.
- Impact on water resources.
- Impact on ambient air quality.
- Impact on noise environment.

Ecological Environment

- Impact on ecologically sensitive area.
- Impact on roadside plantation.
- Impact on flora and fauna.

Socioeconomic Environment

- Impact on cultural properties.
- Impact on common property resources (CPRs).
- Impact on residential properties.
- Impact on commercial properties.

The environmental impact issues or attributes as mentioned above were identified based on the existing environmental conditions in the project areas and project interventions under USRIP. The actual and potential impacts on above attributes due to this project are discussed subsequently in this section.



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Table 6.1 Checklist of Impacts due to the Proposed Project.

Sl. No.	Project Phase / Environmental Impact	Impact		No Change	Short Term	Long Term
		+ve	- ve			
A.	Impacts due to Project Location.					
1	Loss of Land and Trees				*	*
2	Loss of Infrastructure				*	*
3	Public Utilities			*		
4	Cultural Properties			*		
5	Risk Due to Earthquake			*		
B.	Impacts due to Construction.					
6	Change of land use	*				*
7	Soil erosion at construction sites		*		*	
8	Pollution by construction spills			*		
9	Health risks & Cultural Hazards			*		
10	Dust Problem		*		*	
11	Noise Pollution		*		*	
12	Disturbance to traffic		*		*	
13	Effect on Economic Activities		*		*	
C.	Impacts due to Project Operation.					
14	Noise Pollution			*		
15	Traffic Disturbance.	*				*
16	Odor Problem			*		
17	Release of Treated Effluent			*		
D.	Positive Impacts.					
18	Health Benefits	*				*
Sl. No.	Project Phase / Environmental Impact	Impact		No Change	Short Term	Long Term
		+ve	- ve			

Sl. No.	Project Phase / Environmental Impact	Impact		No Change	Short Term	Long Term
		+ve	- ve			
19	Improved Aesthetics	*				*
20	Better infrastructure facilities	*				*
21	Improved Air Quality	*				*
22	Increased Socioeconomics	*				*
23	Increased Agricultural activity	*				*
24	Employment Opportunity	*				*

Approach to mitigation measures

The road design, construction activities and operation can have various levels of environmental impacts and corresponding mitigation measures could be formulated. The approach to mitigation measures has been in the following order:



- Avoiding adverse impacts by integrating environmental issues into project design.
- Minimising adverse impacts by design modification and adopting mitigation measures.
- Compensating adverse impacts for those which could neither been minimized nor avoided
- The anticipated potential adverse environmental impacts and corresponding mitigation measures, for each stage of the project, are discussed in the following paragraphs.

6.2 Physical Environment

6.2.1 Air Environment

Besides, direct impacts of three phases of any road development project, the growth of towns or cities taking place along the main national or state highway also results in impacting the ambient environment along the road. Such ribbon development on one hand adds to the pollution load all along the corridor and on the other, it impacts proves being abject to receptors the road.

Motor vehicles have emerged as one of the most important sources of vehicular air pollution especially in urban area. The road development projects like this are aimed at to enhance the efficiency of road transport system and there by the vehicle number

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plying on such corridor increases absolutely, so impact assessment on ambient air environment is among the most significant impacts of all such projects.

Air quality all along the project corridor will be impacted during all the three phases of the project i.e., pre-construction, construction and post construction (operational) phase. The operational stage impacts though may not be as serve terms of dust level as that of construction phase impacts, which are localized and temporary. The impacts during this phase will be of a long-term nature and the intensity will be confined to the band of width of 75m to 100m from the edge of RoW on both side of the corridor depending on wind direction. However, both the construction and operational stage impacts can be effectively mitigated if the impacts are correctly assessed at the design stage itself and adequate mitigation measures are delineated and properly implemented. Impacts due to the construction activities will be higher nearer to the construction sites and asphalt mixing plants. Movement of vehicles carrying construction materials are also a source of air pollution and it is severe because their movement will be mostly on unpaved roads.

Particulate Matter levels at the various settlement's locations could be of concern if they cross the standards for residential areas. Mitigation measures must be worked out to decrease the Particulate Matter concentrations near sensitive areas.



Motor vehicles have emerged as one of the most important sources of vehicular air pollution especially in urban area. The road development projects like this are aimed at to enhance the efficiency of road transport system and there by the vehicle number plying on such corridor increases absolutely, so impact assessment on ambient air environment is among the most significant impacts of all such projects.

Nature and Characteristics of Pollution Sources Pre-construction Phase

The pre-construction stage activities include site clearance, shifting of various obstruction including ancient trees falling within proposed carriage way, transportation of men and material, construction of labour colonies, offices, material storage and maintenance yards etc. Besides it also focuses on the proper selection of borrow pits and other sources of raw materials for (aggregates) supplier and establishment of transport roads etc.

Typical pre-construction tasks during this phase include:

- Use of heavy vehicles and machinery etc. during site clearance and for trees obstruction and shifting of centre.
- Men and material transportation to the construction sites and installing camps and yard.
- Organization and construction of approach road for transport of earth from borrow pits/ quarries to construction site in the pre-construction phase.

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Dust during such activities would be the predominant pollutant during pre-construction stage and particularly so in case the pre-construction tasks are performed during dry summer or during pre-monsoon season.

But the impacts will be confined to specific location of stockyards labour colonies, width of RoW. All such impacts are not confined, as these locations shall shift throughout the project road as the program progresses. Thus, the magnitude of impacts cannot be quantified because they will be location specific. However, preventive action measures such as proper sprinkling of water on ROW around sites where pre-construction activities concerning site clearances are being undertaken, covering all the material being transported in trucks especially carrying filling materials such as earth aggregates sand, should be adequate to mitigate the impacts during pre-construction. All such activities may generate dust but the level of activities at a single location will not be intensive to cause any significant adverse health impact.

It may be pertinent to mention that such impacts could be significant on new alignments (One new bypasses) because disturbance and these activities without precaution can become adverse impacts because virgin area and agricultural fields are involved.

Construction Phase

During construction stage, the most predominated air pollutant would be particulate matter along with various other gaseous pollutants due to different type of fuels used (in different types of vehicles, and in toxic construction equipment, domestic fuel in construction/ labours camps etc.) along with certain other hazardous emission which are highly toxic pollutants from hot mix plants and leakage/ spillage of hazardous chemical used during construction.

Dust and other pollutants generation will be high on the road stretches (under construction), and around construction yards/ plants etc. due to different construction activities including:

- Asphalt mix plant generating emission of various hazardous toxic pollutants due to heating and mixing of aggregate with bitumen.
- Material storage, transportation and handling (loading/unloading) of different construction materials such as sand, fly ash, earth from borrow pits, aggregate from stone quarries etc.
- Stone-crushing operation in the aggregate yards.
- Construction and other allied activities particularly more intensive on new bypass (new alignments for borrow pits).
- Concrete batching plants.



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Operational Phase

However, during construction phase, the major air pollutant of concern was particulate matter, but during operational stage dust generation from vehicular movements on highway roads are primarily confined to diesel powered vehicles besides toxic dust emission for vehicular tyres. Further roadside dust will have minor impact on surrounding environment as road shoulder has been proposed unpaved.



The toxic dust emission from diesel vehicles (though the emission shall decline progressively after adopting Bharat Stage III and Bharat Stage IV) as well as due to abrasive action of tyres on roads shall continue to pollute the project corridor. But at this stage there are no well defined mitigation action possible. In fact, by having a better road surface during operational stage of this project the toxic dust from vehicular tyres shall be less. The severity of impact of gaseous pollutants due to vehicles plying on the highway at any given time shall depend upon the traffic volume emission rates of auto exhausted pollutants and prevailing meteorological condition within the project corridor. However, such emission is a part and parcel of an overall infrastructural (roads and transport system) development process and efficiency augmentation of transport system. However, compliance of future statutory regulatory requirements and policy plan with respect to emission limits, auto-technology, vehicular fuel quality (including adulteration etc.) which is a dynamic process and changes with economic development along with implementation of preventive/mitigative measures for control pollution exposure should be adequate to prevent any public health impacts of this project.

Impact Predictions

As discussed earlier, the impact assessment based is required for pre-construction phase as well as for operational phases of the project road for the whole designed life of the project.

Impacts Prediction during Construction Phase

Most of the emissions during construction phase are of fugitive nature value nature. Whenever various construction activations are undertaken particularly during dry seasons (when the air humidity is low and wind speed is high) the dust generation from construction activities will be high. The spatial dispersion of dust and all other pollutants generated (though low) during construction shall have adverse impacts firstly on health of workers working in on quarries or on mixing plants, stone crushers and on other construction equipment's and secondly, the pollution spread shall also impact the nearby residential activities with corridor ribbon developments. Volatile toxic gases released through the heating and mixing process during (based on bitumen) for asphalt production shall require more focus attention for prediction because of high-risk occupational exposure of workers as well as residents by locating hot mix

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plant and aggregate stock yard away from all residential colonies (of local-residents as well as of temporary construction labour colonies).

6.2.2 Noise Environment

Noise impacts are perceived in both construction and operation stages of the project. Noise generated from the construction activities will be of high intensity and the construction workers and the residents in settlements around the construction sites will be adversely impacted due to continuous exposure to high noise levels due to the construction's activities. Due to the various construction activities, there will be temporary noise impacts in the immediate vicinity of the project corridor. The construction activity will include the excavation for foundation and grading of the site and construction of structures and facilities. Noise levels exceeding the norms at all places, especially around the settlement stretches along the corridor must be attenuated at least to the daytime noise criteria for residential areas.

Nature of Impacts and Source Characteristics

From an acoustical point of view, environmental noise particularly highway traffic noise is a complex phenomenon because its intensity and characteristics varies with time depending upon the frequency as well as type of vehicle that passes on the road. Many vehicles on road will make the exposure situation of the roadside receptors one of almost continuous nature of noise exposure, fluctuating between the high levels generated by typical noisy vehicles such as trucks/ buses and the lower noise generated by cars. A few events with a high noise level will have the same as many exposure events but at a lower noise level. But from biological point of view, it is unlikely that these two-noise scenario's sharing same but different exposure character will cause an equal effect on the exposed pollution. So main problems in roadside traffic noise exposure is the question of to what extent is the number of different exposure events related to the human perception of environmental stimulation. The health effects that we measure in the exposed population may be discrete physiological reactions particularly of certain complex human responses, such as sleep disturbance or an effect on work performance efficiency. For human responses, those appearing after a single but a rare high exposure as well as those accruing after repeated low noise exposures (Chronic exposure) need to be evaluated carefully.

Noise emission characteristics the mean noise levels in major urban locations of India of four different categories are presented in the following table 1.20. This table shows that actual noise emission from automobiles in Indian cities is higher than the CPCB standards (at manufacturing stage) in use.

Table 6.2 Mean Noise Emission Levels from Vehicles

Type	Mean Sound Pressure Level Emission (dBA)	CPCB*(Std) dBA
2-Wheeler (2 Stroke).	82 dBA.	80
3-Wheeler (2 Stroke).	87 dBA.	80
Motor Car (Taxi Private Car).	85 dBA.	82
Heavy Vehicles (Trucks).	92 dBA.	85

* At free distance of 7.5 meter at manufacturing stage



Auto noise emission on roads depend on many factors such as traffic density, the type and condition of the vehicles plying on the road, vehicle operational changes (acceleration/deceleration/gear changes) depending on the level of congestion and smoothness of road surface (IRC: 104-1988). As far as impact assessment of road development project such as this are concerned, the impacts of noise pollution generated are associated with all the three phases of the project: pre-construction phase, construction phase and operational phase.

Pre-construction Phase

The typical on-site pre-construction phase activates include man and material movements, ROW clearing of obstructions and trees and establishment of labour camps, on-site offices, stock yards, construction material plants and maintenance yards etc. Among all these activities perhaps ROW clearing involves use of heavy machine and equipment otherwise all other activities will prevail for a short duration and shall be localized in nature; besides this they are not likely to generate high noise pollution. The impacts of even such noise generating activities can be mitigated by not placing such project site infrastructure near to any residential or commercial activities or even labour colonies. Whereas the other activities during this phase will prevail only for a short duration during the pre-construction phase and therefore are not likely to be of significance.

Construction Phase

The impacts on community noise exposure during construction stage will be quite significant and characteristics of exposure to different receptors shall also be varying widely. But all such impacts shall again be of temporary in nature as the construction site will go on changing with the progress of the road development along different road stretches. The construction phase activities at during this phase can be broadly divided into two categories; (i) one type include the excavation for foundation and grading of the site (including large scale material transportation and its handling using heavy

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vehicles), and (ii) second is construction of structure and facility along with road development. Besides such construction site specific activities, the other types of construction phase activities which emit noise include stone crushing, asphalt production plant and batching plants, etc. The activities of such plant operations shall relatively prevail for longer than other on-site activities and shall produce significantly high noise levels.

Operation Phase

Uninterrupted movement of heavy and light vehicles at high speeds will give rise to increase in ambient noise levels along the roadway. It may have negative environmental impacts on the sensitive receptors located within the zone of influence. In the period of operation of the proposed road the residential areas on either side of the highway road are likely to experience high day as well as night-time noise levels. Noise propagation from a road is influenced by distance, ground surface meteorological conditions (wind and temperature), reflecting obstacles and increasing through barrier. The influence of the meteorological condition is mainly significant over long distance.

6.2.3 Land Environment Physiography

The impact of road construction on physiography is a function of the terrain of the area.

Since entire length of bypass passes through plain areas and the main carriageway will be raised, therefore, there will be visible and significant impact on physiography of the region.

Preconstruction Stage

No significant impact on topography is envisaged during the pre-construction stage.

Construction Stage



The impacts on the local topography will be significant. Digging for the borrow materials would bring about significant changes in the existing topography around the borrow areas. Similarly, stone quarrying, fill and cuts for widening, provision for construction, yard for material handling and building of project related structures can further alter the local topography of the project direct influence area.

Operation Stage

No significant impact is envisaged on topography during the operation stage.

Loss of Productive Soil

Loss of productive soil, although during the construction stage only, is envisaged at locations of workers' camps, stockyards, storage go-downs etc. if these are located on cultivated areas. Provision has been made in EMP to ensure that no productive areas

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are used for these purposes. In any case, though it would be a direct impact, it would be reversible and low in nature.

Land Use

The land use in all the bypass alignments will be converted into pavement permanently due to construction of the road. Thus, fertile agriculture land coming within the RoW will be lost permanently. During the construction period, there will be temporary land acquisition for access road for construction site in the new alignment area, location of crushers, hot mix plants and workers camp for the project road.

Impact on Ribbon Development

In addition to the above, there will be induced land use changes particularly adjacent to RoW where service road is planned on certain stretches along the side of the main carriage way. Though, the service roads are not continuous even this proposed service road in selected stretches will provide better connectivity to the villages present nearby. Land adjacent to the project stretches of NH-37, Silchar bypass and NH-306 and along the bypasses is built up and irrigated. Therefore, landowner may not be interested to convert their property and productive agricultural land for other use. But certain amount of roadside development is unavoidable near to the settlements as evident from the many sections on the existing NH-37 and NH-306. Hence, it can be envisaged that there will not be any radical changes in land use pattern except minor development along the proposed roads or at road junction and major settlements. Expected land use changes will include establishment of repair shops, tea stall and other small commercial establishments. These induced land use changes may lead to encroachment of RoW, wherever are available by the community. To control unauthorised ribbon development along the project road and proposed bypasses some legislative measures need to be taken-up jointly by the Local Development Authority and Assam state government in consultation with revenue authority.

Soil Erosion

Loss of productive soil due to road construction is direct, adverse and long term. It is therefore necessary to ensure that this topsoil is replaced or rehabilitated for plantations or agriculture after construction. The loss of productive soil especially in irrigated areas can be considered a long-term residual impact. As the project involves the acquisition of some productive agricultural lands, the impact will be mitigated with the help of appropriate measures.

Contamination of Soil Pre-construction Stage

The loss of topsoil and the contamination of the soil will be negligible in the pre-Construction stage, as the site clearances activities do not involve stripping the site. However, the movements of heavy clearing machines will result in temporary compaction of the soil.



Construction Stage

During Construction Stage, the soil is likely to be impacted due to various construction activities. Spilling of Construction materials and the residual waste will result in soil pollution. The topsoil is rich in nutrient value and supports rich biodiversity. Location with this thin soil and soils already under erosion are susceptible to high impacts even with slight modifications in the area. Intense construction activities in these areas lead to erosion and loss of productivity. Impact will be more pronounced in these areas due to lower permeability of the black cotton soil and hence higher retention time of the runoff from construction activities as well as the residential wastes.

Road construction activity will involve stripping all the topsoil, however that is restricted within the direct influence zone i.e., RoW itself. Also, the locations identified as borrow areas will experience the loss of productive soil cover. The EMP thereby ensures proper utilisation of this soil into landscaping activity and adequate trimming and dressing of the borrow areas. Spillage, leakage, and disposal of construction materials, setting up of the construction camps and improper waste disposal will lead to short term contamination of the soil.

Operation Stage

No loss of topsoil is envisaged during the operation stage of the road. However, the commuters along the road envisage contamination of the soil due to accidental leaks, spills, and waste disposal during the operation stage. These impacts are reversible and short term.

Table 6.3 The Type and Scale of Soil Impact

Location	Type of Impact		Scale of Impact	Mitigation measures suggested
	Loss of productive soil	Erosion / Contamination		
Roadside open stretches.	No Loss; Beneficial.	Very less.	May be negative impact during construction.	More trees plantation to enhance environment and for soil Conservation.
Market and Congested areas.	No Loss; Beneficial.	No.	May be negative Impact during construction.	Not needed.
Borrow pit area.	No Loss of productive soil; Beneficial.	No.	-	Can be developed into pond for fisheries.
Near Bridges.	No significant Loss of productive soil.	Soil erosion due to high embankment	-	By turfing, slope should be gradual.

Quarry and Borrow Areas

The borrowing activity inflicts a variety of impacts on the direct and indirect area of influence in different stages of the project Pre-construction Stage. Generation of the dust and other particulate matter is inevitable due to procurement and transportation of borrow/ quarry materials from the identified sources to the site. Frequent movement of the transportation materials and vehicles increase the SPM and noise level at the source, its surrounding areas and destination areas for short term, resulting in increased air concentrations and higher noise levels.

Construction Stage

The above-mentioned air and noise pollution from the extraction and transportation of borrow and quarry material will continue throughout the construction stage. The losses of the productive soil along with borrow pits becoming potent sites for water logging is an issue of concern. The EMP ensures proper trimming, dressing and appropriate utilization of the excavated areas. Stone-crushing activity is also a potential source for the short-term increase of the air pollution levels.

Operation Stage

There will be no impact on borrow or quarry areas during the operation stage of the project.

6.2.4 Roadside Plantations Pre-construction Stage

Impact on the roadside trees during the stage is significant as it involves site clearing. It will reduce the green cover of the region along with triggering many consequent impacts like.

- Reduced absorption of air pollutants and hence increase in pollutant concentration.
- Reduced attenuation of noise leading to increase in noise levels.
- Decreased soil holding capacity and increase in soil erosion.

As the proposed widening to two-lane is to be carried out symmetrically or eccentrically on the existing Row as well as on the additional land to be acquired to save the maximum number of trees, but some felling of trees is unavoidable. Table 6.4 gives the likely number of trees to be impacted.

Table 6.4 Girth wise Roadside Trees to be felled

Sl. No.	Trees Size	Total number of Trees Approx.)
1	Less than 300mm.	3475
2	300–600 mm.	2140
3	600–900 mm.	1950



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Sl. No.	Trees Size	Total number of Trees Approx.)
4	900-1500 mm.	935
5	1500-2100 mm.	NIL
6	2100-3000 mm.	NIL
7	More than 3000 mm.	NIL
	Total	8500 aprx.

Construction Stage

The Impacts envisaged during the construction stage are the same as those in the pre-construction stage. More trees would be chopped down to provide the clear sight distance and meet the geometric requirement. The EMP will need to ensure the appropriate compensatory afforestation and landscaping along the corridor to mitigate the adverse impacts.

Operation Stage

No significant long-term impact is envisaged at this stage though some damage to the roadside trees is envisaged due to increased traffic and the resultant increase in vehicular emissions. The larger positive impact is envisaged with improvement in visuals and aesthetics due to the landscaping. The incidence of accidents would also reduce as there would be adequate sight distance available.

Road Safety

Road Safety is an issue of concern at all the three stages. As mentioned above, the project road is prone to accidents. The activity related to construction and operation will increase the incidence of accidents. However, the situation will be improved during the operation stage due to the improved design.

Construction Stage



The construction activities and equipment's during the construction stage will restrict the effective carriageway and block the traffic flow and become a potential cause for the increase in accidents. There might be cases of other accidents due to the construction activities, operation of hot mix plants etc. However, such incidents would be minimized with the help of appropriate mitigation measures.

Operation Stage

The Operation Stage envisages the design speed of 100 km/ hr. along the urban section, there is pedestrian and cattle movement. These sections become sensitive and are prone to accidents. However, due care has been taken during the design-stage to overcome such related hazards.

Human Health Construction Stage

Human health is an issue of concern, especially in the construction camps. These camps if not adequately equipped for habitation will experience the outbreak of diseases.

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However, the guidelines laid by the MOEFCC, if appropriately, deployed, helps maintain the health standards. Adequate protection and precautionary measures need to be worked out as part of the EMP to effectively address the health uses, especially during the construction stage of the project.

6.3 Socio-economic Environment

Infrastructure development projects bring numerous positive impacts but also cause adverse social impacts in terms of loss of land assets, non-land assets and loss of livelihood particularly the vulnerable sections of the society who are susceptible to socio-economic risks. Assessment of such impacts and development of mitigation measures during the project preparation help achieving the social acceptance of the project. This section of the report presents the social impact assessment of the project road. It details out the project benefits, the associated, and measures adopted to minimize the adverse social impacts.

Likely Positive Impacts

Upgrading and strengthening of road will induce economic and social benefits to the people in the direct influence zone i.e., villages through which the project road traverses and indirect benefits to the districts and state. It will provide impetus for economic development in the immediate surroundings and would also generate local employment. Furthermore, it will facilitate improved access to market centres, educational institutions, healthcare facilities, and offices located in the districts. The cumulative likely positive impacts of the project will result in increased mobility, employment generation, and above all better economic integration of the area with the major market and trade centres within and outside the districts.

Adverse Impacts

The adverse impacts of the project have been quantified based on the survey carried out at site as per the improvement plan. The corridor of impact varies from one point to another along the project stretch. The magnitude of the likely impacts because of the proposed upgrading of the project road broadly classified as impacts on land, structures Government and community property resources (religious structures, passenger shelters, etc), impacts on livelihood, etc.

7

Chapter 7- Environmental Management Plan

7 Environmental Management Plan

7.1 Introduction

The Environmental Management Plan (EMP) consists of set of mitigation, monitoring and institutional measures to be taken during the design, construction, and operation stages of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The plan also includes the action needed for the implementation of these measures. The summary of all activities is provided in Table below.

The major components of the Environmental Management plan are:

- Mitigation of potentially adverse impacts.
- Monitoring during project implementation and operation.
- Institutional capacity building and training.
- Implementation schedule and Environmental cost estimates; and
- Integration of EMP with Project planning, design, construction, and operation.

7.2 Objectives of the EMP

The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated, and the positive impacts are enhanced. The objectives of the EMP at various stages of the project planning and implementation are as follows:

7.2.1 Design Stage

- To have minimum impact on roadside tree, forestation, and ground cover.
- To keep land acquisition and building demolition at a minimum.
- To provide maximum safety to the road users and roadside communities.
- To develop a design that incorporates environmental safeguards; and
- To provide mitigation measures to all expected environmental degradation due to the project activity.

7.2.2 Constructions Stage

- To prevent and reduce the adverse environmental impacts of the project by implementing mitigation measures; and
- To ensure that the provisions of the EMP are strictly followed and implemented by strengthening implementation arrangements.

7.2.3 Operation Stage

- To prevent deterioration of environment components of air, water, soil, noise etc.
- To improve the safety of the road users and roadside communities.



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Pre-construction and construction stage				
Land Acquisition, R&R (Throughout the Project Corridor)	The acquisition of land and private properties will be carried out in accordance with the RAP and entitlement Framework for the project. It will be ensured that all R&R activities are to be completed before the construction activity starts, on any section of project area.	District Magistrate / Deputy Commissioner / CALA	CALA / Revenue Department	CALA/ Revenue Department
Clearance of Encroachment/ Squatters	Advance notice, as per RAP shall be given to the encroachers and squatters which need relocation. All R & R activities will be undertaken. Entitlements as per state govt's entitlement framework for this project will be completed before construction starts.	CALA/ Revenue Authorities	CALA / Revenue Department	CALA/ Revenue Department
Tree Cutting (Throughout the Project Corridor)	8500 no. (appx.) of trees have been identified to be removed. If necessary, the trees will be cut as per guidelines of MoEFCC and forest dept.	Forest Dept.	Contractor	Cachar Forest dept.
Relocation of Community utilities (Throughout the Project Area)	All such Community utilities, if required will be relocated as per Govt. of Mizoram rules.	District Administration.	NHIDCL, Silchar	NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Relocation of Cultural Property Resources (Throughout the Project Area)	No relocation suggested in the planning stage.	District Administration	NHIDCL, Silchar	NHIDCL, Silchar
Crushers, Hot-mix Plants & Batching Plants	Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations.	Silchar, Assam State PCB	Contractor	Contractor/ NHIDCL, Silchar
Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to Noise limits for construction equipment's 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.	Silchar, Assam State PCB	Contractor	Contractor/ NHIDCL, Silchar
Identification and Selection of Material Sources				



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Construction Materials	The Contractor will not start borrowing earth from any borrow area until the formal agreement is signed between landowner and Contractor. The borrow areas are provided in the chapter 2 and annexed in annexure 4.	Cachar (Assam) Mining Department and State PollutionControl Board	Contractor	Contractor/ NHIDCL, Silchar
Stone chips	The Contractor will obtain necessary permission for procurement of materials from Assam State Mining Department and State Pollution Control Board. Contractor will also work out haul road network and report to Environmental Expert who will inspect and in turn report to NHIDCL, Silchar before approval.	Cachar (Assam) Mining Department and State PollutionControl Board	Contractor	Contractor/ NHIDCL, Silchar
Arrangement for Construction Water	The Contractor will source the requirement of water essentially from water supplied by Municipal bodies and cannot use the ponds, which are in use by community. The Contractor will not be allowed to pump from the surface water bodies used by community. In that case, before using any pond water Contractor will inform the owner. To avoid disruption / disturbance to other water users, the Contractor will extract water from fixed locations and consult the Environmental Expert before finalizing the locations. The Contractor will need to comply with the requirements of the state Ground Water Department and seek their approval for doing so, if inevitable.	CGWB, Contractor, and water supplying agency of the area	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Labour Requirements	The Contractor will use unskilled labour drawn from local communities to avoid any additional stress on the existing facilities (medical services, power, water supply, etc.).		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Construction Camp Locations- Selection, Design & Layout	<p>Siting of the construction camps to be as per the guidelines presented below Construction camps will not be proposed within forest land and 1000 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community.</p> <p>Location for stockyards for construction materials will be identified at least 1000 m from water courses.</p> <p>The waste disposal and sewage system for the camp will be designed, built and operated such that no odour is generated. Unless otherwise arranged by the 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 NATIONAL HIGHWAY DIVISION, Kolasib will need to be provided by the Contractor.</p>		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Hot Mix Plants and Batching Plant Locations	Hot mix plants and batching plants will be sited sufficiently away from forest land, settlements and agricultural operations or any commercial establishments.	Cachar, Assam State Pollution Control Board	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	Such plants will be located outside of forest land and at least 1000 m away from the nearest village settlements preferably in the downwind direction.			
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 Environmental Expert of Authority Engineer / NHIDCL, Silchar will be required to ensure that the clearing up of the site prior to handing over to		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Environmental Issue	Mitigation Measures the owner (after construction or completion of the activity) is included in the Concession Agreement.	Reference and Authority	Implementation	Responsibility



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Site Clearance				
Construction Wastes Disposal including Fly Ash	<p>The pre-identified dump locations will be a part of comprehensive solid waste management plan to be prepared by the Contractor in consultation with Environmental Expert of Authority Engineer / National Highway Division, Silchar. Location of disposal sites will be finalized prior to completion of the work on any section of the project area. The Environmental Expert of Authority Engineer / NHIDCL, Silchar will approve these disposal sites.</p> <p>Contractor will ensure that any spoils of material unsuitable will not be disposed of near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and quarries, low-lying area in barren lands along the project corridors.</p> <p>No fly ash will be disposed in any disposal site. Contractor will take care if any residual fly ash (if used) is remained after construction work either this will be returned to the source or used in construction. AE/NHIDCL, Silchar will keep strict vigil on this aspect. All waste materials will be completely disposed, and the site will be fully cleaned before handing over. The Environmental Expert of Authority Engineer / NHIDCL will certify the site after approval. The Contractor at its cost shall resolve any claim, arising out of waste disposal.</p>		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Stripping, Stocking and Preservation of Topsoil's	<p>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. At least 10% of the temporarily acquired area will be earmarked for storing topsoil and following precautionary measures will be taken to preserve them till they are used:</p> <p>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, the edges of the pile will be protected by silt fencing.</p> <p>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 tarpaulin sheets.</p> <p>It will be ensured by the Contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles.</p> <p>Such stockpiled topsoil will be utilized for covering all disturbed areas including borrow areas, top dressing of the project area embankments and fill slopes filling up of tree pits, in the median, and in the agricultural fields of farmers, acquired temporarily.</p> <p>The management of topsoil shall be reported regularly to the Environmental Expert of AE/NHIDCL, Silchar.</p>		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Accessibility	<p>The Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project area.</p> <p>The Contractor will also ensure that the existing accesses will not be undertaken without providing adequate provisions to the prior satisfaction of the Environmental Expert of AE/NHIDCL, Silchar.</p> <p>The Contractor will take care that the cross-project areas are constructed in such a sequence that construction work over the adjacent cross project areas are taken up one after one so that traffic movement in any given area not get affected much.</p>	RTO, Traffic Dept.	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Raw Materials.	The Contractor shall obtain materials only from the approved sources after consent of the department of Mining.	Department of Mining, Govt. of Assam	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Transporting Construction Materials and Haul Road Management	<p>Contractor will maintain all project areas (existing or built for the project), which are used for transporting construction materials, equipment and machineries.</p> <p>All vehicles delivering materials to the site will be covered to avoid spillage of materials.</p> <p>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 clean and clear of all dust/mud or other extraneous materials dropped by such vehicles.</p> <p>Contractor will arrange for regular water sprinkling at least thrice a day (i.e., morning, noon and evening) for dust suppression of such project areas particularly the earthen project areas.</p> <p>The unloading of materials at construction sites close to settlements will be restricted to daytime only.</p>		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Water				
Construction Water	<p>Contractor will arrange adequate supply and storage of water for the whole construction period at his own costs.</p> <p>Contractor will not open new bore well or extract groundwater without permission from the Cachar, Assam Ground Water Board. The Contractor will take all precaution to minimize the wastage of water in the construction process/operation.</p>	Silchar GroundWater Board	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



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Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	<p>Contractor will not take water from any irrigation canal or any other surface water bodies without written permission by the competent authority.</p> <p>If Contractor uses any existing source of water, (subject to the provision that any claim arising out of conflicts with other users of the said water body shall be dealt with entirely by the Contractor) (s) he will seek permission from the owner and Environmental Expert of AE / NHIDCL Silchar will ensure that such activity will not deprive the original user of the concern water source (s). Environmental Expert of AE / NHIDCL Silchar, will also keep a strict vigil on this aspect and it will be reflected in compliance report to MoEFCC.</p>			
Drainage and Flood Control	<p>Contractor will ensure that no construction materials like earth, stone, ash or appendage disposed of so as not to block the flow of water of any water course, and cross drainage channels.</p> <p>Contractor will take all necessary measures to prevent the blockage of water flow.</p> <p>In addition to the design requirements, the Contractor will take all required measures as directed by the Environmental Expert of AE / NHIDCL Silchar, to prevent temporary or permanent flooding of the site or any adjacent area.</p>	District Administration	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Water Pollution from Construction Wastewater	The Contractor will take all precautionary measures to prevent the wastewater during construction from entering directly into streams, water bodies or the irrigation system. The Contractor will strictly follow the discharge standards promulgated under the Environmental Protection Act, 1986. All waste arising from the project is to be disposed-off in the manner that is acceptable to the Assam State Pollution Control Board (ASSAM STATE PCB). Environmental Expert of AE / NHIDCL Division, Silchar will certify that all liquid wastes disposed-off from the sites meet the discharge standards.	Silchar, Assam State PCB	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Siltation of Water Bodies and Degradation of Water Quality	The Contractor will not excavate beds of any stream/ canals/ any other water body. Contractor will construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (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 earthworks 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	Dept. of Irrigation, Silchar Govt. of Assam	Environmental Expert of Authority Engineer / NHIDCL, Silchar	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	located in truck lay bays and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m. (refer Annexure 3) Contractor will ensure that construction materials containing fine particles stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.			
Slope Protection and Control of Soil Erosion.	The Concessionaire will take slope protection measures as per design, or as directed by the Environmental Expert of IE to control soil erosion, sedimentation through use of dykes, sedimentation chambers, basins, fibber mats, mulches, grasses, slope, drains and other devices. 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. Concessionaire will ensure the following aspects: 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. Turfing works will be taken up as soon as possible provided the season is favourable for the establishment of grass sods. Other measures of slopes slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks.	Dept. of Irrigation, Silchar Govt. of Assam	Contractor	Contractor/ NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



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Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	<p>In borrow pits, the depth of the pits shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontals, from the edge of the final section of the bank.</p> <p>Along sections abutting water bodies, stone pitching as per design specification will protect</p>			
Water Pollution from Fuel and Lubricants	<p>The Contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refuelling sites will be located at least 1000 m from rivers and irrigation canal/ponds or as directed by the Environmental Expert of AE/NHIDCL Silchar.</p> <p>Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants will be minimised and does not contaminate the ground. Oil interceptor will be provided for vehicle parking, wash down and refuelling areas.</p> <p>Contractor will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed-off in accordance with MoEFCC and Assam State, PCB guidelines.</p>	Silchar, Assam State PCB	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Air				
Dust Pollution from Batching Plants	All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. Clearance for siting shall be obtained from the Mizoram State PCB. Alternatively, only approved plants licensed by the Assam State PCB shall be used. Regular water sprinkling should be provided to ensure the dust suppression. The PM10 value at 50m from a unit located in a cluster should be less than 100 µg/m ³ . The monitoring is to be conducted as per the monitoring plan.	Silchar, Assam State PCB	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
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 Mizoram State PCB & Environmental Expert of AE / NHIDCL Division, Silchar, will be required to inspect regularly to ensure the compliance of EMP.	Silchar, Assam State PCB	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Noise				
Noise from Vehicles, Plants and Equipment	The Contractor will confirm the following: All plants and equipment used in construction shall strictly conform to the MoEFCC / CPCB noise standards.	Silchar, Assam State PCB	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



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Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	<p>All vehicles and equipment used in construction will be fitted with exhaust silencers.</p> <p>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.</p> <p>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. At the construction sites within 150 m of the nearest habitation, noisy construction work such as, concrete mixing, batching will be stopped during the night times between 10.00 pm to 6.00 am.</p> <p>Contractor will provide appropriate noise barriers to their premises. Noise barrier may be of 2 to 3 m high wall separating the sensitive building from noise or it may be a green barrier of vegetation having density of minimum 5 m between sensitive location and the highway. Monitoring shall be carried out near construction site as per monitoring schedule. Environmental Expert of NATIONAL HIGHWAY</p>			



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Safety				
Personal Safety Measures for Labours	<p>Contractor will provide:</p> <p>Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc.</p> <p>Welder's protective eye-shields to workers who are engaged in welding works</p> <p>Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals.</p> <p>Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation.</p> <p>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.</p> <p>The Contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.</p> <p>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 rubbed and scrapped.</p>	Office of the Factory Inspector, Office of the Labour Commissioner	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
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, marking, flags, lights and		Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	flagmen as may be required by the Environmental Expert of AE / NHIDCL Division, Silchar for the information and protection of traffic approaching or passing through the section of any existing crossroads. Any such activity should be reported to traffic police and a prior consent are taken.			
Precautionary/Safety Measures during Construction	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 will be adhered to. The Contractor will comply with all the precautions as required for the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62. The Contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Risk from Electrical Equipment (s)	The Contractor will take adequate precautions to prevent danger from electrical equipment i.e., 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.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



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Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	All machines to be used in the 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.			
Risk Force Measure	The Contractor will take all reasonable precaution to prevent danger of the workers and public from fire, flood, etc. The Contractor will keep emergency arrangement so that in case of any mishap all necessary steps can be taken for prompt first aid treatment.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
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 of Mizoram at every workplace. Suitable transport to take injured or sick person(s) to the nearest hospital. Equipment and trained nursing staff at every workplace and construction premise.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Heritage protection and care				



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Project area Plantation.	The Contractor will do the plantation in their premises as per requirement of the NBCC and Industrial plant's code.	Forest Dept. MoEFCC.	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Flora/ Fauna	<p>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 animal.</p> <p>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 National Highway Division, Kolasib and report to the nearby forest office (forest range office or divisional forest office) and will take appropriate steps/ measures, if required in consultation with the forest officials.</p>	Forest Dept. MoEFCC..	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
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 Ancient Monuments and Archaeological Sites and Remains Act, 1958.	Archaeological. survey of India	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Additional Occupational Facility				



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Provision of Potable Water	<p>The Contractor will provide, erect, and maintain necessary (temporary) living accommodation and ancillary facilities for labour up to standards and scales approved by AE / NHIDCL Division, Silchar at the location identified for such facilities in pre-construction phase.</p> <p>The Contractor will provide these facilities within the precincts of every workplace, latrines and urinals in an accessible place, and the accommodation, as per standards set by the building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.</p> <p>The Contractor will construct and maintain all temporary accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing.</p> <p>The Contractor will also guarantee the followings: Supply of sufficient quantity of potable water (as per IS 10500) in every workplace/labour campsite at suitable and easily accessible places and regular maintenance of such facilities.</p> <p>If any water storage tank is provided that will be kept at a distance of not less than 15 m. from any latrine, drain or other source of pollution.</p> <p>If water is drawn from any existing well, which is within close proximity of any latrine, drain or other source of pollution, the well will be disinfected before water is used for drinking.</p> <p>All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof.</p>	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	<p>A reliable pump will be fitted to each covered well. The trap door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.</p> <p>Testing of water will be done every month as per parameters prescribed in IS 10500:1991.</p>			
Sanitation and Sewage System	<p>The Contractor will ensure that the sewage system for the camp is 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.</p> <p>Separate latrine and urinals, screened from those from men (and marked in the vernacular) are provided for women</p> <p>Adequate water supply is there to all latrines and urinals.</p> <p>All latrines in workplaces are with dry-earth system (receptacles) which are cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition</p> <p>Night soil is disposed-off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covering it with 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight.</p>	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contactor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Waste Disposal	<p>The Contractor will provide garbage bins in the premises and regularly emptied and disposed-off in a hygienic manner as per the comprehensive Solid Waste Management plan for the labour/ Contractor's premise approved by the Environmental Expert of AE / NHIDCL Division, Silchar.</p> <p>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 labour camp.</p> <p>The Contractor will make arrangement for disposal of night soil by composting at the workplace unless otherwise arranged by the local sanitary authority. The composting of night soil will be done as per direction of Environmental Expert of AE / NHIDCL Division, Silchar.</p> <p>The Contractor will also ensure that on completion of the work, all temporary structures are cleared, all rubbish are burnt, night soil or other disposal pits or trenches filled in and effectively sealed off. The site will be left clean and tidy, at the Contractor's expense, to the entire satisfaction to the Environmental Expert of AE / NHIDCL Division, Silchar.</p>	Building and other Construction Workers. (Regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Monitoring and Community Participation				



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Monitoring of Environmental Conditions	The Contractor will undertake seasonal monitoring of air, water, noise, and soil quality through MoEFCC's approved monitoring agency. The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the monitoring plan presented in the next section.	MoEFCC	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Continuous Community Participation	The Environmental Expert of AE / NHIDCL Division, Silchar, will have continuous interactions with local people around the project area to ensure that the construction activities are not causing undue inconvenience to the locals residing in the vicinity of project site under construction due to noise, dust or disposal of debris etc.	AE / NHIDCL Division, Silchar	Environmental Expert of Authority Engineer / NHIDCL, Silchar	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Cleaning of Construction Premises and Restoration	The Contractor will clear all temporary structures, remove or burn all rubbish, and night soils. All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed on adjoining/ proximate barren land or areas identified by Environmental Expert of AE / NHIDCL Division, Silchar in a layer of thickness of 75 mm-150 mm.	Dept of Labour, Govt. of Silchar, Assam	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Plantation	Avenue plantation (wherever space is available) will be implemented by Contractor. The plantation will be done as per the plantation	Forest Dept.	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	scheme prepared for this project. The plantation will be carried by Contractor. Around 13000 trees will be planted along the corridor			
OPERATION PHASE				
Monitoring Operation Performance	Authority Engineer / NHIDCL division Silchar, will monitor the operational performance of the various mitigation / enhancement measures carried out as a part of this project. The indicators selected for monitoring include the survival rate of trees, utility of enhancement provision for relocated temples and other important structures, status of rehabilitation of borrow areas and utility of double glazing for noise sensitive receptors.	AE / NHIDCL Division, Silchar	Contractor	Environmental Expert of Authority Engineer / NHIDCL, Silchar
Environmental Compliance Monitoring				
Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination in the select location as suggested in pollution monitoring plan in EMP will be responsibility of AE / NHIDCL. Authority Engineer / NHIDCL will appoint CPCB/MoEFCC approved pollution monitoring agency for this purpose.	Silchar, Assam State PCB	Contractor/ NHIDCL	Contractor/ NHIDCL



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
Atmospheric Pollution	Ambient Air concentrations of various pollutants shall be monitored as envisaged in the pollution- monitoring plan.	Assam State PCB	Contractor	AE / NHIDCL
Ground and Surface Water Analysis	Ground and Surface water has to be analysed as per IS 10500.	Assam State PCB	Contractor	AE / NHIDCL
Noise Pollution	Noise pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs to be enforced strictly. Monitoring of the effectiveness of the pollution attenuation barriers, if there is any will be taken up thrice in the operation period.	Assam State PCB	Contractor	AE / NHIDCL
Wastewater management	Provision of Soak pit.		Contractor	AE / NHIDCL
Municipal Solid waste management	Proper disposal.	Assam State PCB	Contractor	AE / NHIDCL
Hazardous waste management	Proper disposal.	Assam State PCB	Contractor	AE / NHIDCL
Changes in and Use Pattern	AE / NHIDCL shall take initiative and act as facilitator to prepare an action plan for balanced regional development in consultation with Local Development Authority and State Government to control the ribbon development along the project area including new bypasses. A land use regulation control, if applicable need to be adopted. A separate governing body may be formed with the representation of NHIDCL, Revenue Department and Local Civic Body (Municipal Corporation/ Gram Panchayat) with	District Administration	NHIDCL & Local Authorities (Revenue department and Local Civic bodies)	AE / NHIDCL



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Issue	Mitigation Measures	Reference & Authority	Implementation	Responsibility
	the power of taking necessary action, if required to remove unauthorized development along the project area. This special body will meet periodically and monitor the development along the project area.			
Orientation of Implementing Agency and Contractors	AE / NHIDCL shall organize orientation sessions during all stages of the project. The orientation session shall involve all staff of Environmental Cell, field level implementation staff of AE / NHIDCL Environmental Expert and Contractor.		Contractor	AE / NHIDCL



	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to 49+360)</p> <p>EIA: Chapter 7: Environmental Management Plan</p>	
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Table 7.1 Matrix of Potential Environmental Impacts due to the project and Preliminary mitigation measures

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
Design & Preconstruction					
Land	Land Acquisition	D	H	L	The alignment finalization should be in such manner to minimize the acquisition of land. As far as possible the productive land area should be avoided to acquire.
Trees	Tree cutting	D	H	L	Cut only those trees affected by permanent works Compensatory plantation
Socio-Economic	Problem of Resettlement and rehabilitation	D	H	L	Adjustment in alignment to avoid displacement Early identification and entitlement of the project affected people Early planning of rehabilitation and resettlement
	Impact on public utilities, cultural sites	D	H	L	Utility shifting as per R&R Plan Alignment to be finalized considering minimum damage to the cultural properties
Construction					
Physical Resources					
Soil	Loss of topsoil due to excavation site clearance and	D	H	L	Topsoil should be removed & stored separately during excavation. Re-vegetate the disturbed slope as early as possible
		D	H	L	Regulation of movement and parking of vehicles and equipment outside ROW.



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
	Soil compaction due to storage of quarry materials and other heavy equipment, movement of heavy vehicles at the site				Storage of materials should be allowed only at wasteland or barren area.
Air Quality	Reduced buffering of air pollutants, hotter, drier microclimate due to tree felling and vegetation loss during site clearance	I	L	L	Tree plantation
	Localized increase in pollutants due to increase in number of construction vehicles and equipment	D	L	S	Vehicles should be maintained such that exhaust emissions are minimum
	Dust generation due to earth excavation, transportation & heavy	I	L	S	Vehicles delivering materials should be covered Regular water sprinkling over exposed surfaces



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
	vehicles maintenance or operation, Construction of structures and earthworks, asphalt & crusher plants				
	Toxic gas emission during asphalt preparation, bituminous heating	D	M	S	The asphalt mixing plant should be located in conformity with the statutory requirements. Consent to Establish and Consent to Operate from SPCB should be obtained prior to operation of plant.
Noise Quality	Increased noise level due to excavators/ machinery etc., operation and maintenance of heavy vehicles and equipment's, Asphalt preparation and crushing	D	M	S	Noise standards of industrial enterprises shall be strictly enforced. Proper scheduling of the operation of equipment. The stationary noise generating equipment should be installed sufficiently away from habitation area.
	Additional pressure on water demand due to the water requirement for	D	M	S	Alternative water supply system for construction should be ensured in such a way to prevent the additional pressure on public water supply system.



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
Surface Water	construction works				
	Blockage of water channels unmanaged excavation and earth filling.	D	M	S	Proper excavation and disposal of the extra fill material away from stream Provision of cross drainage during construction along the water bodies
	Contamination Of water Due to Spillage of construction waste.	I	M	L	Strict regulation of traffic flow, waste disposals, bunding around fuel storage site, proper disposal system at equipment and vehicle service stations
	Impairment of surface water bodies, new waterbodies due to Quarries/ borrow pits	I	H	L	Controlled quarrying and borrowing
Ground water	Ground water exploitation for construction works and workforce camp	I	L	S	Regulation of ground water extraction Surface water should be used for construction
Drainage Pattern	Interference with natural drainage flow due to earth excavation dumping, disposal of	D	M	S	Regulation of dumping of waste materials and proper care should be taken at the site of construction to minimize the wastage. Clean fill material devoid of soil particles to prevent siltation



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
	wastes and surplus earth materials, and construction of structures and earthworks				and deposition on the way of natural drainage
Ecological Resources					
Vegetation	Fire risks during vegetation clearance and asphalt preparation	I	H	L	Kerosene or gas cylinders should be supplied to campsite to avoid use of firewood Prohibition of clearing of trees for firewood
Wild Fauna	Disturbance or hunting of fauna	I	H	S	construction camps to be located away from the estuary Control workforce, awareness programme for the workforce, strict enforcement of Wildlife protection Act, Prohibition of hunting of animals
Aquatic fauna	Adverse impact due to increased turbidity and alkalinity	I	H	S	Sediment flow will be kept at minimum level through a mix of management measures during construction near water bodies or construction of ridges Prohibition of unauthorized fishing
Social Environment					
Livelihood	Economic losses as a result of	D	M	L	The widening should be done in a way to minimize the land acquisition





Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 7: Environmental Management Plan

Environmental Components	Impacts	Significance (Direct/Indirect/ High/ Medium/Low)		Duration of Impacts (Long/ Short)	Mitigations
	property loss due to land take for widening				
Employment	Employment on road construction, and resultant flow	D	H	S	Encourage local recruitment
Religious / Cultural feature	Impact on religious/ cultural structure	D	H	L	Shifting and restoration of structures through public consultation
Health	Health problems to the local people settled near the construction sites because of toxic gaseous emissions due to asphalt preparation and crushing Asphalt odour and dust due to asphalt and crusherplant and laying of pavement	D D	M M	S S	Appropriate siting of plant establishment Strict adherence to the emission standards laid by the Central Pollution Control Board, regular monitoring of emissions. Provision of emergency medical facility
	Insanitation condition at Campsite	D	H	S	Suitable medical facilities for workers First Aid facilities at camp/ construction site

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to 49+360)</p> <p>EIA: Chapter 7: Environmental Management Plan</p>	
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7.3 Clearances and Permissions Required

7.3.1 Environmental Clearance

The Environment Impact Assessment (EIA) Notification 2006, Ministry of Environment, Forests & Climate Change, Government of India, came into effect from 14th September 2006. The EIA Notification, 2006 specifies the requirement of prior clearance from MOEF & CC for certain development projects specified under the schedule of the Notification. The projects and activities under the Notification have been classified into two categories- Category A and Category B, based on the spatial extent of potential impacts on human health, natural and man-made resources. As per Schedule of the Notification, the Highway project has been classified under Physical Infrastructure including Environmental Services and is listed under item no. 7(f), including new highways or expansion of existing highways. The categorisation related to highway projects are as follows:

Category A: New National Highways and Expansion of National Highways greater than 100 Km involving additional right of way or land acquisition greater than 40 m on existing alignments and 60 m on re-alignments or by-passes.

Category B: All new State Highway projects and State Highway expansion projects in hilly terrain (above 1000 m AMSL) and or ecologically sensitive areas.

Moreover, any project or activity specified in Category B will be treated as Category A if located in whole or in part within 5 km from the boundary of:

- i) Protected areas notified under the Wildlife (Protection) Act, 1972,
- ii) Critically Polluted areas as notified by Central Pollution Control Board from time to time,
- iii) Eco sensitive areas as notified under section 3 of Environment Protection Act, 1986
- iv) Inter State boundaries and international boundaries.

Provided that the requirement regarding distance of 5 km of the inter-state boundaries can be reduced or completely done away with by an agreement between the respective States or U.Ts sharing the common boundary in the case the activity does not fall within 5 kilometres of the areas mentioned at item (i), (ii) and (iii) above.

Environmental Clearance may or may not be employed for this project. It should be confirmed by the authority of SEIAA and SEAC after submission of FORM I of EIA to the aid authority.

7.3.2 Forest Clearance

As discussed above under Chapter 5.1.4 (a), the portion of project alignment (last stretch) encounters forest land i.e., from existing km 40+500 (D. Ch. 47+260) to km



43+000 (D. Ch. 49+360) for a design length of 2.1 km comprising area of 13.889ha, due to technically non-feasible scope of widening of existing 2-lane road to 4-lane of NH-306, proposal for clearance has been submitted to DFO office in Silchar and PCCF office Guwahati through PARIVESH portal with all necessary drawings and documents and shape file and awaiting for further outcome.

Approximately, 8500 trees including forest, private, government mainly jungle tree, bamboos, betelnuts and Roadside plantation that needs to be cut.

From the survey, it was found that the area near Vairengte, border of Assam & Mizoram, although the said stretch (areas) accorded under Cachar forest as per survey of India (SOI) map, but the local people of Mizoram already settle that area between exiting km 42+750 (D.Ch. 48+820) to existing km 43+000 (D. Ch. 49+360) for a length of 540m which is physically under controlled by Govt. of Mizoram and farming on said land. Also, from the notice given by land revenue and settlement department, Government of Mizoram, letter No. K.12011/53/2020/REV on 5th July 2021, it shows that the land belongs to private owners and the compensation shall be done in accordance with the ruling on the appeal or outcome of the appeal or litigation.



Pic 7.1 Photo: Private owner plantation found in the area which is forest land as per SOI map

7.4 Roadside Tree Felling Permission

Roadside tree felling permission is to be obtained from Department of Environment Forest and Climate Change, Assam before the commencement of construction. Approximately, there are about 8500 trees are accorded during DPR Consultant survey team however, same needs to be confirm by forest department during joint survey.

7.5 Clearances/Permission to be obtained by Contractor

Following clearances / permissions are to be obtained by the Contractor for the project before commencing the construction work:





 <p>संस्कृत नगर M.O.R.T.H. Govt. of India</p>	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to 49+360)</p> <p>EIA: Chapter 7: Environmental Management Plan</p>	 <p>NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION</p>
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Table 7.2 Clearances/Permissions to be obtained by Contractor

S. No.	Type of Clearance / Permission	Statutory Authority	Applicability	Project stage
1.	Consent to Establish under the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974	Assam PCB	For establishment of construction camp, construction plant, crusher, batching plant etc.	Pre-construction
2.	Consent to Operate under the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974	Assam PCB	For operating construction plant, crusher, batching plant etc.	Construction stage (Prior to initiation of any work)
3.	Permission to withdraw water for construction from surface water sources such as Rivers / Ponds	Assam Irrigation Dept.	Use of surface water for construction	Construction stage (Prior to initiation of any work)
4	Permission for storage, handling, and transport of hazardous materials	APCB	Manufacture storage and Import of Hazardous Chemical	Construction stage (Prior to initiation of any work)
5	Explosive License	APCB	For storing fuel oil, lubricants, diesel etc. at construction camp	Construction stage (Prior to initiation of any work)
6	Quarry Lease Deed and Quarry License from State Department of Mines and Geology	Dept. of Mining; Concerned District Admin; SEIAA	Quarry operation (for new quarry) Environmental Clearance from SEIAA & TE/CTO from Assam PCB	Construction stage (Prior to initiation of any work)
7	PUC for vehicles for construction under Central Motor and Vehicle Act 1988	Motor Vehicle Dept. of Cachar, Assam	For all construction vehicles	Construction stage (Prior to initiation of any work)

8

Chapter 8- Public consultation and Information disclosure

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to 49+360)</p> <p>EIA: Chapter 8: Public consultation and Information disclosure</p>	
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8 Public consultation and Information disclosure

8.1 Purpose

Public consultation has been carried out in the Project roads with the objectives to minimise the probable adverse impacts of the project through alternate design solutions and to achieve speedy implementation of the project through bringing in awareness among the community on the benefits of the project. Purpose of the public consultation includes the following:

- To ascertain the public views on various environmental issues related to road improvement.
- To encourage people's participation in project design and development stage.
- To serve as an important tool for collecting information about natural and the human environments, much of which would never be accessible through more traditional approaches of data collection and to appropriating possible mitigation measures based on local knowledge of the communities.
- To ensure reduction of public resistance to the project by providing them a role in the decision-making process.



8.2 Process Adopted

Public consultation with key stakeholder is an integral part of EIA study, as per the requirements of ADB's Environmental Assessment Guidelines of 2003. Environmental and social public consultations were started at the early stage of EA process while carrying out the survey and investigation works, that is, while environmental screening and prioritization was undertaken. While details of public consultations on social issues are provided in social assessment report, this section provides details of public consultation on environmental issues.

Local communities, who are primary stakeholders on environmental aspects, were chosen for consultation. Focussed group discussion with the local community is adopted as a tool for the consultation.

In the procedure of information dissemination, collecting relevant information and to acquaint with requirements of the project, the key stakeholder i.e., Govt. officials, PRI officials were consulted during reconnaissance survey. Consultations have been carried out with key stakeholders to understand environmental and social concerns, identify potential impacts, necessity of specific safeguard measures and statutory compliance procedures for each of the project activities.

The public consultation in the project area is held at various levels, Village level, Block level and District level. The local communities have been briefed on project

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interventions including its benefits and disadvantages. Again, the consultation started by disseminating the participants about the nitty-gritty of the project.

The environmental concerns and suggestions made by the participants has been listed out, discussed and dissolved.

8.3 Outcome and Action Taken

Local communities are well aware of the proposed road project. All the participants welcomed the project and requested for early completion. People are sure about their more opportunities due to this project, especially through direct engagement during construction. Specific environmental concerns and suggestions put forth by the local community and the action taken for incorporating the same are provided,

The environmental issues discussed by the participants are summarised below:

- Impact on air quality due to increased dust level and emission level.
- Impact on nearby human habitats due to increased noise level.
- Construction of drains as part of project design.
- Restoration of water supply sources and common property resources before demolition, if affected.
- Provision of public toilets in habitations.
- Plantation of trees along project roads to compensate trees cutting; and
- Provision of Bus stop in the project road.

8.4 Information Disclosure

Environmental assessment reports for ADB projects are intended to accessible to the interested parties and the general public. As per the requirements for Category B Project the full EIA report is also to be made available to the interested parties upon request at PMU, Silchar office.

Table 8.1 Public Consultation

Name of the Village	Issues Raised	Concerns	Response
Rongpur Kasipur Dhanehari Kajidahar Clever House Narsingpur Sadagram Islambad	Air Pollution	The residents are concerned about the dust pollution during construction.	The dust suppression echanism will bein place and water sprinkling will be regularly done
	Encroachment	Few PAPs agreed that they are encroachers, butthey also	Assistance to vulnerable encroachers,



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Section : Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Chapter 8: Public consultation and Information disclosure

Name of the Village	Issues Raised	Concerns	Response
Hawaihang Lailapur		said that they have no space for reconstruction	squatters and Kiosk as per R&R policy
	Widening option	Should be widened according to the land availability	Concentric Widening
	Employment	Would prefer permanent employment either with PWD or contractor. Temporary employment with contractor was also agreed upon	As per the policy, contractor to give preference to local population
	Drainage	Provide drains on the both side of the road and internal road of the village	Drainage provided in all rural as well as urban areas
	Ground water	The usage of ground water will further deteriorate the condition	Water supply would be explored from municipal sources
	Hiring of Local labour	The concern raised that the migrant labour would be used for construction	The local unskilled labour shall be hired as much as possible
	Safety	In replacement place provide three breakers within a distance of 1 km along with the median and street light	Various safety signage will be provided. Footpath and safety railing in every urban area. Project has a separate component on road safety
	Civic Amenities	Sanitation, Drinking Water, Internal road be provided	Will be provided in Resettlement sites
	Widening option	Should be widened according to the land availability	Concentric Widening



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Name of the Village	Issues Raised	Concerns	Response
	Compensation	Cash compensation at replacement value	As per the policy, compensation will be provided at replacement value



Pic 8.1 Photo: Public Consultation and House to House survey

9

Chapter 9 - Institutional requirement, Environmental monitoring plan & Environmental budget

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9 Institutional requirement, Environmental monitoring plan & Environmental budget

9.1 Executing Agency

The PMU (NHIDCL Division) and Regional Office, Guwahati on behalf of NHIDCL are the Executive Agency of the Project.



- PMU and its environmental unit.
- Construction Supervision Consultant (SC) i.e., Authority Engineer and his representatives; and
- Contractor.

Environmental and social development experts will support the PMU in implementing the environmental assessment and monitoring during implementation of proposed safeguard measures at PMU level. The Environment expert will assist the project implementation units (PIU), which will be responsible for managing the project road. Project Implementation Unit (PIU) is established at PMU (NHIDCL Division) Circle level for the implementation of Projects. Each PIU will be headed by Executive Director (Project) assisted by General Manager and at least 2 other technical staff including staff with expertise in environmental management and social development, an accounts officer and to support/administrative staff. PMU General Manager, who will be trained on environmental management by the NHIDCL, HQ specialists with the assistance of designated Environmental and Social Officer will be overall responsible for ensuring compliance of safeguard measures in the field and submit monthly reports to Regional office (RO), Guwahati, certifying that relevant environmental safeguard measures have been complied with during project implementation but coordinating and supervising implementation of safeguard measures will be undertaken by the designated Environmental and Social Officer.

The Head of each PMU office will coordinate and liaise with the Executive Director (RO) and will be supported by the Program Support Consultants as and when needed in Cachar. There is need for capacity building of environmental unit at PMU level through various trainings.

PMU may engage independent agencies for carrying out pollution monitoring of ambient air, Surface water and Ambient Noise during construction activities. The Supervision Consultant may interact with the monitoring agencies and facilitate them in carrying out such activities.

The Supervision Consultant (AE) will liaise with PMU /RO environment unit to ensure that Contractor complies with the requirements of various environmental safeguard



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measures through supervision, monitoring and reporting on the same. Efforts must be made by AE to ensure that environmental mitigation and good-construction-practices are not only considered but implemented as integral component of each civil activity. It should be considered as day-to-day activity. Implementation of environmental safeguard measures needs team effort and as such the Team Leader of AE will delegate the responsibilities to each member of the supervision team with respect to their core responsibilities. The project has a provision of part time input of Environmental Specialist within AE to supervise implementation of safeguard measures. His role would be more on advisory. He will assist the Team Leader of AE on the following:

- Advise PMU on preparing reports to ADB and other statutory bodies.
- Preparing procedures for implementing EMP.
- Review Contractor's EMP, traffic management plan and safety plan and recommend for its approval / improvements, to the Team Leader.
- Provide training to PMU, AE, and Contractors' staff on implementing environmental safeguard measures.
- Advise on obtaining various statutory environmental clearances on time.
- Conduct periodic field visits to examine environmental compliances and suggest corrective actions; and
- Any other issues as will be required to ensure environmental compliance.

Besides, the Team Leader of Authority Engineer, an Environmental Officer (EO) from the commencement to completion of the project from AE will be responsible for day-to-day supervision and implementation of stipulated safeguard measures as per EMP. He will provide guidance to the field staff of SC and Contractor for implementing each of the activities as per the EMP. He will be responsible for record keeping, providing instructions through the Engineer for corrective actions, ensuring compliance of various statutory and legislative requirements and assist Engineer for submitting reports to PMU. He will maintain a close coordination with the Contractor and PMU for successful implementation of the environmental safeguard measures.

A full time Environmental & Safety Officer (ESO) from Contractor side will be nominated for effective implementation of EMP during construction activities. If, it is not nominated, the Senior Project Engineer/ Project Manager will be responsible for implementation of EMP during construction activities. The qualification and responsibilities of Contractor's Environmental & Safety Officer (ESO) as stipulated below should be considered.



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The qualification of ESO will be as given below:

- Diploma or Graduate in Civil Engineering with post graduate specialization in Environmental Engineering or Environmental Science or equivalent.
- 5 to 10 years of total professional experience; and
- About 3 to 5 years of experience in similar projects i.e., management of environmental issues in design and construction of road / highway / flyover / bridge projects.

The responsibilities of ESO of Contractor will include the following:

- Directly reporting to the Project Manager of the Contractor.
- Discussing various environmental issues and environmental mitigation, enhancement and monitoring actions with all concerned directly or indirectly.
- Prepare Contractor's EMP, traffic management plan and safety plan as part of their Work Program.
- Ensure contractor's compliance with the EMP stipulations and conditions of statutory bodies.
- Assisting his project manager to ensure environmentally sound and safe construction practices.
- Assisting his project manager to ensure the timely procurement of materials that are included in the Bill of Quantities relating to environmental mitigation and enhancement measures.
- Conducting periodic environmental and safety training for contractor's engineers, supervisors and workers.
- Preparing a register for material sources, labour, pollution monitoring results, public complaint and as may be directed by the Engineer.
- Assisting the PMU on various environmental monitoring and control activities including pollution monitoring; and
- Preparing and submitting monthly reports to AE on status of implementation safeguard measures.
- As mentioned above, there is a need for capacity building of PIU on various environmental and social aspects of the project through various environmental training. Thus, there is a need for the PIU staff to updating the information and keeping abreast with the changing legal and administrative requirement. The requirements of various statutory permits and clearances are mentioned, for

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successful implementation of EMP, it is essential to orient engineers of PIU, SC and Contractor who would be mobilized for this project.

9.2 Environmental Budget



A budgetary provision of Rs. 14.72 Crores has been proposed which includes for implementation of EMP in the project, which includes Forest land acquisition, compensatory afforestation, median plantation, muck management, various mitigation costs during preconstruction, construction and operation stages, environmental enhancement measures, as well as environmental monitoring cost. The tentative cost, for implementing of various mitigation measures suggested on different items is expected to be about Rs. 14.72 Crores.

Table 9.1 Environmental Budget

Sl. No.	Components	Budget
1	Compensatory Afforestation	₹ 2,00,00,000.00
2	Median Plantation	₹ 2,88,00,000.00
3	Mitigation cost	₹ 4,17,00,000.00
4	Environmental Enhancement	₹ 1,25,00,000.00
5	Monitoring and evaluation (Construction)	₹ 1,75,00,000.00
6	Monitoring (Operation)	₹ 2,25,00,000.00
7	Contingency 5%	₹ 42,90,000.00
8	Total	₹ 14,72,90,000.00

Or Say, Environmental Budgetary cost = 14.75cr

ANNEXURE 1



	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
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RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Project Title: Preparation of DPR for Development of Economic Corridors, inter Corridors and Feeder Routes to improve the efficiency of Freight movement under Bharatmala.

Screening questions	Yes	No	Remarks
A. Project siting			
Is the project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		N	
▪ Protected area	Y		
▪ Wetland	Y		
▪ Mangrove		N	
▪ Estuarine		N	
▪ Buffer zone of protected area	Y		
▪ Special area for protecting Biodiversity		N	
B. Potential environmental impacts			
Will the project cause?			
Encroachment on historical / cultural areas; disfiguration of landscape by road embankments, Y cuts, fills, and quarries?	Y		
Encroachment on precious ecology (e.g., Sensitive or protected areas)?		N	
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		N	No water body en-route.

After reviewing the answers above the Mission Leader and Environment Specialist agree that the project.

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- Should be categorized as an A project.
- Should be categorized as a B project.
- Should be categorized as a B project in an environmentally sensitive area. Should be categorized as a C project.
- Should be categorized as an A/B project because (give reason).
- Requires additional information for classification. Final categorization needs to be made by SEIAA and SEAC board.

Screening questions	Yes	No	Remarks
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		N	The construction camp will be placed at appropriate location.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	Y		Cutting & Filling will be carried out with due care, so that the air pollution shall be minimum
Noise and vibration due to blasting and other civil works?	Y		Locating quarries at least 500 m from settlement and public properties, adopting controlled blasting, providing PPEs to workers etc.
Dislocation or involuntary resettlement of people		N	
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		N	Temporary concerns during construction. However, the dust management plan has been Provided.
Hazardous driving conditions where construction interferes with pre-existing roads?	Y		Suitable traffic management plan will be followed as per IRC 55 and MoRT&H Specification for Road and Bridge Works along with planned construction to minimise impact on road users.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	Y		Construction camps will be provided with necessary water supply, sanitation, storm water drainage, solid waste management and first aid facilities.
Creation of temporary breeding habitats for mosquito vectors of disease?	Y		Sound borrows area and quarry management, proper disposal of liquid effluent at camps to avoid water stagnation and creation of breeding grounds.



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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ANNEXURE 2



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Annexure 2



CAMP SITE MANAGEMENT

Purpose

Campsite of a contractor represents the single potentially most polluting location during implementation of any road project. Air pollution may be caused by emissions from Crushers, Hot-Mix, and Concrete Batching Plants. Water pollution may be caused by discharge of sediment, oil & grease, and organics laden run-off from these plants and their ancillary facilities as well as workshops, residential quarters for the labour. Land may be polluted due to indiscriminate disposal of domestic waste or (accidental) release of hazardous solids from storage areas.

While the installation and operation of Crushers and Hot-Mix Plants are regulated by the respective Pollution Control Boards, the other sources described above usually do not appear to be causes of significant concern. Items to be considered for labour camps are mentioned briefly in Clause 105.2 (as part of 105: Scope of Work) of the Ministry of Road Transport and Highways (MoRTH) publication: Specifications for Road and Bridge Works. Some specific requirements for labour accommodation and facilities are to be met by the Contractor in line with Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. Currently, there is no one-point guidance regarding the environmental management aspects of the Contractor's campsite. This guideline on Campsites is designed to fill this gap.



Scope

This guideline covers the Contractors' camp sites – whether used by in-house crew or by any sub-contractor's crew. It covers siting, operation, maintenance, repair and dismantling procedures for facilities for labour employed on project (and ancillary) activities as well as equipment and vehicles. It does not include

- *Siting, operation, maintenance, repair and dismantling of major plants – Hot-mix Plant, Concrete Batching Plant, Crusher or Wet Mix Macadam Plant.*

Potential Environmental Impacts

Construction camps require large areas for siting facilities like major plants, storage areas for material, residential accommodation for construction labour and supervisors, and offices. Removal of topsoil and vegetation from the land to be utilized for camps is the first direct impact of any such establishment. In addition, local drainage may be impaired if proper drainage is not effected by grading. Other impacts may include damage to ecologically important flora and fauna, if campsites are located close to such areas. Water pollution because of discharge of sediment, fuel and chemicals is also a possibility. Pollution of land due to indiscriminate disposal of construction wastes including scarified pavement, concrete and even substantial quantities of domestic wastes from residential areas can also be potentially disastrous, especially if the site is reverted to its original use after the project.

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Mitigation Measures



1. Siting of Construction Camps

The following guidelines will assist the Contractor to avoid any environmental issues while siting construction camps:

- Maintain a distance of at least 1.5 km from boundaries of designated Reserved Forests, Sanctuary or National Park area for locating any temporary or permanent camps.
- Maintain 1.5 m from river, stream and lake
- Maintain 250m from the boundary of state and national highways
- Locate facilities in areas not affected by flooding and clear of any natural or storm water courses.
- Locate campsites in the (most prevalent) downwind direction of nearest village(s). The boundary of the campsite should be at least 1.5 km from the nearest habitation so that the incoming labour does not stress the existing local civic facilities.
- The ground should have gentle slope to allow free drainage of the site.
- Recorded consultations should be held with residents of the nearest settlement and/or their representatives to understand and incorporate where possible, what they would like to see within their locality.

2. Establishment, Operation, and Closure of Camps

- The facilities within the camp site should be laid out so that the separation distances suggested in other guidelines are maintained. A notional lay-out of the facilities except the major plants is included in this guideline.
- Topsoil from the area of the plant shall be stored separately for the duration of the operation of the camp and protected from being washed away, unless agreed otherwise in writing with the owner. If stored, it will be returned on to its original location at the time of closure of the site.
- The Contractor shall prepare, make widely available (specially to staff responsible for water and material management), and implement a Storm water Management Plan (SWMP) for (all) the site(s) following approval of the same by the Engineer.
- The Contractor shall prepare an Emergency and Spill Response Plan as per the requirements of Annexure 1 to Clause 501 of Specifications for Road and Bridge Works to cover the spillage of bitumen and/or chemicals like retarders, curing compounds, etc.

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- The Contractor shall prepare a Waste Management Plan describing the types and quantities that are likely to be generated from within the camp site, with the period and duration during the construction schedule; methods to be adopted to minimize these; methods of removal, treatment and (on-site or off-site) disposal for each type; as well as location of final disposal site, if any.
- The Contractor shall provide safe ingress and egress for vehicles from the site and public roads and shall not impact existing through traffic.
- Water tankers with sprayers must be available at the camp site at all times to prevent dust generation.
- In case of stockpiles of stored material rising higher than wind-breaking perimeter fencing provided, sprinklers shall be available on site to prevent dusting from the piles during windy days.
- On completion of works, the Contractor shall restore the site to the condition it was in before the establishment of the campsite, unless agreed otherwise in writing with the owner(s) of the site(s). If such a written agreement has been made, the Contractor shall hand over the site to the owner(s) in accordance with such an agreement.



Equipment and Vehicle-related issues Potential Environmental Impacts

The maintenance and repair of equipment and vehicles in Contractor's camp are activities that can have significant adverse impacts if not carried out properly. The concern mainly arises from discharge of wash water contaminated with oil and grease, whether from washing of vehicles or degreasing of equipment and vehicle parts. Vehicle washing, especially dirt from tires, also gives rise to sediment-laden run-off. No such discharges should be directly allowed into surface water bodies, since they can be harmful to aquatic species.

Mitigation Measures

1. Vehicles

- All vehicles used by the Contractor must have copies of currently valid Pollution under Control Certificates displayed as per the requirement of the Motor Vehicles Department for the duration of the Contract.
- All vehicles and equipment will be fitted with silencers and/or mufflers which will be serviced regularly to maintain them in good working condition and conforming to the standard of 75dB (A) at 1m from surface of enclosure.

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2. Workshop and Maintenance areas

- These areas must have impervious flooring to prevent seepage of any leaked oil & grease into the ground. The area should be covered with a roof to prevent the entry of rainwater.
- The flooring shall be sloped to from both directions to one corner where an oil-and- grease trap with sufficient capacity should be installed. All discharges from the workshop area must pass through the trap to remove the floating oil and grease before entering the drainage system of the site. The trap should be designed to provide a hydraulic residence time of about 20 minutes for the peak hourly discharge anticipated from the area (as per following figure).
- Alternatively, degreasing can also be carried out using mechanical spray type degreaser, with complete recycle using an enclosure with nozzles and two sieves, coarse above and fine below, may be used as shown in the adjacent photograph. This arrangement will require some initial investment and running cost for the pump, but the payback period, in terms of the use of diesel, under Indian conditions, has been reported to be less than 1 year.

Facilities for Labour

Potential Environmental Impacts

The sudden arrival and relatively longer duration of stay of construction crew can cause substantial strain on the existing infrastructure facilities like water supply, sanitation and medical care, especially in rural areas. Pollution from domestic wastes can affect local sources of water supply and may harm the crew themselves as well as local residents. Improper sanitation and inadequate health care also potential bottlenecks that the Contractor can eliminate with relatively little effort.

Mitigation Measures

It should be emphasized that the Indian Law requires that the Contractor provide several facilities to for the workers as per Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. Some of the provisions described herein are more stringent to act as benchmark for improved environmental performance of road projects:

- The contractor shall provide free-of-charge temporary accommodation to all the labour employed for the project. The accommodation includes separate cooking place, bathing, washing and lavatory facilities. At least, one toilet will be provided for every 35 people and one urinal will be provided for every 20 persons. All latrines will be provided with dry- earth system (receptacle) which will be cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition. More toilets and/or urinals may have to be provided if the Engineer decides that these numbers are insufficient. In case



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EIA: Annexure 2



female labourers are employed, separate toilet and urinals will be provided in locations clearly marked “Ladies Toilets” in a language understood by most labourers.

- The contractor shall ensure the supply of wholesome water for all the labour, including those employed by any other agency working for the contractor. These locations will be marked “Drinking Water” in the language most commonly understood among the labour. In hot season, the contractor shall make efforts to ensure supply of cool water. No water point shall be located within 15 m of any washing place, urinal, or latrine.
- The contractor shall ensure that adequate cooking fuel, preferably kerosene or LPG, is available on-site. The contractor will ensure that wood/ coal is not used as fuel on the site. Workers need to be made aware of this restriction. In cases where more than 250 labours are employed, canteen facility should be provided by the Contractor.
- A crèche must be provided in each campsite where more than 50 female labourers are employed, whether directly or indirectly, for the project or its ancillary activities.
- Contractor must provide adequate facilities for first-aid treatment at the campsite. A doctor / ambulance should be available on call for the duration of project implementation.
- The contractor shall obtain the approval of the Engineer for these facilities within 30 days of mobilization.
- The contractor must insure that in any case no labour will use any forest resources located nearby the project road.

ANNEXURE 3

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Annexure 3</p>	
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QUARRY AREA MANAGEMENT

Purpose

Quarries generally required to provide material for road construction sites, can have significant adverse environmental effects, especially on ecologically sensitive areas. Quarries can become environmental hotspots and can significantly affect the visual appearance of an area. Special mitigation and management measures are often required to avoid or minimise the environmental and social impacts of quarries.

Scope

These guidelines for quarries cover:

- statutory approvals
- environmental and social impacts of quarries
- selection of quarries
- operation of quarries
- rehabilitation of quarries

The guidelines seek to ensure that Contractors1:



- comply with the regulatory requirements in force at the time
- reasonably manage any impacts
- reinstate and rehabilitate the land appropriately
- consult with affected communities

Impacts



Some of the potential impacts of quarries are:

- rock blasting causing air pollution, and noise and vibrations
- trucks transporting materials to the site causing air pollution, and noise and vibrations
- ponds of stagnant water forming in excavated areas giving rise to the breeding of mosquitoes and the spreading of malaria and other mosquito-borne diseases
- natural beauty of the landscape being affected by excavations and the removal of vegetation
- natural drainage systems in the area being affected by excavations

The procedure for identification and finalization of quarry site/s shall be as given below:

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>EIA: Annexure 3</p>	
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- Estimating the quantity of quarry material to be collected from each quarry area.
- Only licensed quarry will be used.
- New quarry will be at least 1.5 km away from the settlement and other ecologically sensitive areas.
- New quarry will be at least 0.5 km away from river, canal, reserved forest, health & education institution, state and national highway.
- Away from agricultural land
- Contractor shall identify alternative quarry sites along the whole corridor based on required quantity and environmental consideration as given in the following prescribed format of Quarry source identification.
- Contractor shall submit to the Engineer the detailed information / documents as prescribed in the format.
- Engineer shall undertake site inspection of alternate quarry sites and convey to Contractor on accepting a particular quarry site on environmental consideration.
- Contractor shall then take apply and obtain Quarry Lease Deed / License from the Department of Mines and Geology and provide copy of the same to the Engineer prior to operation.
- Contractor shall estimate water requirement for dust suppression at quarry sites during operation and for water spraying on kutcha (non-metal) haul road and ensure availability water by identifying sources and obtaining necessary permission.
- Contractor shall prepare quarry sites operation and redevelopment plan considering surrounding land uses, local needs and agreement with the landowner.
- Only licensed blaster i.e., short-firer certificate holder will be responsible for quarry blasting.
- Permits for transportation, storage and use of explosive, as will be required, shall be obtained from the Controller of Explosive.
- Whenever so advised by the Engineer, controlled blasting e.g. using less charge, restricting depth and dia or drill holes, cut-off blasting etc., shall be undertaken; and
- Quarry operation will be undertaken in stages with adequate benching.

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- The procedure for environmentally sound operation and management of quarry sites is given below:
- Estimating the quantity of quarry material to be collected from each quarry area.
- Demarcating the entire quarry area by fencing and putting red-flag poles.
- Providing adequate metallic access road.
- Preserving topsoil from the quarry compound, if any, by stripping and stacking aside separately at corners.
- Carrying out blasting as per agreed operational plan complying with the requirements of MoRT&H Specification (Clause 302 & 303) and Ministry of Environment & Forests (MoEF) as given below.
- Maintaining a Quarry Material Collection Register on daily material collection for each of the quarry area, which shall be produced to Engineer's representative as and when requested; and
- Redeveloping the area within 2 months (or as will be agreed upon) of completion of quarry material collection.

Use of Explosive for Blasting General

Blasting shall be carried out in a manner that completes the excavation to the lines indicated in drawings, with the least disturbance to adjacent material. It shall be done only with the written permission of the Engineer. All the statutory laws, regulations, rules, etc., pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed.

The Contractor may adopt any method or methods of blasting consistent with the safety and job requirements. Prior to starting any phase of the operation, the Contractor shall provide information describing pertinent blasting procedures, dimension and notes.

The magazine for the storage of explosives shall be built as per national / international standards and located at the approved site. No unauthorized person shall be admitted into the magazine which when not in use shall be kept securely locked. No matches or inflammable material shall be allowed in the magazine. The magazine shall have an effective lightning conductor. The following shall be displayed in the lobby of the magazine:

- A copy of the relevant rules regarding safe storage in English and in the local language with which the workers concerned are familiar.
- A statement of up-to-date stock in the magazine.
- A certificate showing the last date of testing of the lightning conductor.
- A notice that smoking is strictly prohibited.



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Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Annexure 3



All explosives shall be stored in a secure manner in compliance with all laws and ordinances, and all such storage places shall be clearly marked. Where no local laws or ordinances apply, storage shall be provided to the satisfaction of the Engineer and in general not closer than 300 m from the road or from any building or camping area or place of human occupancy. In addition to these, the Contractor shall also observe the following instructions and any further additional instructions which may be given by the Engineer and shall be responsible for damage to property and any accident which may occur to workmen or the public on account of any operations connected with the storage, handling or use of explosives and blasting. The Engineer shall frequently check the Contractor's compliance with these precautions.

Materials, Tools and Equipment

All the materials, tools and equipment used for blasting operations shall be of approved type. The Engineer may specify the type of explosives to be allowed in special cases. The fuse to be used in wet locations shall be sufficiently water-resistant as to be unaffected when immersed in water for 30 minutes. The rate of burning of the fuse shall be uniform and definitely known to permit such a length being cut as will permit sufficient time to the firer to reach safety before explosion takes place. Detonators shall be capable of giving effective blasting of the explosives. The blasting powder, explosives, detonators, fuses, etc., shall be fresh and not damaged due to dampness, moisture or any other cause. They shall be inspected before use and damaged articles shall be discarded totally and removed from the site immediately.

Personnel

The blasting operation shall remain in the charge of competent and experienced supervisor and workmen who are thoroughly acquainted with the details of handling explosives and blasting operations.

Blasting Operations

The blasting shall be carried out during fixed hours of the day preferably during the mid-day luncheon hour or at the close of the work as ordered in writing by the Engineer. The hours shall be made known to the people in the vicinity. All the charges shall be prepared by the man in charge only.

The Contractor shall notify each public utility company having structures in proximity to the site of the work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the companies to take such steps as they may deem necessary to protect their property from injury. Red danger flags shall be displayed prominently in all directions during the blasting operations. The flags shall be planted 200m and 500m from the blasting site in all directions for blasting at work site and quarry, respectively. People, except those who actually light the fuse, shall be prohibited from entering this area, and all persons including workmen shall be



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Section : Silchar to Vairengte (Km 0+000 to Km 49+360)

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excluded from the flagged area at least 10 minutes before the firing, a warning siren being sounded for the purpose.

The charge holes shall be drilled to required depths and at suitable places. Blasting should be as light as possible consistent with thorough breakage of the material necessary for economic loading and hauling. Any method of blasting which leads to overshooting shall be discontinued.

When blasting is done with powder, the fuse cut to the required length shall be inserted into the hole and the powder dropped in. The powder shall be gently tamped with copper rods with rounded ends. The explosive powder shall then be covered with tamping material which shall be tamped lightly but firmly.

When blasting is done with dynamite and other high explosives, dynamite cartridges shall be prepared by inserting the square cut end of a fuse into the detonator and finishing it with nippers at the open end, the detonator gently pushed into the primer leaving 1/3rd of the copper tube exposed outside. The paper of the cartridge shall then be closed up and securely bound with wire or twine. The primer shall be housed into the explosive. Boreholes shall be such size that the cartridge can easily go down. The holes shall be cleared of all debris and explosive inserted. The space of about 200 mm above the charge shall then be gently filled with dry clay, pressed home and the rest of the tamping formed of any convenient material gently packed with a wooden rammer.

At a time, not more than 10 such charges will be prepared and fired. The man in charge shall blow a siren in a recognised manner for cautioning the people. All the people shall then be required to move to safe distances. The charges shall be lighted by the man-in-charge only. The man-in-charge shall count the number of explosions. He shall satisfy himself that all the charges have been exploded before allowing the workmen to go back to the blasting site.



Misfire

In case of misfire, the following procedure shall be observed:

Sufficient time shall be allowed to account for the delayed blast. The man-in-charge shall inspect all the charges and determine the missed charge.

If it is the blasting powder charge, it shall be completely flooded with water. A new hole shall be drilled at about 450 mm from the old hole and fired. This should blast the old charge. Should it not blast the old charge, the procedure shall be repeated till the old charge is blasted.

In case of charges of gelignite, dynamite, etc., the man-in-charge shall gently remove the tamping and the primer with the detonator. A fresh detonator and primer shall then be used to blast the charge. Alternatively, the hole may be cleared of 300 mm of tamping and the direction then ascertained by placing a stick in the hole. Another hole may then be drilled 150 mm away and parallel to it. This hole shall then be charged

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	<p>EIA: Annexure 3</p>	

and fired when the misfired hole should explode at the same time. The man-in-charge shall at once report to the Contractor's office and the Engineer all cases of misfire, the cause of the same and what steps were taken in connection therewith.

If a misfire has been found to be due to defective detonator or dynamite, the whole quantity in the box from which defective article was taken must be sent to the authority directed by the Engineer for inspection to ascertain whether all the remaining materials in the box are also defective.

Account

A careful and day to day account of the explosive shall be maintained by the Contractor in an approved register and manner which shall be open to inspection by the Engineer at all times.

ANNEXURE 4



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section : Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Annexure 4

STANDARD ENVIRONMENTAL MONITORING PLAN

Environmental Component	Project Stage	MONITORING						RESPONSIBILITY	
		Parameters	Measurement Method	Standards	Location	Frequency	Duration	Implementat ion	Supervisiøn
Air	Construction on Stage	PM10	Gravimetric (High-Volume)	National Ambient Quality Standards (Refer Annexure5)	Hot mixplant /Batching plant (1 location)	Once in a Quarter and as may be instructed by SC	Continuous 24 hours/ or for 1 full working day	Contractor through approved monitoring agency	SC, PIU
		PM2.5	Gravimetric (High-Volume with Cyclone)						
		SO ₂	EPA Modified West & Gaeke method						
		NO _x	Arsenite modified Jacob & Hochheiser						
		CO	NDIR technique						



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Section : Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Annexure 4

Environmental Component	Project Stage	MONITORING						RESPONSIBILITY	
		Parameters	Measurement Method	Standards	Location	Frequency	Duration	Implementation	Supervision
		PM10, PM2.5, SO ₂ , NO _x , CO	Same as Above.	National Ambient Quality Standards (Refer Annexure 5)	Stretch of the road where construction is in progress (1 locations) ²	Once in a Quarter	Continuous 24 hours/ or for 1 full working day	Contractor through approved monitoring agency	SC, PIU
	Operation Stage	PM10, PM2.5, SO ₂ , NO _x , CO	Same as above.	National Ambient Quality Standards	1 location throughout the stretch during operation	Half-yearly for first two years and as may be required	Continuous 24 hours/ or for 1 full working day	PIU through approved monitoring agency	PIU
Water Quality	Construction stage (surface water)	pH, temperature, turbidity, DO, BOD, TDS, TSS, Oil & Grease	Grab sample collected from source and analysed as per IS : 2488 (Part 1-5) methods for sampling and testing of Industrial effluents	Water quality standards by CPCB (Refer Annexure 5)	1 locations throughout the corridor will be monitored till end of construction period	Once in a Quarter	-	Contractor through approved monitoring agency	SC, PIU



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Section : Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Annexure 4

Environmental Component	Project Stage	MONITORING						RESPONSIBILITY	
		Parameters	Measurement Method	Standards	Location	Frequency	Duration	Implementation	Supervision
	Construction stage (ground water)	All parameters of drinking water		IS: 10500, 1991 (Refer Annexure5)	1 location at Camp site	half yearly for two years		Contractor through approved monitoring agency	SC, PIU
	Operation Stage (surface water)	pH, temperature, turbidity, DO, BOD, TDS, TSS, Oil & Grease and Pb	Grab sample collected from source and analysed as per IS : 2488 (Part 1-5) methods for sampling and testing of Industrial effluents	Water quality standards by CPCB	1 locations through out the corridor will be monitored till end of construction period	half yearly for two years	-	PIU through approved monitoring agency	PIU



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Section : Silchar to Vairengte (Km 0+000 to 49+360)



EIA: Annexure 4

Environmental Component	Project Stage	MONITORING						RESPONSIBILITY	
		Parameters	Measurement Method	Standards	Location	Frequency	Duration	Implementat ion	Supervision
Noise levels	Constructi on stage	Noise levelson dB (A) scale	Equivalent noise levels using an integrated noise level meter kept ata distance of10-15 m from edge of pavement	Noise standardsby CPCB (Refer Annexure 13)	As directed by the Engineer (At maximum 3 locations)	Once in a Quarter	Readings to be takenat15 seconds interval for15 minutes every hour and then Leq should beestimated	Contractor through approved monitoring agency	SC, PIU
Tree plantation	Operation stage	Rate ofSurvival	Physical verification	Ensuring at least75% survival.	Area of plantation along the road will be specified by PIU	For three years	-	Forest Deptt.	PIU

ANNEXURE 5



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Annexure 7



ENVIRONMENTAL STANDARDS

National Ambient Air Quality Standards

The air quality parameters viz: Sulphur Dioxide (SO₂), Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Hydro-Carbons (HC) & Particulate Matters (PM_{2.5} & PM₁₀) 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 as given in Table 1. The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan Table 5.

Table 1: National Ambient Air Quality Standards

Sl. No.	Pollutants	Time-weighted average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural & other Areas	Ecologically Sensitive Areas (notified by Central Government)	
1	Sulphur Dioxide (SO ₂) µg/m ³	Annual*	50	20	- Improved West & Gaeke - Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO ₂) µg/m ³	Annual*	40	30	- Modified Jacob and Hochheiser (Na-Arsenite) - Chemiluminescence
		24 hours**	80	80	
3	Particulate Matter (size less than 10 µm) or PM ₁₀ µg/m ³	Annual*	60	60	- Gravimetric - TOEM - Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5µm) or PM _{2.5} µg/m ³	Annual*	40	40	- Gravimetric - TOEM - Beta attenuation
		24 hours**	60	60	
5	Ozone (O ₃) µg/m ³	8 hours**	100	100	- UV photometric - Chemiluminescence - Chemical Method
		1 hours**	180	180	
6	Lead (Pb) µg/m ³	Annual*	0.50	0.50	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) (mg/m ³)	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hours**	04	04	
8	Ammonia (NH ₃) µg/m ³	Annual*	100	100	- Chemiluminescence - Indophenol Blue Method
		24 hours**	400	400	
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas chromatography based continuous analyser - Adsorption and Desorption followed by GC analysis
10	Benzo(a) Pyrene Particulate Phase only ng/m ³	Annual*	01	01	- Solvent Extraction followed by HPLC/GC analysis
11	As ng/m ³	Annual*	06	06	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Ni ng/m ³	Annual*	20	20	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or monitoring and further investigation.

Source: MoEF Notification dated 16th November, 2009



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

EIA: Annexure 7



Indian Standards of Drinking Water Specifications-IS 10500: 1991.

Sr.	Parameters	Unit	Standard Classification for Inland Surface Water ²				E
			A	B	C	D	
1	Temperature	^o C					
2	pH	pH Scale	6.5 - 8.5	6.5 - 8.5	6.0 - 9.0	6.5 - 8.5	6.5 - 8.5
3	Dissolved oxygen	mg/l	>6	>5	>4	>4	NS
4	Total Dissolved Solids	mg/l	500	NS	1500	NS	2100
5	Electrical Conductivity	μmohs/cm	NS	NS	NS	1000	2250
6	BOD	mg/l	2	3	3	NS	NS
7	Total Hardness	mg/l	300	NS	NS	NS	NS
8	Ca++ Hardness	mg/l	200	NS	NS	NS	NS
9	Mg++ Hardness	mg/l	100	NS	NS	NS	NS
10	Chlorides (as CL)	mg/l	250	NS	600	NS	600
11	Sulphates	mg/l	400	NS	400	NS	1000
12	Nitrate (as NO ₃)	mg/l	20	NS	50	NS	NS
13	Fluoride	mg/l	1.5	1.5	1.5	NS	NS
14	Ammoniacal N	mg/l	NS	NS	NS	1.2	NS
15	Copper	mg/l	1.5	NS	1.5	NS	NS
16	Iron	mg/l	0.3	NS	50	NS	NS
17	Manganese	mg/l	0.5	NS	NS	NS	NS

Noise Level Standards.

Category	Noise level for Day Time Leq dB (A)	Noise level for Nighttime dB (A)
Industrial area.	75	70
Commercial area.	65	55
Residential area.	55	45
Silence Zone.	50	40

Note: Day Time- 6:00 am –10:00 pm (16 hours) Nighttime- 10:00 pm –6:00 am (8 hours)

Silence Zone: The silence zone includes a radius of 100 m around premises where loud noise is prohibited (including hospitals and educational institutions)



Social Impact Assessment Report

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte(49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km))

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Section : Silchar to Vairengte (Km 0+000 to Km 49+360)





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Chapter 1- Introduction

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 1: Introduction</p>	
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1 Chapter 1 – Introduction

Report on Baseline Preliminary Environmental and Social Screening of the Project

1.1 General

M/s. Transys Consulting Pvt. Ltd., in association with Assam Eco-Management Services has been appointed as consultants by National Highways Division, Dispur, Assam for carrying out feasibility study and preparation of DPR for the work of formation of Economic corridors to improve the efficiency of freight movement in India under Bharatmala Pariyojana (Lot-1) from Silchar to Vairengte.

The letter of award was issued on Date: 08.04.2021 Ref.No. Transys/B'Lore/410/Silchar/2021-22/40330.

However, portion of approved DPR alignment i.e., from existing km 13+200 (D. Ch. 21+000) onwards was suggested to re-route the proposed alignment as the alignment between D.Ch. 33+000 (existing km 26+750) till end of the package was proposed to be navigated through forest land keeping technical (4-lane development), social and financial viability in mind but denied by forest department at later stage with various reasons (explained in chapter - 0 under “executive summary”) placed as per MoEF norms.

Therefore, fresh work order was issued by NHIDCL vide letter no. NHIDCL / Bharatmala / Miz / DPR (Vairengte-Sairang) / 2018-19/102 dated 21.06.2022

So, as per modified alignment approved by NHIDCL dated 14.07.2022 vide through letter no. NHIDCL/Assam/2021-22/SIL-VAI/TRANSYS/204315/1705, Feasibility Report (FR) was submitted for Package: P2 (mod) on 14.11.2022 vide through letter no. Transys / B'Lore /410/Silchar-Sairang/ 2022-23/401.

This Social Impact Assessment Report (SIA Report), part of Draft Detailed Project Report (DDPR) is being submitted under pkg-P2(mod) in response to the Terms of Reference Clause 10.9 and contains the findings by our Project Team during detailed survey and investigations of the project road and several interaction with officials of NHIDCL.



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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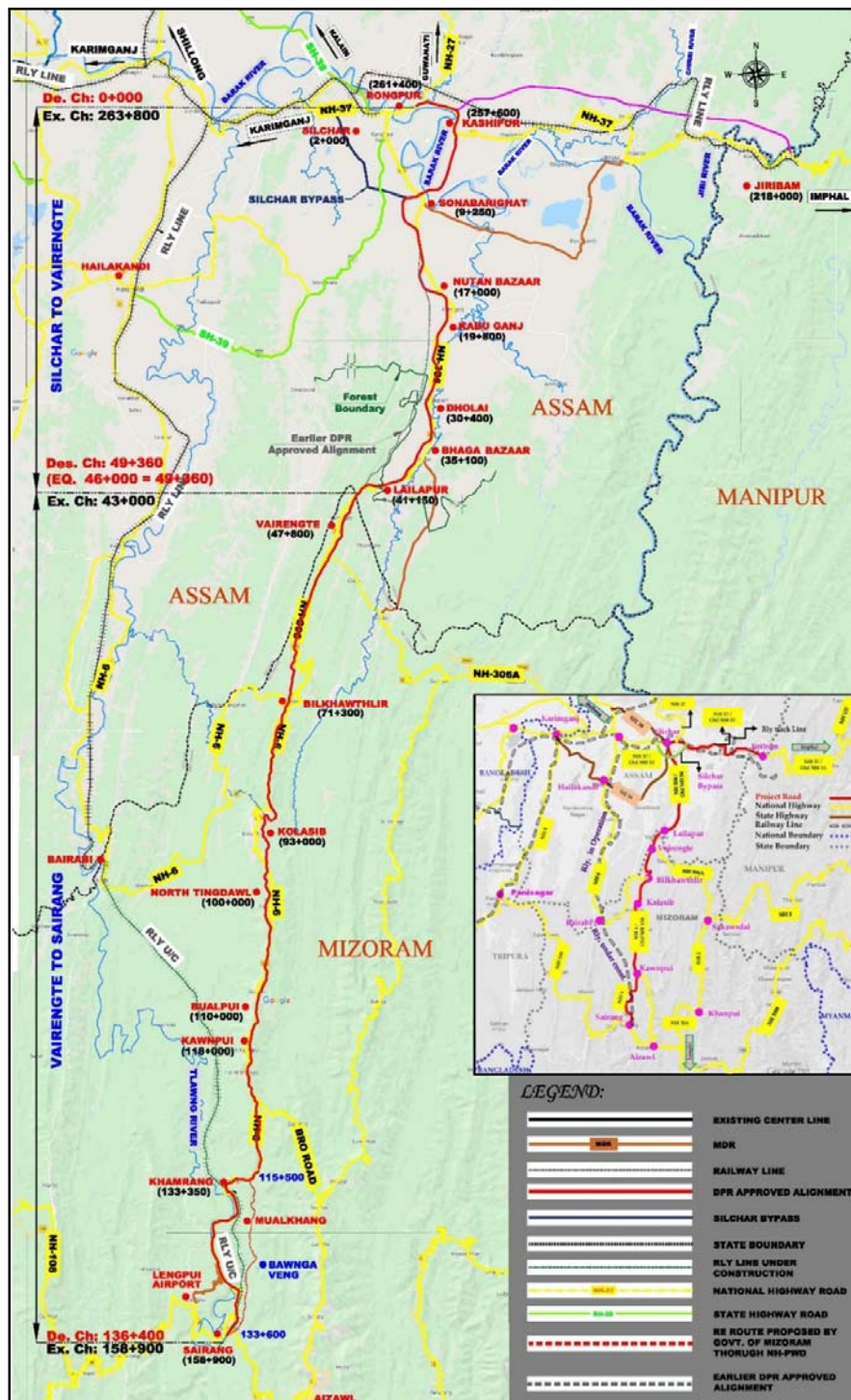




Fig 1.1 Index Map of Project Road

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 1: Introduction</p>	
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1.2 Purpose of the Report

The purpose of this Resettlement Plan (RP) is to mitigate all such unavoidable negative impacts caused due to the sub-project and resettle the displaced persons and restore their livelihoods. Full Resettlement Plan has been prepared based on sub project census survey findings and consultation with various stakeholders. The plan complies with World Bank Operational Policy to protect the rights of the displaced persons and communities. The issues identified and addressed in this document are as follows:

- Type and extent of loss of land/ non-land assets, loss of livelihood, loss of common property resources and social infrastructure.
- Impacts on indigenous people, vulnerable groups like poor, women and other disadvantaged sections of society.
- Public consultation and people participation in the sub-project.
- Existing legal and administrative framework and formulation of resettlement policy for the sub-project.
- Preparation of entitlement matrix, formulation of relocation strategy and restoration of businesses/income.
- R&R cost estimate including provision for fund.
- Institutional framework for the implementation of the plan, including grievance redressed mechanism, monitoring and reporting.



1.3 Scope of EIA Study

The scope of the SIA includes the following:

- To carry out Social Impact Study including Social Impact Assessment (SIA) in accordance with World Bank and Government of India Guidelines and State Government of Mizoram guidelines.
- To carry out Resettlement Screening to assess the direct and induced impacts due to the project works.
- Planning of Land Acquisition.
- Census Survey and Inventory of Assets.
- Public Consultation

1.4 Methodology

This section deals with the approach and methodology followed for the collection and analysis of data. The project followed both quantitative and qualitative approach for data collection. Social impact assessment and resettlement planning component have three main elements:

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 1: Introduction</p>	
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- Early screening as part of project feasibility studies.
- Social Impact Assessment: Census and baseline socio-economic survey of potentially affected population.
- Preparation of the Social Impact Assessment and Resettlement Action Plan

These elements have been further elaborated in the following paragraphs:

1.4.1 Social Assessment Process

The complete R&R process included integration of engineering, environment and social inputs. The R&R team included Social Scientist, Civil Engineers, Field Supervisors, Community Organizers and field investigators doing the census, verification, socioeconomic surveys and public consultations. PWD, National Highways, Assam is also closely integrated into the loop.



The different steps in the R&R process are as follows:

Step 1: Reconnaissance Survey and Familiarization

This step involves preliminary reconnaissance of the project road to consider sections with potential environment and R&R issues. This is done with the Social Scientist in charge along with the field surveyor and investigators. At this stage, the sections of roads having social impact and type of impacts are identified. Screening results were presented in the Project Feasibility Report. Team also familiarized itself with the concerned and important stakeholders to identify and collect the available literature and with scope & activities. This involved two-pronged approach (a) discussions with project authorities and sample community members along the corridors (b) project specific R&R policy as approved by government of Assam and collection of other available relevant project literature; and details of right of way (ROW). Relevant national and state legislations and regulations pertinent to the land acquisition and resettlement were reviewed. Guidelines of some funding agency i.e., World Bank were also studied.

Step 2: Census and Socio-economic Survey

This was done through collection of land records from revenue department. The right of way information is important in knowing the land available, and land acquisition requirements for widening. Collection of the right of way information continued simultaneously with the census and the socioeconomic surveys. The census survey covers 100% of the potentially affected population within existing ROW and proposed realignment. The census registered the owners' name, address, legal document if any towards the claim of the property, all household members and individuals within the potential Corridor of Impact (COI); their assets and incomes and sufficient demographic and social information to determine whether they are to be categorized as vulnerable groups with special entitlements under the project. Private landowners,

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tenants and squatters and encroaches within the ROW were covered in the census. Social Census team is preceded by Civil Engineers responsible for measuring the potentially affected structure across and along the road to record the size and shape of the structures. Each structure was measured and its location was recorded. The socio-economic survey, which was also carried out on census basis, provides the baseline against which mitigation measures and support will be measured. The analysis covers the needs and resources of different groups and individuals, including inter and intra-household analysis and gender analysis. The following information was collected during the survey:



- Socio economic conditions of the affected persons.
- Family structure and number of family members.
- Literacy levels.
- Occupation type and income levels.
- Inventory of household assets.
- Loss of immovable assets due to the project by type and degree of loss.
- Accessibility to the community resources.
- Perceptions on the resettlement and rehabilitation measures.
- Perceived income restoration measures.
- Grievances of affected persons and its possible redresses.
- Awareness and knowledge levels on HIV/AIDS and gender issues.
- Willingness to participate in the project.

The study tried to identify people losing their livelihood directly or indirectly. Also through consultations the rehabilitation strategies for those losses by way of training requirements for income generation and other remedial and restoration measures were identified. For this the consultations were conducted among:

- People losing properties/resources.
- Village community (where only government / van/ panchayat land is being taken).
- Knowledgeable persons / opinion leaders in the village.
- Village heads.

Step 3: Identifying Social Hotspots

This step involves deciding sections, which need realignments, if any. This was executed by measuring the distance of structures from the existing centreline. If the width available is short of minimum requirement, then the option of demolition of structures is considered. The proximity of location of settlements along the roads is one

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of the deciding factors in addressing the degree of impact. This process is facilitated by local level consultations where the needs and opinion of the local people are taken into consideration, to find out the opinion of the local community about widening the road through the village, and its impacts.

Step 4: Social Input to Design

The inputs of field information are integrated with the engineering designs. This is done by the Social Scientist with topographic surveyor in-charge. This exercise includes analysis of various Alternatives.

Step 5: Identifying Actual PAPs

After the integration of the social and environmental inputs, the final engineering drawings were completed. Once this was done then the actual number of PAF's were identified, especially in the built-up area, where there is reduced COI. For identifying legal owners, encroachers and squatters, revenue records were used for verification of legal ROW and the boundaries of properties likely to be within the COI. With the completion of final drawings, only those within the actual ROW were considered eligible for entitlement under the project and list of PAFs is generated. During the local level consultations and during door-to-door survey, community was informed on the definition of impacts and corridor of impact. All those outside the COI but within the ROW were also well informed that they will not be adversely impacted by the project.

Step 6: Preparing Resettlement Action Plan



The last step in the process involves the preparation of Resettlement Action Plan. The RAP includes number of PAPs and families by impact category; their entitlements, grievance mechanism; institutional arrangement for implementation; implementation schedule and budgetary requirements.

1.4.2 Consultations

Considering the importance of people's participation in the project planning, public consultation and FGDs were also carried out at different levels at various stages of project preparation. The objectives of the consultation were to disseminate information about the project to the potentially affected population in order to incorporate their views and suggestion for preparing the RAP and to assess the economic situation of the settlement. The consultation focuses on identification of issues raised by the PAPs and its integration in the Resettlement Action Plan.

1.4.3 Local Level Consultation

For local level consultations, villages were selected. It was ensured that information regarding consultations is disseminated in the concerned village at least two days prior to consultations. The participants included village head and/or opinion leader of the village or community and potentially affected persons. The targeted segments included

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men and women affected by loss of residential structures, commercial structures, land, livelihood, or sources of livelihood.

1.4.4 Consultation with Government Officials



The objective of these consultations was to (i) create awareness about the project among the district administration, and officials of line departments along the project road. (ii) To study implementation arrangements, its capacity in delivering the R&R services and verification of these arrangements.

1.4.5 Collection of Data from Secondary Sources

Throughout the Study, various types of secondary data were used along with the primary data collected through surveys. Secondary data sources included Assam at a Glance, Social, Cultural, Demographic and Economic profile of Assam.

2

Chapter 2- Project Description and Existing Scenario

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 2: Project Description and Existing Scenario</p>	
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2 Project Description and Existing Scenario

2.1 Importance of Project Road

Dispur is the formal capital city of Assam and is a suburb at Guwahati having population around 6.8 lakhs (Dispur) and 11.55 lakhs (Guwahati) as per 2022. Dispur, as a capital city of Assam, accounts for all the trade and commerce occurring inside the state. Following are the important roads inside Assam.

The total length of all types of roads in Assam has increased considerably CEIC and Ministry of Road Transport and Highways from 241789 kms at the beginning (i.e., 2003) to 399122 kms in 2019, which is 39% increase during the past fifteen years. The details of road length in Assam as on 2019 is shown below:

1. Under Assam PWD, NH Wing (NH-PWD): 2541.937 Km
2. Under National Highway Authority of India (NHAI): 696.308 Km
3. Under National Highway Infrastructure Development Corporation Limited (NHIDCL): 399.36 Km
4. Under Border Road Organization (BRO): 31.00 Km
5. Under Ministry of Road Transport & Highways (MoRT&H): 25.807 Km
6. Newly declared NHs but yet to be entrusted: 192.38 Km

Total of Roads under PWD: 7547.39 Kms

1. State Highways (SH) : 3134.36 Kms
2. Major District Road (MDR) : 4413.03 Kms

The funding agency for construction and maintenance of roads within Assam, other than that allocated annually under State Plan includes those from NLCP (DoNER), NEC, PMGSY, NABARD, ADB Loan, World Bank Loan and Ministry of State Road Transportation & Highway.

Roads are considered the most important component of infrastructure, to which national economy either directly or indirectly connected. Assam is mainly dependent on roadways for transportation. Therefore, for the overall progress of the state it is essential to provide good road network with increased connectivity. National highways in Assam connect the state with the rest of the country. Some of the national highways in Assam are as below,



	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
	<p>SIA: Chapter 2: Project Description and Existing Scenario</p>	

Table 2.1 Description of NH around the Project Alignment

National Highways	Description
NH-306	Mizoram Road is a National Highway, Start from Silchar and ends at Lailapur in the border of Assam and Mizoram in Cachar district
NH-37	Karimganj-Silchar Road is a National Highway, Start from Salchapra and ends at Jirighat in the border of Assam and Manipur in Cachar district
NH-27	Lumding-Silchar Road is a National Highway, Start from Silchar and ends at Khasia Village in Cachar district
NH-6	The national highway starts from Katigara and ends at Lakhicherra Khasia Punjee border of Assam and Meghalaya in Cachar District.
SH-38	Kalain Road is a State highway, Starts from Lakhipur and ends at Silchar in the district of Cachar.
SH-39	Hailakandi Road is a State highway, Starts from Silchar and ends at Duarbond Grant in the district of Cachar.

With constant projects focusing inter-state connectivity, requirement of roads for connecting villages in various districts has also become crucial.

2.2 Location of Project Road



The proposed alignment is located geographically inside Cachar district of Assam State. The latitude and longitude of the proposed alignments within Mizoram are as given below.

Table 2.2 Location of Project.

Location (Proposed Chainage)	Latitude	Longitude
Start of Package - 1	24°50'11.356"N	92°49'34.363"E
Start of Package - 2	24°43'13.225"N	92°49'46.6"E

Table 2.3 Package Distribution

Sl. No.	Construction Packages	Design Chainage			Existing Chainage			State
		From	To	Length (km)	From	To	Length (km)	
1	Package-1	0+000	20+000	20.000	263+800 (Of NH-37)	12+920 of NH-306	31.260	Assam
2	Package -2	20+000	*49+360	29.360	12+920	43+000	17.500	Assam
3	Package-3	*46+000	**60+850	14.850	43+000	59+700	16.700	Mizoram
4	Package -4	61+000	77+500	16.500	59+700	86+000	26.300	

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p>	
	<p>SIA: Chapter 2: Project Description and Existing Scenario</p>	

5	Package -5	77+500	95+500	18.000	86+000	107+850	21.850	Mizoram
6	Package -6	95+500	111+850	16.350	107+850	126+315	18.465	
7	Package -7	111+850	125+500	13.650	126+315	142+060	15.745	
8	Package -8	125+500	136+400	10.900	142+060	158+900	16.840	
Total Design Length				136.400			164.660	

*EQ (km 49+360 = km 46+000), ** EQ (km 60+850 = km 61+000)

This Report mainly deals with for entire Silchar to Vairengte Section of NH-306 under Cachar district in Assam State.

2.3 The Project Area

The proposed alignment lies in Cachar (Silchar as administrative HQ) district of Assam state, and it traverse through major settlements like. Rongpur, kashipur, Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. The other important built-up areas are Saidpur Mukkam, Narsingpur, Katakai, Panibhora, Ramprasadpur, Saptagram, Islamabad and Lailapur. The alignment mostly passes through agricultural area, semi built-up, built-up areas and few stretches lying on hill cum forest area. The alignment mostly passes through agricultural area, semi built-up, built-up areas and few stretches lying on hill cum forest area.

The State is severely affected by floods especially in and around of Silchar town during rainy seasons causing enormous damage to crops, livestock, land, property & bringing untold miseries to the people at large. Both the Brahmaputra and Barak Valley witness devastating floods every year, which not only washes away valuable life & crops, but also lead to bank erosion and drainage congestion, virtually destroy the economy, more particularly, the rural economy of the State.

2.4 Existing Chainage System

The proposed road is not completely a new alignment but align with the existing National Highway (widening) avoiding most of the town areas.

2.5 Land use and Settlements along Project Road

The land use is principally of four categories, Urban/Built-up/residential plots, rural agricultural, rural barren and forest areas. Agriculture plays a predominant role in the economy of the region particularly with respect to generation of employment and share in the GDP. Land use pattern along the project road is usually agriculture crop cultivation and few rural livelihood areas. Most of them are private land use for different farming practices.

Following table gives the detail of land use along the proposed alignment.



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	<p>SIA: Chapter 2: Project Description and Existing Scenario</p>	

Table 2.4 Summary of Land use along project road

Sl.No.	Land use description	Existing length (Km)	% of Length
1	Built up Area	27.750	57.00
2	Semi Built up Area	5.500	11.00
3	Agricultural Land	13.650	28.00
4	Hill Cum Forest Area	2.000	04.00
	Total length	48.900	100 %

Settlements:

The existing road from 0+00 to Km 7+950 passes through heart of the city resulting, no scope of widening in terms of 4-lane development, hence the said stretch was descope from development and proposed to develop through NH-37 from junction of NH-27 & NH-37 up to existing km 257+500 of NH-37 and then proposed to be developed existing partially constructed Silchar bypass from junction of NH-37 & partially constructed Silchar bypass up to cross-junction of NH-307. However, from Km 7+950 of NH-306 till end of package encounter number of habitations. Major Builtup areas on route are Sonabharighat, Nutan Bazar, Kabuganj, Dolhai and Baga Bazar. Aggregate length of built-up areas along the Stretch is 48% of total length of project road.

The major built – up areas mentioned above are clustered with commercial, residential and industrial activities on both sides of existing road. Besides the above, the appreciable movement of pedestrians crisscrossing the road is observed at these locations. Numbers of Brick factories are observed along the project road. Existing horizontal geometrics are not as per NH standard at many locations, which are required to be upgraded.

Altogether, there are total 28 villages/towns fall along existing project road. Out of 29 nos. of villages, 22 nos. of villages/towns proposed under Bypass in this project. The remaining stretches, proposed alignment follows the existing road with geometrics improvement/ Realignment. In some small villages, where existing alignment has been followed neither much of roadside activities nor any heavy local traffic coupled with pedestrian traffic exists. Following table gives list of villages along the project road.

Table 2.5 Following table gives list of revenue villages along the proposed alignment.

Sl.No	Village Name	Remarks
1	Rongpur	Agricultural Land & stretch of sparse built-up area
2	Kashipur	Agricultural Land & stretch of sparse built-up area
3	Badripar	Agricultural Land & stretch of sparse built-up area
4	Bagpur	Agricultural Land & stretch of sparse built-up area
5	Neairgram	Agricultural Land & stretch of sparse built-up area
6	Sabashpur	Agricultural Land & stretch of sparse built-up area
7	Saidpur	Agricultural Land & stretch of sparse built-up area
8	Sonabarighat	Agricultural Land & stretch of sparse built-up area
9	Dhanehari	Agricultural Land & stretch of sparse built-up area
10	Kajidahar	Agricultural Land & stretch of sparse built-up area
11	Nutan Bazar	Agricultural Land & stretch of sparse built-up area
12	Berabak	Agricultural Land & stretch of sparse built-up area
13	Nagdirgram	Agricultural Land & stretch of sparse built-up area
14	Kabuganj	Agricultural Land & stretch of sparse built-up area
15	Narsingpur Pt I	Agricultural Land & stretch of sparse built-up area
16	Jalenga	Agricultural Land & stretch of sparse built-up area
17	Ramprasadpur	Agricultural Land & stretch of sparse built-up area
18	Rajanikhal	Agricultural Land & stretch of sparse built-up area
19	Sadagram	Agricultural Land & stretch of sparse built-up area



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Sl.No	Village Name	Remarks
20	Arjanpur	Agricultural Land & stretch of sparse built-up area
21	Saptagram	Agricultural Land & stretch of sparse built-up area
22	Loknathpu	Agricultural Land & stretch of sparse built-up area
23	Islamabad	Agricultural Land & stretch of sparse built-up area
24	Bhaga	Agricultural Land & stretch of sparse built-up area
25	Rajghat	Agricultural Land & stretch of sparse built-up area
26	Howaitang	Agricultural Land & stretch of sparse built-up area
27	Joydhanpur	Agricultural Land & stretch of sparse built-up area
28	Lailapur	Agricultural Land & stretch of sparse built-up area



Forest covers:

The Existing Project Road passes through hill cum thickly vegetated/forest (**Inner line reserve forest / Roadside reserve forest**) from Km 41+000 to Km 43+000 for an approximate 2.00 km. The Project Highway is lying with moderate number of trees on both sides after Lailapur town from Km 41+000 to Km 43+000.

2.6 Terrain & Climate

A significant geographical aspect of Assam is that it contains three of six physiographic divisions of India – The Northern Himalayas (Eastern Hills), The Northern Plains (Brahmaputra plain) and Deccan Plateau (Karbi Anglong). As the Brahmaputra flows in Assam the climate here is cold and there is rainfall most of the month.

The climate of Assam is typically ‘tropical monsoon rainfall’ type, with high levels of humidity and heavy rainfall. People here enjoy a moderate climate all throughout the year, with warm summers and mild winters. In the monsoon season, the whole state comes alive with the beauty of nature. Climatic variations can be seen regionally. While the plains of Assam have a tropical climate with high humidity, the hills have a sub-alpine type of climate. During summer average temperature between 35 and 38 degrees Celsius. In fact, the mercury level never rises more than 38 degrees, even in the hottest month of the year. The rainy season have the highest rainfall in the world. The average annual rainfall in the state is around 70 inches in the west and around 120 inches in the east. The winter season in Assam is basically characterized by scanty rainfall and misty

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mornings and afternoons. The mercury reading at this time of the year is around 6 to 8 degrees Celsius or 43- 46-degree Fahrenheit. In Assam, spring (March- April) and autumn (September- October) present pleasant seasons, with moderate temperature and rainfall.

2.7 Existing Alignment

Whereas project road starts from existing Km 263+800 of NH-37 (Old NH-53) with Design Ch. 0+000 and end point at Km 43+000 with Design Ch. 49+360 at Lailapur-Vairengte state border leading towards Aizawl in the state of Assam.

2.8 Culverts & Bridges

The proposed highway is aligned with an existing Highway, hence there are many existing culverts & bridges.

2.9 Traffic Flow Conditions

Records from 2011 to 2018 figures of road accidents indicate somewhat constant trending Assam. But accidents are likely to increase with increase in the number of vehicles, the quality of roads, and inadequate adherence to traffic rules.

2.10 Petrol Pumps

The proposed highway is aligned with an existing Highway, hence there are many existing Petrol Pumps.



2.11 Hospitals and Schools

The proposed highway is aligned with an existing Highway, hence existing Hospitals & Schools.

2.12 Constraints

There are number of constraints for widening the existing project road. Some of them are:

- Bypass to Silchar town is already proposed by PWD, NH Division Silchar. The map of the Silchar bypass is given in below figure.
- Barak River is running parallel to LHS of existing road from Km 0+000 to Km 9+000. Sonai and rukuni River is also following parallel to the LHS of existing road to continuous length.
- Commercial traffic carrying different commodities from Guwahati and Karimganj (NH-27) uses the project road (NH-37) and SH-39 to reach various parts of Assam and Mizoram state. Improvement of existing road may boost to tourism sector. Improvement of existing road may boost to tourism sector.
- Inadequate existing ROW width at built-up areas,
- Settlements close to project road involving rehabilitation and resettlement action plan,

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- Presence of religious structures along the project road – there are approx. 19 nos. of temples, 17 nos of masjid, 3 nos of darga and 06 nos Church along the existing project road.
- Presence of utility service lines like water pipes, electricity lines, telephone and OFC line on both sides of highway,
- Presence of number of matured trees along the project road within EROW.
- Some stretches are flying in hilly area with plantation.
- The existing alignment is also facing so numerous blackspots, which details are provided below.

2.13 Utilities

Many electric lines including high voltage transmission line are affected by the improvement of proposed alignment, predominantly near built-up areas. Some Borewells with pump, hand pumps, small water storage tanks and wells are also affected by the improvement of the proposed alignment. A detail list of these utilities has been provided in “Utility Relocation Plan & Schedules”.



2.14 Environmentally Sensitive Areas

The proposed alignment passes through environmentally sensitive area and Reserved Forest for short length of 2.0km however, no major changes in ecological and environmental features are anticipated. The findings of the environmental study in this “Environmental Impact Assessment” report.

2.15 Government/Private Agencies to be consulted

Following Government departments need to be consulted to seek their consent / suggestions for fixation of alignment, relocation of utilities etc.

- a) Department of Land Survey & revenue for land/buildings records and acquisition.
- b) Different telecommunication service department for relocation of telephone/ OFC lines.
- c) Electricity department for relocation of LT lines, HT lines, Transformers etc.
- d) District Forest Officer, Cachar.
- e) Mining Department, Cachar.
- f) State PWD.
- g) Cachar Industrial Area Development Board.
- h) District Horticulture Officer, Cachar.
- i) Cachar Urban Development Authority.

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2.16 Recommendations Concerning the alignment

Built-up Areas



After detailed Study of preliminary alignment plan a transect walk has been conducted with the officials from NH division, Cachar along the proposed alignment to verify the alignment physically on ground and to get their suggestion/ recommendation on the proposed alignment.

Following suggestions are made for the alignment:

- 1) The proposed alignment should be sufficiently away from built-up areas.
- 2) Due to development of proposed alignment the effect on any permanent structures like churches, monuments, pucca residential/commercial buildings etc. should be minimal.
- 3) The alignment passing through quarry area should be finalized in such a manner that it should involve minimum possible earthwork (Cut/Fill).
- 4) The proposed alignment should be sufficiently away from Protected Forest areas.

3

Chapter 3- Minimizing Negative Social Impact

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3 Minimising Negative Social Impact

3.1 Minimising the Social Impact

The need for resettlement arises when a proposed infrastructure project displaces many people and households for a defined public purpose which, in this case, is the widening and upgrading of the existing road project corridor. As per the policy the displacement should be avoided or minimized. The objectives of the social analysis are to be done to understand the ways and means to minimize the negative impact on the lives of the affected population, offering them opportunities to enhance their living standards. While the land acquisition on the account of widening the road and new alignment is unavoidable, the area with the high population density could be marginalized and displacement could be minimized. The project specific R&R policy, also, acknowledges the importance of avoiding adverse socioeconomic impacts in road design and construction.



The success of a project depends to a large extent on the improvement that it brings about in the living standards of the people, both in the short and the long term. While preparing the engineering design, the prime consideration has been to minimize the social negative impacts within the limitations of technical requirements and cost effectiveness and to enhance the benefits. Despite the best efforts to minimize the negative social impact, however, land acquisition at few places and resettlement have been unavoidable.

In general, the design considerations adopted by the project to minimize the land acquisition in the project are as below:

- The corridor of impact (CoI)/proposed cross-section would be restricted within the existing right of way.
- The corridor of impact (CoI) for the project would broadly range between 25-30(minimum land width required in settlement areas) to 45 m (minimum land width required in non-settlement areas) to fit the typical cross sections, space for drains, roadside furniture and utilities. However, in specific locations, CoI of less than 20m would also be considered to minimize the impact on properties.
- Only One bypass and realignment have been proposed to minimize land acquisition.

3.2 Right of Way and Corridor of Impact

Right of way is the public land owned by the State Government and administered by the PWD, National Highways, for the existing road. Right of way held by the PWD, National Highways is the lawfully acquired corridor of land. Existing right of way width varies from 20-45 m. The existing ROW is not free of encumbrances, as will be seen from the strip maps. Using available records with the PWD and the revenue

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department, R&R team have verified the boundaries of legal right of way as well as boundaries of private properties within and near the corridor of impact. The limit of displacement will be limited not to the legal right of way but only to the corridor of impact. The corridor of impact is the corridor required for the actual construction of the road, including carriageway, shoulders, embankments and longitudinal drainage.

Within this corridor there should be no structures or hindrances. Details of existing ROW are mentioned in chapter 2.

3.3 Design and R&R Co-ordination

The prime objective of the RAP is to minimize negative impact on the people/community because of the project execution. Therefore, during preparation of the project, due consideration was given to minimize the negative impacts within the limitations of technical requirements and cost effectiveness. The built-up areas generally have dense developments on either side of the existing road including high level of encroachment and residential/commercial squatting. Though some of the structures on the encroached land are permanent in nature, most of the squatting is in temporary structures. The rural open stretches are characterized by agriculture encroachment or fallow land. As a result, two distinct design approaches were adopted: one for built up areas and other for open rural areas. The broad parameters considered by the design team based on the inputs from the R&R surveys were:

- Minimize the impact on roadside settlements.
- Minimize impact on agricultural land.
- Minimize impact on community assets.
- Avoid the adverse impacts of the crowded areas along the project stretch.

3.4 Widening Options

Due importance has been given to social issues while road designing. The coordination between social and design team helped in minimizing the number of PAPs and affected PAHs. Concentric widening has been proposed in majority of project stretch to develop the project highway within the available RoW and to avoid involuntary land taking & hence, minimize the social impact. Additional Land acquisitions have been proposed only in bypasses, realignment and the locations where geometric improvement is not possible within the available RoW. The proposed RoW at these locations is 30-60 m.

3.5 Improvement in Built-up Locations

In context of present project improvement that consists of widening to 4-lane road with paved shoulders, the Corridor of Impact was the most important parameter in determining the number of PAPs. The requirement of the project demands that the entire corridor of impact should be free from encroachments, human habitation and structure, causing hindrances to traffic.

4

Chapter 4- Resettlement Policies and Framework

4 Resettlement Policies and Legal Framework

4.1 Key Social Laws and Regulations

This section presents the legal framework for the land acquisition process and the Resettlement and Rehabilitation Policy which also includes the entitlements for affected eligible families. Project has developed Resettlement and Rehabilitation Policy based on the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013; and various government orders issued by state government for issues related to R&R. The policy recognizes the need to support restoration of livelihoods of adversely affected people and lays down norms for rehabilitating the affected people and broadly outlines an approach and institutional framework to achieve its objectives. The key social regulations and legislations that will govern preparation and implementation of the project are presented below.

Table 4.1 Relevant Social Legislations

Acts/Rule/ Policy	Year	Objective	Applicability to this project	Responsible Agency
Right to fair compensation and transparency in land acquisition, rehabilitation and Resettlement Act	2013	Fair compensation for acquisition of immovable assets; Resettlement of displaced population due to LA and economic rehabilitation of all those who are affected due to land acquisition.	Yes, as project will be acquiring private land	Revenue Department. Govt. of Mizoram

4.2 Process of Land Acquisition and Other Immovable Assets

The project specific R&R policy provides two options for acquisition of land and other movable assets. Option 1 on direct purchase and Option 2 is through RFCTLARR Act 2013. The details are given below:

Option 1: Direct Purchase of land based on Clause 46 of RFCTLARR Act, 2013

Under this option following steps will be followed:

- Project to identify land parcels to be purchased and owners during SIA in consultation with the local revenue officials.
- List of such landowners along with intent to purchase and purpose of purchase will be forwarded to the District Magistrate. A committee will be set up as per the existing government order (GO) number 271/83 dated September 2, 2013 for direct purchase.

- The base price of land will be as per the process mentioned in RFCTLARR Act, 2013.
- The rate will be finalized by the land purchase committee.
- The rate agreed upon will be exclusive of R&R assistances as mentioned in project specific R&R policy.

Option 2: Acquisition of private land through Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation and Resettlement Act, 2013.

As per option II, all private immovable assets will be acquired as per new RFCTLARR Act 2013. All eligible PAPs will be entitled to R&R assistance over and above the compensation. Those PAPs who are not entitled for compensation (encroachers and squatters) will get R&R benefits as per their entitlement given in project specific R&R policy. The entitlement of compensation and assistance will be extended to only those PAPs who are identified on or prior to the cut-off date. Claims regarding R&R assistance should be dealt by Grievance redress committee. However, acquisition through the Act may take 3.5 to 4 years of time as shown in table below.

Table 4.2 Timelines for SIA, Land Acquisition and Compensation Payments

Sl. No.	Key Activity	TimeLine	Remarks
1	SIA Notification (Sec.4)	0	
2	SIA Report	6 months	
3	Appraisal of SIA by Expert Committee (Sec 7)	2 months	
4	Decision of Appropriate Government on SIA report	No time frame is suggested	
5	Preliminary Notification for Land acquisition (Sec.11)	Within 1 year of SIA Appraisal	Simultaneous update of Land records (2 months)
6	Final Declaration of Land acquisition (Sec. 19)	Within 1 year of Preliminary Notification	
7	Compensation Award (sec. 30)	Within 1 year of declaration	
8	Compensation Payment	Within 3 months of award 9	
9	Payment of R&R monetary assistance	Within 6 months of award	
10	Development of R&R sites and infrastructure, if needed	Within 18 months from the date of award	
11	Total Time Frame for taking over of acquired properties	About 3.5 to 4 years	

4.3 Project Specific R&R Policy

The Resettlement and Rehabilitation (R&R) policy for this project is based on RFCTLARR Act 2013 (National acts). The action plan has been prepared based on the broad outlines laid down in the policy. The principle of the R&R policy is the guiding philosophy to provide a development approach to resettle and rehabilitate the people affected by project. The project specific R&R policy recognizes that involuntary resettlement results in dismantling of existing production system and way of life. Therefore, all rehabilitation programs will adopt a developmental approach rather than the welfare approach. The policy details out the assistance in re-establishing the homes and livelihoods of the Project Affected People (PAP) during projects. The entitlement matrix as given in below:

Table 4.3 Entitlement Matrix

Sl. No.	Applica tion	Definition of Entitled Unit	Entitlement	Details
A. Loss of Private Agricultural, Homestead & Commercial Land				
1	Land within the Corridor of Impact (COI)	Titleholder Family and families with traditional land Right	Compensation at Replacement value, Resettlement and Rehabilitation	Land for land, if available. Or Cash compensation for the land at replacement value, which will be determined as provided under section 26 of RFCTLARR Act 2013. b) The land if allotted will be in the name of both husband and wife. c) If post-acquisition, residual land is economically unviable, the landowner will have the choice of either retaining or sell off rest of the land. d) Refund of stamp duty and registration charges incurred for replacement land to be paid by the project; replacement land must be bought within a year from the date of payment of compensation to project affected persons. e) Subsistence allowance of Rs. 36000 as one-time grants f) One-time grant of Rs. 500,000 or annuity g) Compensation at replacement value for loss of crops if any.
B. Loss of Private Structures (Residential/Commercial)				





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2	Structure within the Corridor of Impact (Col)	Title Holder/ Owner	Compensation at Replacement value, Resettlement & Rehabilitation Assistance	a) Cash compensation for the structure at replacement value which would be determined as per as per section 29 of the RFCTLARR Act 2013. House under Indira Awas Yojna in rural area or Rs 50000 in lieu off and house under RAY in urban area or Rs 100,000 in lieu of the house if allotted will be in the name of both husband and wife. b) Right to salvage material from the demolished structures. c) Three months' notice to vacate structures. d) Refund of stamp duty and registration charges for purchase of new alternative houses/shops at prevailing rates on the replacement value as determined in (a) above. Alternative. Houses/shops must be bought within a year from the date of payment of compensation. e) In case of partially affected structures and the remaining structure remains viable, additional 10% to restore the structure. In case of partially
3	Structure within the Corridor of Impact (Col)	Tenants/ Lease Holders	Resettlement & Rehabilitation Assistance	a) Registered lessees will be entitled to an apportionment of the compensation payable to structure owner as per applicable local laws. b) In case of tenants, three months written notice will be provided along with Rs 50,000 towards shifting allowance.
C. Loss of Trees and Crops				
4	Standing Trees, Crops within the Corridor of Impact (Col)	Owners and beneficiaries (Registered / Un-registered tenants, contract cultivators, leaseholders & sharecroppers.	Compensation at replacement value	a) Three months' notice to project affected persons to harvest fruits, standing crops and removal of trees. b) Compensation to be paid at the rate estimated by i) The Forest Department for timber trees. ii) The State Agriculture Extension Department for crops iii) The Horticulture Department for fruit/flower bearing trees. c) Registered tenants, contract cultivators & leaseholders & sharecroppers will be eligible for compensation for trees and crops as per the agreement document between the owner and the beneficiaries. d) Un-registered tenants, contract cultivators, leaseholders & sharecroppers will be eligible for compensation for trees and crops as per mutual understanding between the owner and the beneficiaries.

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D. Loss of Residential/ Commercial Structures to Non-Titled Holders				
5	Structures within the Corridor of Impact (Col) or Government land	Owners of Structures or Occupants of structures identified as per Project Census Survey	Resettlement & Rehabilitation Assistance	a) Non-vulnerable encroachers shall be given three months' notice to vacate occupied land b) Vulnerable encroachers will be provided cash assistance at replacement cost for loss of structures as described in section 29 of the RFCTLARR Act 2013. c) Any encroacher identified as non-vulnerable but losing more than 25% of structure used will be paid cash assistance at replacement cost for loss of structures. The amount will be determined as per section 29 of the RFCTLARR Act 2013. d) All squatters to be paid cash assistance for their structures at replacement costs which will be determined as mentioned in section 29 of the RFCTLARR Act 2013. e) All squatters (other than kiosks) will be eligible for one-time grant of Rs 36000 as subsistence allowance. f) All squatters other than Kiosks will be given shifting allowance of Rs 50,000 per family as one-time grant for a permanent structure and Rs. 30,000 for a semipermanent structure and Rs. 10,000 for a temporary structure. g) Each affected person who is a rural artisan, small trader or self-employed person assistance' of Rs 25,000/- for construction of working shed or shop. h) In case of Kiosks, only Rs. 5000 will be paid as one-time grant.
E. Loss of Livelihood				
6	Families living within the Corridor of Impact (Col)	Title Holders/ Non-Title holders/ sharecroppers, agricultural laborers, and employees	Resettlement & Rehabilitation Assistance	a) Subsistence allowance of Rs. 36,000 as one-time grants. (PAPs covered under 1(f), 2 (f) and 5 (e) above would not be eligible for this assistance). b) Training Assistance of Rs 10,000/- for income generation per family. c) Temporary employment in the project construction work to project affected persons with attention to vulnerable groups by the project contractor during construction, to the extent possible
F. Additional Support to Vulnerable Families				
7	Families within the Corridor of Impact (Col)	SC, ST, BPL, WHH families	Resettlement & Rehabilitation Assistance	One-time additional financial assistance of Rs. 50,000. Squatters and encroachers already covered under clause 5 are not eligible for this assistance.
G. Loss of Community Infrastructure/Common Property Resources				



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8	Structures & other resources (e.g., land, water, access to structures etc.) within the Corridor of Impact (Col)	Affected communities and groups.	Reconstruction of community structure and • common property resources	Reconstruction of community structure and Common property resources in consultation with the community.
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H. Temporary Impact During Construction

9	Land & assets temporarily impacted during Construction	Owners of land & Assets	Compensation for temporary impact during construction e.g., diversion of normal traffic, damage to adjacent parcel of land / assets due to movement of heavy machinery and Plant site	Compensation to be paid by the contractor for loss of assets, crops, and any other damage as per prior agreement between the 'Contractor' and the 'Affected Party'.
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J. Resettlement Site

10	Loss of residential structures	Displaced titleholders and non-titleholders	Provision of resettlement site/ vendor replacement	Resettlement sites will be developed as part of the project if a minimum of 25 project displaced families opt for assisted resettlement. Vulnerable PAPs will be given preference in allotment of plots/flats at the resettlement site. Plot size will be equivalent to size lost subject to a maximum of provision given in RFCTLARR Act 2013. Basic facilities shall be provided by the project at resettlement site as per the provisions given in the Third Schedule of
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				<p>RFCTLARR Act 2013. Similarly, if at least 25 displaced commercial establishments (small business enterprises) opt for shopping units, the Project Authority will develop the vendor replacement at suitable location in the nearby area in consultation with displaced persons. Basic facilities such as approach road, electricity connection, water and sanitation facility, will be provided in the vendor replacement by the project. Vulnerable PAPs will be given preference in allotment of shops in vendor replacement. One displaced family will be eligible for only one land plot at resettlement site or shop in the vendor replacement.</p>
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4.4 National Highways Act 1956



Land for construction of a new highway or up gradation /widening is acquired using the NH Act 1956. Key provisions relating to acquisition are as follows:

3A. Power to Acquire Land, etc

- Where the Central Government is satisfied that for a public purpose any land is required for the building, maintenance, management or operation of a national highway or part thereof, it may, by notification in the Official Gazette, declare its intention to acquire such land.
- Every notification under sub-section (1) shall give a brief description of the land.
- The competent authority shall cause the substance of the notification to be published in two local newspapers, one of which will be in a vernacular language.

3B. Declaration of Acquisition

- Where no objection under sub-section (1) of section 3C has been made to the competent authority within the period specified therein or where the competent authority has disallowed the objection under sub-section (2) of that section, the competent authority shall, as soon as may be, submit a report accordingly to the Central Government and on receipt of such report, the Central Government shall declare, by notification in the Official Gazette, that the land should be acquired for the purpose or purposes mentioned in sub-section (1) of section 3A.
- On the publication of the declaration under sub-section (1), the land shall vest absolutely in the Central Government free from all encumbrances.
- Where in respect of any land, a notification has been published under subsection (1) of section 3A for its acquisition but no declaration under sub-section (1) has been published within a period of one year from the date of publication of that notification, the said notification shall cease to have any effect: Provided that in

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computing the said period of one year, the period or periods during which any action or proceedings to be taken in pursuance of the notification issued under subsection (1) of section 3A is stayed by an order of a court shall be excluded.



- (iv) A declaration made by the Central Government under sub-section (1) shall not be called in question in any court or by any other authority.

3C. Power to take Possession

- (i) Where any land has vested in the Central Government under sub-section (2) of section 3D, and the amount determined by the competent authority under section 3G with respect to such land has been deposited under sub-section (1) of section 3H, with the competent authority by the Central Government, the competent authority may by notice in writing direct the owner as well as any other person who may be in possession of such land to surrender or deliver possession thereof to the competent authority or any person duly authorized by it in this behalf within sixty days of the service of the notice.
- (ii) If any person refuses or fails to comply with any direction made under subsection (1), the competent authority shall apply— a. In the case of any land situated in any area falling within the metropolitan area, to the Commissioner of Police, b. In case of any land situated in any area other than the area referred to in clause (a), to the Collector of a District, and such Commissioner or Collector shall enforce the surrender of the land, to the competent authority or to the person duly authorized by it.



3D. Determination of amount payable as compensation

- (i) Where any land is acquired under this Act, there shall be paid an amount which shall be determined by an order of the competent authority.
- (ii) Where the right of user or any right an easement on, any land is acquired under this Act, there shall be paid an amount to the owner and any other person whose right of enjoyment in that land has been affected in any manner whatsoever because of such acquisition an amount calculated at ten per cent. of the amount determined under sub-section (1), for that land.
- (iii) Before proceeding to determine the amount under sub-section (1) or sub-section (2), the competent authority shall give a public notice published in two local newspapers, one of which will be in a vernacular language inviting claims from all persons interested in the land to be acquired. (iv) Such notice shall state the of the land and shall require all persons interested in such land to appear in person or by an agent or by a legal practitioner referred to in sub-section (2) of section 3C, before the competent authority, at a time and place and to state the nature of their respective interest in such land.

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- (iv) If the amount determined by the competent authority under sub-section (1) or subsection (2) is not acceptable to either of the parties, the amount shall, on an application by either of the parties, be determined by the arbitrator to be appointed by the Central Government.
- (v) Subject to the provisions of this Act, the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) shall apply to every arbitration under this Act.
- (vi) The competent authority or the arbitrator while determining the amount under sub-section (1) or sub-section (5) shall take into consideration.
 - a. The market value of the land on the date of publication of the notification under section 3A.
 - b. The damage, if any, sustained by the person interested at the time of taking possession of the land, because of the severing of such land from other land.
 - c. The damage, if any, sustained by the person interested at the time of taking possession of the land, because of the acquisition injuriously affecting his other immovable property in any manner, or his earnings.
 - d. If, in consequences of the acquisition of the land, the person interested is compelled to change his residence or place of business, the reasonable expenses, if any, incidental to such change.

Chapter 5- Profile of Area and Project Affected Persons

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 5: Profile of Area and Project Affected Persons</p>	
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5 Profile of Area and Project Affected Persons



Assam is a state in Northeast India, with Dispur as its capital city. The word Assam has its origin in the Sanskrit word Asom meaning Unparalleled or Peerless. In the mythological text this land is described as Pragjyotishpura or the "City of eastern lights"; the site where Lord Brahma first created the stars. Within the northeast region, it is the southernmost landlocked state, sharing borders with six of the Seven Sister States, namely Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya and also with state of West Bengal. The state also shares a 533.3-kilometre border with the neighbouring countries of Bangladesh and Bhutan.

5.1 Profile of Assam

Assam, the gateway to the Northeast India is the largest State in the Northeast is bordering seven states (also called as 07 sisters) viz. Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Assam and two countries viz. Bangladesh & Bhutan. The State is endowed with abundant fertile land and water resources with total geographical area of 78,438 sq.km. Of which 98.4% area is rural. Assam shares about 2.4% of the country's total geographical area and provides shelter to 2.6% population of the country. Most of the state population lives in the lush valleys of its two major river system in the 30 districts of the Brahmaputra valley & 3 districts of the Barak valley. Less densely populated three hill districts viz. Karbi-Anglong, West Karbi-Anglong & Dima Hasao, set in the low-laying hills that separate the two valleys. For administrative and revenue purposes, the state has 33 districts including four districts Under the Bodoland Territorial Council (BTC) area viz. Kokrajhar, Chirang, Baska & Udalguri and 6 newly created districts viz., Biswanath, Charaideo, Hojai, South Salmara-Macachar, West Karbi-Anglong and Majuli.

The State has been blessed bountiful by nature. The mighty Brahmaputra truncating the state, the Barak River in the south and their tributaries provide abundant water resource; the dense forest cover is home to a wide range of valuable timber, bamboo & medical plants; the state reserve of oil and natural gas; the fertile valleys & hills lopes nourish tea gardens and horticultural crops while the rich and fertile soil lend itself to raising vital food-grains.

Assam is administratively divided into 33 districts with 80 sub-division, 219 Development Blocks and 2202 Gaon Panchayats, out of which 3 districts with 4 sub-divisions & 16 Development Blocks are under three hill districts of Karbi-Along, East Karbi-Along & Dima Hasao. Further, four district with eight sub-divisions are under Bodoland Territorial Council (BTC) area viz Kokrajhar, Chirang, Baska & Udalguri. The Brahmaputra valley consists of North Bank Plains Zone (NBPZ), Upper Brahmaputra valley Zone (UBVZ), Central Brahmaputra valley Zone (CBVZ) and

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Lower Brahmaputra Valley Zone (LBVZ), whereas the Barak Valley Zone mainly consists of plain area of three districts, viz. Cachar, Karimganj & Hailakandi.

The State is severely affected by floods during rainy seasons causing enormous damage to crops, livestock, land, property & bringing untold miseries to the people at large. Both the Brahmaputra and Barak Valley witness devastating floods every year, which not only washes away valuable life & crops, but also lead to bank erosion and drainage congestion, virtually destroy the economy, more particularly, the rural economy of the State.



Assam has heterogeneous population with socio-cultural & ethnic diversity. According to the Census of India, 2011 the population of Assam stands at 312.05 lakh of which 159.39 lakh are male and 152.66 lakh are female. The decadal growth of the State's population works out at 17.07 percent during the decade 2001-2011 as against 17.68 percent for the country as a whole. Out of the total 312.05 lakh population, 86 percent population live in rural areas & 14 percent population live in urban areas of the State. The density of the population of Assam has increased to 398 persons in 2011 from 340 persons in 2001 Census or on an average, 58 more people inhabit every square kilometre in the State as compared to a decade ago.

5.2 History of Assam State

The history of Assam is the history of a confluence of people from the east, west and the north; the confluence of the Tibeto-Burman (Sino-Tibetan), Indo-Aryan and Austroasiatic cultures. Although invaded over the centuries, it was never a vassal or a colony to an external power until the third Burmese invasion in 1821, and, subsequently, the British ingress into Assam in 1824 during the First Anglo-Burmese War.

The Assamese history has been derived from multiple sources. The Ahom kingdom of medieval Assam maintained chronicles, called Buranjis, written in the Ahom and the Assamese languages. History of ancient Assam comes from a corpus of Kamarupa inscriptions on rock, copper plates, clay; royal grants, etc. that the Kamarupa kings issued during their reign. Protohistory has been reconstructed from folklore: epics like Mahabharata, and two medieval texts compiled in the Assam region—the Kalika Purana and the Yogini Tantra.

The history of Assam can be divided into four eras. The ancient era began in the 4th century with the mention of Kamarupa in Samudragupta's inscriptions on the Allahabad pillar and the establishment of the Kamarupa kingdom. The medieval era began with the attacks from the Bengal Sultanate, the first of which took place in 1206 by Bakhtiyar Khilji as mentioned in the Kanai-boroxiboa rock inscription, after the breakup of the ancient kingdom and the sprouting of medieval kingdoms and

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chieftain-ships in its place. The colonial era began with the establishment of British control after the Treaty of Yandaboo in 1826, and the post-colonial era began in 1947 after the Independence of India.

5.3 Culture of Assam State



Assam is the meeting ground of diverse cultures. The people of the enchanting state of Assam are an intermixture of various racial stocks such as Mongoloid, Indo-Burmese, Indo-Iranian and Aryan. The Assamese culture is a rich and exotic tapestry of all these races evolved through a long assimilative process. The natives of the state of Assam are known as "Asomiya" (Assamese), which is also the state language of Assam. A majority of the Assamese is the Vaishnavas (a sect of Hinduism). The Vaishnavas do not believe in idol worshiping and perform Namkirtana where the glory of Lord Vishnu is recited. The two important cultural and religious institutions that influence the cultural fabric of Assam: the Satras, the site of religious and cultural practice which have been in existence for over 400 years and and the Naamghar, the house of prayers. Villagers generally associate on the basis of membership of a local center of devotional worship called "Naamghar". The most important social and cultural celebrations are the three Bihu festivals observed with great enthusiasm irrespective of caste, creed and religious affinity.

5.4 Profile of Cachar District

The project road lies between Latitude 24° 50' 11.356"N to 24° 43' 13.225"N and Longitude 92° 49' 34.363"E to 92° 49' 46.6"E. The project road passes mainly through Plain, Rolling and few stretch in hilly terrain.

Cachar:

The District of Cachar is located in the Southernmost part of Assam is one of the oldest districts of Assam. It is bounded on the North by Barali and Jayantia hill ranges, on the South by the State Mizoram, on the East by the State of Manipur and West by sister districts Hailakandi and Karimganj. The district was created in 1830 after annexation of Kachari Kingdom by British. In 1854, North Cachar was annexed and tagged to the district. The name Cachar traces its origin to the Kachari kingdom called Dimasa Kingdom in medieval times. Cachar district occupies an area of 3,786 square kilometres. The Barak is the main river of the district and apart from that there are numerous small rivers which flow from Dima Hasao district, Manipur or Mizoram. The district is mostly made up of plains, but there are a number of hills spread across the district. Cachar receives an average annual rainfall of more than 3,000 mm. The climate is Tropical wet with hot and wet summers and cool winters. The district headquarters, Silchar, is one of the most important business centres of Assam. In 2006 the Indian government named Cachar one of the country's 250 most backward districts out of a total of 640. It is one of the eleven districts in Assam currently receiving funds from the Backward Regions Grant Fund Programme (BRGF). There are seven

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Assembly constituencies in this district, viz. Silchar, Sonai, Dholai, Udharbond, Lakhipur, Barkhola and Katigorah. Dholai is designated for scheduled castes. The seven constituencies make up the Silchar Lok Sabha constituency. According to the 2011 census Cachar district has a population of 1736319, roughly equal to the nation of The Gambia or the US state of Nebraska. This gives it a ranking of 278th in India out of a total of 640. Cachar has a sex ratio of 958 females for every 1000 males, and a literacy rate of 80.36%. Bengali is the status of Official Language in this district with majority of the people primarily speaking Bengali and Sylheti. Apart from Bengali, other minority languages spoken in the district include Meitei Manipuri, Bishnupuriya Manipuri, Dimasa and Rongmei-Naga. There are also few Mizo, Kuki and Khasi people who form microscopic minority. The district of Cachar has a number of well-known educational institutes in Northeast India. Silchar, the district headquarters, is a major learning hub of Assam. The district has a central university, the Assam University, which is situated at Durgakona, 18 km from Silchar. It also has NIT Silchar, one of the 30 NITs in India. The Silchar Medical College and Hospital is the only medical college of southern Assam.

5.5 Climate

The climate of Assam is typically ‘tropical monsoon rainfall’ type, with high levels of humidity and heavy rainfall. People here enjoy a moderate climate all throughout the year, with warm summers and mild winters. In the monsoon season, the whole state comes alive with the beauty of nature. Climatic variations can be seen regionally. While the plains of Assam have a tropical climate with high humidity, the hills have a sub-alpine type of climate. There are four distinct seasons in Assam - summer, monsoon, autumn and winter. The best time to visit the place is the winter season i.e., from October to April, which is also the festive season of Assam. Let us gather some more information on the weather and climate of Assam

The summer season in Assam starts from the month of March and extends till the end of June. The season is characterized by extreme humidity and frequent showers. The average temperature during this time of the year is between 35 and 38 degrees Celsius. In fact, the mercury level never rises more than 38 degrees, even in the hottest month of the year. So, light cotton clothes are the best option during summers.

This season brings relief from the scorching heat of the summers. The neighboring areas of Cherapunji and Mawsynram have the highest rainfall in the world. The average annual rainfall in the state is around 70 inches in the west and around 120 inches in the east. In the afternoons, thunderstorms known as Bordoicila are very common. The season covers the entire state with a green blanket.

The winter season in Assam is basically characterized by scanty rainfall and misty mornings and afternoons. It starts in November and continues till the month of February. The mercury reading at this time of the year is around 6 to 8 degrees Celsius



or 43- 46 degree Fahrenheit. This is the best time to visit the north-eastern state of Assam.

In Assam, spring (March- April) and autumn (September- October) present pleasant seasons, with moderate temperature and rainfall. These are amongst the popular months for tourist rush. As it is neither too cold nor too hot, you don't have to carry any special type of garment for these seasons. Therefore, if you are planning a trip to Assam, spring and autumn may be your choice.

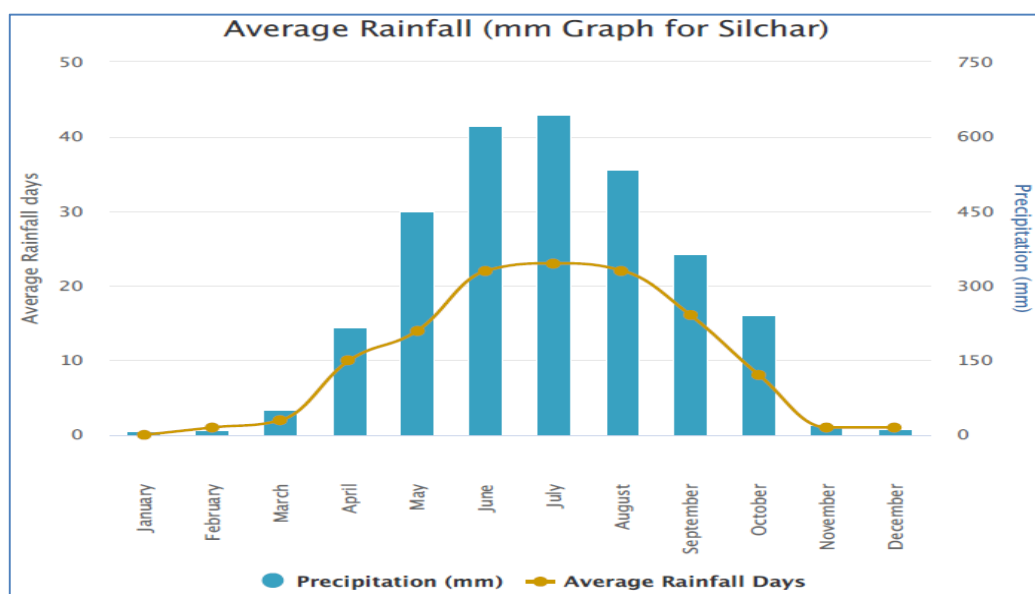
5.6 Flooding and Rain

Every year, flooding from the Brahmaputra and other rivers such as Barak River etc. deluges places in Assam. The water levels of the rivers rise because of rainfall resulting in the rivers overflowing their banks and engulfing nearby areas. Apart from houses and livestock being washed away by flood water, bridges, railway tracks, and roads are also damaged by the calamity, which causes communication breakdown in many places. Fatalities are also caused by the natural disaster in many places of the State.

In year 2022, Barak Valley in Assam has been hit by Assam floods to a major extent out of continuous rainfall in Cachar, Hailakandi, and Karimganj districts. Unfortunately, Silchar was entirely submerged in water.

Several houses were being washed away; no electricity and no food was the new normal. There has been an absolute lack of drinking water as well. It was during these tough times that a few Non-Government Organisations (NGOs) extended their helping hand to the flood victims.

Average Rainfall has been accorded in year 2022 and presented below,





5.7 Demographic Pattern

The town/village wise profile were as below:

1. Rongpur :

Rongpur village is located in Doom Dooma subdivision of Tinsukia district in Assam, India. It is situated 15km away from sub-district headquarter Doom Dooma (tehsildar office) and 40km away from district headquarter Tinsukia. As per 2009 stats, Gabharubheti is the gram panchayat of Rangpur village.

The village has literate population of 720 of which 382 are males while 338 are females, where illiterate population is 492 out of which 231 are male and 261 females.

In Rongpur Pt III village out of total population, 368 were engaged in work activities. 95.11 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 4.89 % were involved in Marginal activity providing livelihood for less than 6 months. Of 368 workers engaged in Main Work, 19 were cultivators (owner or co-owner) while 15 were Agricultural labourer.

Total area of Rongpur Pt Iii is 231.52 Hectares as per the data available for the year 2009 where agricultural area is 170.42 ha, 170.42 ha is un-irrigated area, 40 ha is in non-agricultural use, 1.1 ha is under miscellaneous tree crops and 20 ha is culturable waste land.

Silchr is nearest town to rongpur for all major economic activities, which is approximately 5km away.

The nearest Rail Station is Silchar Rail Station, and it is 5.0 km far and the Nearest Airport is Silchar Airport, it is 20.3 km.

Table 5.1 Sex Ratio of Vairengte

Particulars	Total	Male	Female
Total No. of Houses	257	-	-
Population	1,254	632	622
Child (0-6)	114	59	55
Schedule Caste	0	0	0
Schedule Tribe	0	0	0
Literacy	93.77 %	95.99 %	91.53 %
Total Workers	368	345	23
Main Worker	350	-	-
Marginal Worker	18	14	4



2. Kashipur

Kashipur village is located in Silchar subdivision of Cachar district in Assam, India. It is situated 7km away from Silchar, which is both district & sub-district headquarter of Kashipur village. As per 2009 stats, Borkhola is the gram panchayat of Kashipur village.

The total geographical area of village is 130.68 hectares, where 122ha is agricultural, 68ha non-agricultural, 0.53ha waste land and 1.47ha is lying as fallow land. Silchar is nearest town to kashipur for all major economic activities, which is approximately 7km away

The village has literate population of 760 of which 393 are males while 367 are females, where illiterate population is 204 out of which 90 are male and 114 females.

In Kashipur village out of total population, 341 were engaged in work activities. 85.04 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 14.96 % were involved in Marginal activity providing livelihood for less than 6 months. Of 341 workers engaged in Main Work, 93 were cultivators (owner or co-owner) while 2 were Agricultural labourer.

Village is connected by road and railways, which are within 5 to 10 km and 21.48 km from Silchar Airport.

Table 5.2 Sex Ratio of Kashipur

Particulars	Total	Male	Female
Total No. of Houses	206	-	-
Population	964	483	481
Child (0-6)	136	66	70
Schedule Caste	179	91	88
Schedule Tribe	0	0	0
Literacy	91.79 %	94.24 %	89.29 %
Total Workers	341	236	105
Main Worker	290	-	-
Marginal Worker	51	20	31



3. Dhanehari

Dhanehari village is located in Sonai subdivision of Cachar district in Assam, India. It is situated 355km away from sub-district headquarter Sonai (tehsildar office) and 10km away from district headquarter Silchar. As per 2009 stats, Sonabarighat is the gram panchayat of Dhanehari village.

The total geographical area of village is 361 hectares, where 290.49ha agricultural, 30ha is grazing land, 9.51ha is culturable waste land and 31ha is barren land. Silchar is nearest town to dhanehari pt i for all major economic activities, which is approximately 10km away.

The village has literate population of 2362 of which 1292 are males while 1070 are females, where illiterate population is 717 out of which 292 are male and 425 females.

In Dhanehari Pt I village out of total population, 963 were engaged in work activities. 82.76 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 17.24 % were involved in Marginal activity providing livelihood for less than 6 months. Of 963 workers engaged in Main Work, 388 were cultivators (owner or co-owner) while 46 were Agricultural labourer.

Village is connected by road and railways, which are within 5 to 10 km.

Table 5.3 Sex Ratio of Dhanehari

Particulars	Total	Male	Female
Total No. of Houses	679	-	-
Population	3079	1584	1495
Child (0-6)	439	224	215
Schedule Caste	14	6	8
Schedule Tribe	0	0	0
Literacy	89.47 %	95.00 %	83.59 %
Total Workers	963	864	99
Main Worker	797	-	-
Marginal Worker	166	98	68

4. Clever House

Clever House Pt I village is located in Silchar subdivision of Cachar district in Assam, India. It is situated 25km away from Silchar, which is both district & sub-district headquarter of Clever House Pt I village. As per 2009 stats, Cleverhouse is the gram panchayat of Clever House Pt I village.

The total geographical area of village is 85.01 hectares, where 24.8ha agricultural, 13.38ha is lying as current fallow area, 6.69ha is culturable waste land, 6.69ha is lying as other than current fallows and 6.69ha is barren land. Silchar is nearest town to clever house pt i for all major economic activities, which is approximately 25km away.

In Clever House Pt I village out of total population, 315 were engaged in work activities. 93.02 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 6.98 % were involved in Marginal activity providing livelihood for less than 6 months. Of 315 workers engaged in Main Work, 78 were cultivators (owner or co-owner) while 35 were Agricultural labourer.

The village has literate population of 791 of which 411 are males while 380 are females, where illiterate population is 339 out of which 160 are male and 179 females. Village is connected by road and railways, which are within 5 to 10 km.

Table 5.4 Sex Ratio of Clever House

Particulars	Total	Male	Female
Total No. of Houses	258	-	-
Population	1130	571	559
Child (0-6)	142	70	72
Schedule Caste	457	243	214
Schedule Tribe	0	0	0
Literacy	80.06 %	82.04 %	78.03 %
Total Workers	315	277	38
Main Worker	293	-	-
Marginal Worker	22	10	12



5. Narsingpur:

Narsingpur Pt I village is located in Sonai subdivision of Cachar district in Assam, India. It is situated 365km away from sub-district headquarter Sonai (tehsildar office) and 18km away from district headquarter Silchar. As per 2009 stats, Nagdirgram is the gram panchayat of Narsingpur Pt I village.

The total geographical area of village is 152.62 hectares, where 143.1 agricultural land, 1ha non-agricultural, 2.59ha grazing land, 2ha miscellaneous land and 3.93ha is barren land. Silchar is nearest town to narsingpur pt i for all major economic activities, which is approximately 18km away.

In Narsingpur Pt I village out of total population, 775 were engaged in work activities. 91.35 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 8.65 % were involved in Marginal activity providing livelihood for less than 6 months. Of 775 workers engaged in Main Work, 162 were cultivators (owner or co-owner) while 28 were Agricultural labourer.

The village has literate population of 2170 of which 1068 are males while 1102 are females, where illiterate population is 294 out of which 149 are male and 145 females. Village is connected by road and railways, which are within 5 to 10 km.

Table 5.5 Sex Ratio of Narsingpur

Particulars	Total	Male	Female
Total No. of Houses	617	-	-
Population	2464	1217	1247
Child (0-6)	236	136	100
Schedule Caste	1	1	0
Schedule Tribe	0	0	-0
Literacy	88.07%	87.76%	88.37%
Total Workers	775	636	139
Main Worker	708	-	-
Marginal Worker	67	49	18

6. Borjalenga

Bor Jalenga Pt Vii village is located in Silchar subdivision of Cachar district in Assam, India. It is situated 25km away from Silchar, which is both district & sub-district headquarter of Bor Jalenga Pt Vii village. As per 2009 stats, Panibhora is the gram panchayat of Bor Jalenga Pt Vii village.

The total geographical area of village is 271.25 hectares, where 88.68ha un-irrigated area, 26.78ha non-agricultural, 8.77ha miscellaneous, 16.77 current fallow, 10.52ha waste land, 8.73 otherthan current fallow and 40.23ha barren land. Silchar is nearest town to bor jalenga pt vii for all major economic activities, which is approximately 25km away. Borjalenga is surrounded by Silchar Tehsil towards North, Narsingpur Tehsil towards East, Tapang Tehsil towards North, Banskandi Tehsil towards East. Silchar , Hailakandi , Karimganj , Haflong are the nearby Cities to Borjalenga. This Place is in the border of the Cachar District and Hailakandi District.

In Bor Jalenga Pt VII village out of total population, 1282 were engaged in work activities. 61.08 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 38.92 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1282 workers engaged in Main Work, 207 were cultivators (owner or co-owner) while 44 were Agricultural labourer.

The village has literate population of 2417 of which 1295 are males while 1122 are females, where illiterate population is 496 out of which 209 are male and 287 females. Village is connected by road and railways, which are within 5 to 10 km Kumbhigram airport is 29km.

Table 5.6 Sex Ratio of Narsingpur

Particulars	Total	Male	Female
Total No. of Houses	660	-	-
Population	2913	1504	1409
Child (0-6)	312	925	857
Schedule Caste	302	153	149
Schedule Tribe	0	0	-0
Literacy	82.97%	86.10%	79.63%
Total Workers	1,282	816	466
Main Worker	783	-	-
Marginal Worker	499	89	410

7. Sadagram:

Sadagram village is located in Sonai subdivision of Cachar district in Assam, India. It is situated 374km away from sub-district headquarter Sonai (tehsildar office) and 29km away from district headquarter Silchar. As per 2009 stats, Dholai is the gram panchayat of Sadagram village.

The total geographical area of village is 286.38 hectares, from which agricultural area is 202.22 ha un-irrigated area, 17.06 ha is in non-agricultural, and 20 ha is under miscellaneous tree crops. Silchar is nearest town to sadagram for all major economic activities, which is approximately 29km away.

In Sadagram village out of total population, 1445 were engaged in work activities. 86.30 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 13.70 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1445 workers engaged in Main Work, 182 were cultivators (owner or co-owner) while 115 were Agricultural labourer.

The village has literate population of 3612 of which 1846 are males while 1766 are females, where illiterate population is 626 out of which 276 are male and 350 females. Village is connected by road and railways, which are within 5 to 10 km Kumbhigram airport is 29km.

Table 5.1 Sex Ratio of Sadagram

Particulars	Total	Male	Female
Total No. of Houses	1022	-	-
Population	4238	2122	2116
Child (0-6)	395	199	196
Schedule Caste	726	351	375
Schedule Tribe	310	146	164
Literacy	93.99 %	96.00 %	91.98 %
Total Workers	1,445	1,228	217
Main Worker	1,247	-	-
Marginal Worker	198	142	56

8. Islamabad:

Islamabad village is located in Sonai subdivision of Cachar district in Assam, India. It is situated 378km away from sub-district headquarter Sonai (tehsildar office) and 33km away from district headquarter Silchar. As per 2009 stats, Saptagram is the gram panchayat of Islamabad village.

The total geographical area of village is 282.74 hectares from which agricultural area is 222.58 ha, 222.58 ha is un-irrigated area, 7.04 ha is in non-agricultural, 6.23 ha is used permanent pastures and grazing lands and 12.09 ha is under miscellaneous tree crops. About 34.8 ha is covered by barren and un-cultivable land. Silchar is nearest town to sadagram for all major economic activities, which is approximately 29km away.

Islamabad is a large village located in Sonai Circle of Cachar district, Assam with total 727 families residing.

In Islamabad village out of total population, 1084 were engaged in work activities. 86.90 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 13.10 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1084 workers engaged in Main Work, 391 were cultivators (owner or co-owner) while 196 were Agricultural labourer.

As per constitution of India and Panchyati Raaj Act, Islamabad village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website doesn't have information about schools and hospital in Islamabad village.

The village has literate population of 2371 of which 1287 are males while 1084 are females, where illiterate population is 1368 out of which 603 are male and 765 females. Village is connected by road and railways, which are within 10 km Kumbhigram airport is 29km. Silchar is nearest town to islamabad for all major economic activities, which is approximately 33km away.

Table 5.1 Sex Ratio of Islamabad

Particulars	Total	Male	Female
Total No. of Houses	727	-	-
Population	3,739	1,890	1,849
Child (0-6)	695	361	334
Schedule Caste	7	5	2
Schedule Tribe	0	0	0
Literacy	77.89 %	84.17 %	71.55 %



Particulars	Total	Male	Female
Total Workers	1,084	930	154
Main Worker	942	-	-
Marginal Worker	142	61	81

9. Lailapur:

The village Lailapur is located in Sonai Circle of Cachar District in the State of Assam in India. It comes under Narsingpur Community Development Block. It is situated 403km away from sub-district headquarter Sonai (tehsildar office) and 43km away from district headquarter Silchar.

Total area of Lailapur is 17 Hectares as per the data available for the year 2009, from which, agricultural area is 5 ha, 5 ha is un-irrigated area, and 2 ha is under miscellaneous tree crops.

In Lailapur village out of total population, 236 were engaged in work activities. 97.46 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 2.54 % were involved in Marginal activity providing livelihood for less than 6 months. Of 236 workers engaged in Main Work, 16 were cultivators (owner or co-owner) while 208 were Agricultural labourer.

The village has literate population of 335 of which 190 are males while 145 are females, where illiterate population is 550 out of which 250 are male and 300 females.

The village is connected by public bus services. Private buses services are available for the village. There is a railway station more than 10 kms away from the village.

Table 5.1 Sex Ratio of Lailapur

Particulars	Total	Male	Female
Total No. of Houses	171	-	-
Population	885	440	445
Child (0-6)	210	105	105
Schedule Caste	4	1	3
Schedule Tribe	13	7	6
Literacy	49.63 %	56.72 %	42.65 %

Particulars	Total	Male	Female
Total Workers	236	217	19
Main Worker	230	230	230
Marginal Worker	6	2	4

5.8 Forest covers:

The State of Assam; criss-crossed by mountains, valleys and an intricate river system; is located in the eastern most part of India. Topographically the state can be divided in to three parts viz the Brahmaputra valley, the Surma valley and the mountainous Assam Ranges. The recorded forest area of Assam is 26,832 sq km accounting for 34.21% of its geographical area. According to their legal status, Reserved Forests constitute 66.58% and Unclassed Forests 33.42% of the total forest area. The protected area network of Assam includes 7 National Parks and 18 wildlife sanctuaries covering an area of 4938.53 km².

Forest type mapping using satellite data has been undertaken by the Forest Survey of India with reference to Champion and Seth Classification. As per this assessment, the state has 18 forest types belonging to five forest type groups viz Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous, Tropical Dry Deciduous and Sub Tropical Pine Forests.

Table 5.2 District-wise Forest Cover of Assam (Area in sq km)

District	Geographical area (GA)	Very Dense Forest	Moderately Dense Forest	Open Forest	Total	Percent of GA
Assam	78,438	2,794.86	10,278.91	15,252.74	28,326.51	36.11
Cachar	3,786	93.00	1,077.58	1,051.76	2,222.34	58.70

Source: ISFR, 2018

Table 5.3 District-wise forests cover in percentage

District	Aizawl	Kolasib
Very Dense Forest	3.56%	2.46%
Moderately Dense Forest	13.10%	28.46
Open Forest	19.45%	27.78

Source: ISFR, 2018



5.9 Eco sensitive zone/Wildlife Sanctuary

Project Road does not pass through or fall within 10 Km of any notified eco-sensitive zone or Wildlife Sanctuary.

5.10 Water Resources



The study area is rich in water sources. Such water resources include the rivers streams, backwaters, irrigation tanks, ponds, etc. A large number of people depend on these water resources especially during dry seasons these water resources serves an important domestically purposes.



Pic 6.1 Water Resources

6

Chapter 6- Social Impact Assessment

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 6: Social Impact Assessment</p>	
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6 Social Impact Assessment

6.1 Introduction

The project road from Silchar to Vairengte is a combination of new alignment (as bypasses) and widening of existing road of NH-37 from Rongpur to Kasipur, Silchar Bypass & NH-306 Dhanehari to Lailapur border of Assam and Mizoram. Total design length of project road is 49.360km. The entire stretch passes through Cachar district. It is bounded on the North by Barali and Jayantia hill ranges, on the South by the State Mizoram, on the East by the State Of Manipur and West by sister districts Hailakandi and Karimganj. The district occupies an area of 3786 km². The district headquarters, Silchar, is one of the most important business centres of Assam. In 2006 the Indian government named Cachar one of the country's 250 most backward districts out of a total of 640. It is one of the eleven districts in Assam currently receiving funds from the Backward Regions Grant Fund Programme (BRGF). There are seven Assembly constituencies in this district, viz. Silchar, Sonai, Dholai, Udharbond, Lakhimpur, Barkhola and Katigorah. Dholai is designated for scheduled castes. The seven constituencies make up the Silchar Lok Sabha constituency. The district of Cachar has a number of well-known educational institutes in Northeast India. Silchar, the district headquarters, is a major learning hub of Assam. The district has a central university, the Assam University, which is situated at Durgakona, 18 km from Silchar. It also has NIT Silchar, one of the 30 NITs in India. The Silchar Medical College and Hospital is the only medical college of southern Assam.

6.2 Likely Positive Impacts

The proposed road is aligned with an existing road which will induce economic and social benefits to the people in the direct influence zone i.e., villages through which the project road traverses and indirect benefits to the districts and state. It will provide impetus for economic development in the immediate surroundings and would also generate local employment. Furthermore, it will facilitate improved access to market centres, educational institutions, healthcare facilities, and offices located in the districts. The cumulative likely positive impacts of the project will result in increased mobility, employment generation, and above all better economic integration of the area with the major market and trade centres within and outside the districts.

6.3 Adverse Impacts

The adverse impacts of the project have been quantified based on the survey carried out at site as per the improvement plan. The corridor of impact varies from one point to another along the project stretch. The magnitude of the likely impacts because of the proposed upgrading of the project road is discussed below. The project impacts have been broadly classified as impacts on land, structures Government and community

property resources (religious structures, passenger shelters, etc), impacts on livelihood, etc.

6.3.1 Impact on Land

The proposed road is aligned with an existing road which will induce economic and social benefits to the people in the direct influence zone i.e., villages

6.3.2 Impact on Structures

Several structures are likely to be affected including the government and common properties resources. Most of these private structures are belonging to mix of non-titleholders (encroachment) and titleholders' categories however, **26 Schools but no hospitals are affected.**

6.3.3 Loss of Access to Public Amenities

Following table gives the detail of loss of access to public amenities due to improvement of project road.

Table 6.1 Loss of Access to Public Amenities

Public Amenities	Number
Religious Structure	30
School	26
Hospital	0
Graveyard	1
Others	1267

6.4 Tribal Population

The project road is not passing through tribal area so that there are no tribal families are likely to be impact along the project road.

6.5 Compensation Option for Structure Loser

In project families lose their structures due proposed project road. Compensation will be taken by competent authority. Most of the structure lose are mainly sheds and Water Tank.



Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

SIA: Chapter 6: Social Impact Assessment



Pic 6.1 Few photographs from site during the Census and Socio-Economic Survey

7

Chapter 7- Public Information and Consultations

7 Public Information and Consultations

7.1 Introduction

Public information and consultation are an important method of involving various stakeholders particularly, local community with reference to the proposed development initiatives. It provides a platform to participants to express their views, concerns and apprehensions that might affect them positively or negatively. Through participation and consultation stakeholders influence development initiatives, and decision-making process. The effectiveness of participation and consultation is directly related to the degree of involvement by the likely project affected persons and the local community and integration of outcome of consultations wherever feasible in the proposed development initiatives. Detailed planning is required to ensure that likely project affected persons, local community, interested groups, non-governmental organizations, civil society organizations; local government, line departments, etc are consulted regularly, frequently and purposefully during different stages of the project including project preparation.

7.2 Objectives of the EMP

Public information and consultation were carried out during the project preparation stage in the form of public meeting, focus group discussion, in-depth interviews and individual consultations. The consultation process ensured that the likely project affected persons (PAPs), local community and other stakeholders were informed in advance, and allowed to participate actively and consulted.



Pic 7.1





Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).

Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Pic 7.2 Public Consultation

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 7: Public Information and Consultations</p>	
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This serves to reduce the insecurity among local community and likely PAPs and thereby opposition to the project because of its transparent nature inbuilt in the consultation process. The purpose of consultations was to inform people about the project, take note of their issues, concerns and preferences, and allow them to make meaningful choices. Consultation will be carried out during the implementation, and monitoring and evaluation of the project as well. Concerns, views and suggestions expressed by the participants during these consultations have been presented in the following sections. The outcomes of consultations have been shared with design team so as to integrate their concerns and suggestions wherever possible. Concerns expressed by the participants covered compensation for lost assets, impacts on structures, shifting of religious structures, etc. The local leaders were found actively involved in all the consultation meetings.

Consultation with PAPs is the starting point to address involuntary resettlement issues concerning land acquisition and resettlement. People affected by resettlement may be apprehensive that they will lose their livelihoods and communities. Participation in planning and managing resettlement helps to reduce their fears and gives PAPs an opportunity to participate in key decisions that affect their lives. The first step in developing plans for consultation and participation is to identify the primary and secondary stakeholders. Information sharing is the first principle of participation.



7.3 Objectives

The main objective of the consultation process is to maximize the benefits from the project and to minimize negative impacts of the project. The objectives of public consultation as part of this project are:

- Promote public awareness and improve understanding of the potential impacts of proposed projects.
- Identify alternative sites or designs, and mitigation measures.
- Solicit the views of affected communities / individuals on environmental and social problems; • Improve environmental and social soundness.
- Clarify values and trade-offs associated with the different alternatives.
- Identify contentious local issues which might jeopardize the implementation of the project.
- Establish transparent procedures for carrying out proposed works.
- Create accountability and sense of local ownership during project implementation.

7.4 Levels of Consultations

The public consultations were carried out at the screening, feasibility, and Social Impact Assessment stages of the project. The extent of likely adverse impacts was one

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of the major criteria for deciding the locations of public consultations. Types of consultations done with various participants using various tools including, interviews with government officials, individual consultations, key informant interviews, focus group discussion, stakeholder consultations, etc, are presented in Table 7.1.



Table 7.1 Public Consultation held at Different Stages of Project

Level	Type Key	Participants
Individual	Local level Consultation	People along the project corridor
Individual	Door to Door Personal Contact	People along the project corridor including those that are not impacted directly
Settlement	Focus Group Discussion	PAP, Women, truckers, weaker sections, agriculturist, School teachers
Institutional	Stake holder Discussion	Line departments

7.5 Methodology Adopted

The following methodology has been adopted for carrying out public consultations in this project which were held at village, Tehsil and District levels:

- Disseminating information and requesting villagers to attend the public consultation meetings.
- Sharing the opinions and preferences of the PAPs.
- Involving the PAPs in decision-making
- Different techniques of consultation with stakeholders were used during project preparation, viz., in-depth interviews, public meetings, group discussions, Individual Consultations etc. to understand the socio-economic profile of the community and the affected families, questionnaires were designed, and information was collected from the individuals on one-to one basis. The consultations have also been carried out with special emphasis on the vulnerable groups. The key informants during the project preparation phase included both individuals and groups namely:
 - Heads and members of households likely to be affected.
 - Groups/clusters of PAPs.
 - Village Panchayats, Village Head and members.
 - Local voluntary organizations and NGO.
 - Government agencies and departments such as local revenue authority.
 - Other project stakeholders with special focus on PAPs belonging to the vulnerable group

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7.6 Types of stakeholders:

In our present study, most important stake holders are the public living by or near the project road, Road development / construction department officials including project implementation unit, forest officials and NGO's working in the locality. These stakeholders hugely influence the process of project decision making. Stakeholders were identified to ensure as wide coverage as possible of the project area as follows:

- Households in the project area including potential Project Affected Persons
- Local voluntary organizations / Non-government Organizations (NGO's)
- Government agencies / Forest department
- Community leaders

Questionnaire survey/discussions were designed to obtain background information and details of general environmental issues that concern people in the project area. In addition, environmental issues were discussed with relevant government officials, beneficiaries, and community leaders.

7.7 Findings of the stakeholder consultation and issues of concern that need attention

The General issues which were put forward before us during the public consultation were:



- Cutting of trees for road construction.
- Land acquisition for road improvement.
- Provision of safety measures in the DPR in order to enhance the safety of road users.
- Provision of routine maintenance of the road after construction.
- Affected people want the accurate explanation from the department about the rate of compensation and the area of resettlement.

7.8 Types of Consultations

7.8.1 General Consultations

The dissemination process and the type of information shared with the stakeholders during consultations are described below:

- While undertaking inventory of roadside utilities and structures, and census survey of PAHs, information dissemination focused on the proposed road improvements.
- Potential PAHs were consulted to inform them about the proposed road improvement program, resultant impacts, and possible socio-cultural conflict (if any) including loss of access to and relocation of CPRs.

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- People were requested to gather at common places including panchayat Bhawans, temples, schools, Village Organization centers, etc.
- During these consultations pictorial Methods were also used to explain proposed improvement and possible social impacts in the concerned villages.

7.8.2 Structured Consultations

Besides general consultations described above, consultations were conducted in a structured manner. For this purpose, date and venue of consultation were fixed in advance and in coordination with the PRI representatives at village level and officials from RD, PWD National Highways and NGOs.

Such structured consultations helped in highlighting issues as raised by stakeholders about the proposed road improvement.

7.8.3 Specific Consultations

In addition to the local/village level meetings, consultations were organized at specific locations; - critical stretches along the proposed corridors. At these locations, FGDs were also organized.

7.8.4 Discussions with District Level Officials

In the discussion with officials of the district administration, Assam PWD as well, Cachar, Forest Officer etc were explained about the proposed project interventions.

Some of the issues about shifting of utilities, tree cutting, etc were also discussed in these meetings with the respective officials.



7.9 Details about the Consultations Carried Out

The people living in the impact zone of the project road were consulted regarding environmental issues in their area using structured questionnaire as well as unstructured questionnaire. The inputs of stakeholders on policy/plan development in respect to proposed project road are very important. Stake holder consultation process in the project ideally follows the following steps: Survey: Surveys are mechanisms for dialog, creativity and consensus building for to identify the local stakeholders.

One-on-one/group meetings:

- Obtaining & documenting the stakeholders' views/needs.
- Assessing & analyzing the need, feasibility, and interest in implementing the documented stakeholders' views and also managing them.
- Take necessary corrective actions/modifications if needed and review the status.

Stakeholder consultation would help us in identifying the interests of all stakeholders, who may affect or be affected by the project, potential issues that could intervene in the

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successful project implementation, and also possible ways to reduce potential negative impacts & manage negative stakeholders.

7.10 Summary of the Consultations

In order to provide the information of the project related field study, investigations and survey to the public, a notice was issued by district administration vide their letter no.YKD-452/2018 dated 20th Nov. 2018 & 27th Nov. 2018 and letter no. SNG/DEV-01/2019dated 06th Jan. 2019.

During the public consultation, it was observed that many of the people were aware of the environmental conditions in and around their village and most of the people appreciated the government for development proposal of the project road. Since the villages at the end point of project road i.e., Sadagram, Islambad, Hawaithang and Lailapur.



7.11 Consultation outcomes

The people were generally enthusiastic about the project and believed that it will bring social and economic development in the region. There is scarcity of employment opportunities and health facilities etc. within the villages which is affecting overall social and economic development. People believed that the development of road will improve connectivity for the local people apart from the highway traffic. Agriculture is the main economic activity in the project area. The farmers believe the road will improve their accessibility with the nearby marketplaces by reducing the travel time. They anticipate better income as the cost of travel will be reduced. People wanted that the payment of compensation and other rehabilitation measures be completed before the start of construction work. People were particularly concerned about the road safety issues and expressed the need of proper signage, speed breakers and pedestrian crossings to minimize the risk of accidents.

The community perceives that the project will help in increasing road safety, promote more business, better service facilities, and better conveyance and promote local employment opportunities. They consider that it would lead to increase in land rates and smooth traffic. Apprehensions raised by the community include more accidents, houses coming closer to the proposed alignment, more noise pollution, agriculture loss, effect on livelihood.

One of the main objectives of stakeholder consultation was orienting project affected persons on the project and inviting their suggestions to make the project responsive to social development concerns. The suggestions of stakeholders are as below:

- Adequate livelihood support to the affected persons.
- Adequate rearrangements for affected families who are losing commercial structures.

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- Minimize loss of agricultural and homestead land.
- Minimize impact on structures.
- Provision of drinking water facilities, drainage system, cemented village approach road, health center, construction of school boundary wall, renovation of rest shade etc.

7.12 Framework for Continued Consultation

Information dissemination and consultation was held during RAP implementation and monitoring and evaluation stages. Consultation was carried out by the Project Authority through NGO with active involvement of R&R Officer at sub-project level. Besides, the Social Officer at state level was also carried out consultations with PAPs, local community and other government department officials at suitable time intervals directly with support from NGO and R&R Officer at site.

8

Chapter 8- Income Restoration

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 8: Income Restoration</p>	
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8 Income Restoration

8.1 Background

Development project may have an adverse impact on the income of project-affected persons. They also have a negative impact on the socio-cultural systems of affected communities. The basic postulates of all developmental activities should be that no one is worse off than before the project. Restoration of pre-project levels of income is an important part of rehabilitating socioeconomic and cultural systems in affected communities.

To achieve this goal, preparation of Income Restoration (IR) programs under SIA/Rehabilitation Action Plan should precede exactly as it would have for any other economic development program. IR schemes should be designed in consultation with the affected persons, and they should explicitly approve the program. In this project families are likely to lose their structure and livelihood due to Project Road.

8.2 Income Restoration Options Preferred by PAFs

During the survey PAPs were specifically asked about their preference for rehabilitation in case they are affected / displaced by the proposed project. Most of the affected PAPs opted for cash grant.

8.3 Resettlement



8.3.1 Affected Families

Resettlement and rehabilitation consist of the following broad entitlements of the “entitled person/family group”.

- Compensation for the loss of property at replacement value.
- Compensation for relocation support of the displaced titleholder families.
- R&R assistance to the titleholder affected/displaced families.
- Livelihood and income restoration support and assistance to the families/persons belonging to the vulnerable group.

8.3.2 Replacement of Amenities

All amenities affected will be either conserved or replaced by the project. While replacing the amenities particularly those used as a common resource with no restriction of access, development of the surrounding site will be given due consideration. (For example, while replacing hand pumps or tube wells, drainage and access path of the immediate surrounding will be improved, and sitting/washing facilities) will be provided, irrespective of the fact that at present there is no proper access, or that the areas surrounding the extremely muddy, or there is no associated facility whatsoever. The location of common property resources and other community

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amenities will be finalized in consultation with the community. Separate consultations will be held with men and women. The preference of women will be given priority. Plans, designs, drawings have been prepared for replacement of all these amenities, along with technical specifications (including specifications for material and workmanship) and bill of quantities have been prepared in consultation with the community and project engineering staff.

8.4 Inter-Agency Linkages for Income Restoration

Majority of the eligible families for income restoration earn their livelihood through petty businesses or cultivation (primarily small and marginal), and therefore, it is imperative to ensure that the PAPs can reconstruct their livelihood. The NGOs engaged in the implementation of the RAP will ensure that the PAPs are facilitated to obtain plots near their existing habitation to minimize disruption to their social network and normal work pattern.

For Income restoration, it is important that available skills with the PAPs is identified and further upgraded. During the survey, PAPs were specifically asked about the skill they possess other than the one related to their current occupation. However, none of the PAPs possessed any skill, which can be further upgraded through training. Hence, NGO contracted for implementation will have to conduct a survey among the PAPs with options of various skills related to the resource base of the area and available replacement (with proper forward and backward linkages) and accordingly select trades for training. Based on the training, NGO will identify income-generating activities for sustainable economic opportunities. This would include establishing forward and backward linkages for marketing and credit facility. NGOs in consultation with the PAPs, R&R Coordinator of PWD, district administration and other stakeholders in institutional financing and marketing federations will prepare micro plans for IR activities.

In case of upgrading agriculture productivity, the training on technical know-how will be arranged as per the choices of the target group population. In case of creation of alternative livelihood schemes, felt needs of the target group population will be prioritized through people's participation. Further, these options will be tested for their viability against availability of skills, resource base of the area and available appropriate technology. Suitable alternative livelihood schemes will be chosen finally, where training on skill up-gradation, capital assistance, and assistance in the form of backward-forward linkages can be provided for making these pursuits sustainable for the beneficiaries or the target groups.

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8.5 Steps in Income Restoration (IR)

8.5.1 Information on Economic Activities of PAPs

Basic information on IR activities of PAPs will be available from the census and socioeconomic surveys. Information from base line surveys will be available on features of economic activities of PAPs under two categories, viz.

- Land based economic activities.
- Non-land economic activities.
- Total income of PAPs from various sources.
- Based on this information IR activities can be planned. IR activities are of two types:
- Short term; and long term. The ensuing section describes both IR schemes.



Short Term IR activities

Short term IR activities mean restoring PAPs' income during periods immediately before and after relocation. Such activities will focus on the following:

- Ensuring that adequate compensation is paid before relocation.
- Relocation and transit allowances.
- Providing short term, welfare-based grants and allowances such as:
- One-time relocation allowance.
- Free transport to resettlement areas or assistance for transport.
- Free or subsidized items.
- Transitional allowances or a grant until adequate income is generated, special allowances for vulnerable groups.
- With consideration of PAPs skills and needs, promoting PAP access to project related employment opportunities such as:
- Work under the Main Investment Project.
- Work on relocation teams (e.g., driver, food provision, etc.)
- Work on resettlement sites, if any (e.g., construction on, transport, maintenance etc.

Long Term IR Activities

PAP should participate in developing a range of feasible long-term IR options. Long term options are affected by the scale of resettlement which may affect the feasibility of various non-lands based and land-based IR options. The long-term options are

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government financed; therefore, no separate budget is required. However, in R&R budget provision has been made for the expenses to be incurred towards the coordination between project and concerned departments for dovetailing of poverty alleviation schemes. The project officials will coordinate with government (district administration), including tribal development and social welfare departments, to assure PAPs access to all schemes for improving IR services. Project financed programs should include a specific time frame for handing over the project to local administration at the end of a stipulated period. Availability and access to existing programs should be sought for all PAPs. Long Term IR activities will be generated once the census surveys and consultation get over. IR activities will be generated in consultation with the community. Mechanism to dovetail existing government poverty alleviation programs will be developed in consultation with the community and officials of district administration and District Rural Development Agency (DRDA).

8.5.2 Categories of Impacts

Project induced displacement may lead to loss or diminished income for Project Affected Person (PAPs). The main categories of impacts are as follows:



- Loss of agriculture land in part or full
- Loss of commercial establishments (permanent)
- Loss of temporary commercial structure or mobile vendor (Squatters)
- Loss of livelihood (Commercial tenants or helping hands, agriculture labours)

Projects like road development involve acquiring linear strips of land as such the impacts are not expected to be significant. However, mitigation measures need to be planned and implemented however insignificant the impacts may be.

The best way to tackle loss of farmland in part or full is to help the concerned PAP to buy equivalent farmland in a nearby area using the land compensation received. Land for land has been found to be the best sustainable option for Income Restoration. This option can only be exercised when a PAP has lost a significant amount of land; it would be impossible and inadvisable to replace small strips of land. The compensation received can be deposited in blocked bank accounts. The interest accruing will supplement their income from other sources.

The money can only be released for buying replacement land. It is important to see that the compensation money is not frittered away for consumption expenditure or paying off loans especially for the vulnerable sections of PAPs – the more well off can be exempted from this provision and directly paid in cash. The land compensation will be paid at replacement value and will be sufficient for buying replacement land.

Loss of Permanent Commercial Structure is a more complicated problem since the complementary issue of retaining the present customer base is to be simultaneously

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tackled. There is also the problem of tenants and owners with most of structures being occupied by tenants. Though the ideal mitigation would involve re-constructing the commercial structures in an adjacent area so that the present customer base is retained; it will not be possible in the current scenario as majority of the displaced commercial structures asked for self-relocation with the guidance and support of the PWD. Regarding ownership, the status quo can be maintained i.e., ownership remains with the owner while the tenant occupies it. As in the previous case, the compensation money can be deposited in blocked bank accounts to be released only for constructing or buying the replacement structure. Since the construction involves different activities, the money can be released in four instalments, coinciding with pre-determined stages in the construction activity.

Loss of commercial space (for temporary structures and mobile vendors) should be given utmost importance since this involves vulnerable sections of the PAPs.



While mitigation measures for specific impacts are discussed above, there is also the general impact of a disturbance upon displacement in the life and livelihood of PAPs. They need to be compensated through payment of a Subsistence Allowance. The income restoration cannot be fully achieved by using the compensation amount; there can be a provision of rehabilitation grant at least for the vulnerable sections of PAPs to enable them reach or improve upon their former standard of living. The Policy document also highlights this issue by acknowledging that the PAPs should be assisted in improving or at minimum regaining their former status of living at no cost to themselves.

8.6 Alternative Individual Income Restoration Scheme

Basis for Identification of Alternative IR Scheme

Keeping in view the resource base of the entitled persons (EPs) and the socio-economic characteristics and preferences, PWD and the NGO contracted for the implementation will have to chalk out individual IR schemes. This is an ongoing activity that needs to be completed by NGO. The terms of reference of NGO details the activities to be carried out to complete the task. The important factors that need to be considered for identification of alternative IR schemes are:

- Education level of PAPs.
- Skill possession.
- Likely economic activities in the post displacement period.
- Extent of land left.
- Extent of land purchased.
- Suitability of economic activity to supplement the income.

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- Market potential and marketing facilities.

“The best option is to allow the EP to continue its former occupation”. However, during any development program, occupations always change.

8.7 Monitoring of IR Schemes

The monitoring of IR schemes will be carried out along with the monitoring of other components of RAP by an outside agency contracted for the purpose. The contract will specifically provide for regular (every six months) monitoring of income restoration of PAPs. The monitoring will be carried out based on economic indicators. The first monitoring visit should be after the first month then every 6 months. This will help to identify and possibly reduce PAPs who receive cash compensation from spending resources immediately. Vulnerable PAPs who lose their livelihood due to the project will be assisted in alternative economic rehabilitation schemes and vocational training for skill upgradation as per the requirement of suggested economic scheme. Special emphasis will be laid on both economic and socially vulnerable PAPs such as those who are below poverty line; belong to scheduled caste community; and women headed households.

9

Chapter 9 - Institutional Arrangements

9 Institutional Arrangements

9.1 Background

Institutions for planning and implementation of resettlement programs are numerous and vary substantially in terms of their respective roles and capacity to successfully carry out various components. Timely establishment and involvement of appropriate R and R institutions would significantly facilitate achievement of the objectives of the R&R Program. This document reflects an institutional assessment and provides a strategy for developing required implementation capacity and minimizing risks. Capacity building and training are coordinated with the project implementation schedule to ensure that skilled staff is available to implement the RAP without delay in civil works. The main R&R institutions would include:



- Official Agencies
 - (i) PWD National Highways.
 - (ii) Local Administration.
- Line Departments.
- NGO/CBO.
- Training Institutions.
- Monitoring & Evaluation Agency.

9.2 The Process

PWD National Highways will focus effort in three critical areas to commence RAP implementation:

- a. To initiate the process, orientation and awareness seminars will be organized for the PWD National Highways and other RAP implementers.
- b. To establish an Environment, Social Development and Resettlement Cell (ESDRC);
- c. NGOs with experience in social development and a track record in resettlement and rehabilitation will be partners in RAP implementation.
- d. To establish Coordination Committee with representatives from local self-government, PAPs and implementing NGO. The objective of this committee is to coordinate between various implementing agencies.

In addition, PMC will provide technical assistance in resettlement and rehabilitation planning during the transition to project and RAP implementation. The institutional context of resettlement in the project is reviewed below and major features of RAP implementation are described in sections that follow.

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Effective RAP implementation will require institutional relationships and responsibilities, rapid organizational development, and collaborative efforts by PWD National Highways, State Government, partner NGO and affected population. The ESDRC should have representation of other line department's viz., revenue, forest, public health, rural engineering, etc. The responsibility of co-ordination lies with R&R Coordinator. The ESDRC will establish operational links within PWD National Highways and with other agencies of government involved in project-induced resettlement. It will bridge the distance between the project and project affected persons and communities. It will provide the means and mechanisms for coordinating the delivery of the compensation and assistance entitled to those who will suffer loss. ESDRC will link the project with state government agencies, provide liaison with PWD National Highways field units and impacted communities, and establish district level committees to co-ordinate social development and resettlement operations in the field and also to assist NGO partners it will also engage required training services, oversee a grievance redress process and actively monitor RAP implementation.

On behalf of PWD National Highways, the ESDRC will assume the responsibility for representing the social impact and resettlement components of the project for environment clearance. The ESDRC will also be responsible for disseminating this information to the public and providing additional opportunities for public comment. The Social Development Specialist (SDP) will implement the RAP & supervision by the PMC in coordination and support of the field teams as will be positioned in different packages.

Among government agencies, the revenue department will have the most important role. While the responsibility for land acquisition and payment of compensation for land acquired (including properties there on) lies with the Revenue Department, the ESDRC has to assume responsibility for coordinating various matters with the Revenue Department so that both physical possession of land acquired, and payment of compensation is not unduly delayed. The responsibility for income restoration and replacement of common property resources would fully be with the ESDRC along with the nodal NGO.

9.3 Need for NGO/CBO

The relocation disturbs the present activities of PAPs and therefore there is a need to establish and stabilize their economic living. While all tasks relating to Land Acquisition are taken care by the Land Acquisition Officer and his staff, the implementation of RAP is the responsibility of the ESDRC under PWD National Highways. The NGO will help in implementing various components of the RAP, particularly the use of compensation and rehabilitation assistance for more productive purposes like purchase of land, self-employment, etc. Its involvement is more important since there are no social community organization among the PAPs which otherwise could have taken lead in this regard.



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Being new to the area of working with PAPs, the selected NGO will have to work directly under the ESDRC Coordinator who will be in charge for implementation of RAP. Thus, implementation becomes joint responsibility of PWD National Highways and NGO. Developing rapport with the PAPs is one of the responsibilities of the NGO as specified in the TOR. To do so, NGO will hold regular community meetings and will also carry out door to door interaction with the PAPs. Whereas community meetings will include both PAPs as well as those who are not adversely affected, additional emphases will be made for vulnerable community members in door-to-door interaction.

9.4 Role of NGO

Resettlement relates to human aspects and economic rehabilitation requires human resources development consisting of education, training, awareness generation, etc. In absence of any sociologist / anthropologist, NGO will be involved to assist PWD National Highways in implementation of RAP. The NGO will help educating PAPs on the proper utilization of compensation and rehabilitation grant and help them in getting financial assistance, if required, under various subsidy related development programs. It will also organize training programs to impart required skill for such PAPs who would prefer to go for self-employment schemes. Specifically, the tasks of the NGO will be to:

- Develop rapport with PAPs and between PAPs and PWD National Highways.
- Verification of PAPs.
- Post design consultations with the community.
- Assess the level of skills and efficiency in pursuing economic activities, identify needs for training and organize programs either to improve the efficiency and/or to impart new skills.
- Assist PAP in receiving rehabilitation entitlement due to them.
- Motivate and guide PAP for proper utilization of benefits under R&R policy provisions.
- Facilitate purchase of agriculture land in negotiating price and settling at a reasonable price or expedite the same through Land Purchase Committee.
- Assist PAPs in obtaining benefits from the appropriate development programs.
- Help PAPs in increasing their farm income through provision of irrigation facility or improving farm practices and ensure replacement of produce particularly those under self-employment activities.
- Complete the consultation at the community level and provide support by describing the entitlements to the EPs and assisting them in their choices.

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- Accompany and represent the EPs at the Grievance Committee meeting.
- Assist the EPs to take advantage of the existing government housing schemes and employment and training schemes that are selected for use during the project and carry out other responsibilities as required and identified.

In the context of implementing of RAP, it is important that NGO, which is genuine and committed to the task entrusted, is selected. An NGO with local presence is, however, more suitable hence would be preferred. The NGO may be contracted on specified terms and conditions with proper fixation of financial accountability. The payment to NGO will be linked to the performance of the task assigned and the time. The payment will be arranged on quarterly basis to be released on certification of completing the previous task. The monitoring of R&R programme will also include the performance of NGO. The NGO services will be required for implementation period for which provisions have been provided in the plan.



Simultaneously steps can be taken for promoting location specific Community Based Organizations (CBOs) of PAPs to handle resettlement planning, implementation and monitoring. These groups can be promoted for each adversely affected settlement/village or a group of contiguous villages. Until and unless sufficient institutional capacity is built amongst the PAPs, so that they can act and react as a group, participatory planning and implementation of good reestablishment solutions is nearly impossible.

Resettlement negotiation, if carried out individually with all displaced families, is both uneven and time consuming. It favours the good bargainers over the bad bargainers and as bargaining capacity is directly related to income levels – favour the more affluent over the poorer and more vulnerable sections of the displaced population. This can be minimized by organizing homogenous groups of displaced persons to handle resettlement negotiations together with participatory planning and implementation of re-establishment solutions.

9.5 Training Modules:

Following training modules will be followed during initial and repeat training sessions of PWD National Highways staff (both at head office and at field level) and NGO staff.

- Overview of social issues: Social issues; methodology followed for SIA; entitlement framework and detailed R&R policy.
- Land Acquisition: Legal and operational issues; RFCTLARR Act 2013.
- Resettlement: Issues pertaining to planning and preparation for relocation; implementation issues; factors necessary for identification and finalization of resettlement area.

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- Rehabilitation: Issues in economic rehabilitation; factors necessary for identification and finalization of alternative economic rehabilitation schemes; training needs.
- Public Consultations: Issues to be discussed during various stages of project viz., preparation, implementation, and post implementation; public consultation in project delivery; techniques of public consultations.
- Social Impact Assessment: Definition; steps; output; required surveys viz., screening, census, Socio-economic, verification, etc.; issues to look at for preparation of entitlement framework; institutional capacity.

9.6 Areas of Capacity Building

PWD National Highways needs to build their capacity in the following areas:

Land Acquisition

Total Land requirement for the development of project road from Silchar to Vairengte is 576.162 ha. out of which 11.777 ha. land is available along NH-37, 37.584 ha on Silchar Bypass and 20.195 ha on NH-306, Balance 212.910 ha. of land need to be acquired, whereas Package-2 is required total land of 164.7787 Ha. out of which 17.983 Ha. Land is available and balance 146.796 ha. of land need to be acquire from which 13.885ha is falling on forest.

Considering the above, it would be important to address the following:

- The procedural requirements must be fulfilled. An official thoroughly conversant with the procedural requirements should be in position to co-ordinate the land purchase or acquisition process.
- For better co-ordination, the officer responsible must spend sufficient time at the site.
- To enable better follow up the officer should be of sufficiently high rank.
- The procedural requirements must be formalized and documented for the benefit of all projects concerned.
- Ensuring timely land acquisition is demanding requirement and requires full time involvement of an officer, at least during the first six months of the project.

Women Participation

It is imperative to bring the issue of women's development in the process of socioeconomic uplift within the scope of RAP. Encouraging women's participation in development projects is a policy being followed by Government of India. Involving women meaningfully at all levels of the project will show greater commitment to the nationwide goals. Women constitute half of the total affected population; though number of women headed families are very few in roads.



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Possible areas of Women involvement include managing health and hygiene issues at the construction camps and in controlling the spread of highway diseases. Similarly, it may be specified in the Terms of Reference of NGO contracted for the implementation to have at least 33% of the total person months for women. A similar provision can be made in the TOR of external agency appointed for monitoring of RAP implementation.

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Chapter 10 - Grievance Redress Mechanism

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10 Grievance Redress Mechanism

10.1 Need for Grievance Redress Mechanism

There is a provision for redress of grievances of PAPs in all aspects relating to Land Acquisition (LA) and payment of compensation in Rehabilitation Action Plan. Various provision under LA act enables aggrieved EPs at different stages of LA to represent their cases to Land Acquisition Officer or even refer to court for redress and seek higher compensation. It is suggested that LAO & RRO should hold a meeting at a fixed date every month to hear the grievances of EPs. Moreover, Lok Adalat can be held for quick disposals of cases.



However, R&R policy of Government of Mizoram has a provision of Grievance Redress Committee to be headed by District Magistrate of respective districts. Members of the committee: Apart from District Magistrate as head of the committee at district level, the committee will comprise of representatives of two local NGOs, representative of people (viz., Member of Parliament, Member of Legislative Assembly, etc.), representatives of blocks, districts, line departments & affected persons. At central level, Head of the Project Implementation Unit (Chief Engineer, National Highways) will head the committee.

Meetings and decision-making process of the committee: It is suggested that Grievance cell shall meet regularly (at least once a month) on a pre-fixed date (preferably on first 7th day of the month). The committee will fix responsibilities to implement the decisions of the committee. This will not only help proper assessment of the situation but also in suggesting corrective measures at the field level itself. The committee shall deliver its decision within a month of the case registration. The Divisional Commissioner of the area shall hear appeal against the decision of the grievance redress committee.

10.2 Functions of the Committee

The functions of the grievance committee shall be,

- To provide support for the EPs on problems arising out LA/property acquisition.
- To record the grievances of the EPs, categories and priorities and solve them within a month.
- To inform PWD, National Highways of serious cases within an appropriate time frame.
- To report to the aggrieved parties about the developments regarding their grievance & decision of PWD, National Highways.
- To priorities cases based on following criteria:

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- (i) Cases pertaining to the land and structures of displaced persons.
- (ii) Cases pertaining to the land and structures of adversely affected PAPs.
- (iii) Cases pertaining to the land and structures of partially affected PAPs.

As said earlier Divisional Commissioner of the area will have the final say and that decision will not be contested in any other forum except the regular arbitration forum or, if required, in the courts of law. In case court fails, NGO will have to motivate the agitated EPs to smoothen implementation of the R&R programme.



10.3 Integrated Grievance Redresses Mechanism

An Integrated Grievance Redress Mechanism (IGRM) will be established at the head quarter level that will register user complaints using combination of various mediums (e.g., a dedicated toll-free phone line, web-based complaints, written complaints in feedback register and open public days) and address them in a time bound system. The project will appoint a grievance redressal or Public Relation officer solely responsible for handling phone and web-based complaints. The person will be responsible for directing the aggrieved person to the concerned official through e-mail. On receiving any phone call or web based or email, a unique number will be generated which will be the reference number for the caller and he can trace the progress of his grievance / query through that number. Any complaint lodged will be addressed within 15 days of receiving the complaint.

The grievance officer will then direct that mail to the concerned official and follow-up. The recorded message will be responded back the next day. The project will also commit itself for proactive disclosure and sharing of information with the key stakeholders, including the communities/beneficiaries. The website of PWD, National Highways will have the name and number of social developments officer; the toll-free number and the website address. NGO staff will be responsible for assisting illiterate and other vulnerable PAPs in registering their grievances.

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Chapter 11 – Monitoring and Evaluation

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11 Monitoring and Evaluation

11.1 Introduction

Monitoring and Evaluation (M&E) are critical activities in involuntary resettlement. Monitoring involves periodic checking to ascertain whether activities are going according to the plan. It provides the feedback necessary for project management to keep the programmes on schedule.

By contrast, evaluation is essentially a summing up, the end of the project assessment of whether those activities achieved their intended aims. As per World Bank's Operational Directive 4.30 "Monitoring provides both working system for project managers and a channel for the resettles to make known their needs and their reactions to resettlement execution". Monitoring exercise will be undertaken both internally and externally. While R&R Coordinator of PWD National Highways on monthly basis will carry out the project's internal monitoring, an external agency will be appointed for third party monitoring. External agency will conduct quarterly monitoring and midterm, annual and end term evaluation of the project.

Indicators, which will be monitored during the project, consist of two broad categories:



- Process and output indicators or internal monitoring.
- Outcome/ impact indicators or external monitoring.

11.2 Process and Output Indicators

Monitoring of involuntary resettlement operations require an application of general project monitoring procedures and methods to the process accruing in resettlement but with attention to the specific high risks intrinsic in such operations. This means monitoring of R&R requires certain specialized skills. Therefore, a specialized group reporting to the PWD National Highways must carry out M&E.

The conventional monitoring through government machinery often misses focus on certain vital aspects, which may otherwise be very important. Therefore R&R Coordinator at Bangalore in close coordination with his counterparts at division level will carry out regular monitoring and will produce monthly reports.

The internal monitoring is a conventional monitoring of government related to physical factors such as, number of families affected, resettled, assistance extended infrastructure facilities provided, etc. and other financial aspects, such as compensation paid, grant extended, etc. The internal M&E must be simultaneous with the implementation of the Rehabilitation Action Plan (RAP).

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11.2.1 The Objectives of the Internal Monitoring

The objectives of the internal monitoring are:

- Daily Operations Planning (DOP).
- Management and Implementation (M&I).
- Operational Trouble shooting and Feedback (OTSF)

The periodicity of internal monitoring could be daily or weekly depending on the issues and level.

11.2.2 Information Required for Internal Monitoring

For internal monitoring following information will be required:

- Individual files on each project affected person.
- Village Proforma.
- Action Plan and Progress reports.

11.2.3 Monitoring and Reporting Systems

Crisis and day to day management and monitoring management will require its own improved action plans, regular coordination and onsite training sessions and a Management Information System as internal system. It also requires trouble-shooters and informal networks of feedback from the communities, NGOs, M&E agencies and other government bodies.

Physical monitoring of movement and progress reporting of input stocks, finance and service resource in the system to ensure management and financing functions in a timely and effective manner.

Monitoring and verification of the eligible progress of the resettlement programme to indicate the timeliness of the financial disbursements already agreed to and deviations from the critical path for overall project completion and the required integrated arrangements to resettle PAPs.

11.2.4 External Monitoring

An external monitoring and evaluation (M&E) agency will be appointed to meaningfully and realistically monitor and evaluate R&R programmes on periodical basis. The role of such an agency will not be fault finding but to act as a catalyst in smoothening the process of R&R and thus provide a helping hand in the proper implementation of rehabilitation programmes. It should also endeavour to bring the problem and difficulties faced by the PAPs to the notice of PWD National Highways so as to help in formulating corrective measures. Financial provisions have been made to appoint an external agency for M&E. As feedback to the PWD National Highways

and other concerned, the external agency should submit quarterly report on progress made relating to different aspect of R&R.

11.2.5 The Objectives of the External Monitoring

The objectives of the external monitoring are:

- To track resettled and host population over time to document the restoration of incomes and standard of living.
- Determine remedial action if required.
- If income and standard of living of the PAPs has at least been restored and has not declined.
- In case of host population, whether income and standard of living of host population have not declined due to influence of resettles.
- Whether resettles and host population have re-integrated with each other.

11.2.6 The Information's required for External Monitoring

The information required for external monitoring is:

- Baseline survey data (conducted by PMC).
- Sample survey (to be conducted by M&E agency).
- Case studies/Thematic studies * Issue based research (to be conducted by M&E agency).
- Participatory research (to be carried out by M&E agency).
- Target group monitoring (to be carried out by M&E agency).

11.3 Monitoring Project Input and Output

Project monitoring will be the responsibility of the R&R Coordinator who will prepare monthly 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.

Table 11.1 Monitoring Project Input and Output

Progress	Assessment Methodology	Expected Output
Financial		
Amount disbursed for acquisition of land, structure, wells, trees, etc.	Structured Schedule, informal and formal discussion	Adequate compensation
Amount disbursed for	Structured Schedule, informal	Proper Assistance



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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)

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Progress	Assessment Methodology	Expected Output
productive assets grant (Agriculture and business)	and formal discussion	
Amount disbursed for house construction grant, transitional allowance, economic rehabilitation grant, shifting assistance, rent, assistance to tenants	Structured Schedule, informal and formal discussion	Proper Assistance
Amount disbursed for restoration of CPR, community infrastructure, conservation of religious structures	Structured Schedule, informal and formal discussion	Community Welfare
Amount disbursed for extension of development programmes, training and capacity building	Structured Schedule, informal and formal discussion	Income Restoration
Fees paid to NGO for implementation of RAP and consultants for M&E activities	Structured Schedule, informal and formal discussion	Implementation and Monitoring
Amount disbursed for training of implementation staff of PWD National Highways	Formal Discussion with concerned officials	Better implementation and Coordination
Physical		
Total Land Acquired	Structured Schedule	Extent of land acquired
Number of PAFs whose land, residence and business establishment affected and totally demolished	Structured Schedule	Adequate Compensation
Number of PAFs allotted residential structures/plots	Structured Schedule	Assistance and Resettlement
Number of PAFs allotted agriculture land, Commercial structure/plots	Structured Schedule	Economic Rehabilitation
Extent of agriculture land, and commercial plots/structures distributed	Structured Schedule	Economic Rehabilitation





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Section: Silchar to Vairengte (Km 0+000 to Km 49+360)



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Progress	Assessment Methodology	Expected Output
Extent of residential plots/structures distributed	Structured Schedule	Assistance and Resettlement
Total area of community and government land transferred for resettlement sites and infrastructure	Structured Schedule	Assistance and Resettlement
Number of PAFs received productive asset grant (Agriculture and business)	Structured Schedule	Economic Rehabilitation
Number of PAFs received house construction grant, transitional, shifting and rental allowances	Structured Schedule	Resettlement and Assistance
Number of PAFs received economic rehabilitation grant	Structured Schedule	Economic Rehabilitation
Implementation of IR Schemes	Structured Schedule	Formal Discussion/ Structured Schedule
Social		
Area and type of house and facility	Core Rapid Appraisal	Resettlement
Morbidity and mortality rates	Structured Schedule	Social well being
Communal harmony	Core Rapid Appraisal	Social well being
Women time disposition and decision making power	Participatory Appraisal	Women Empowerment
Literacy Level, drinking water, schools, health facilities, and other community infrastructures	Structured Schedule	Social well being
Economic		
Annual Household Income and Expenditure	Structured Schedule	Economic Status
Number of PAFs below poverty line	Structured Schedule	Poverty Status
Utilization of Compensation		Proper utilization of compensation amount
Number of PAPs and Women gainfully employed in project	Structured Schedule	Improvement of Economic Status and Women Empowerment

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	<p>SIA: Chapter 11: Monitoring and Evaluation</p>	

Progress	Assessment Methodology	Expected Output
Number of PAFs brought above poverty line	Structured Schedule	Improved economic status, Poverty Alleviation
Number of shop sites purchased	Structured Schedule	Proper utilization of compensation amount and economic rehabilitation
Extent of agriculture land purchased	Structured Schedule	
Community Participation		
Number of meetings for dissemination of information on resettlement	Informal Discussion and structured schedule	Increased local participation
Number of meetings with each PAF to finalize R&R options	Informal Discussion and structured schedule	Involvement in project cycle
Number of PAFs approaching Grievance Redress Cell	Structured Schedule	Increased Awareness
Selection of Resettlement Sites	Informal Discussion and Structured Schedule	Involvement in project cycle
Number of PAFs self relocated	Informal Discussion and Structured Schedule	Informed choice of Selection
Grievance		
Number of PAPs moved to court	Structured Schedule	Adequate Compensation
Cases referred to court pending settlement and those settled	Structured Schedule and IDI with concerned officials	Adequate Compensation
Number of grievance cell meetings	Structured Schedule	Participation
Number of village level meetings	Structured Schedule	Participation
Number of field visits by SDO and number of cases disposed by SDO to the satisfaction of Eps	Structured Schedule	Involvement of concerned Officials
Number of grievances received and resolved	Structured schedule; review of monitoring reports	Lesser grievances; community support
Number of grievances unresolved	Structured schedule; review of monitoring reports	Lesser grievances; community support

 <p>सत्यमेव जयते M.O.R.T.H. Govt. of India</p>	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 11: Monitoring and Evaluation</p>	 <p>MIDCL BUILDING INFRASTRUCTURE - BUILDING THE NATION</p>
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11.3.1 Monitoring and Evaluation Systems

Observing and appraising various specific parameters and processes as objectively as possible will be carried out. Periodic evaluation of these would indicate where and when policy changes could occur. Periodic evaluation of these would indicate where and when policy changes could occur or where deficiencies in implementation method or style are apparent. The boundaries of this assessment will need the agencies (M&E) to examine the multiplier effects and linkages outside of the project definition of affected people and areas.

The evaluation will be carried out in two level and two stages. The two levels include internal evaluation by the department through its existing Institution system. Second level will be carried out by an external and third-party agency. The stages of evaluation include midterm evaluation which will be carried out during the implementation of RAP to carryout timely corrective action. The second stage of evaluation will be carried out to identify, document and enlist any good practices and any gap in implementation of the RAP. The end term evaluation is generally carried out after 3 to 5 years of project completion as retrofit survey to understand the benefit (Positive and adverse) due to project development.



The impact evaluation will be carried out after the implementation of RAP is over. This is never an easy matter to determine. Financial consideration often requires an impact evaluation shortly before or after the project concludes. However, project continuous to evolve overtime.

Impact evaluation will all the affected population; self-relocate; assisted resettled population; host population. Further this large population will be further broken down into vulnerable segments of each population. Impact evaluation will be carried out on randomly selected segment of population.

The external agency will submit quarterly report to the PWD National Highways.

11.3.2 Evaluation Indicators

- 1) Present Condition of the PAPs.
- 2) Annual income in INR.
- 3) Number of Family Member.
- 4) Number of Earners within Family.
- 5) Type of Loss (Specify).
- 6) Categories of Loss: Titled Holder or Non-Titled Holder.
- 7) Compensation Received Yes/No If Yes then Date of Received.
- 8) Compensation Received by Partly or Fully.



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11.3.3 Economic Indicators

- What Type of compensation Received; i. Cash; ii. Kind; iii. Both.
- Have you received any Training i. Yes, ii. No.
- Are you happy with Compensation i. Yes, ii. No.
- How you used Compensation Amount.
- What is your present source of income?
- Is it different than earlier?

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Chapter 12 – Implementation Arrangement and Schedule

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section : Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 12: Implementation Arrangement and Schedule</p>	
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12 Implementation Arrangement and Schedule

Implementation arrangement and scheduling for RAP implementation shall be linked with civil construction work. Handing over of reasonable length of project road section free from encumbrances is a pre-requisite for starting the civil works. As per the standard conditions of civil contracts, land free from all encumbrances will be made available to the contractor. Present day road construction works use heavy machinery and less of human labour. It therefore becomes more important that obstacles such as dismantling of structures and other properties falling within the proposed right of way are removed before the mobilization of contractor at site.

Official to be designated as R&R Officer at sub-project level shall be in place before the mobilization of NGO. The R&R officer shall be acquainted with RAP and preferably receive short term training by the time various activities related to RAP implementation is commenced at site by the NGO. Important issues which need to be understood in resettlement action plan implementation are the following:

- Understanding procedures and steps involved in land acquisition – not applicable in this case.
- Understanding RPF.
- Understanding the implementation schedule activities step by step.
- Preparation of micro plan.
- Development of income restoration plan based on the survey carried out.
- Identification of relocation site for displaced persons.
- Preparation of relocation and rehabilitation and disbursement of assistances.
- Institutional arrangements, etc.

12.1 Schedules for Resettlement Plan Implementation



Keeping in view the magnitude of the project on structures and CPRs, a time of 18 months has been considered for the implementation of RAP.

12.2 Implementation Process

The major activities related to the implementation of the resettlement action plan are related to impact on structures and CPRs. The project will provide adequate notice to the project affected persons so that they are able to move or take away their assets without undue hardship before commencement of civil works.

The implementation of RAP consists of following major activities:

- (i) Deployment of required staffs (at Central, State and Sub-Project Level).

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- (ii) Verification of PAPs, listing and measurement of property and assets affected and their estimation.
- (iii) Release of R&R assistance.
- (iv) Preparation of list of PAPs entitled for relocation; if any and
- (v) Relocation and rehabilitation of PAPs.

Consultations with project affected persons and other community members will be organized by the NGO. Consultations will be carried as per the consultation framework about issues related to resettlement and rehabilitation. PAPs to be displaced shall be gradually prepared for relocation by conducting individual consultation, counselling, group consultations and village level consultations involving Panchayats. Information about resettlement action plan will be provided by the NGO to individuals as well as community. Consultations with PAPs will also cover explaining the entitlement; method of calculating the assistance, and mechanism for approaching grievance redress committee, etc. In case of PAPs likely to be displaced would be assisted in self relocation or assisted relocation at resettlement site after they have been paid compensation and R&R assistances as applicable. Some of the above-mentioned activities may, however, change sequence due to ground condition and other reasons beyond the control of the project.



12.3 Resettlement Implementation Completion

The Resettlement Plan completion (compliance monitoring) of the RAP Implementation will cover (i) project compensation and entitlement policies, (ii) adequacy of organizational mechanism for implementing the RAP, (iii) restoration of APs incomes, (iv) settling complaints and grievances, and (v) provisions for adequate budgetary support by the EA for implementing the RAP.

The RAP Implementation Completion Report will be submitted by the NGO and the third-party external monitor will assess and evaluate the activities relating to resettlement, by following appropriate methodology to measure the progress and degree/level of targeted achievements.

13

Chapter 13 – Rehabilitation and Resettlement Budget

	<p>Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).</p> <p>Section: Silchar to Vairengte (Km 0+000 to Km 49+360)</p> <p>SIA: Chapter 13: Rehabilitation and Resettlement Budget</p>	
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13 Rehabilitation and Resettlement Budget

13.1 Introduction

The resettlement cost estimate for this project includes eligible compensation, resettlement assistance and support cost for RP implementation. The support cost, which includes staffing requirement, monitoring, and reporting, involvement of NGO in sub project implementation and other administrative expenses are part of the overall project cost. The unit cost for land and other assets in this budget has been derived through field survey, consultation with affected families, relevant local authorities, and reference from old practices. Contingency provisions have also been made to consider variations from this estimate. Some of the major items of this R&R cost estimate are outlined below:

13.2 Compensation for Loss of Land

For cost estimate, the unit rate for agricultural land has been estimated based on market value assessment during census survey. However, the actual compensation for land at replacement cost has been calculated based on rate collected from Registration & Stamps Department and local Village Councils.

13.2.1 Compensation for Partial Loss and Full Affected of Structures

Will be calculated and compensate by the competent authorities.

13.2.2 Compensation for Community and Government Properties

Will be calculated and compensate by the competent authorities.

13.3 Cost towards Implementation Arrangement

Will be calculated and compensate by the competent authorities.

13.4 Source of Funding and Fund Flow Management

13.5 Budget

The budget for RP implementation comes to appx. 1028.67 crores (including LA cost+ crop compensation + building compensation) for entire project falls under Mizoram State.