Initial Environmental Examination (Draft)

August 2013

IND: Rural Connectivity Investment Program – Project II

Assam

Prepared by Assam Rural Road Development Agency for the Asian Development Bank.

CURRENCY EQUIVALENTS

as of 16 August 2013

Currency unit	–	Indian rupee (Rs)
Rs 1.00	=	$ .01628
$1.00	=	Rs 61.4250

ABBREVIATIONS

ADB	–	Asian Development Bank
BIS	–	Bureau of Indian Standards
CD	–	Cross Drainage
CGWB	–	Central Ground Water Board
CO	–	Carbon Monoxide
COI	–	Corridor of Impact
DM	–	District Magistrate
EA	–	Executing Agency
EAF	–	Environment Assessment Framework
ECOP	–	Environmental Codes of Practice
EIA	–	Environmental Impact Assessment
EMAP	–	Environmental Management Action Plan
EO	–	Environmental Officer
FEO	–	Field Environmental Officer
FGD	–	Focus Group Discussion
FFA	–	Framework Financing Agreement
GOI	–	Government of India
GP	–	Gram panchyat
GSB	–	Granular Sub Base
HA	–	Hectare
HC	–	Hydro Carbon
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination
IRC	–	Indian Road Congress
LPG	–	Liquefied Petroleum Gas
MFF	–	Multitranche Financing Facility
MORD	–	Ministry of Rural Development
MORTH	–	Ministry of Road Transport and Highways
MOU	–	Memorandum of Understanding
NAAQS	–	National Ambient Air Quality Standards
NC	–	Not Connected
NGO	–	Non-governmental Organization
NOx	–	Nitrogen Oxide
NRRDA	–	National Rural Road Development Agency
PIU	–	Project Implementation Unit
PIC	–	Project Implementation Consultants
PRIs	–	Panchyati Raj Institutions
PMGSY	–	Pradhan Mantri Gram Sadak Yojana
POL	–	Petroleum, Oil and Lubricants
PPTA	–	Project Preparation Technical Assistance
ROW	–	Right-of-Way

RPM	–	Respirable Particulate Matter
RRP	–	Report and Recommendation of the President
SRRDA	–	State Rural Road Development Agency
SBD	–	Standard Bidding Documents
SO_2	–	Sulphur di-Oxide
SPM	–	Suspended Particulate Matter
TA	–	Technical Assistance
TOR	–	Terms of Reference
TSC	–	Technical Support Consultants
UG	–	Upgradation
WBM	–	Water Bound Macadam
MPRRA	–	Madhya Pradesh Rural Road Agency
ZP	–	Zilla Parishad

WEIGHTS AND MEASURES

km	–	kilometer
m	–	meter

NOTE

In this report, "$" refers to US dollars.

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I. INTRODUCTION

A. Project Background

1. As one of the key features of the Government's poverty reduction agenda for the rural sector, the Government of India (GoI) is implementing a nation-wide rural road investment program, Pradhan Mantri Gram Sadak Yojana (PMGSY). PMGSY aims to provide all-weather road connectivity to currently unserved habitations in India's rural areas, where 70% of the population live. The Government of India (GOI) launched "The Pradhan Mantri Gram Sadak Yojna (PMGSY)" in year 2000 The objective of PMGSY is to provide all-weather road connectivity to all rural habitations with a population of more than 500 persons in plains and and 250 persons in hill states. This program is being implemented through National Rural Road Development Authority (NRRDA) under Ministry of Rural Development (MORD) at central level and through State Rural Road Development Authority/Agencies (SRRDA) at state level.

2. The Rural Connectivity Investment Program (RCIP) is continuation of Rural Road Sector II Investment Program (RRS IIP) and is a multitranche financing facility (MFF) that will construct or upgrade to the all-weather standard about 9,000 km of rural roads connecting around 4,800 habitations in the states of Assam, Chhattisgarh, Orissa, Madhya Pradesh, and West Bengal (RCIP states). The RCIP will also focus on improvement of institutional arrangements, business processes and associated capacity building. This will especially be done in relation with design, operation, safeguard, financial, road safety, and asset management matters. Investments in rural roads will improve connectivity, cut transport costs, and provide enabling infrastructure to areas currently with poor access to markets and urban towns, and thus contribute to growth and equity in the country's largest sector. Project 1 (Loan 2881) totaling $252 million is currently ongoing.

3. The Government is now planning to submit to ADB the second Periodic Finance Request (PFR) that includes the proposal for about 495.569.68 km of rural roads in the state of Assam. The Assam Rural Road Development Agency (ARRDA) is the implementing agency (IA) for the ADB funded subprojects in the state. The preparatory works for the proposed second batch of roads have been completed for the state. As per the requirements of ADB, it is mandatory that the subprojects under the programme comply with ADB's environmental safeguards. The project as per classification of ADB has been categorized as 'Category B' project and therefore requires an Initial Environmental Examination (IEE). The Initial environmental examination (IEE) for the first batch has been prepared by using environmental checklist.

4. The report has been prepared by M/s Operations Research Group (P) Ltd., The Technical Support Consultants (TSC) appointed by National Rural Road Development Agency (NRRDA) under the ADB loan assistance.

B. Project Roads Identification and Location

5. PMGSY has prepared specific guidelines for the selection of roads under this programme. The key requirements is that any road will be eligible for construction or upgradation only if it is part of the Core Network1 and satisfy the following environmental safeguards:

[1] Core Network is that minimal network of roads (routes) that is essential to provide access to essential social and economic services to all eligible habitations in the selected areas through at least single all-weather road connectivity. A core network comprises of through routes and link routes. Through routes are the ones, which collect traffic from several link roads or a long chain of habitations and lead it to marketing centres either directly or through the higher category roads i.e., the district roads or the state or national highways. Link routes are the roads connecting a single habitation or a group of habitations to through routes or

i. The selected road shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.

ii. The selected shall not pass through any designated wildlife sanctuaries, national parks, notified ecological sensitive areas or area of internationally significance (e.g., protected wetland designated by the Wetland Convention);

iii. The subprojects shall only involve activities that follow Government of India laws and regulations and meets funding agency safeguard policies.

6. The ARRDA has selected about 495.569 km of rural roads to be taken up under RCIP as batch 2-subproject roads in Assam. The 495.569 km of roads comprises 201 different stretches spread over in 18 out of the 27 districts of the State. Within each district, the roads are further scattered in several blocks and sub divisions. In this batch of subprojects, the longest road is 118.384 km under Karbi Anglong District, while the shortest road is 0.715 km located in Jorhat District. The average length of roads works out to 2.466 km.

7. The list of 495.569 km roads with their location and length is given in **Appendix 1.1**.

C. Rural Road Construction Proposal

8. The proposal for rural road construction works typically considers a 10-12 m right of way (ROW), which includes side slopes for embankment, side drains on either side of the alignment. However, as per the recent NRRDA guidelines a RoW of 6 m has been considered for roads having an average traffic flow of 100 vehicles per day The roads consists both Black Top (B.T.) and Cement Concrete (C.C.) as per the ROW availability.

9. The construction proposals are confined to the existing alignment of the unpaved tracks. Majority of these are foot/pathways traditionally used by the villagers and transformed into the present form of unpaved tracks/roads through minor construction works taken up by the communities, local bodies and state Government over the decades.

D. ADB Safeguard Policies and Category of the Project

10. The Asian Development Bank has defined its Safeguard requirements under its 'Safeguard Policy Statement 2009' (SPS 2009). The SPS 2009 require environmental assessment, mitigation and commitment towards environmental protection. The prime objectives of these safeguard policies are to (i) avoid adverse impacts of projects on the environment and affected people, where possible; and (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible. ADB as per SPS 2009 classify a project into category A, B or C depending on potential adverse environmental impacts.

11. All environmentally sensitive components along each subproject roads is critically analyzed to assess the magnitude and extent of likely impacts. These sample subproject roads stretch does not pass through any protected areas nor located near any archeologically important monument. As per selection guidelines, none of the selected subproject road passes through reserved forests either. Few trees cutting though may be involved. The road primarily passes through agricultural and residential areas. Most of the roads follow existing village roads

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district roads leading to market centres. Link routes generally have dead ends terminating on a habitation, while through routes arise from the confluence of two or more link routes and emerge on to a major road or to a market centre.

and unpaved movement paths. As such, land acquisition is also low. Hence, the project will fall under category B as per ADB SPS 2009.

No categorisation is made under environmental legislation since these small roads do not require any environmental clearance in accordance to Indian Environmental (Protection) Act and Rules, 1986 amended till date.

E. Objectives and Approach for Environmental Assessment

12. The prime objectives of the environmental assessment is to identify the likely environmental impacts during design, construction and operation stage of each subproject and suggest cost effective mitigation and monitoring measures with institutional mechanism applicable to all the subprojects as well as specific to a subproject.

13. Since there is large number of subproject roads involved under RCIP and magnitude of each road is small, preparation of individual IEE's for each road will be difficult and time consuming. ADB had finalized Environmental Code of Practices (ECOP) checklist under RRS II which is modified for RCIP. Subprojects specific Initial Environmental Assessment (IEE) is carried out as per this ECOP checklist. These completed ECOP checklist with annexures on tree, utility and community structures, strip maps and photographs for each selected sample road are enclosed as **Appendix 1.2.**

14. The findings of subproject specific assessment suggest that similar issues exist amongst the state roads with very few subproject specific issues. Therefore, state specific IEE report has been prepared based on ECOP checklist of selected sample subproject roads (about 100 km per state). This IEE approach will be followed in conducting environmental assessment for remaining subprojects under RCIP.

F. IEE Methodology and Content

15. The state specific IEE has been largely structured as per SPS 2009 and ADB's Environmental Assessment Guidelines (2003). The IEE reports including EMPs, and monitoring plans, cover the most environmentally sensitive components in state as well as specific to subproject roads.

16. **Corridor of Impact**: The direct area of influence or the corridor of impact (COI) has been considered as, 10 m on either side of the proposed sample roads alignment Based on the proposed cross-section.

17. **Field visits, Primary and Secondary Data Collection**: Each selected sample road was visited along with concerned PIU officials for environmental assessment and identification of associated environmental issues. Each road specific strip map was prepared during the field visit to capture the information related to tree inventory, utility and community structures located along the proposed road alignment, surface water bodies, and ecological sensitivities. Secondary environmental information pertaining to the environmental issues, protected area, forests areas were collected from various government and non-governmental/research institutions for assessment of the baseline environment of the project locations, district and state as a whole.

18. **Data Analysis, Impact identification and Mitigation Measures**: Information collected was analyses and impact was identified using expert's assessment and following established

practices. Mitigative measures are proposed common to larger roads and specific to the roads. EMP is prepared considering mitigative measures and institutional framework of SRRDA.

19. The IEE report includes following seven chapters including this introduction Chapter.

- Chapter 1- Introduction
- Chapter 2- Description of Project
- Chapter 3- Description of Environment
- Chapter 4- Anticipated Impacts and Mitigation Measures
- Chapter 5- Institutional Requirement and Environmental Monitoring Plan
- Chapter 6- Public Consultation and Information Disclosure
- Chapter 7- Conclusion and Recommendation

G. Legal Framework and Legislative Requirements:

20. India has well defined institutional and legislative framework. The legislation covers all components of environment viz air, water, soil, terrestrial and aquatic flora and fauna, natural resources, and sensitive habitats. India is also signatory to various international conventions and protocols.

21. As per Environment (Protection) Act, 1986; the Environmental Impact Assessment Notification, 2006; amended in 2009 defines the environmental impact assessment for defined development projects. All New or expansion of National and State Highways requires Environmental Impact Assessment and Environmental Clearance from central or state level Environmental Appraisal Authority. However, small roads projects as proposed under RCIP do not require environmental assessment or clearance as per above notification. Since above environmental assessment requirement is not applicable, the mainstream environmental concerns specific procedures that were formulated under Rural Roads Sector I (RRS I) and Rural Roads Sector II Investment Program (RRS II) will in any case be implemented.

22. In addition to above, new road construction or road improvement work attract many legislation including for diversion of forest land, tree cutting, opening of new quarry, establishment of temporary workshops, construction camps, hot mix plants, and use of vehicles for construction. The legislation applicable for sample RCIP roads are listed below:

Sl. No.	Legislation	Applicability
1.	Environment (Protection) Act 1986- EIA Notification 2006 (Amended 2009)	Not applicable to these rural roads. It is applicable only to highways (NH and SH).
2.	Forests (Conservation) Act 1980 (Amended 1988), and Forest (Conservation) Rules, 1981, (Amended 2003)	As per above Act/Rules *Forest Clearance* from Department of Forests/Ministry of Environment and Forests Govt. of India is required for diversion of forest land (if any) for non-forest purpose. Prior permission is required from forests department to carry out any work within the forest areas and felling of roadside trees. Cutting of trees need to be compensated by compensatory afforestation as per permission condition.
3.	The Wildlife (Protection) Act, 1972 (Amended 1993); Not applicable in	Not Applicable, since no sample road is selected if it passes through protected areas.

Sl. No.	Legislation	Applicability
	this case. Since No roads will be selected passing through protected areas or sanctuaries	
4.	The Water (Prevention and Control of Pollution) Act 1972 (Amended 1988), and the Water (Prevention and Control of Pollution) Rules, 1974	Placement of hot-mix plants, quarrying and crushers, batch mixing plants, discharge of sewage from construction camps requires *No Objection Certificate (Consent to Establish and Consent to Operate)* from State Pollution Control Board prior to start of construction or setting up specific facility. *Authorisation* will also be required for disposal of Hazardous Waste like waste oil etc. from State Pollution Control Board
5.	The Air (Prevention and Control of Pollution) Act, 1981, (Amended 1987), and the Air (Prevention and Control of Pollution) Rules, 1982	
6.	The Noise Pollution (Regulation and Control) Rules, 2000 (Amended 2002)	
7.	The Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (Amended 2009), and the Batteries (Management and Handling) Rule, 2001	
8.	Guidelines for Ground Water Extraction Prescribed by Central Ground Water Authority under the power granted under Environment (Protection) Act 1986	*Permission* from Central Ground Water Authority (CGWA) is required for extracting ground water for construction purposes, from declared as Semi-critical, Critical and Overexploited areas from ground water potential prospective. For NOC, An application in the prescribed Performa is to be submitted either to the Office of the Regional Director, (CGWB) of the concerned state, or to Member Secretary, CGWA, New Delhi

23. The PMGSY Scheme and Guidelines (2004) No. 12025/8/2001-RC, Ministry of Rural Development (MORD) also defines environmental safeguards particularly with respect to sample road selection and regulatory compliance which is also to be complied with.

H. Acknowledgement

24. The Technical Support consultants (TSC) gratefully acknowledge the support received from NRRDA and ARRDA throughout the environmental assessment process. We also acknowledge the assistance received from respective PIUs and the PIC during field visits and other government agencies for primary and secondary data collection as well during public consultation.

II. DESCRIPTION OF THE PROJECT

A. General

25. The PMGSY program has mandate to provide all-weather roads to all the rural habitations within the country. RCIP is planned to meet above objective. Under RCIP batch 1 in Assam around 495.569 km roads have been identified for implementation. The broad specifications for road alignment selection, payment design, construction methodology, geometric design etc. are same and in accordance with "Specification for Rural Roads" published by IRC on behalf of the Ministry of Rural Development, Govt. of India. The design details presented in this chapter are as per above specifications. Minor changes will apply depending on road specific issues and design consideration.

26. Since topography of Assam state is largely flat, the design details applicable to flat terrain are presented in following section.

B. Sample Roads Selected in Assam State

27. The Assam state has selected 167 roads with a total length of 495.569 km spread over 20 districts as summarised at **Table 2.1** below and detailed at **Appendix 1.1.**

Table II.1 : Summary of District Wise Rural Roads

Sl. No.	Name of District	No. of Roads	Length of Roads (Km)			
			Total	Max	Min	Average
1	Barpeta	7	14.66	3.61	0.9	2.094
2	Baska	17	36.963	3.700	1.00	2.174
3	Bongaigaon	6	8.37	2.00	1.00	1.395
4	Chirang	13	32.10	8.000	0.750	2.469
5	Dhubri	3	3.000	1.000	1.000	1.000
6	Dibrugarh	29	79.345	6.330	1.000	2.736
7	Golaghat	13	65.48	13.08	1.59	5.037
8	Jorhat	19	38.065	4.500	0.715	2.003
9	Kamrup	4	11.86	4.35	1.000	2.965
10	Karbi Anglong	9	36.881	18.384	0.872	4.098
11	Kokrajhar	17	44.470	5.800	1.020	2.616
12	Lakhimpur	3	6.33	2.575	1.780	2.11
13	Nagaon	21	28.1215	2.029	0.686	1.339
14	Nalbari	5	9.81	3.00	1.000	1.962
15	Sonitpur	11	18.563	3.000	0.727	1.688
16	Tinsukia	1	3.50	3.50	3.50	3.50
17	Udalguri	1	1.700	1.700	1.700	1.700
18	Sibsagar	22	56.53	9.900	0.900	2.561
Total of RCIP Batch I		**201**	**495.569**	**13.01**	**0.52**	**2.466**

C. Project Description

1. Rural Road Construction Proposals

28. The proposed rural road construction work will provide 3.75 to 7.5 m roadway width[2] with 3.75 m carriageway in accordance with the IRC-SP 20: 2002 in plain terrain. The proposal considers a 3.75 m cement concrete pavement with lined storm water drains for stretches passing through built-up areas, waterlogged/water overtopping/ flood-prone areas. The pavement design considers a base layer of variable thickness as per the design with granular sub base, 150 mm thick water bound macadam (WBM grade I & II) and finally topped with 20 mm thick bituminous pavement. Adequate cross drainage structures like pipe or slab culverts/bridge structures are considered for drainage channels across the roads. Few minor bridges are also proposed for construction. **Figure 2.1** shows the typical cross section of the rural roads.

29. The rural road construction works will be in conformance with the Rural Roads Manual and/ or Technical Specifications (IRC: SP20: 2002) for Rural Roads published by the Indian Road Congress (IRC) on behalf of Ministry of Rural Development, Government of India. The broad design considerations are given at later part of this chapter.

2. Present Condition

30. The project roads mainly pass through plain or riverine terrain and agricultural area. The project roads have several cross drainage structures, electric posts and telephone post along the existing alignment. There are some community physical structures like Temple, Mosque, primary or secondary schools beside the roads alignment, but largely will not be affected due to the widening of roads.

3. Alignment and Profile

31. The existing road is generally an earthen track with some stretches of brickbat soling (description of the road surface). Thus, the project road is a new connectivity road. The construction works are to be confined to the existing alignment. The existing horizontal and vertical alignment / profile will be generally maintained except for minor smoothening or corrections to sustain consistent design speed without causing any land acquisition requirements and thereby the possible social and/or environmental concerns.

4. Design Considerations

32. **Geometrical Design and ROW Requirements**: The geometric design standards for this project will conform to PMGSY (ADB) guidelines and the guidelines as stated in *IRC-SP 20:2002* and the final recommendations of NRRDA expert committee *(refer D.O. no. - 17305/1/2007-Tech/12 dated 30/09/2010)*. Recommended design standards vis-à-vis the standards followed for this road are described below. The requirement of ROW as per PMGSY guidelines considered for the design is given at Table 2.2 below:

Table II.2 : ROW Requirement

Road classification	Plain and Rolling Terrain (ROW in m)			
	Open Area		Built-up Area	
	Width	Range	Width	Range
Rural roads (ODR and VR)	15	15-25	6.0	6.0

ODR= other district road, VR= village road.

[2] The road width may be reduced to 6 m in case of BT and 3.75 m in case of CC as per PMGSY recent guideline.

33. Since terrain is plain, the design speed considered is as per recommended design speed of 50 Km/h for ruling (40 km/h as minimum speed). The radius of horizontal curve is considered as 90 m ruling minimum (60m absolute minimum). The vertical alignment is designed as per ruling gradient of 3.3% applicable for plain terrain.

34. **Pavement and Embankment Design**: Considering the sub-grade strength, projected traffic and the design life, the pavement design for low volume PMGSY roads are proposed to be carried out as per guidelines of IRC: SP: 72 – 2007 or IRC SP:77 "Design of Gravel Road" and IRC SP:62-2004 "Cement Concrete roads". In built up area for hygienic and safety reasons, C.C pavement is proposed with a hard shoulder and appropriate line drain. A design life of 10 years is considered for the purpose of pavement design of flexible and granular pavements. The embankment height considered as 1m (average) from ground to crust except at the approaches of cross drainage structures. The embankment height will vary in flood prone area as per the HFL.

35. **Road side drain**: As the insufficient drainage of surface water leads to rapid damage of road, road side drain (***Figure 2.1***) are provided on the locations of habitation areas with concrete pavement. The rain water will flow along the longitudinal slope and intermittent gaps in concrete curbs

36. **Carriageway:** The carriageway is proposed as 3.75 m as per IRC-SP20: 2002. It may be even restricted to 3.0 m, where traffic intensity is less than 100 motorised vehicles per day and where the traffic is not likely to increase due to situation, like dead end, low habitation and difficult terrain condition. The ROW requirement in built-up/constricted area may be even reduced to 4 m.

37. **Shoulder:** Earthen shoulder shall be constructed in layers and compacted to 100% of Proctor's Density. It is proposed to have 1.875 m wide shoulder (0.875 m hard shoulder and 1 m earthen shoulder) on either side of carriage way.

38. **Surfacing**: Slow setting bitumen emulsion will be applied as primer on water bound layer. Rapid setting bituminous emulsion shall be used for Tack coat. Premixed carpet 20 mm thick and mixed with equivalent viscosity grade bitumen shall be laid as surfacing course. 6 mm thick, Type B seal coat is considered for sealing of the premixed carpet.

39. **Structural Works**: Following grades of concrete are proposed for structural works as per specified MORD and IRC specifications:

- Concrete in superstructure of Slab Culvert – M-25 (RCC)
- Concrete in Abutment cap, Dirt wall of slab culverts – M-25 (PCC)
- Brickwork in Abutment, Return Wall, Headwall – Cement mortar (1:4)
- Concrete below Abutment, Return Wall, Headwall – M-10 (PCC)
- Concrete in pavement (on carriageway) – M-30 (PCC)
- Concrete in pavement (on shoulder and drain) – M-25 (PCC

5. Construction Methods

40. Since these are smaller roads, NRRDA has framed specific guidelines for cost effective construction of these rural roads. As per the guideline of NRRDA, construction by more of manual means is preferred. Motor grader & tractor-towed rotavator shall be used for handling of bulk materials like spreading of aggregates in sub-base & base courses by mix-in-place method. Ordinary smooth wheeled roller shall be used for compaction if the thickness of the compacted layer does not exceed 100 mm. It is also considered that, hot mix plant of medium type & capacity with separate dryer arrangement for aggregate shall be used for bituminous surfacing

work that can be easily shifted. A self-propelled or towed bitumen pressure sprayer shall be used for spraying the materials in narrow strips with a pressure hand sprayer. For structural works, concrete shall be mixed in a mechanical mixer fitted with water measuring device. The excavation shall be done manually or mechanically using suitable medium size excavators.

6. Available Right of Way

41. As per the information available with Assam Public Work Division (PWD), ROW is largely available for the rural roads. However, in most of the roads, the required ROW of 10-15 m is encroached and in some of the road, it is put to agricultural use by the adjacent landowners. The private landowners along the proposed right of way (ROW) however, are voluntarily parting the encroached land and in some cases parted even their own private land without any compensation, anticipating the developmental benefits from the road construction works.

7. Traffic

42. The present traffic data on each of these rural roads typically varies between 10-15 vehicles per day on most of the rural stretches. The traffic largely comprises motorcycles/two-wheelers, tractors, light commercial vehicles, animal drawn carts and bicycles.

8. Economic Assessment

43. The economic analysis carried out for the project has indicated that the rural road construction works will act as a catalyst for the rural economic growth and poverty alleviation of the community in the region.

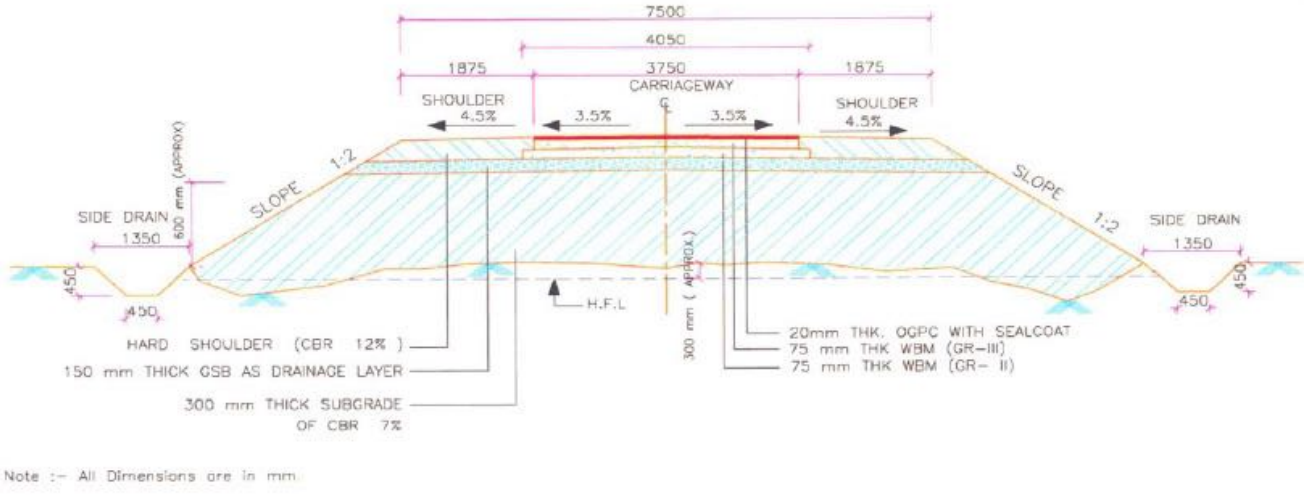

Figure II.1 : Cross-section of Rural Roads

III. DESCRIPTION OF THE ENVIRONMENT

A. Background

44. Baseline environmental conditions about all facets of environment viz. physical, biological and socioeconomic have been established using both primary and secondary sources. Efforts have been made to collect the latest information both at regional as well as local level especially along the project corridor. This will help to predict likely changes in the environment due to the project and will serve as performance indicators for various components.

45. The project roads are located almost all over the state covering 20 out of the 27 districts. The baseline information is presented below. Road specific environmental salient features has also been summarised in this chapter.

46. Assam is located between Situated between lat 24° 07′ to 28°00′ N long 89° 42′ to 96°02′ E. The Geographical area of the state is 78,438 km² (30,285 Sq mi), which constitutes 2.4 % of the area of the country. The forest area of the state is 27,826 km² (10,743.68 Sq mi) constituting 35.48% of the geographical area of the state and 0.85% of the forest area of the country. The state boundary touches in the North and East by the Kingdom of Bhutan and Arunachal Pradesh. Along the South lie Nagaland, Manipur and Mizoram. Meghalaya lies to her South-West, Bengal and Bangladesh to her West.

B. Physical Environment

1. Meteorology and Climate

47. Assam has a humid climatic condition (Tropical Monsoon Rainforest Climate). The weather in Assam is dry in winter, hot, and wet in summer. Its most distinguishing feature is the copious rainfall between March and May at a time when precipitation in upper India is at its minimum. The state has three main seasons:

- **Winter**: November to February are the months of winter during which the average temperatures range from 06° to 08° C (42° to 46° F).
- **Summer**: The March-to-May season is hot and wet. Summers are hot, with an average temperature of 35° C (92° F) and a high temperature that at times reaches 39° C (102.2° F).
- **Monsoon season:** This season brings relief from the scorching heat of the summers. The average annual rainfall in the state is around 70 inches in the west and around 120 inches in the east.

48. The climate map of Assam is presented in **Map 3.**1.

2. Air Quality

49. Most of the project area lies in vast open agricultural land and is largely free from air pollution sources other than traffic. As such, the ambient air quality for major pollutants like SO_2, SPM and NO_X is expected to be within the limits. However, in absence of any existing data on ambient air quality levels of the project area, secondary sources were referred.

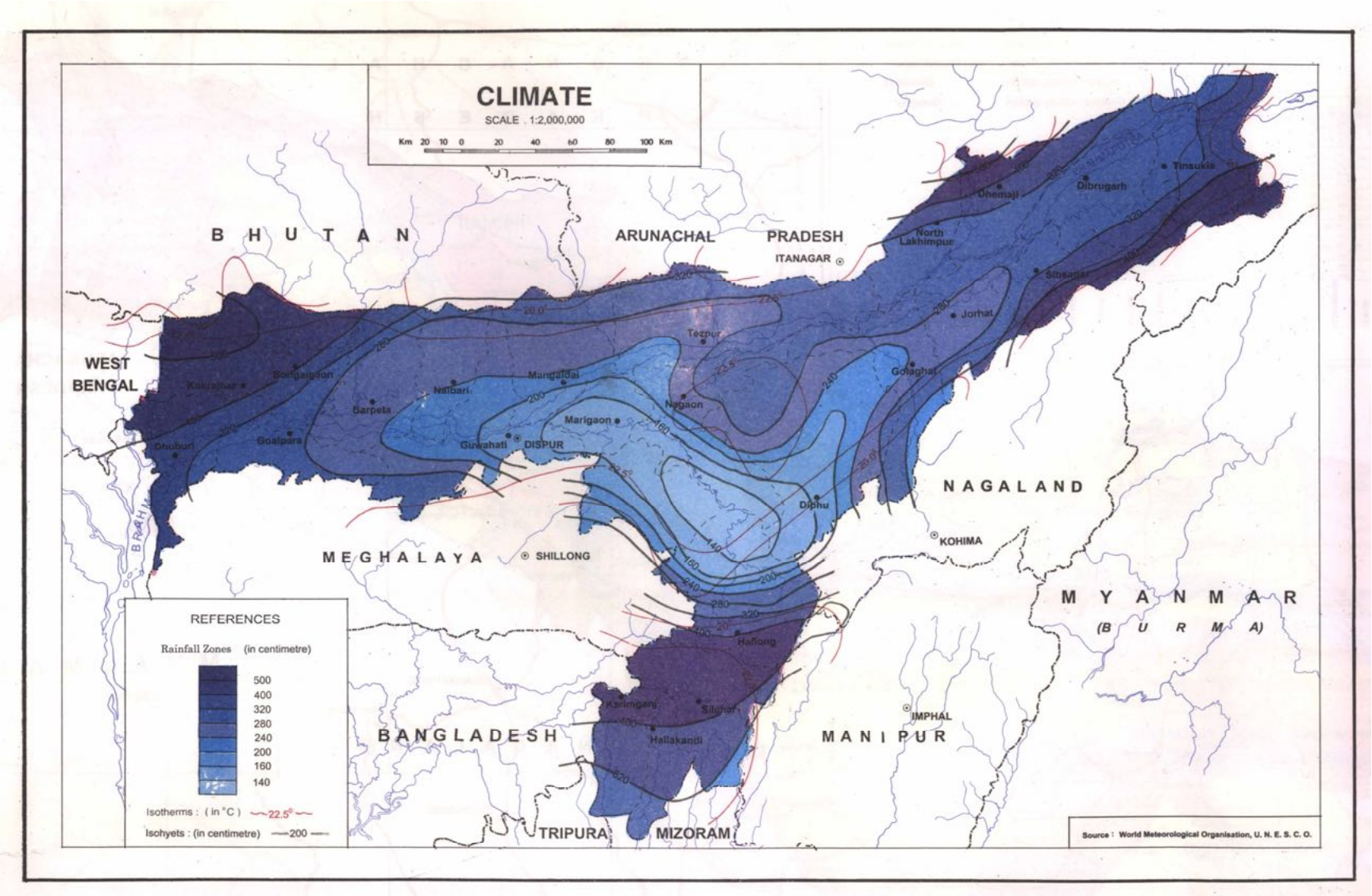

Figure III.1 Climate Map of Project Districts –Assam

Table III.1 :Maximum observed Ambient Air Quality during 2008

Area classification	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	RSPM ($\mu g/m^3$)	SPM $\mu g/m^3$)
Industrial (maximum observed value)	30	27	265	30
Residential (maximum observed value)	8	20	105	8
National Ambient Air Quality Standards for Industrial and Residential Areas	80	80	100	80

Source: *National Ambient Air Quality Status, 2008, CPCB, and Table 3.3*

50. The above **Table 3.1** reveals that concentration of all the pollutants is higher in industrial area especially respirable suspended particulate matter. The levels of sulphur dioxide and nitrogen dioxide are however, well within the limits (NAAQS). The higher particulate matter levels are attributed to the vehicular movement on unpaved roads and the loose dust in the agricultural fields that lead to formation of dust clouds over short periods. The same can be concluded from **Table 3.2** which provides a comparison of air quality at different locations.

Table III.2 Ambient Air Quality Status of Assam in Previous Years

City	Location	Type of Area	SO_2	NO_2	RSPM (PM10)	SPM
NAAQS						
Bongaigaon	Barapara office Bldg	R	5	11	56	91
	Campus of oil India	R	5	10	76	113
Dibrugarh	Dibrugarh office Bldg	R	5	11	56	92
Golaghat	Golaghat office Bldg	R	4	11	71	108
Guwahati	Fire brigade station	R	9	18	141	211
	Gopinath Nagar	R	7	14	103	163
	Head office	R	9	19	152	233
	Near Pragiyotish college	R	7	15	96	151
Hailakandi	CISF Campus	R	6	13	66	104
Shivsagar	Shivsagar Office Bldg	R	5	12	81	119
Tezpur	Tezpur office Bldg	R	5	11	76	131

Source: *National Ambient Air Quality Monitoring Series, CPCB, 2008.*

R – Residential and other areas,

I – Industrial area,

L– Low, M– Moderate, H– High and C– Critical levels of pollution based on exceedence factor (calculated for n > 50 days)

BDL = Below Detection Limit (Concentration less than 4 $\mu g/m^3$ for SO_2)
BDL = Below Detection Limit (Concentration less than 9 $\mu g/m^3$ for NO_2)

3. Noise

51. Along the proposed road construction proposals, there is neither significant industrial activity nor significant vehicular traffic contributing to ambient noise levels. The occasional vehicular movement on the unpaved roads contributes to increased noise levels over short duration and limited to daytime. The existing roads do not appear to have vehicular traffic in the nigh time. Therefore, the ambient noise levels are expected to be within the National Ambient Noise Standards

4. Topography and Geomorphology

52. Assam is an important geographic location of North-East India. Situated between altitudes 28º18' and 24º North and latitudes 89º 46' and 97º 4' East, Assam is bordered in the North and East by the Kingdom of Bhutan and Arunachal Pradesh. Along the South lie Nagaland, Manipur and Mizoram. Meghalaya lies to her South-West, Bengal and Bangladesh to her West. **Map 3.2** shows the physiography of project districts in Assam.

53. 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 modern alluvium deposits. The colour of these soils is generally gray to molted gray. On the other hand, the old alluvial soils occurs in some patches of Kokrajgar, Barpeta, Nalbari, Kamrup, darrang, Sonitpur, Lakhimpuir and Dhemaji district. Generally, the old alluvial soils are very deep with fine loams to coarce 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 grayish 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. Geomorphological Map of Assam is given in **Figure 3.3.**

5. Geology/Soil

54. Geologically, as per the plate tectonics, Assam is in the eastern most projection of the Indian Plate, where it thrusts underneath the Eurasian Plate creating asubduction zone. It is postulated that due to the north-easterly movement of the Indian plate, the sedimentary layers of an ancient geosynclines called the Tethys (in between Indian and Eurasian Plates) were pushed upward to form the Himalayas. It is estimated that the height of the Himalayas is increasing by 4 cm each year. Therefore, Assam possesses a special geomorphic environment, with large plains and dissected hills of the South Indian Plateau system abutting the Himalayas to the north, north-east and east.

55. Geomorphic studies also conclude that the Brahmaputra is a paleo-river, older than the Himalayas, which often crosses higher altitudes in the Himalayas eroding at a greater pace than the increase in the height of the mountain range to sustain its flow. The height of the surrounding regions still increasing forming steep gorges in Arunachal. The Brahmaputra valley in Assam is underlain by recent alluvium approximately 200-300m thick consisting of clay, silt, sand and Pebbles.

56. The geological map of the Brahmaputra valley covering the entire Assam state / project districts is given in **Figure 3.4**

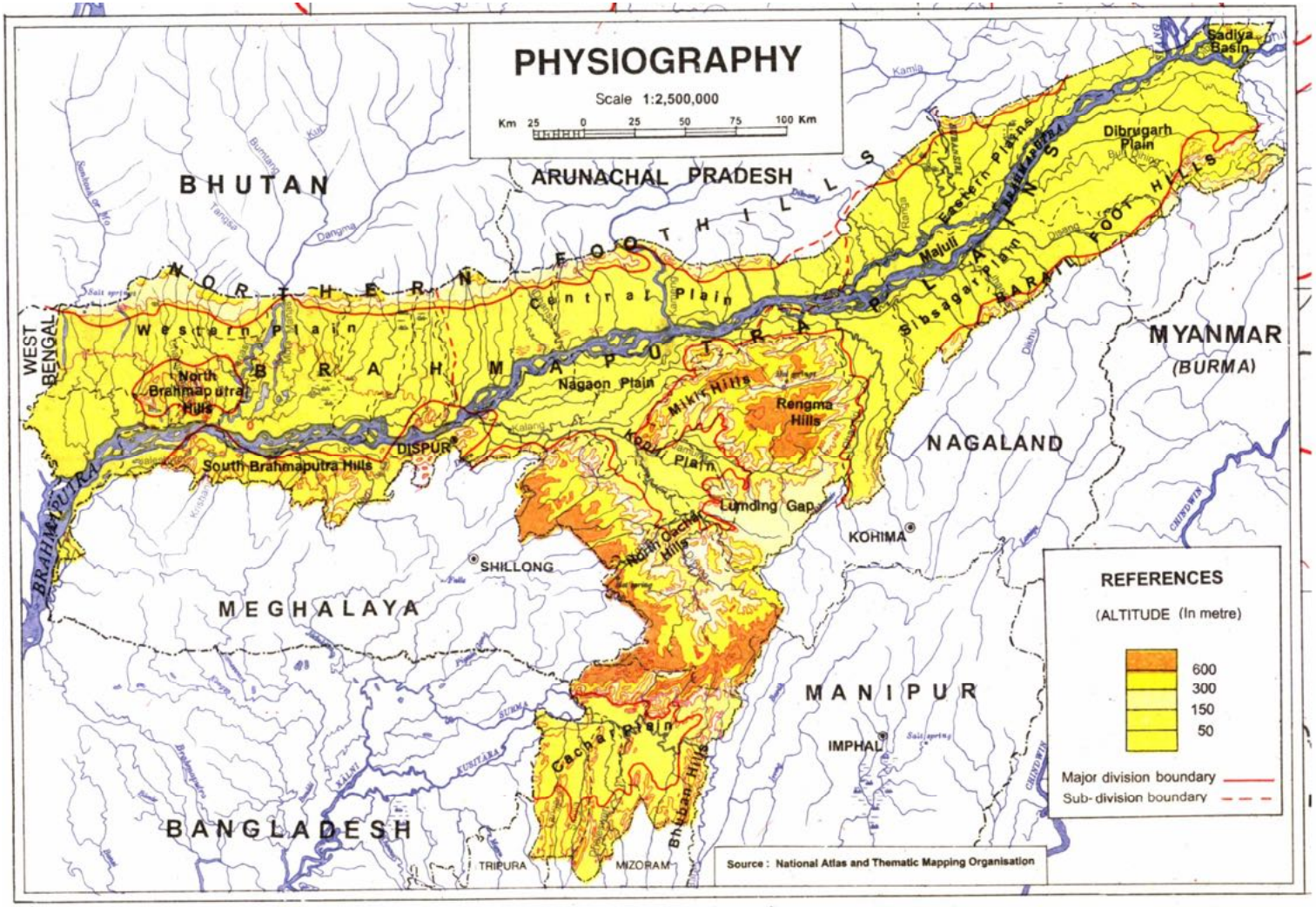

Figure III.2 Physiography of Project Districts –Assam

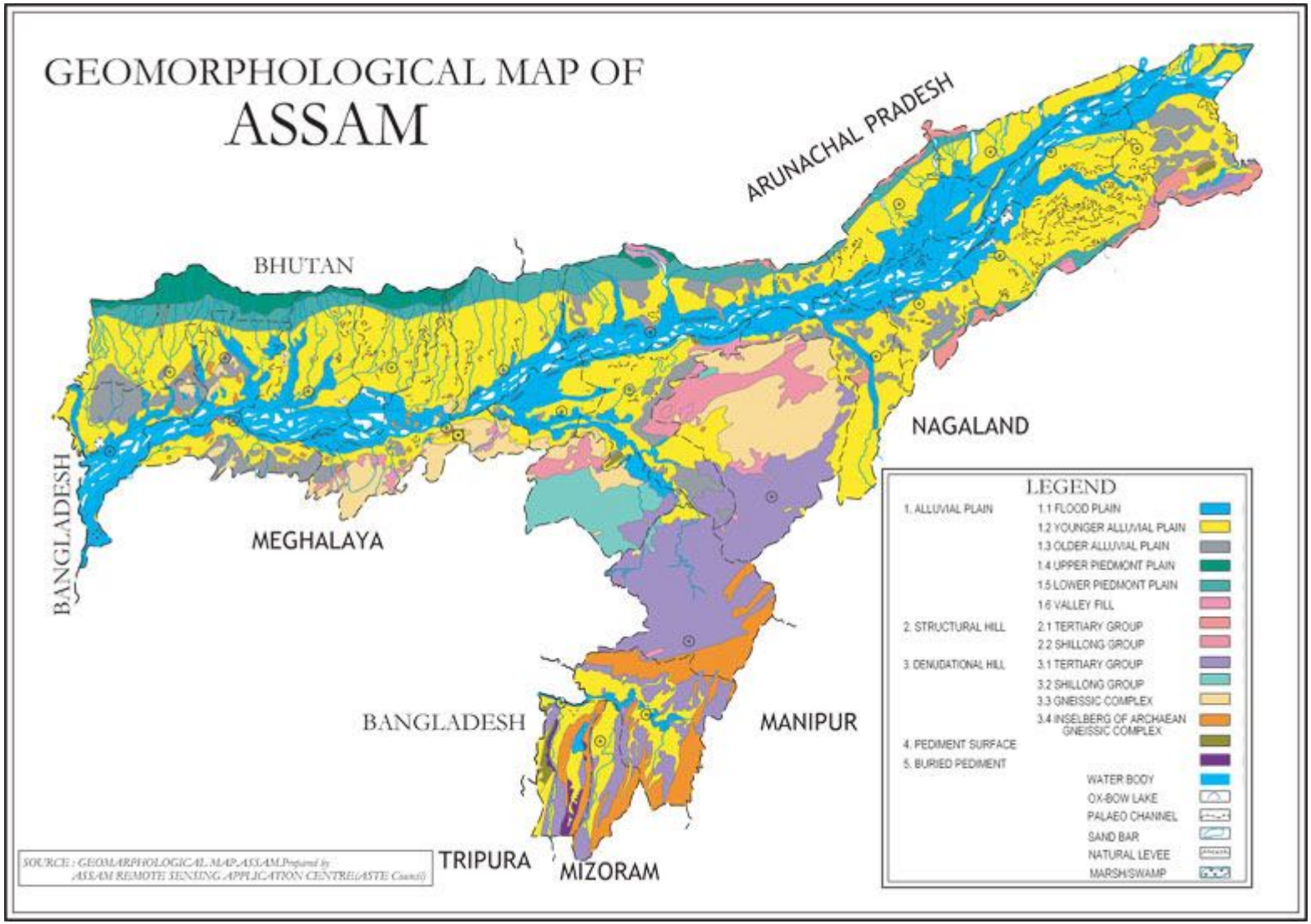

Figure III.3 Geomorphology & Landforms Maps of Project Districts –Assam

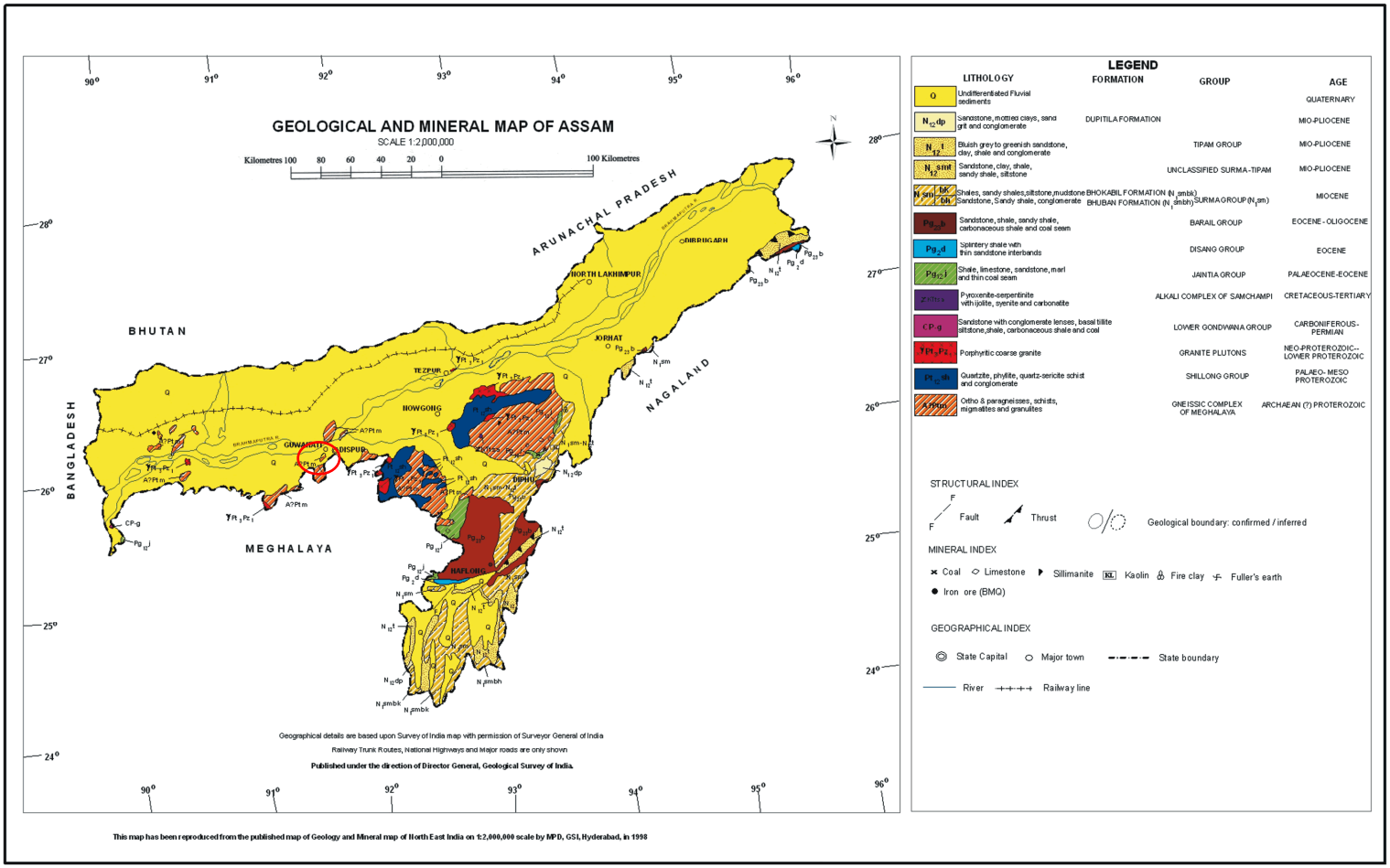

Figure III.4 Geological Map of Assam

6. Soil

57. Soil is the most valuable nature resource and serves as one of the prime requisite of life. Soils and in its turn the land through their relative fertility support all agricultural activity ant the plant growth and thereby the most important element of the natural ecosystem. As regards the soils of Assam, geology (parent material), topography and climate seem to play vital role in their formations. Therefore, under varying geological conditions, topographical characteristics and agro-climatic situations different types of soils are found to occur in the hills, piedmonts, plateaus and plains. The soils of Assam may thus generally be divided into four groups, viz. a) Alluvial soils b) Piedmont soils c) Hill soils d) Lateritic soils.

58. The major soil types within the state can be classified into five groups namely Entisols. Mollisols, Alfisols, Ultisols, Histosols. These soil types can be further classified into several sub groups. The Entisols can be sub classified into Younger alluvium and Bhabar. The Younger alluvium can be predominantly seen along the Brahmaputra River and some sporadic patches in southern parts of state. The Mollisols can be seen in western and Northern fringes of the state. The alfisols can be seen in central parts of state. The soil map project districts are given in **Figure 3.5**.

7. Earthquake & Seismicity

Seismic Hazard

59. The seismic hazard map of India was updated by Bureau of Indian Standards (BIS) . The entire state of Assam lies in Zone V (Highest level of vulnerability)

60. The Brahmaputra valley and its adjoining highlands are seismically very unstable. The earthquakes of 1897 and 1950, measuring 8.7 on Richter scale are among the most severe in recorded history, and have caused extensive landslips. Rock falls on hill slope, subsidence and fissuring of ground in the valley changes in the courses and morphology of several tributary rivers. The hazard zoning map is shown in **Figure 3.6**

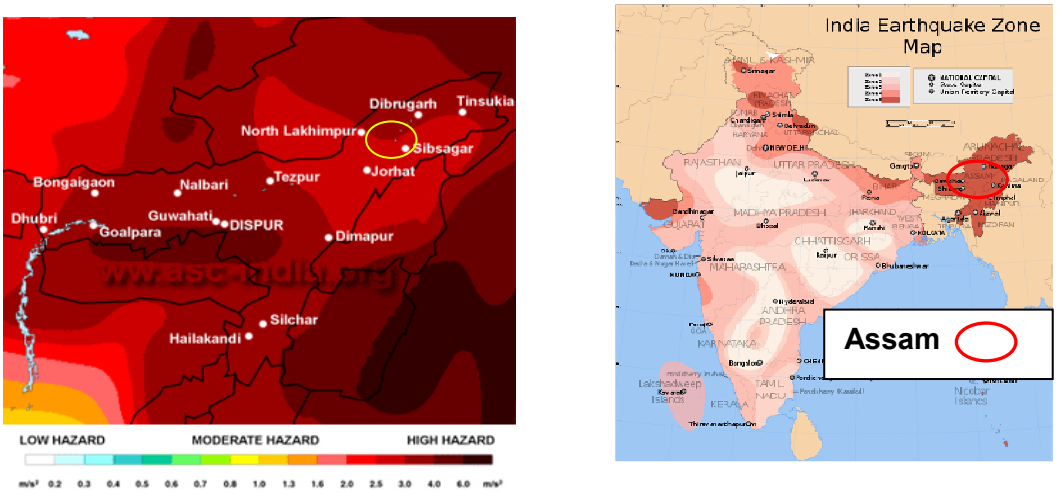

Figure III.6 : Hazard and Seismic Zone Map

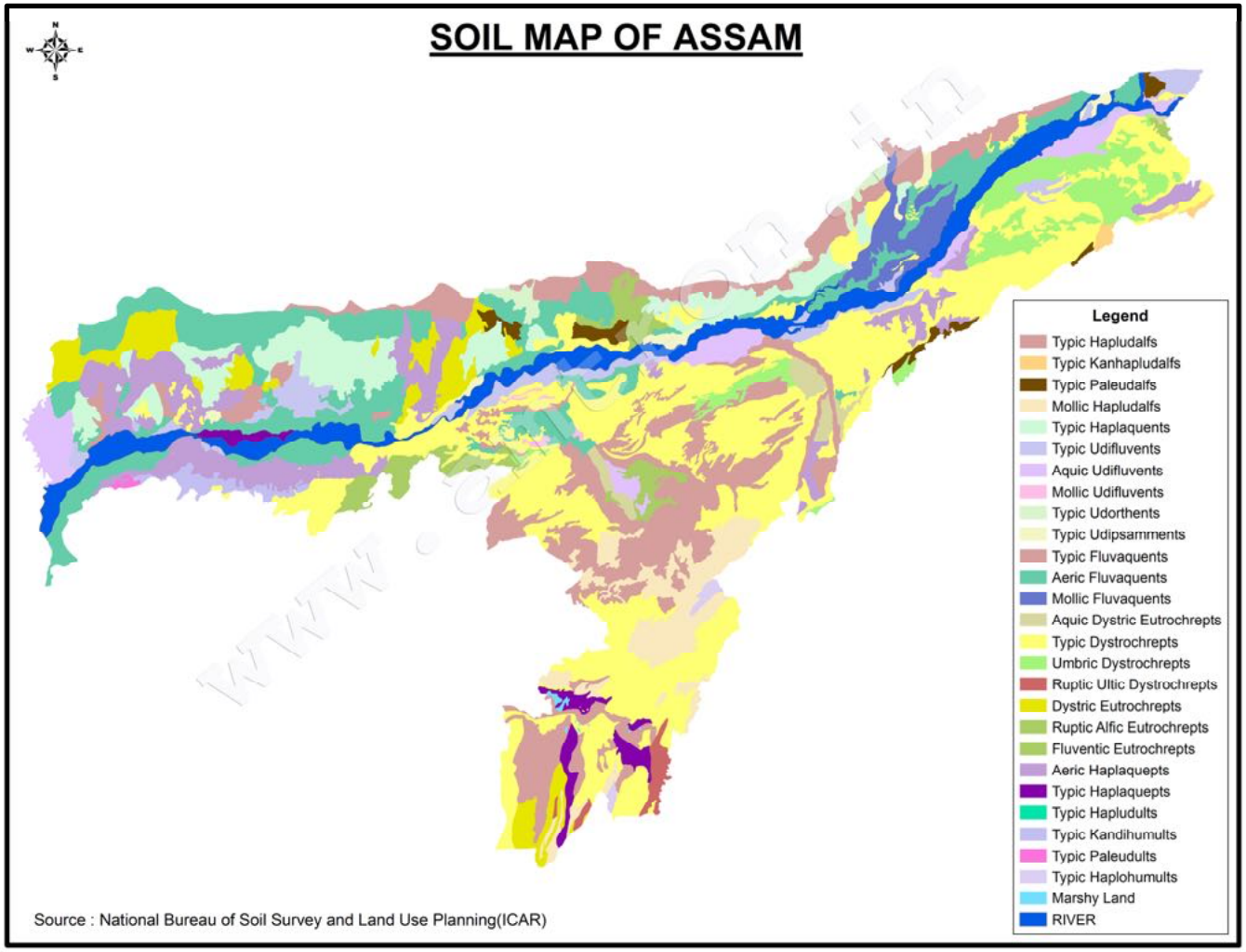

Figure III.5 Soil map of Assam

8. Land Use

61. The large geographical area is classified as forest area (26832 sq km or 34.21% of the total geographic area of the State). According to legal classification, reserved forests constitute 66.58 % and Unclassified forests, 33.42%.Details of land use is given in **Table 3.3** and **Figure 3.7**.

Table III.3 : Land Use Pattern in the State

Land Use	Area in '000 ha	Percentage
Total Geographical area	7844	
Reporting area for land Utilization	7850	100.0
Forests	1932	24.61
Not Available for cultivation	2531	32.24
Permanent pastures and other grassing land	163	2.08
Land under miscellaneous tree crops & groves	234	2.98
Culturable wasteland	80	1.02
Fallow lands other current fallows	65	0.83
Current fallows	110	1.40
Net area sown (as per agriculture census 1995-96 expect total cropped area)	2734	34.83

Source: State of Forest Report, 2005, Forest Survey of India Dehradun.

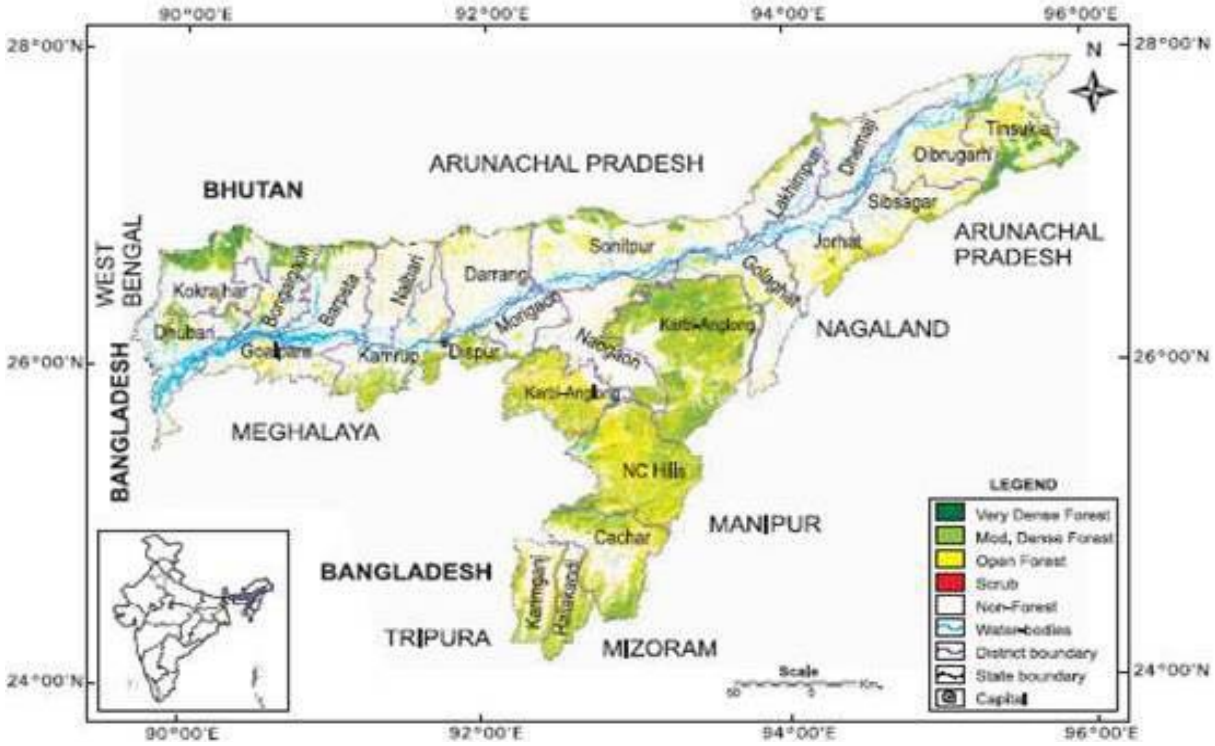

Figure III.7 : Landuse of Assam

9. Hydrology and Water quality

62. Assam has extensive river system consisting of the Brahmaputra, the Kusiyara and the Barak and their tributaries. All the rivers in Assam are liable to floods, mainly because they receive heavy rainfall within a short time. These rivers are in their early stage of maturity and are very active agents of erosion. The river waters collect a tremendous amount of silt and other debris and raise the level of the river beds. Therefore, it becomes impossible for the main channel to cope with the vast volume of water received during the rains. The Brahmaputra River has a total drainage area of about 935,500 sq. km. So far, a total of 4, 77,163 hectares of land have been irrigated in Assam. The drainage map of the project districts in Assam is presented in **Figure 3.8.**

63. Sample roads are mostly crossed by seasonal small channels. However many of the sample roads are located in close proximity of the rivers and are prone to flood. Ground water being extracted through hand pumps or tubewell and is the main source of water supply to villagers.

64. In Assam, pollution is increasing in most of surface water resources in major towns due to increasing urbanization trend. None of the water sources are safe for drinking or bathing without conventional water treatment. Rivers such as Bharmputra, Buridihing, Disang, Jhanji, Dhansiri, Subbansiri and Borakk etc. are found to be polluted at different stretches due to industrial, domestic and agricultural pollution. Among all the rivers, Bharmputra and Dhansiri River is the most polluted. The hydro geological conditions in both porous and fissured formations spread across project districts / state are given in **Table 3.4**

Table III.4 : Hydro geological Conditions of Project District / Assam

Dynamic Ground Water Resources	
Annual Replenishable Ground water Resource	27.23 Billion Cubic meter
Net Annual Ground Water Availability	24.89 Billion Cubic meter
Annual Ground Water Draft	5.44 Billion Cubic meter
Stage of Ground Water Development	22 %
Ground Water Development & Management	
Over Exploited	NIL
Critical	NIL
Semi- critical	NIL
Artificial Recharge to Ground Water (AR)	▪ Feasible AR structures: 250 Check Dams, 500 weirs, 1000 Gabion structures, 250 development of springs 600 RWH in Urban Areas
Ground Water Quality Problems	
Contaminants	**Districts affected (in part)**
Fluoride (>1.5 mg/l)	Goalpapra, Kamrup, Karbi Anglong, Nagaon,
Iron (>1.0 mg/l)	Cachar, Darrang, Dhemaji, Dhubri, Goalpapra, Golaghat, Hailakandi, Jorhat, Kamrup, Karbi Anglong, Karimganj, Kokrajhar, Lakhimpur, Morigaon, Nagaon, Nalbari, Sibsagar, Sonitpur
Arsenic (>0.05 mg/l)	Dhemaji

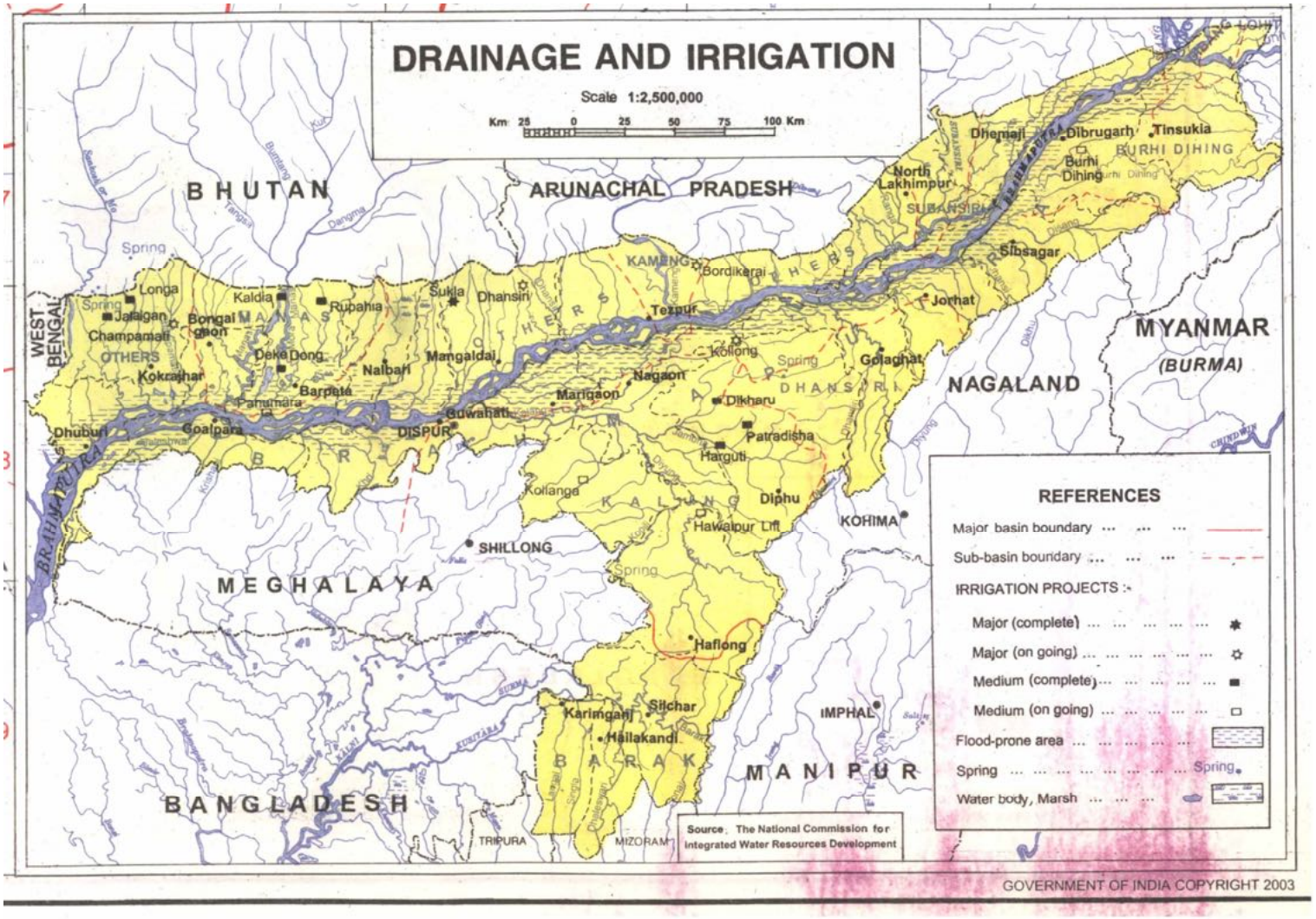

Figure III.8 : Drainage Map of Project Districts of Assam

65. **Surface water Quality :** Water resources of the State as a whole are substantial. About 8251 sq km, which is 10.5% of the total geographical area of the State, is occupied by surface water bodies. Of this about 6503 sq km is occupied by the river systems including the mighty Brahmaputra and 1748 sq km by natural wet lands including seasonal and permanent water logged and marshy areas and man-made reservoirs and tanks of size more than 2.5 ha. The total surface water resource of the State is estimated at about 600 billion cubic.

66. **Groundwater Quality and Availability**: The annual replenishable ground water resource of the state has been estimated as 27.23 billion cubic meter and net annual groundwater availability 24.89 billion cubic meter. The annual groundwater draft is estimated as 5.44 billion cubic meter of which 4.85 billion cubic meter is for irrigation and 0.59 billion cubic meter is for domestic and industrial uses. The overall stage of groundwater development in the state is 22% - with the lowest figure of 2% in Cachar district and highest 56%in Bongaigaon district .

67. **Flood Affected Prone areas:** The chronically flood prone areas within the state are mainly along the river Brahmaputra from eastern to western part of the state. The year 1988 witness worst flood when a total of 42.23 lakh hectares of land (including 11.20 lakh hectares of crop damage) affecting more then 8 million people in 8770 villages.

68. **Hydrology:** The Brahmaputra River and the 33 major tributaries joining it in Assam, including the main trans-Himalayan tributaries of Subansiri, Jia Bharali, and Manas, carry about 30% of the country's total surface water. Surface water bodies covering about 8,251 square kilometers (km²) account for 10.5% of the geographical area of the state. Of these, the river systems, including waterlogged areas, occupy 6,503 km². The annual surface water availability is more than 53 million hectare-meters. Brahmaputra valley in Assam has 3,513 wetlands, covering 1,012.3 km². Groundwater is also plentiful at shallow depth in the valley; utilizable groundwater is estimated to exceed 2 million hectare-meters.

C. Biological Environment / Ecological Resources

1. Biological Environment / Ecological Resources of the State

69. Assam is one of the richest biodiversity zones in the world. There are a number of tropical rainforests in Assam. Moreover, there are riverine grass lands, bamboo orchards and numerous wetland ecosystems. Many of these areas have been protected by developing national parks and reserved forests. The Kaziranga and Manas are the two World Heritage Sites in the region. The Kaziranga is the home for the rare Indian Rhinoceros, while Manas is a project tiger sanctuary area. However, no project roads pass through any of the protected areas.

2. Floral diversity of the state

Forest and forest type of State

70. Forestry in Assam is one of the most important economic activities of the state. This has been possible due to the vast stretch of forests in Assam. The forest in Assam can be described as : Tropical Wet Evergreen Forests, Tropical Semi Evergreen Forests, and Tropical Moist Deciduous Forests. The total forest area of state is 26,748 Sq. Km. (2.4 % of Country). Reserved Forest 13,870 Sq. Km. (17.68% of State Geo Area) Protected Area is 3,925 Sq. Km. (5% of State's Geo Area).

Although, none of the road stretches passes through any forest land/area but still has trees, which might require felling during clearing up operations for construction of rural roads. In most of cases, tree cutting has been minimized by suitably modifying the alignment

Mammals

71. Macaca (Rhesus macaque), Golden langur (Trachypithecus geei), Bay bamboo rat (Connomys badius), Spotted Deer (Curvus axis), Otter (Aonyx congica), Indian Mongoose (Herpestes javanicus), Clouded leopard (Neofelis nebulosa) were reported in the forests of Guwahati. List of mammals is given in **Table 3.5**.

Table III.5 : Mammals Recorded In Guwahati City And Forest Area

S.N	Common Name	Scientific Name
1.	Spotted deer	*Axis axis*
2.	Swamp deer	*Rucervus duvaucelii*
3.	Clouded leopard	*Neofelis nebulosa*
4.	Golden langur	*Trachypithecus geei*
5.	Indian mongoose	*Herpestes javanicus*
6.	Bay bamboo rat	*Cannomys badius*
7.	Hog badger	*Arctonyx collaris*
8.	Rhesus macaque	*Macaca mulatta*
9.	Hoary bamboo rat	*Rhizomys pruinosus*
10.	Otter	*Lutra perspicillata*
11	Ganges river dolphin	*Platanista gangetica*

Avifauna

72. Assam state supports rich avifauna, due to abundance of feeding, breeding and roosting places. In this state both endemic and exotic species were reported. Mainly endemic species were confined to upper Assam and exotic species were mainly migratory birds, which arrive in winter for roosting. Birds reported during the time of survey in Guwahati were cosmopolitan in distribution. No endangered species were noticed. Due to high abundance of avifauna, they were noticed along the roadside, in market places, along the banks of river, lakes and in human settlement areas. Majority of the birds recorded in core and buffer zone show short distance and local migration during the daytime (diurnal migration). Their migrations were mainly in search food and new feeding ground.

73. Birds recorded in large number were rock pigeon (*Columba livia),* house crow (*Corvus splendens),* cattle egret (*Bubulcus ibis),* House sparrow, Myna. Three subspecies of myna like pied myna, common myna and bank myna were commonly noticed. They represent species diversity. **Table: 3.6** gives the list of avifauna found in Assam including part of subproject districts.

Table III.6 List of Fauna

S. N	Scientific Name	Common Name
1.	*Acridotheres tristis*	Common myna
2.	*Columba livia*	Blue rock pigeon
3.	*Corvus splendens*	House crow
4.	*Dicrurus adsimilis*	Black drango
5.	*Haleyon smyrensis*	White breasted
		kingfisher
6.	*Milvus migrans*	Pariah kite
7.	*Passer domesticus*	House sparrow
8.	*Streptopelia chinensis*	Spotted dove

S. N	Scientific Name	Common Name
9.	*Apus affinis*	House swift
10.	*Tringa hypoleucos*	Common sandpiper
11.	*Mirafra assamica*	Lark
12.	*Corvus*	Jungle Crow
	macrorhynchos	
13.	*Ocyceros birostris*	Indian Grey
		hornbill
14.	*Dicrurus hottentottus*	Hair-crested
		Drongo
15.	*Anthus rufulus*	Paddyfield pipit
16.	*Cercomela fusca*	Indian Chat
17.	*Coracias*	Indian Roller
	benghalensis	
18.	*Merops orientalis*	Green Bee Eater
19.	*Ardeola gravii*	Pond heron
20.	*Turdoides striata*	Red vented bulbul
21.	*Vanellus indicus*	Red wattled lapwing
22.	*Egretta garzetta*	Little egret
23.	*Ardeola grayigrayi*	Indian pond heron
24.	*Bubulcus ibis*	Cattle egret
25.	*Turdoides striata*	Jungle babbler
26.	*Acridotheres*	Bank myna
	ginginianus	
27.	*Gracupica contra*	Pied myna
28.	*Psittacula kramen*	Rose ring parakeet
29.	*Upupa epops*	Hoopoe

3. Wildlife and Protected Areas:

74. **Table 3.7** provides details of National park and Sanctuaries and **Figure 3.9** shows their locations. There is no wildlife Sanctuaries/National Parks, Tiger Reserves etc. along the project area.

Table III.7 : List of Protected Areas in Assam

Name	Area in Sq. km	Main attraction
Kaziranga NP	858.98	Rhino, Tiger, Bears, Wild Buffalo, Swamp Deer, Gaur, Gibbon, Bengal Florican, Dolphin, Otter
Manas NP	500	Tiger, Asiatic Wild Buffalo, Asian Elephant, Gaur, Dhole Pigmy hog, Hispid hare, Golden langur, Bengal florican
Dibru-Saikhowa NP	340	Ferel horses, Asiatic Wild Buffalo, White winged wood duck and Salix swamp
Nameri NP	200	Tiger, 4 species of Hornbill, White Winged Wood duck, Golden Mahaseer
Rajiv Gandhi	78.91	Rhino, Tiger, Maljurias Bengal Florican, Otter
Wildlife Sanctuaries		
Garampani	6.05	Elephant, Hot Water Springs
Laokhowa	70.13	Elephant, Tiger, Asiatic Wild Buffalo, Bengal Florican

Name	Area in Sq. km	Main attraction
Bornadi	26.22	Hispid Hare, Pygmy Hog, Dhole, Elephants, Tiger, Great Pied Hornbill, Peafowl
Chakrasila	45.5	Golden Langur, Gaur, Sambar, Barking deer
Burachapori	44.06	Elephants, Tiger, Wild buffalo, Aquatic Birds, Bengal Florican
Pani-Dihing	33.93	Stray Elephants; Birds Paradise
Hollongapar Gibbon	20.98	7 Primates (Hoolock Gibbon, Stump-tailed Macaque, Capped Langur, Pig –tailed Macaque, Assamese Macaque, Slow Loris and Rhesus Macaque), Elephant, Leopard
Pobitora	38.8	Rhino, Leopards, Barking Deer, Migratory Birds
Sonai -Rupai	220	Elephant, Tiger, Gaur, Dhole, Sambar, White Winged Wood duck
Bherjan, Borajan-Padumoni	7.22	Hoolock Gibbon, Capped Langur, Pig-tailed Macaque, Slow Loris and Rhesus Macaque, Leopard
East Karbi Anglong	222	Gaur, Elephants, Tiger, Sambar, Barking Deer, Lesser Cats, Hoolock, Gibbon, Capped Langur, Wreathed Hornbill,
Nambor	37	Gaur, Elephants, Tiger, Sambar, Barking Deer, Lesser Cats, Hoolock Gibbon, Capped Langur, Wreathed Hornbill
Marat Longri	451	Tigers, Leopards, Gaur, Elephants, Hoolock Gibbon
Nambor-Doigurung	97.15	Gaur, Elephants, Tiger, Sambar, Barking Deer, Lesser Cats, Hoolock Gibbon, Capped Langur, Wreathed Hornbill
Amchang	78.64	Elephant, Gaur, Leopard, Lesser Cats, Slow Loris, Hoolock Gibbon, Capped Langur
Dehing Patkai	111.19	Elephants, Tiger, Hoolock Gibbon, White winged Wood Duck, Hornbills, Rain forests
Borail	326.25	Serow, Himalayan Black Bear, Hoolock Gibbon, Langur, Spectacled Monkey

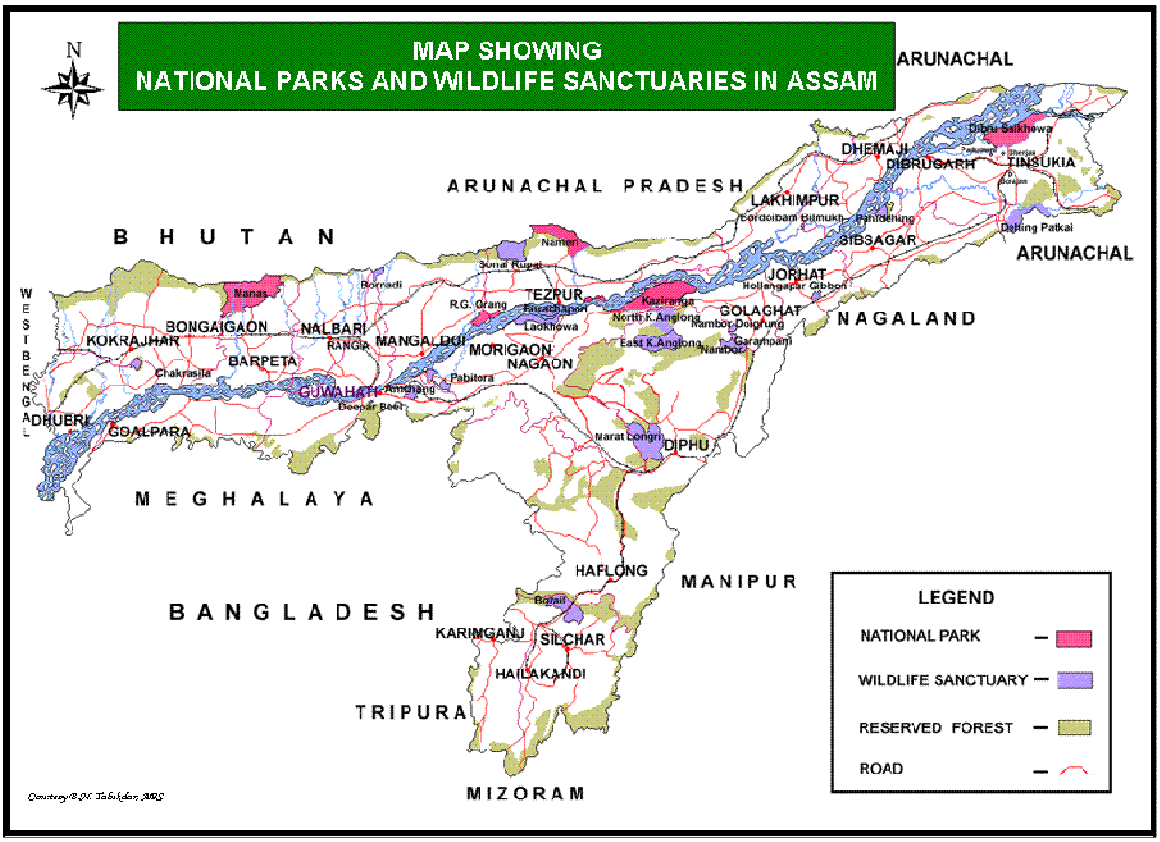

Figure III.9 Protected Areas of Assam

4. Aquatic Biology:

75. No wetland or large water body falls in and around the selected project roads area. Fisheries activities are common in Assam including subproject areas.

D. Socioeconomic Environment

76. Following paragraphs describes about the socioeconomic and cultural environmental of the project surrounding area.

1. Demography

77. As per census state having highest population density among NE states, of 339 persons per sq. km. As against decadal growth rate of 21.54% at the national level, the population of the State has grown by 18.92% over the period 1991-2001. The sex ratio of Assam at 935 females to 1000 males is higher than the national average of 933. Female literacy of the State rose to 56.03% from 43.03% in 1991. There are so many major tribes and a number of sub-tribes inhabiting the area. (**Table 3.8**)

Table III.8 : Demographic Profile

Population (2011 census)	31169272
Males	15954927
Females	15214345
Urban population (Census 2001)%	12.72

Literacy Rate (census 2011) in %	73.18
Male Literacy in %	78.81
Male Literate in numbers	10756937
Female Literacy in %	67.27
Female Literacy in numbers	8750080

Note: Figures in bracket indicate percentage Source: Census, 2011.

2. Healthcare

78. The Total Fertility Rate of the State is 2.6. The Infant Mortality Rate is 64 and Maternal Mortality Ratio is 480 (SRS 2004 - 2006) which are higher than the National average. The Sex Ratio in the State is 935 (as compared to 933 for the country). Comparative figures of major health and demographic indicators are as follows:

Table III.9 : Demographic, Socioeconomic and Health profile of Assam State as compared to India figures

S. No.	Item	Assam	India
1	Total population (Census 2001) (in million)	26.66	1028.61
2	Decadal Growth (Census 2011) (%)	16.93	17.64
3	Crude Birth Rate (SRS 2008)	23.9	22.8
4	Crude Death Rate (SRS 2008)	8.6	7.4
5	Total Fertility Rate (SRS 2008)	2.6	2.6
6	Infant Mortality Rate (SRS 2008)	64	53
7	Maternal Mortality Ratio (SRS 2004 - 2006)	480	254
8	Sex Ratio (Census 2011)	954	940
9	Population below Poverty line (%)	36.09	26.10
10	Schedule Caste population (in million)	1.83	166.64
11	Schedule Tribe population (in million)	3.31	84.33
12	Female Literacy Rate (Census 2001) (%)	54.6	53.7

3. Literacy and Education

79. The state as well as the central government gives primary focus on developing the state of the education in the state. Assam has the highest number of schools, colleges and universities in the region. There are a total number of 44,309 primary and middle schools, secondary schools, high schools, colleges for professional as well as general education, universities and other educational institutions in the state. There are some of the best known technical and professional institutes of international repute. These include; Cotton College, Centre for Plasma Physics, Indian Institute of Technology Guwahati, National Institute of Technology, Silchar, North Eastern Regional Institute of Water and Land Management, Defence Research Laboratory, and others.

,Universities	5
College of general education	431
College of professional education	34
High School	620
Secondary School	4607
Primary and Middle School	38,410
Other Institutions	202
Total	44,309

4. Affluence

80. The percentage of pucca houses both in rural and urban areas of Assam is lower than the all India average. There has also been a reduction in the percentage of pucca houses in rural Assam between 1991 and 1993-94.House holds with semi pucca houses continued to be higher in urban Assam and lower in rural Assam than the corresponding all India averages. The percentage of households with semi pucca houses in urban Assam decreased between 1991 and 1993-94.

5. Economy

81. Agriculture is the main occupation of the people of the state. Since rice is the staple diet of the people, cultivation of rice is the main occupation of those practicing agriculture. Other than that, pulses, tea, jute and fruit are also cultivated in good quantity.

82. Approximately 15% of the world's tea production comes from this small state, which is its main source of revenue. Almost 75% of the tea gardens are upper Assam districts of Darrang, Sibsagar and Lakhimpur. Other than tea, fruits like oranges, bananas, guavas, pineapples and guavas are also grown. Forests are an important part of the economy. Timber and bamboo are major products from these forests that bring income to the state.

6. Agriculture

83. Agriculture accounts for more than a third of Assam's income and employs 69 percent of total workforce. Assam's biggest contribution to the world is its tea. Assam produces some of the finest and most expensive teas in the world. Other than the Chinese tea variety Camellia sinensis, Assam is the only region in the world that has its own variety of tea, called Camellia assamica. Assam tea is grown at elevations near sea level, giving it a malty sweetness and an earthy flavor, as opposed to the floral aroma of highland (e.g. Darjeeling, Taiwanese) teas. Assam also accounts for fair share of India's production of rice, rapeseed, mustard, jute, potato, sweet potato, banana, papaya, areca nut and turmeric. Assam is also a home of large varieties of citrus fruits, leaf vegetables, vegetables, useful grasses, herbs, spices, etc, which are mostly subsistence crops.

7. Industries, Cottage and Small Industries

84. Agro-based industries of Assam include-tea industry, sugar industry, grain mill products industry-(Rice, Oil and Flour Mill), Food processing industry and textile industry.

85. Assam was traditionally famous for its cottage industry, especially spinning and weaving. Pat or pure silk production is essentially confined to Assam. Assam produces about 10% of total natural silk of India. Assam also produces Muga, the golden silk. Weaving is an important cottage industry of Assam. It is a traditional industry, which can be traced back to very ancient times. Assam also has, agro-based industries which include-tea, sugar, grain mill products (Rice, Oil and Flour Mill), Food processing and textile industries. Mineral-based industries of Assam includes-railway workshop, engineering industry, re-rolling mill, steel work, etc.

Table III.10 : Salient Environmental Features of Sample Roads

District	Block	Road Name (length)	Salient Environmental Features
Barpeta	Chenga	Batgaon to Kadamtola Road (1.00 Km)	• Topography is flat. • Project road passes mainly through agricultural land. • Inhabited areas are located on both sides of the road almost on the entire length of the road. • Erosion prone areas are identified at 0+010 km(LHS), 0+580 km(LHS), 0+890 km(LHS), 0+200 km(RHS), 0+240 km(RHS), 0+260 km(RHS), 0+580 km(RHS), 0+630 km(RHS), 0+740 km(RHS), 0+800 km(RHS) and 0+870 km(RHS). • Few tree cutting and utility/community structure shifting will be required.
Baska	Goreswar	Baitamari Chowk to Dallongdia Road (2.500 km)	• Topography is flat. • Inhabited areas are concentrated at 0+000-0+070 (RHS), 0+370-0+395 (RHS), 0+365-0+385 (LHS), 0+430-0+530 (RHS), 0+535-0+605 (LHS), 0+650-0+935 (LHS), 1+650-1+815 (LHS),1+720-1+760 (RHS), • 56 trees are located within 10 m on either side of the CL..Few tree cutting and utility/community structure shifting will be required.
Bongaigaon	Boitamari	Garoimari to Garoimari I (0.810km)	• Topography is flat. • Inhabited areas are concentrated at 0+000 to 0+450 (LHS) • Erosion prone areas are identified at Ch 0+430km, Ch 0+630 km • 2 Ponds are located alongside the corridor.Slope protection measures should be considered at respective locations. • Few tree cutting and utility/community structure shifting will be required.
Cachar	Narsingpur	T01 to Bishnupur FV (2.500 km)	• Topography is flat. • Project road passes through patches of agricultural and barren land. • Inhabited areas are concentrated at 01+920 to 2+140 LHS, • 2+000 to 2+480 LHS, • 1+910 to 2+000 RHS • Erosion prone locations are identified at 0+330 (LHS), 0+382(LHS) and 0+440 (LHS). • 5 electric poles, 3 stand posts, 1 transformer and 1 well will be affected by the project.

District	Block	Road Name (length)	Salient Environmental Features
Chirang	Borobazar	Dangarpara I to Dangarpara II (2.500 km)	• Topography is plain. • Inhabited areas are concentrated between • 0+200-0+400(RHS) • 0+600-0+800(RHS) • 1+400-1+600(Both Side) • 3 electric poles would beaffected due to the project.
Darrang	Pachim Mangaldoi	Bezpara No. 2 (B. J. Road, part) to MPK Road (0.824km)	• Topography is plain. • Inhabited areas are concentrated between LHS:Ch • 0+000 - 0+410, • 0+450 – 0+610, RHS: Ch • 0+000 – 0+600 • Erosion prone areas identified at Ch. 0+580 km (LHS), 1+600 (LHS), 2+555 (RHS), 2+625 (RHS), 2+650 (LHS), 2+815 (RHS), 3+335 (RHS), 3+580 (LHS), 3+590 (RHS) and 4+620 (RHS). • 16 trees, 7 electric poles, 1 hand pump and 1 stand post would be affected due to the proposed improvement..
Dhubri	Mahamaya	NH 31 to Pasuarkhal Pt-III Road (1.00 km)	• Topography is plain. • Inhabited areas are concentrated on the entire length of the road • Erosion prone areas are identified at ch.0+000 km (LHS), 0+360 km(LHS) and 0+010 km(RHS). • Entire length along the road is prone to flooding. • Few tree cutting and utility/community structure shifting will be required.
Dibrugarh	Khowang	Dehingia Gaon – Changmai Gaon (1.140 km)	• Topography is plain. • Inhabited areas are concentrated all along the road length (Both Sides) • No erosion prone area identified • 5 trees will be cut due to the road improvement.
Golaghat	Golaghat South	Henevi to Milongaon Road (9.150 km)	• Topography is plain. • No erosion prone areas identified • Few tree cutting and utility/community structure shifting will be required.
Jorhat	Kallapani	T06 to Bhakatchuk Road (4.10 km)	• Topography is plain. • The road mainly passes through inhabited areas and a few tea gardens • No erosion prone areas identified • Cutting of 4 trees and utility/community structure shifting will be required.
Kamrup	Dimolia	T08 to Rewa Pathar Road (3.600 km)	• Topography is plain. • Erosion prone areas are identified at ch 0+130 km (LHS), 0+390 km (RHS), 0+660 km (LHS), 1+030 km (LHS), 1+240 km (LHS), 1+310 (LHS), 1+450 (LHS), 1+530 (LHS), 1+400 (RHS), 1+600 (LHS), 1+610 (RHS), 3+260 km (LHS), 3+310 km (LHS) and 3+530 km (LHS).

District	Block	Road Name (length)	Salient Environmental Features
			• Few tree (4 nos.) cutting and 4 electric pole shifting will be required. • 1 temple and 1 school are located within 10m from CL of the road
Karbi Anglong	Rongkhang	T03 to Mekwe Pather Road (2.655 Km)	• Topography is plain. • Inhabited areas are concentrated between Ch.0.0 to 0.2 and 1.50 to 1.90. • 1 temple is located within 10 m on either side of the alignment. • Few tree cutting and utility/community structure shifting will be required.
Karimganj	North Karimganj	NH 151-Suprakandi (1.00 km)	• Topography is plain. • The road section between Ch 0+600 and Ch 1+000 km is flood prone. • 17 trees would be affected and shifting of 2 electric poles will be required due to the proposed improvement
Kokrajhar	Kokrajhar	138 (Latagaon) to Laltari road (2.30 km)	• Topography is rolling. • Inhabited areas are concentrated at Ch 0+000-0+100 (RHS), • 0+400-0+600 (Both Side), • 0+700-0+900 (Both side, • 2+100-2+200 (RHS), • 2+200-2+300 (Both side) • 12 trees (including areca nut and bamboo) would be affected due to the proposed improvement...
Lakhimpur	Nowboicha	Fulbari No.2 to Dhemagarh No.2 (1.975 Km)	• Topography is plain. • Project road passes mainly through agricultural land. • 1 trees, 6 electric poles would be affected due to the proposed improvement.. • 1 namghar5, is located within 10 m on either side from the center line of the road alignment
Nagaon	Pakhimaria	Nonoi Dakhipat Road to Rangalumukh (1.68km)	• Topography is plain. • Project road passes through patches of agricultural land. • Inhabited areas are concentrated at 00+000 to 0+260 LHS, 0+000 to 0+050 RHS • The road is flood prone. • 9 trees, 5 electric poles would be affected due to the proposed improvement.
Nalbari	Pub Nalbari	Sandha LP School to Katra HE School Road (2.200 Km)	• Topography is plain. • Erosion prone areas are identified at ch 0+055 km(LHS), 0+290 km(RHS), 0+660 km (LHS), 1+440 km(LHS), 1+730 km(LHS) and 1+760 km(LHS) • Flood prone area is identified between ch.1+670 km and ch. 2+100 km. • 6 trees will be affected due to the project. • 1 namghor and 2 schools are located within 10m on either side of the CL

District	Block	Road Name (length)	Salient Environmental Features
Sonitpur	Borchala	Mahkhowajan to Amguri Kachari Road (2.00 km)	• Topography is plain. • Project road passes through patches of agricultural area • 1 mosque is located within 10 m on either side of the alignment. • Few tree cutting and utility/community structure shifting will be required.
Tinsukia	Guijan	Kachujan to Gelapukhuri Road (1.890Km)	• Topography is plain. • Project road passes through patches of agricultural area • 1 school is located within 10 m on either side of the alignment. • Few tree cutting and utility/community structure shifting will be required.
Udalguri	Kalaigaon	Batabari No1 to Hatibandha Road (1.70 km)	• Topography is plain. • Project road passes through patches of agricultural area • Inhabited areas are at LHS:0+080 - 0+170, 0+200 - 0+700, 0+880 - 1+000, 1+130 - 1+170, 1+230 - 1+590 and RHS: 0+000 - 0+200, 0+605 - 0+720, 0+820 - 0+850, 1+340 - 1+400, 1+540 - 1+630 • Few tree cutting and utility/community structure shifting will be required. • 1 temple is identified within 10 m on either side of the CL. The structure would be affected due to the proposed improvement.

86. The overall summary of the key environmental features within 10m corridor of impacts of the tranche 1 roads in Assam is presented in ***Appendix – 3.1***

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

87. Road improvements work brings substantial economic and social benefits to rural communities and national economies. However, it may also cause adverse environmental impacts though of smaller magnitude, since rural road subprojects aligned along the existing road alignments and will be of 7.5 m width only (in special cases it will be between 4-6m).. The impacts are expected largely during construction phase, which can be mitigated through engineering measures and adoption of best construction practices. This section outlines the identified impacts during design, construction and operation phases along with proposed mitigation measures for eliminating or minimizing the adverse impacts.

88. The associated environmental impacts are assessed considering present environmental setting of the project area, nature, and extent of the proposed activities. Impacts are analyzed on both generic and specific nature and are classified as insignificant, minor, moderate and major.

89. Since the issues associated with most of the roads are similar, the impacts and mitigation measures given below are applicable to most of the subprojects. Any issue specific to a road, is separately mentioned.

A. Common Impacts during Design and Construction Phase

1. Climate change

90. **Impact**: The proposed roads are analyzed considering climate change vulnerability screening checklist defined under EARF to RCIP. The resource (like borrow earth, aggregate, cement, concrete) requirements for these rural roads as such are minimal. None of these resources is likely to be affected by climate changes (such as changes in temperature and precipitation). None of the project roads passes through protected areas. Most of the sample roads (23 out of the 25 samples) are prone to flood from river/streams, ponds and due to heavy rains (**Table 4.1**). One of the sample roads Joypur Pichala to Durpang in Lakhimpur district has 54 nos. small and medium ponds along the project road corridor. Adequate engineering measures are adopted to protect the roads. The entire Assam state fall under zone V indicating highest level of seismicity. All the subproject roads therefore are prone to earthquake. The habitation is less along these rural roads and as such, no exponential population growth is expected considering the generic trend of population migration from rural to urban areas. Most of the sample roads pass through agricultural fields and along the existing road alignments with low embankment height of 1m (average) from ground to crust except at the approaches to cross drainage structures. As such, the subproject roads are unlikely to be vulnerable or increase the vulnerability of surrounding areas (with respect to population growth, settlement patterns, increasing runoff or landslides).

Table IV.1 : List of Sample Subproject Roads Prone to Flood and Erosion

District	Block	Name of Road	Road length (km)
Barpeta	Chenga	Batgaon to Kadamtola Road	1.00
Bongaigaon	Boitamari	Garoimari to Garoimari I	0.810
Cachar	Narsingpur	T01 to Bishnupur FV	*2.500*
Darrang	Pachim Mangaldoi	Bezpara No. 2 (B. J. Road, part) to MPK Road	0.824
Dhubri	Mahamaya	NH 31 to Pasuarkhal Pt-III Road	1.00
Kamrup	Dimolia	T08 to Rewa Pathar Road	3.600
Nagaon	Pakhimaria	Nonoi Dakhipat Road to Rangalumukh	1.68
Nalbari	Pub Nalbari	Sandha LP School to Katra HE School	2.200

		Road	

91. **Mitigation Measures**: Roads will be designed considering IRC guidelines for earthquake prone areas. Compensatory tree plantations[3] (1:3) will be made to compensate the loss of trees if any for the construction of sample roads. Additional efforts shall be made for tree plantation wherever feasible. All non-sample rural roads to be included in RCIP, will also be screened for climate change vulnerability and necessary mitigation measures shall be adopted for minimisation of identified vulnerability if any.

2. Finalization of Alignment

92. **Impact**: The proposed rural road will be constructed to provide 7.5 m roadway in accordance with PMGSY guidelines and technical specifications (IRC-SP 20: 2002) for plain terrains. Sample rural road are aligned to existing road (earthen track with some stretches of brickbat soling). The existing road passes through plain terrain and primarily agriculture areas. None of the sample roads passes close to any protected monument or through protected areas. Impacts due to road alignment and design is expected to be minor and limited to shifting of some common utilities, community structures (temple, school) and cutting of trees falling within road way.

93. **Mitigation Measures**: The road alignment is finalized considering availability of right of way. The ROW is reduced in built up area or constricted areas to minimize land acquisition. The road alignment is modified to avoid tree cutting, shifting of utilities or community structure to the extent feasible. The road is designed to follow natural topography to avoid excessive cut and fill. All future roads to be included in RCIP will follow above measures. In addition these subprojects will comply with the following alignment finalization criteria:

a. The road will be part of district core network and will comply with PMGSY guidelines

b. Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.

c. Subproject will not pass through any designated wildlife sanctuaries, national park, notified eco-sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area..

d. Subproject to comply with local and National legislative requirements (such as forest clearance for diversion of forest land) and ADB's Safeguard Policy Statement 2009.

3. Land Acquisition

94. **Impact**: Minor impact, since no land acquisition is involved due to various measures considered for finalization of road alignment. Villagers have volunteered to donate their land if at certain stages land is required for geometrical correction or alignment adjustment for avoiding tree cutting or shifting of community structure. There could be some impact on the encroachers; however, most of them have also volunteered to shift from the proposed alignment.

95. **Mitigation Measures**: All efforts shall be made to minimize the land acquisition while finalising the alignment. In an unavoidable situation, adopt suitable engineering measures to reduce the ROW requirement or donation of land from landowners. In the encroached areas, efforts shall be made to restricted road construction to the available space.

4. Protected Areas (National parks, wildlife sanctuaries, Eco sensitive zones, protected /historical monuments) and Forest Areas.

[3] SRRDA mostly undertake this activity through state forest department. The forest department plants tree either along the proposed roads if land is available otherwise on nearby degraded forest land.

96. **Impact**: Assam state including the project districts has many wildlife sanctuaries but none of it is located close to the sample project roads. None of the sample road passes through any forestland and as such, project has no impact on forest cover of the state/Country. Assam is also known to have several national parks and sanctuaries located in various parts of the state. However, none of them is located in close vicinity of sample project roads.

97. **Mitigation Measures**: As there are no protected/ecologically sensitive areas in the subproject areas, no such measures are proposed. In case of a diversion of forest land, prior forest clearance shall be obtained under Forest (Conservation) Act 1980 (amended 1988).

5. Land Clearing Operations

98. **Impact**: The site clearing operations may have impact on common utilities, community properties, land use and vegetation profile of the area if adequate considerations not given to road alignment finalization, utility and community structure shifting plan, tree felling, and demolition waste disposal.

99. **Mitigation Measures**: The following steps shall be taken to minimise the associated impact with land clearing operations.

a. The land clearing operation should be undertaken as per the defined road alignment and community structure, utility and road furniture-shifting plan.

b. The road land width shall be clearly demarcated on the ground.

c. The utility and community structure shifting shall be as per plan and with consultations and concurrence of the community.

d. Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a permission of Forest department. The vegetable cover shall be removed and disposed in consultation with community.

e. All public utilities shall be shifted with a concurrence of respective agencies/authority and to the adjacent location approved by them.

f. The top soils shall be collected and preserved for reuse as a base for turfing of embankment slopes or development of barren areas along roadside. The top soil shall be preserved at identified location with the provision of watering /grass development on the heap surface to prevent air pollution.

6. Cut and Fill and Embankment construction

100. **Impact**: Inadequate alignment planning may increase the cut and fill requirement as well as need for more borrow earth for embankment formation leading to some impact on land use. Inadequate provision for drainage and embankment slope protection may lead to soil erosion. Due consideration is given to above aspect for alignment finalization of sample road. With the adoption of appropriate mitigation measures, the impact due to above activity on land use and other environmental component is expected to be minimal.

101. **Mitigation Measures:** The alignment design shall consider options to minimise excessive cuts and fills. The cut and fill quantities shall be used for embankment to minimise barrow earth requirement. The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. Adequate provision shall be made for cross drainage structures for maintaining natural drainage pattern in the subproject area and preventing soil erosion. The top soil of the cut and fill area shall be used for embankment slope protection.

7. Establishment of Construction Camp, Temporary office and Storage Area

102. **Impact**: The congregation of labor population and technical staff in the subproject area during the construction phase is likely to put considerable stress on the limited resources of village areas. Some of the associated impacts are related to health, safety of the laborers at the construction campsites, availability of safe drinking water, and sanitation.

103. The establishment of construction camp temporary office and storage area will reduce land productivity if these are established on agricultural land. Loading and unloading of construction material, transportation of material, handling of fuel and waste disposal from these areas may have direct and indirect impact on soil, water and air quality

104. **Mitigation Measures**: The following steps shall be taken to minimise/reduce these impacts:

- Construction campsites shall be located away from any local human settlements (minimum 500m away) and preferably located on lands, which are not productive barren/waste lands presently. Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m).
- The construction camps, office and storage areas shall have adequate water supply, sanitation and all requisite infrastructure facilities. This would minimize dependence of construction personnel on outside resources, presently being used by local populace and minimize undesirable social friction thereof.
- The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas.
- The construction camps, office and storage areas shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.
- All construction camps shall have rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.
- The construction camps, office and storage areas shall have health care facilities for adults, pregnant women and children.
- All construction personnel shall be subjected to routine vaccinations and other preventive/healthcare measures.

- Contractor shall arrange all personal protective equipment (PPEs) like helmet, boots, and earplugs for workers, first aid and fire fighting equipment at construction sites. An emergency plan shall be prepared to fight with any emergency like fire.
- Garbage bins must be provided in the camp and regularly emptied and disposed off in a hygienic manner. Domestic solid waste shall be disposed of in a control manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling.
- All fuel oil/lubricant unloading and storage shall be made on the paved areas away from storm water drainage.
- After completion of construction work, the camp /temporary office/storage areas sites shall be restored to its original condition.

8. Traffic Movement

105. **Impact**: Construction work along the existing road could cause disturbances to traffic movements. It will also pose risk of accident to motorist at night if these blockages and disruption are not clearly demarcated.

106. **Mitigation Measures**: The contractor will prepare appropriate traffic diversion scheme, which shall be implemented in different stretches of the road as per the progress of the construction work. This plan shall be approved by PIU and implemented before start of any construction work to avoid any inconvenience to the present road users. The diversion plan should ensure smooth flow of traffic, minimise accidents to road users during construction works. Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and visible and retro reflective in nature for day and night visibility.

9. Associated Impacts due to Construction Activities

a) Loss of productive soil, erosion and land-use

107. **Impact**: No land use will change due to the project, since required ROW is available throughout the alignment. Land use though will change temporarily of construction camp, temporary office storage areas for the period of construction. This will also result in loss of soil productivity. Soil erosion may take place along steep and un-compacted embankment slope, and wherever vegetation is cleared. Soil erosion may have cumulative effect viz. siltation, embankment damage, drainage clogging etc. The siltation, due to soil erosion may occur only in the ponds located close to the roads. There are approximately 14 roads in Assam located near river or flood prone area. Erosion may increase due to proximity to these water bodies and flooding of the area. Loss of soil due to run off from earth stockpiles may also lead to siltation. Land use may also change due to borrowing the earth.

108. **Mitigation Measures**: It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities, is restored back to its original land use before handing it over back to land owner. The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. Therefore, cut and fill shall be planned as per IRC provisions and rural road manual. All steep cuts shall be flattened and benched. Shrubs shall be planted in loose soil area. IRC: 56 - 1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. Soil erosion shall be visually checked on slopes and embankment areas. If soil erosion observed, suitable measures shall be taken to control it.

b) Borrow Areas and Quarries

109. **Impact**: Borrow areas if left un-rehabilitated may pose risk to people, particularly children and animals of accidentally falling into it. This may also become potential breeding ground for mosquitoes and vector born disease. Illegal quarrying may lead to unstable soil condition; destroy the landscape of the terrain, air and noise pollution.

110. **Mitigation Measures**: Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. The borrow earth shall be sourced from identified locations and with prior permission of landowner and with clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and quantity that can be borrowed. The borrow area shall be located/ rehabilitated as per the guidelines given at **Appendix 4.1**. Fly ash shall also be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. The stone aggregate shall be sourced from existing licensed quarries only. The quarry should have requisite consent to operate from State Pollution Control Board. No new quarry shall be opened for the proposed project.

c) Hydrology and Drainage

111. **Impact**: The activities involved with proposed road development may alter the hydrology and drainage pattern of the area in absence of adequate provision for cross drainage structure, construction wastes disposal and drainage in habitat areas.

112. None of the sample roads is crossing any natural stream except T2 to bosagaon (na-pamowa Ali) in golaghat district, alengi chungi road and bogargaon chakilal road in jorhat district, which run close to Kachajan River, Jiladhari, and Bhukajan River respectively. Adequate engineering measures are proposed for protection of road from flood in Kachajan River, Jiladhari, and Bhukajan River. There are many other roads (Table 4.1) which are prone to flood due to accumulation of heavy rainwater. Certain project roads are crossing local and seasonal drains. Village ponds are also located close to few roads. The impact on hydrology and drainage pattern is expected to be minimal.

113. **Mitigation Measures**: The provision of adequate cross drainage structures shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. Road levels shall be designed considering HFL. Low costs measures like using locally available bamboo or eucalyptus tree will be adopted for embankment protection and control of soil erosion. Other slop stabilisation measure like vegetative protection will be made additionally. The construction work shall be planned in dry season so that water quality of the water channel is not affected due to siltation. Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment and to ensure minimum disturbance to natural drainage of surface and subsurface water of the area. Provision of additional cross drainage structures shall be made in the areas where nearby land is sloping towards road alignment in both the both sides.

114. Provision of CC road construction in habitat area with drainage of both side of the road shall be made as per the design specifications and with adequate slope to prevent any water logging.

d) Compaction and Contamination of Soil

115. **Impact**: Soil in the adjoining productive lands beyond the ROW, haulage roads, and construction camp area may be compacted due to movement of construction vehicles, machineries, equipments and construction camps/storage facilities. It may get contaminated due to inappropriate disposal of liquid waste, (lubricating oil and fuel spills, waste oil and

lubricant and vehicle/equipment washing effluent) and solid waste (fuel filters, oily rags) likely to be generated from repair and maintenance of transport vehicles, construction equipment and machinery.

116. **Mitigation Measures**: To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. The productive land shall be reclaimed after construction activity. Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. The non-biodegradable and recyclable waste shall be sold off. Fuel and lubricants shall be stored at the predefined storage location. The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.

e) Construction Debris and Wastes

117. **Impact**: Uncontrolled disposal of debris and waste may create unhygienic and unsafe condition around the disposal areas.

118. **Mitigation Measures**: All excavated materials from roadway, shoulders, verges, drains, cross drainage shall be used for embankments formation if feasible, filling pits, and landscaping. Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. MOSRTH guidelines shall be followed for debris, wastes removal and disposal at unproductive/wastelands which shall be selected with the consent of villagers and Panchayat. The dumping site should be of adequate capacity and to be located away from residential areas (at least 500m away). It should also be located away from water bodies to prevent any contamination of these bodies.

f) Air Quality

119. **Impact**: The potential sources of air emission during the construction phase of the project are given below which can cause localised air pollution.

- Dust from earth works (during site preparation).
- Emissions from the operation of construction equipment and machines.
- Fugitive emissions from vehicles plying on the road, during the transport of construction materials.
- Emissions other than dust particularly from the hot mix plants and laying of bitumen. Hot mix plant will generate carbon monoxide (CO), un-burnt hydrocarbon (HC), sulphur dioxide (SO_2), particulate matters (PM), and nitrogen oxides (NOx) emissions.
- Localised increased traffic congestion in construction areas. Most of the emissions will be in the form of coarse particulate matter, which will settle down in close vicinity of construction site. This may affect the air quality of nearby areas, especially, due to emission discharge from low height of the stack.

120. **Mitigation Measures**: All these impacts will be temporary and hence, no significant impact is envisaged. The following measures will be taken to minimise these:

- Vehicles delivering loose and fine materials like sand and aggregates shall be covered.
- Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads[4], earthworks, stockpiles and asphalt mixing plant areas.
- Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements.
- Material storage areas shall also be located downwind of the habitation area.
- Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by state pollution control board (SPCB) to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions.
- Diesel Generating (DG) sets shall also be fitted with stack of adequate height. Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained.
- The requisite PPE (helmet, mask, boot, hand gloves) shall be provided to the construction workers.

g) Noise Quality

121. **Impact:** Ambient noise level may increase temporarily in the close vicinity of various construction activities, maintenance workshops, vehicles movement and earthmoving equipment.

122. **Mitigation Measures**: The noise level will be intermittent and temporary and will attenuate fast with increase in distance from noise source. Further, vehicles and equipment should be fitted with silencers and maintained regularly. The workers shall be provided with personal protection devices such as earplugs and earmuffs.

[4] Water suppression of fugitive dust can reduce emissions from 12% to 98%.

h) Groundwater and Surface Water Quality and Availability

123. **Impact:** Water will be required for compaction of formation and domestic purposes in the workers camp. These requirements will be mainly sourced from groundwater. Any uncontrolled abstraction of ground water can deplete the ground water table fast. Contamination of groundwater is not envisaged since all construction camps will have septic tanks or mobile toilets depending on the number of workers in each camp. The drinking water supply to the habitat is primarily through hand pumps and bore wells. No significant impact is anticipated on surface water bodies except probability of siltation during construction. Due to non-perennial nature of surface water bodies, water requirements for drinking and construction purpose shall be met from ground water sources.

124. **Mitigation Measures**: Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority[5] if applicable. The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. Water intensive activities shall not be undertaken during summer period to the extent feasible. Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting. Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. Measures are already purposed in earlier section for prevention of siltation in water bodies.

i) Biological Environment

125. **Impact:** Since the sample roads are not passing through any protected areas or forest area, there is no diversion of forestland**.** The major adverse impacts will be due to tree cutting, Siltation and contamination of water bodies may affect the aquatic life particularly pond fisheries.

126. **Mitigation Measures:** All efforts shall be taken to avoid tree cutting wherever possible. Requisite permission from forest department shal**l** be obtained for cutting of roadside trees. Compensatory Afforestation shall be made on 1:3.ratio basis. Additional trees shall be planted wherever feasible. All care shall be taken to avoid siltation/contamination of water bodies. Movement of herbivores like cattle, goats, cows, etc. have been observed in the surrounding agriculture fields. Disturbance to these animals will be avoided to the extent possible.

j) Impact on Common Property Resources

127. **Impact**: There are public utilities like Electric transformer, electric poles, and hand pumps all along the rural roads. The road construction may require shifting of these utilities. There are many community structures like school, playground village office temples.

128. **Mitigation Measures**: All efforts are made to minimize shifting of common utilities and community structures. ROW has been reduced in constricted areas with appropriate engineering measures to minimize land acquisition and shifting of community structures. The community structures/utilities which can not be saved will be shifted to adjacent area with the concurrence and in consultation with community.

[5] As per Central Ground Water Authority (CGWA), there are 43 notified blocks in India where prior permission is required fro extraction of ground water. Currently there are no notified areas in Chhattisgarh state. CGWA is continually updating the list of notified areas.

B. Common Impacts during Operation Phase

1. Air Quality

129. **Impact**: Decrease in air quality due to increase in traffic, idling at congestions.

130. **Mitigation Measures**: The bad road condition is the main cause of poor air pollution at present. The improved road conditions will result in the improved ambient air quality. In addition, the subproject road is largely traversing through vast open agriculture areas, which will provide adequate dispersion to gaseous pollutants, generated from vehicles and will offset the increased pollutants.

2. Noise

131. **Impact**: During the operational phase, movement of traffic will be the prime source of noise. Traffic congestion and pedestrian interferences increase the use of horns. This may result in increased noise levels at habitat areas, nearby schools and religious places.

132. **Mitigation Measures**: Awareness signboard shall be provided for safe driving near the habitat areas. Speed limitation and honking restrictions may be enforced near sensitive locations.

3. Land, Soil, Tree Plantation

133. **Impact**: The better access can lead to conversion of agriculture land for residential and commercial purposes close to roads, which may result in loss of productive land and agricultural produce. Since the rural road are aimed at connecting the villages, and with the general trend of migration of rural population to urban areas, the phenomena of conversion of agriculture land to residential area is unlikely to change.

134. The land occupied for construction camp /temporary office/material storage area will remain unproductive if it is not restored after completion of construction activities.

135. It shall be essential to ensure the survivability of the compensatory tree planted

136. **Mitigation Measures** It shall be ensured that all construction camp/temporary office/material storage areas are restored to its original conditions. The borrow area rehabilitation will also be ensured as per the agreed plan with the landowner. Contractor and PIC will ensure the same and obtained clearance from PIU before handling over the site to SRRDA.

137. The PIC will undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required.

4. Groundwater

138. No impact is anticipated on groundwater due to the project during operation phase, hence, no specific mitigation is proposed.

5. Hydrology and Drainage

139. **Impact**: Water accumulation incidence may occur due to inadequate availability of cross drainage structure or clogging of cross drainage structures.

140. **Mitigation Measures**: Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted.

6. Socioeconomic Impact

141. Assessment of project impact on socioeconomic conditions point to the conclusions that positive benefits are many fold compared to its adverse impact.

142. **Positive Impacts**: The better road access is likely to contribute the overall economic condition of village community. With the quick access to urban market areas, the farmers are likely to get better prices for their farm produce. Children will also be able to access the school and education facilities in the near by urban areas.

143. **Safety Measures** shall be adopted as per NRRDA guidelines. Some of them are highlighted below :

- Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain in rolling terrain.
- Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation.
- The speed breakers are provided and directional sight boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required.
- Hazard markers to be installed at each end of all box culverts, river crossing causeways and similar CD structures
- Shoulder side slopes shall not be steeper than 2h: 1V unless stone pitching of the slopes is provided.
- Cement concrete pavement and V-shaped drain is constructed to the full width of the available roadway within densely populated habitation.
- Directional sight board are installed on all sharp curves and bends
- At main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road.

C. Road Specific Impacts

144. The assessment of sample roads indicates that environmental issue associated with all the roads are similar except two roads (Table 4.1), which are prone to flood. Hence, mitigation measures applicable to the entire road are also will be similar except variation in terms of magnitude, which will depend on length of the road, the presence various environmental components. These components may be assessed in terms of no of pond, number of community structure (mostly temples, playground, school, gram Panchayat office) likely to be shifted, number and type of common utilities (hand pump, water tank, electric transformer, electrical poles).

V. ENVIRONMENTAL MANAGEMENT PLAN, INSTITUTIONAL ARRANGEMENTS AND GRIEVANCE ADDRESS MECHANISM

A. Environmental Management Plan

145. The Environmental Management Plan (EMP) is prepared to facilitate effective implementation of recommended mitigations measures with defined roles and responsibility for implementation and monitoring, regulatory compliance requirements, stages of implementation with location, period and costs. The mitigation measures are proposed to eliminate or minimise the identified impact associated with design, construction and operation stages of the project, to acceptable level by adopting the most feasible options.

146. The EMP is prepared as per Environmental Management Standard (ECOP) applicable to rural road defined in the EARF for RCIP.

147. The identified impacts are insignificant and are related to clearing operations of RoW, traffic diversions, setting and operation of construction camps, quarry and borrowing operations, transportation of materials, construction of cross drainage structures, air & noise pollution due to construction activities and operation of construction equipment, tree cutting and shifting of utilities and physical community structure.

148. Appropriate mitigation measures are identified for all rural road construction and operation activities. The identified impacts associated with rural roads and mitigative measures are largely common to most of the roads. The EMP is detailed at **Appendix 5.1**. It provides action common to all roads at pre construction, construction and operation stage. Since IEE is carried out, prior to preparation of DPR, the EMP will be updated specific to road as per DPR requirements by PIU and included with DPR, which shall be available to contractor at the time of bidding. The areas to be updated as per DPR provisions are highlighted under location column of EMP.

149. Since, these are rural road, the vehicular density and speed will be low. Movement of vehicles would be confined primarily for transfer of agricultural produce to market places. As such, no major emergency is anticipated. In any accidental eventuality, local administration can be reached quickly for help though Gram Panchayat (village administration) communication systems.

B. Environmental Monitoring Plan

150. The environmental monitoring program is prepared with aim to monitor the environmental performance of environmental management plan. The EMOP is planned with the focus on following objectives:

- To the assess the effectiveness of mitigation measures proposed
- To assess the change in environmental quality during construction and operation stage with respect to before the project scenario.
- To assess compliance to regulatory requirements
- To monitor the status of corrective action taken in case of deviation from the planned measures or regulatory requirements.

151. For rural roads, Environmental Monitoring plan will be more observation oriented and it provides observation areas with frequency of monitoring at pre construction aspects[6], construction stage and operation stage. A monitoring plan with monitoring indicator and frequency of monitoring is given at **Appendix 5.2.**

C. Institutional Arrangements and Responsibilities

1. Institutional Arrangement

152. NRRDA constituted by MORD is the nodal agency for the implementation of PMGSY in India. SRRDA is the state level agency responsible for implementation of PMGSY program in the state. NRRDA has developed various guidelines and defined institutional arrangements for effective and timely implementation of PMGSY program, which also covers measures for environmental and social safeguards. In line with the defined institutional requirements, each SRRDA has set up district level project implementation units (PIUs). NRRDA also appoints Technical Support Consultant (TSC) to provide technical support for capacity building in SRRDA/PIUs, facilitating them for environmental and social safeguard compliance monitoring and due diligence. SRRDA appoints PIC (project implementation consultant) for supervision of construction work. PIC also helps PIU in monitoring the EMP.

153. NRRDA is also responsible to coordinate with SRRDA and ensure compliance to ADB safeguard requirements.

154. The institutional arrangement at National Level and state level for implementation of PMGSY including RCIP is shown at **Figure 5.1.**

2. Institutional Environmental Responsibilities

155. The institutional environmental responsibilities for different level and function is elaborated below.

156. MORD,[7] the executing agency, has the responsibility for monitoring implementation of the EMP for all subprojects and undertaking necessary due diligence. MORD ensure this through its Nodal Agency NRRDA (National Rural Road Development Authority). MORD will also ensure that:

a. ADB is given access to undertake environmental due diligence for all subprojects, if and when needed as per EARF requirements;

b. SRRDA meet all environmental assessment requirements in accordance with EARF;

c. It undertakes random monitoring of the implementation of the EMP;

d. Ensure compliance to legislative requirements such as forest clearance for diversion of forest land for non-forest purposes and Consent to Establish/Operate for hot mix plant, batching plant; and

e. Appoint Technical Support Consultant (TSC) to assist SRRDA for various environmental aspect and safeguard compliances.

[6] Aspects related to alignment selection for inclusion of new roads.
[7] MoRD implements it through its nodal agency NRRDA which undertakes this with the help of Environmental Expert of Technical Support Consultant.

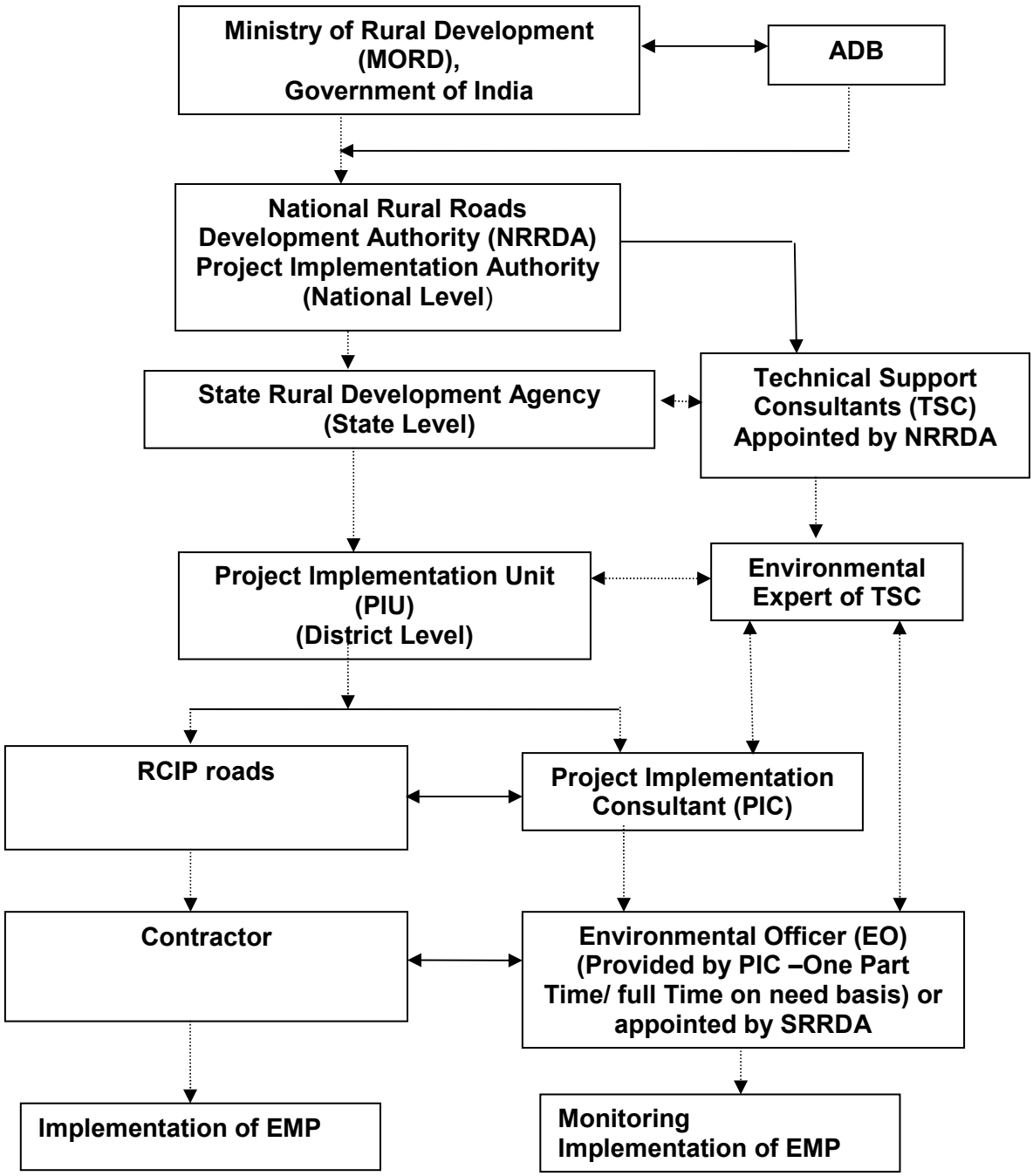

Figure V.1 : Institutional Arrangement for EMP Implementation

157. SRRDA[8] will ensure that:

a. ECOP checklist is prepared for each road;

b. The completed ECOP checklist is included in the DPR with the help of PIC;

c. Ensure that all required statutory environmental clearances are obtained and comply with clearance conditions;

d. Ensure that the subproject specific EMPs and respective budget are included in the bidding documents;

e. Ensure that the ECOP checklists and EMP (including general and site specific issues) are made available to the contractors;

f. Undertake routine monitoring of the implementation of the EMP including spot checks on site and prepare monitoring reports at least once a year;

g. With the support of technical support consultants prepare satisfactory environmental due diligence reports of the earlier tranche/periodic financing request before implementing the next tranche; and

h. Appoint Project Implementation Consultant (PIC) for construction supervision and assist PIUs for EMP implementation and related safeguard compliances.

158. PIU will be responsible to:

a. Complete the ECOP checklists and prepare subproject specific EMPs (including monitoring plan) for each subproject;

b. Obtain necessary statutory environmental clearance prior to commencement of civil works;

c. Update the respective ECOP checklists and EMPs if there are any changes in alignment of the subprojects;

d. To conduct monitoring of all subprojects and prepare pre-, during and post-construction monitoring checklists through the project implementation consultants; and

e. Prepare and submit to SRRDA annual monitoring report as per ADB defined format.

159. The Technical Support Consultants (TSC) appointed by NRRDA. The Environment Expert of TSC will:

a. Provide technical assistance to SRRDA/PIU regarding environmental aspects, environmental permitting/clearances requirement;

b. Periodically review EMP implementation status including spot site inspections;

c. Conduct workshops/capacity building program at different level and functions;

d. Prepare environmental Due Diligence report for each tranche before implementing next tranche; and

e. Prepare state Level IEE reports and EMPs for non sample roads based on the ECOP checklist completed by the PIC.

[8] With assistance from PIU (Project Implementation Unit).

160. Project Implementation Consultant (PIC) is appointed by SRRDA. PIC will provide one Environmental Officer (EO). The EO will be responsible to ensure adherence and implementation of EMP at all stages of works by the contractor. The EO, if found warranting may also conduct field tests, independent of the contractor to determine the effectiveness of EMP under approval of PIC/PIU. The broad duties/responsibilities of the Environmental Officer will include:

- Reviewing project design and specifications to ensure their adequacy and suitability with respect to the implementation of EMP;
- Collecting and disseminating relevant environmental documents including amendments to environmental protection acts issued by the various agencies, namely, ADB, Government of India / State and local bodies;
- Interacting with the counterpart of the Contractor(s), review work progress/plans and ensure implementation of the EMP;
- Coordinating with the NGOs, community groups and government departments on environmental issues, provide clarifications/ and obtain clearances during project implementation if any, as required from the regulatory authorities and/or submitting periodic compliance reports as required by the State Authorities;
- Monitoring sensitive environmental attributes during construction and operation stages[9] to ensure that the suggested mitigation measures in the EMP are implemented;
- Facilitating PIU for preparation of annual monitoring report as per ADB defined format;
- Documentation of the environmental management/monitoring activities for the regular project implementation progress report, which will serve as the basis for the annual environmental monitoring reports; and
- Conducting environmental training/awareness programs for the contractors, the project implementation personnel and the communities.

161. Contractor is appointed by SRRDA for construction of road and ensures implementation of EMP proposed. The broad duties of contractor are as follows**:**

- Make adequate costs provision for EMP requirements while biding
- Ensure effective implementation of mitigative measures as per road specific EMP
- Comply with all applicable legislative requirements and obtain necessary consents for to Establish/Operate before start of hot mix plant and batching plants. Comply with all permit conditions
- Create awareness amongst workers for environment, occupational health and safety aspects. Participate in training and awareness programme along with its executives conducted by PIC.
- Provide PPE and adequate resources for Environment Occupational Health and Safety

[9] Normally PIC is supposed to undertake five site visits and five monitoring reports as per contracts being issued by different SRRDA. It is proposed that PIC shall submit the following five monitoring reports: (1) First report at pre construction stage, (2) Second report after three months of start of construction or on completion of 25% construction, (3) Third report after seven months of start of construction or on completion of 75% of construction, (4) Fourth report after one month of completion of construction and first year of operation stage, and (5) Fifth report in second month of second year of operation stage.

- Follow all the guidelines for borrowing earth and restoration of borrow areas, setting up construction camps
- Sourcing of quarry material from approved quarries only
- Provide all required input to PIC for environmental monitoring as per EMP.

D. Environmental Assessment and Review Framework (EARF) for RCIP

162. ADB has prepared an Environmental Assessment and Review Framework (EARF) which identifies the broad scope of the MFF, outlines the policy, environmental screening and assessment, and institutional requirements for preparing the environmental assessments to be followed for subsequent batches and tranches. This EARF also specifies criteria for eligibility for selection rural roads under RCIP. The sample roads are selected following these criteria. The EMP, monitoring requirement, institutional aspects, capacity building, grievance redress mechanism presented in this chapter are developed in line with above EARF. The eligibility criteria for selection of roads under RCIP, environmental assessment requirement for each tranche and legal framework are given below.

1. Selection Criteria and Environmental Assessment Requirement

163. The following criteria will be followed for selection of non sample roads.

(i) No Category A (as per ADB's SPS) subproject will be included in the MFF.

(ii) Subprojects will be eligible for construction or upgrading in accordance with the PMGSY guidelines, and be included in the respective district core network.

(iii) The subprojects shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.

(iv) The subproject will not pass through any designated wildlife sanctuaries, national parks, other sanctuaries, notified ecological sensitive areas or area of internationally significance (e.g., protected wetland designated by the Wetland Convention).

(v) The projects shall only involve activities that follow Government of India laws and regulations, ADB's Safeguard Policy Statement (2009)

164. The following environmental Assessment requirement will be followed roads included under RCIP

(i) ECOP checklists with annexes on trees, utility structures, community structures, strip plans and photographs will be completed for each and every road.

(ii) Based on the requirements of the PMGSY guidelines separate ECOP checklists will be prepared for bridges that are longer than 15 m.

(iii) Based on the completed ECOP checklists for roads and bridges, IEE reports will be prepared at a state level. These reports must contain a general EMP and a site specific EMP where there are site specific issues.

(iv) ADB's REA checklist for roads and highways will be completed based on the state level IEE reports prepared and submitted to ADB to confirm categorization

165. The vulnerable to climate change will also be screened following screening checklists, which was integrated in the ADB REA Checklists and corresponding mitigation measures will be prepared.

(i) Is the project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes

(ii) Could changes in precipitation patterns or evaporation rates over the lifespan of the project affect its sustainability and cost (i.e., increased landslides increase maintenance costs)?

(iii) Does the project use or depend on resources which could be affected by climate changes such as changes in temperature, precipitation, wind (increased soil moisture content in the sub-grade)?

(iv) Are there any demographic or socioeconomic aspects of the subproject and project area (e.g., population growth, settlement patterns) that increase the vulnerability of the project and surrounding area?

(v) Could the subproject potentially increase the vulnerability of the surrounding area (i.e., by increasing runoff, encouraging settlement in earthquake zones)

2. Legal Framework

166. As per Indian legislation, an environmental clearance is not required for rural roads. However, it may attract provisions of Forest Conservation Act, Wildlife (Protection) Act, and other legislation related with Air, Water and Noise pollution controls and prevention. The legislative applicability screening is presented in chapter 1 of this report and it will apply for non-sample road as well. Additionally, to ensure conformance to ADB's Safeguard Policy Statement, 2009 (SPS 2009), the subprojects will be subject to the following requirements:

(i) Submission of a completed Rapid Environment Assessment (REA) checklist for Roads and Highways and a categorization form for each state level IEE that is prepared;

(ii) An Initial Environmental Examination[10] (IEE) report including the preparation of an Environmental Management Plan (EMP) and a Monitoring Plan; and

(iii) Regular monitoring of implementation of the EMP and submission of monitoring reports and due diligence reports to ADB as necessary.

E. Capacity Building

167. Existing capacity of the State Rural Roads Development Agencies (SRRDAs) and Project Implementation Units (PIUs) for implementing environmental safeguard issues need substantial strengthening. Capacity building activities will mainly comprise training workshops for SRRDA and PIU environmental officers on (i) completion of environmental code of practice (ECOP) checklists; (ii) preparation of environmental management plan (EMP) and monitoring plans; (iii) monitoring of EMP implementation and completion of pre-, during and post-construction monitoring checklists; and (iv) preparation of monitoring reports. These few workshops have already been conducted at participating states though ADB appointed Environmental specialist. Additional training will be carried out periodically, by in-house trained and experienced officials.

F. Consultation and Information Disclosure

[10] As per selection criteria, no Category A subproject will be included under RCIP.

168. During the preparation of ECOP and Detailed Project Report (DPR), the PIU has to ensure consultation, and addressal of concerns of the affected people.

169. All environmental assessment documents are subject to ADB's Public Communication Policy (2011) and will be made available to the public, upon request. The SRRDAs are responsible for ensuring that all environmental checklist documentation, including the environmental due diligence and monitoring reports, are properly and systematically kept as part of the Investment Program specific records. MORD must disclose state specific sample road IEE reports on its website.

G. Grievance Redress Mechanism

170. PRI administered village level committee is the first contact point for any aggrieved person. This committee will try to settle the concern by them self or in consultation with contractor or PIU. The unresolved concerned are forwarded to PIU for further action. PIU resolves these concerns in consultation with PIC, SRRDA, and contractor as the situation demands. This is an established practice and is seen effective enough in RRS II. PIC will also collect concerns received by this committee in the intervening period and report the effectiveness of action taken.

171. At national level, NRRDA has made provision of registering complaint/suggestion through its website. NRRDA forwards these complains to concerned SRRDA for necessary actions. SRRDA directly or through concerned PIU initiate the appropriate action and update the complainant as well as NRRDA. It is proposed that NRRDA website will be cross-linked to each SRRDA website as well or SRRDA will also make provision of complain registry at its website.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. General

172. Public consultation was undertaken consistent with the ADB requirements. All the five principles of information dissemination, information solicitation, integration, coordination and engagement into dialogue were incorporated in the consultation process. A framework of different environmental impacts likely from the project was strengthened and modified based on opinions of all those consulted, especially in the micro level by setting up dialogues with the village people from whom information on site facts and prevailing conditions were collected.

173. Stakeholder's consultations were held with the intent to understand their concerns, apprehensions, overall opinion and solicit recommendations to improve project design. Informal meetings, interviews were organized covering the entire project stretch. The informal consultation generally started with explaining the subprojects, followed by an explanation to potential impacts. Participant's views were gathered with regard to loss of agricultural land, effect on air and noise quality of the area due to traffic, water availability, accident and risk.

174. The discussions were designed to receive maximum inputs from the participants regarding their acceptability and environmental concerns arising out of the sub-project. They were given the brief outline of the project to which their opinion was sought. Suggestions were also sought for mitigating any potential adverse impact.

B. Compliance with Relevant Regulatory Requirements

175. In India, public consultation is mandatory in case of Category A and B1 category projects[11] in select conditions. Being a category B project as per ADB Environmental Guidelines 2003, consultation was carried out during the early stage of IEE report preparation. The requirement of public consultation during the implementation of the project has been proposed as part of the mitigation plan.

C. Beneficiaries' Comments

176. The project has immense acceptability among the local people. They perceived that in addition to providing all weather connectivity, the sub-project road will bring positive socioeconomic changes in the area. Local people mainly discussed on issues related to drainage and commencement of the construction work.

177. Some of the general issues raised during the different consultation sessions can be summed up as follows.

- **Construction Camp** - The participants did not apprehend any adverse impact due to the construction camp near to their villages. They responded positively towards providing support to these, if required, in terms of any food, water requirements.

- **Water Logging and Drainage** - Participants informed about few low-lying areas particularly in along sample roads in Jorahat, Kamrup and Golaghat districts where water logging takes place during monsoon season. The villagers requested for provision of adequate drainage and cross drainage structures at these locations. Villagers also reported for road overtopping in road where they have suggested to raise the road levels.

[11] As per schedule I of EIA notification number S.O. 1533, dated 14th September 2006. This notification also defines when a public consultation is mandatory.

- **Loss of Livelihood and Income Restoration Options** - This issue was raised by those who had encroached on the proposed alignment. However, they offered the encroached space for the proposed project, if demanded.

- **Road Safety** - Safety issues did not raised concern among the inhabitants including women.

- **Land Acquisition** - People were in full support of the project and were ready to donate their land for the same, if required.

- **Losses of Idols/Shrines -** Participants supported the project and were willing to shift the idols, burial grounds and other religious structures observed at certain locations.

- **Loss of Trees Due to Road Construction** - Respondents were of the opinion that trees cutting should be avoided or else minimized. For trees to be cut compensatory plantation should be done. Some villagers expected additional plantation should be done. Recommended tree species for plantation were other local varieties.

- **Impacts on Health** - Separate consultation sessions were organised by social team to identify issues pertaining to health specifically for sexually transmitted diseases (STDs). Settlements along the rural roads were reported to be getting exposed to such diseases, as there are no long distance users on the project roads.

- **Ambient Air & Noise Quality** - The respondents viewed that these are the problems of urban areas and their villages are still untouched from this aspect. They even do not anticipate any of these problems after the completion of the project.

- **Inconvenience during Construction** - The participants viewed that they will manage it as it will be temporary phenomenon.

- **Employment during Construction** - The locals expected that they should be given preference in employment during project implementation.

- **Perceptions and Expectations** - Perceptions and expectations of the community recorded during the consultation sessions can be broadly listed as:
    - The public and the PAPs appreciated and supported the project with their open hearts.
    - Community at large appreciated overall benefits to them resulting from project development;
    - They were aware of the increased access, lesser commuting time after project implementation;

- **Addressal of Issues** - The project has tried its best to address all the issues raised during consultations under the constraints of suitability from engineering point of view. Some of the provisions made under the project to address the issues and concerns of the community are given in **Table VI.1.**

Table VI.1 : Addressal of Issues and Concerns under the Project

Issue/Concern	Addressal under the project
Water Logging and Drainage	Adequate cross drainage structures have been planned
Road Safety	Adequate safely signage planned all along the rural road.
Land acquisition and Mode of compensation	The proposed RoW is 12m along the rural road. No land acquisition is planned in project road.
Loss of roadside idols/shrines	Idols and shrines will be relocated to the other nearby places with consultation and proper rituals
Loss of trees	Compensatory afforestation would be done at the ratio of three trees for each tree to be cut.
Increased pollution levels	Pollution levels are not crossing the prescribed limits of CPCB and planned plantation will screen the emission.
Utilities and basic infrastructure	All the utilities, electric poles, telephone lines, wells, tubewells etc. to be impacted will be relocated under the project cost.
Employment of locals during construction	Locals will be given preference for employment during the project implementation

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

178. The findings of Environment Assessment of sample roads indicate that impacts are mostly similar and subprojects are unlikely to cause any significant environmental impacts. While some of the impacts are negative, there are many bearing benefits to the area. Most of the impacts are likely to occur during construction stage, are temporary in nature, and can be mitigated with minor to negligible residual impacts.

179. The project received immense support from local people, as they perceive that this project will improve the overall connectivity and bring various economic opportunities to the people of the area.

180. All sample roads included under RCIP were selected based on ecological and climate change consideration defined under EARF. Accordingly, none of the sample roads passes through protected areas or encroaches precious ecology (sensitive or protected areas) or any historical or archeologically protected areas. As per selection guidelines, none of the selected sample road passes through reserved forests either. Few trees cutting though may be involved.

181. Among the sample project roads there are 23 roads which are prone to flood due to river, proximity to rivers or due to accumulation of rainwater in and around project road area. Adequate engineering measures like cross drainage structures, slop stabilisation are proposed for the protection of road from the flood.

182. All the sample roads are aligned with existing village roads and unpaved movement paths. As such, land acquisition is nil or very minimal which is also acquired through donations from villagers.

183. Considering insignificant environmental sensitivity, the project is categorized as category B as per ADB Safeguard Policy Statement 2009.

184. No categorisation is made under environmental legislation of India, since these small roads do not require any environmental clearance in accordance to Indian Environmental (Protection) Act and Rules, 1986 amended till date. However, clearance from Forest Department will be required for cutting of trees.

185. The impacts identified are mostly related to alignment selection, land clearing, borrowing earth, and cutting of trees, shifting of utilities and community structures, establishment of construction camp or material storage areas, transportation of material and operation of hot mix plant. All identified impacts are either eliminated or minimized through design consideration and suitable mitigative measures.

186. Environmental Management plan covering all stages of road construction (design, construction and operation) is prepared with defined responsibility for its implementation. Environmental Monitoring plan is also prepared to ensure effective implementation of EMPs.

187. NRRDA/SRRDA has defined institutional setup including specified responsibility for environmental management. Existing capacity of the State Rural Roads Development Agencies (SRRDAs) and Project Implementation Units (PIUs) for implementing environmental safeguard issues need substantial strengthening. The capacity enhancement is proposed through focused workshops and training session. Few workshops have already been conducted at participating states through ADB officials and TSC Experts. Trained and experienced in-house officials should carry out more raining in future periodically.

188. The IEE also indicate that rural road construction works does not warrant further EIA study for subsequent rural road construction works in Assam.

B. Key Recommendations

189. Any major changes or any major additional work other than the proposed project activities will require preparation of another environmental assessment. This additional assessment will have to be submitted to NRRDA, Concerned Government authorities and ADB for concurrence before civil works commence.

190. The implementation of prescribed mitigation measures will minimize/avoid the adverse impacts. Moreover, the impacts shall be monitored continually by implementing and updating the Environmental Management plan and Environmental Monitoring Plan.

191. These IEE is prepared based on ECOPs and feasibility stage. Subproject specific EMP shall be improved as per the final provisions made under DPRs. The updated EMP if there is any change shall also be sent to ADB for information.

192. Executing agency shall ensure that EMP and EMoP is included in Bill of Quantity (BOQ) and forms part of bid document and civil works contract. The contractor will specify the quantity and budget for various activities like rehabilitation of borrow earth pits, first aid and sanitation facilities at construction camp and temporary office/material storage place. The same shall be revised if necessary during project implementation or if there is any change in the project design. Any such change shall be reported to ADB as well.

Appendix 1.1: Details of Proposed Batch 2 Roads in Assam

S. No.	District	Block	Package No.	Road Name	Length in Km	Cost Rs in Lakh
1	2	3	4	5	6	7
1	Barpeta	Chakchaka	AS01-153	Rampur to Santradoha *(Duarmora to Satradoha)*	3.61	169.56
2	Barpeta	Barpeta	AS01-155	Keotkuchi to Taparbari (Keotkuchi to Satra Baradi Road)	0.9	39.68
3	Barpeta	Chenga	AS01-156	Batgaon to Kadamtola *(Kadamtola to Batgoan)*	1.02	53.23
4	Barpeta	Gumafulbari	AS01-157	Block Boundary (Bhella) to Barbila road (Borbilla to Bhella)	2.5	112.05
5	Barpeta	Chakchaka	AS01-159	Kumargaon to Kahitama road (Unneiguri)	2.79	128.15
6	Barpeta	Barpeta	AS01-161	Kharia to Bharegaon *(Bharegaon Kharia)*	1.41	72.05
7	Barpeta	Bhabanipur	AS01-164	Khandakarpara to Deolipara	2.43	115.27
	Sub Total Barpeta		**7**	**7**	**14.66**	**689.99**
8	Bongaigaon	Tapattary	AS-02-63	Nayasatra to Piradhara Road	1.37	69.94
9	Bongaigaon	Manikpur	AS-02-67	Khushlaiguri Kawadi to Kwadi - II Road *(Patiladoha to Kawadi-II)*	1.5	60.06
10	Bongaigaon	Srijangram	AS-02-68	T1 to Solmara Road *(Sonakhuli Pt-II to Kakoijana)*	1.0	41.66
11	Bongaigaon	Dangtol	AS-02-69	Dhontola to Ligdoba	2.0	80.83
12	Bongaigaon	Dangtol		Bidyapur Ravapur to Bhubaneswari *(Pub Bhadragaon II to Bhumeswari)*	1.0	37.6
13	Bongaigaon	Srijangram	AS-02-71	Huramara I to Huramara-II	1.5	69.15
	Sub Total Bongaigaon		**5**	**6**	**8.37**	**359.24**
14	Dhubri	Bilasipara	AS-05-100	Bhasanigaon to Tarangmukh	1.0	43.06
15	Dhubri	Bilasipara	AS-05-101	Bhasanigaon to Singimari	1.0	44.12
16	Dhubri	Mahamaya	AS-05-102	NH 31 to Pasuarkhal	1.0	41.46
	Sub Total Dhubri		**3**	**3**	**3**	**128.64**
17	Dibrugarh	Joypur	AS-06-91	Dighalia gaon to Khatua gaon	3.2	140.03
18	Dibrugarh	Joypur	AS-06-93	Chenelipather gaon to Getupather gaon *(Chengelijan gaon to Getupather gaon)*	4.35	174.83
19	Dibrugarh	Joypur	AS-06-94	Dighalia No2 to Naharani block No 2	5.03	217.47
20	Dibrugarh	Tingkhong	AS-06-95	Keseruguri - Dilibari Tiniali	3.0	134.13
21	Dibrugarh	Tingkhong	AS-06-96	Tingkhong - Na Sripuria	3.0	133.06
22	Dibrugarh	Tingkhong	AS-06-97	Kasalupathar – Tipamia (Tipomia Raidongia road)	4.5	194.21
23	Dibrugarh	Khowang	AS-06-101	Panitola Gaon - Teporchalibam Gaon *(Gazpuria ali to Teporchali bam)*	1.05	61.27
24	Dibrugarh	Khowang	AS-06-102	Dehingia Gaon - Changmai Gaon *(Old Moran ali)*	1.14	65.74
25	Dibrugarh	Joypur	AS-06-103	Tingrai Doomgaon to Santipur	4.95	215.42
26	Dibrugarh	Joypur	AS-06-104	Silgrant to Namrup Grant (T02 to Block Boundary)	6.33	234.57
27	Dibrugarh	Joipur	AS-06-105	Amguri Nepali to Khatua gaon	3.6	149.786
28	Dibrugarh	Tingkhong	AS-06-107	Kekuri Sawal to Kekuri (M N Road to Kekuriswal	1.0	51.5
29	Dibrugarh	Joypur	AS-06-108	Uriamguri Block to Merbil grant No 5	4.665	203.26
30	Dibrugarh	Joypur	AS-06-109	Tarani pather gaon to Hudupara gaon	2.78	111.93
31	Dibrugarh	Joypur	AS-06-110	Dissang Block to Nakhatia NC gaon	5.0	222.99
32	Dibrugarh	Tengakhat	AS-06-114	Chakali Pather to Tikirabali Road *(Jikirabai Chakali Pathar Road)*	1.5	71.605
33	Dibrugarh	Tengakhat	AS-06-115	Niz Tengakhat to Nakhangia Bongali *(Nakhana Chakala Boria road)*	2.75	121.333
34	Dibrugarh	Tengakhat	AS-06-116	Dharia (Belbari Road) to Naharani No. 1 *(Naharani Dharia road)*	2.6	122.096
35	Dibrugarh	Tengakhat	AS-06-118	Bor Aboipuria to Borhula *(Ghanigaon Road)*	2.627	117.881
36	Dibrugarh	Tengakhat	AS-06-119	Bokuloni No. 1 to Kerekoni No. 2 *(Kerekani Bahonigaon road)*	1.273	57.498
37	Dibrugarh	Lahowal	AS-06-121	Lonpuria to Teporchali Gaon Road *(ROMAI road)*	1.0	50.09
38	Dibrugarh	Khowang	AS-06-122	Changmai gaon to Teliapathar *(Old Moran Ali)*	2.0	117.73
39	Dibrugarh	Tingkhong	AS-06-123	Ouphelia TE to Tipamia *(Tipamia dighala to Ouphelia TE)*	2.0	101.68
40	Dibrugarh	Lahowal	AS-06-127	Romai Road to Dongapather (Phulampur road)	1.0	50.63
41	Dibrugarh	Khowang	AS-06-128	Sensua Pukhuri Gaon to Silsili Demow Kinar *(Khowang to Demow Borphukan ali)*	1.5	86.68
42	Dibrugarh	Lahowal	AS-06-132	NH-37 to Ekoratoli *(Ekaratoli Christian road)*	1.0	59.55
43	Dibrugarh	Tengakhat	AS-06-135	Na Bhekulaja to Tingrai Borhula *(Bhekulajan OIL road)*	3.0	127.19
44	Dibrugarh	Tingkhong	AS-06-137	Thulia Chuk to Kabulai No. 28 (Kabula Majgaon road)	1.0	44.65
45	Dibrugarh	Tingkhong	AS-06-138	Sisumuria to Kabula No. 28 (Kabula Majgaon road)	2.5	111.37
	Sub Total Dibrugarh		**29**	**29**	**79.345**	**3550.179**

S. No.	District	Block	Package No.	Road Name	Length in Km	Cost Rs in Lakh
46	Golaghat	Golaghat South	AS-08-153	Dhupguri to Uriamghat *(Majgaon Uriamghat Road via Haripur Joyapathar)*	5.0	201.9
47	Golaghat	Central Dev Block	AS-08-157	T09 toKathiatoli (Sevadol Ali)	2.5	139.02
48	Golaghat	Morongi	AS-08-159	T04 (02G17) to Gurukani (Extension Sensowa to Kathargaon)	3.05	154.05
49	Golaghat	Golaghat South	AS-08-163	Dagaon no5 to Bilgaon Bilgaon station app road to railwaygate via Bilgaon PHC	3.15	133.831
50	Golaghat	Golaghat South	AS-08-164	Bosapather No1 to Bilgaon Amguri Bosapather ali	2.61	117.454
51	Golaghat	Golaghat South	AS-08-165	Modhupur No2 to Chungajan via Uriamghat Naojan (Pithaghat Modhupur Road}	8.42	311.404
52	Golaghat	Golaghat South	AS-08-166	Zotoi to Bornodi No2 (Lachitgaon Chetia gaon road)	13.08	604.375
53	Golaghat	Golaghat South	AS-08-168	Lakui Nagar to Indrapur (Azarguri bidyapur Road vil Lakhi jayanti)	2.11	96.118
54	Golaghat	Golaghat South	AS-08-169	Old Subha to Sonalinagar No1 (Haldibari Bidyapur via Chetanpur)	10.32	482.659
55	Golaghat	Golaghat South	AS-08-171	Henevi to Milongaon (Rengma pani to Homeland)	9.15	340.271
56	Golaghat	Morongi Dev Block	AS-08-173	G59 to Borgonia (Letekuchapori to Borgoria Connecting Road)	2.0	92.58
57	Golaghat	Golaghat West	AS-08-176	NH 37 to Rawduargaon (Rawduar pathar ali)	1.59	83.85
58	Golaghat	Golaghat West	AS-08-178	T06 to Bhalukaguri (Bahikhowa ali)	2.5	109.062
	Sub Total Golaghat		**13**	**13**	**65.48**	**2866.574**
59	Jorhat	Jorhat North West	AS-10-106	T04 to Barmar Chapori	1.135	77.05
60	Jorhat	Kaliapani	AS-10-111	T06 to Bhakatchuk	4.1	200.73
61	Jorhat	Jorhat Central	AS-10-112	T02 to Bhoroluachuk	2.0	109.143
62	Jorhat	Titabor	AS-10-113	T04 to Kakatikuri	2.0	123.43
63	Jorhat	Majuli	AS-10-114	T04 to Kathoibari	1.5	91.66
64	Jorhat	Ujani Majuli	AS-10-117	T01 to Puriagaon *(Sunowal Kachari to Puriagaon)*	1.89	131.3
65	Jorhat	Ujani Majuli	AS-10-118	L026 to Kandulimari *(Phutchang to Kandulimari)*	2.277	149.387
66	Jorhat	Ujani Majuli	AS-10-119	T01 to Kuhiar Bari *(Samahati to Panikhati Kuhiarbari)*	1.25	84.622
67	Jorhat	Ujani Majuli	AS-10-120	T02 to Mayengia (Bhakatidwar to Mayangia)	1.975	125.985
68	Jorhat	Ujani Majuli	AS-10-121	T03 to Sriram Nepalibari *(Pholongani to shriram Nepalibari)*	1.25	74.472
69	Jorhat	Ujani Majuli	AS-10-123	T05 to Jamudchuk *(Karki chuk to jamud chuk)*	3.24	197.66
70	Jorhat	Jorhat North West	AS-10-124	T05 to Kakatichuk *(Namgharia to Kakatichuk)*	2.0	130.28
71	Jorhat	Kaliapani	AS-10-125	Burakuri to TBN *(T03 to Burakurichuk)*	1.643	86.95
72	Jorhat	Kaliapani	AS-10-126	Majkuri to TBN *(T03 to Khanikar)*	2.29	125.62
73	Jorhat	Titabor	AS-10-127	T07 to Balbasti *(Balbasti SCP road)*	0.715	42.23
74	Jorhat	Majuli	AS-10-128	T04 to Upper Sumonimari	1.0	62.39
75	Jorhat	Majuli	AS-10-129	Dighaligaon to Bongaon *(T04 to Kohalgaon)*	4.5	300.15
76	Jorhat	Majuli	AS-10-131	Redcross near Bongaligaon to Borbari *(T01 to Borbari)*	1.3	77.49
77	Jorhat	Ujani Majuli	AS-10-134	T05 to Jorbil Baniagaon *(Boroguri to pahumora borbam)*	2.0	116.85
	Sub total Jorhat		**19**	**19**	**38.065**	**2307.399**
78	Kamrup	Boko	AS-11-196	55 to Dhekiabori *(Jalukbari Dhekiabori Road)*	1.0	45.8
79	Kamrup	Boko	AS-11-197	98 to Kaithapara*(Raipara Kaithpara Road)*	4.35	190.49
80	Kamrup	Dimoria	AS-11-210	T02 to Nibira NC (*Bherakuchi Pathar to Nibira NC Road)*	2.91	173.96
81	Kamrup	Dimoria	AS-11-212	T08 to Rewa Pather *(Maheswari Mitani Bogibari road)*	3.6	177.02
	Sub Total Kamrup		**4**	**4**	**11.86**	**587.27**
82	Karbianglong	Rangkhang	AS-12-77	L062 to Rangkuru *(7th km of Kollonga Sildubi road to Rongkuro)*	3.0	152.59
83	Karbianglong	Rangkhang	AS-12-78	T03 to Ngharia (*86th Km of SH 35 to Nigheria)*	0.872	42.384
84	Karbianglong	Rangkhang		T02 to Tukhahaidi *(3rd Km of KHL road to Towkhahidi)*	3.5	159.805
85	Karbianglong	Rangkhang	AS-12-79	Lo68 to Harlong Chebat *(3rd Km of Disah Road to Harlong Chebat)*	1.8	98.328
86	Karbianglong	Rangkhang	AS-12-80	T03 to Rikhang Mibom *(79th Km of SH-35 to Rikhang Mibom)*	1.83	88.882
87	Karbianglong	Rangkhang		T03 to Mekwe pather (80th Km of SH-35 to Mekwe pather)	4.0	191.6
88	Karbianglong	Lumbajong	AS-12-81	SH 33 to Nagaon Basti *(Road from 10th Km of DLHS road to Nagaon Basti)*	1.995	100.821
89	Karbianglong	Amri	AS-12-82	T06 to Marjang Lalung *(Road from Umswai Pantaloo PWD road to Marjong Lalung gaon)*	1.5	68.185
90	Karbianglong	Cinthong	AS-12-86	Langpi to Rumphum *(Loboi to Rumphum)*	18.384	933.337

S. No.	District	Block	Package No.	Road Name	Length in Km	Cost Rs in Lakh
	Sub total Karbianglong		**7**	**9**	**36.881**	**1835.932**
91	Kokrajhar	Hatidhura	AS14-136	Srirampur to Khayerghutu *(77 to Khayerghutu)*	2.5	101.84
92	Kokrajhar	Kokrajhar	AS14-140	Maoriagaon-I to Amjulipara *(162, Nayekgaon to Amjulipara)*	2.7	135.21
93	Kokrajhar	Hatidhura	AS14-144	Naisapur Mechpara to Palashguri *(54, Naisapur to Naisapur Mechpara)*	4.5	186.88
94	Kokrajhar	Kokrajhar	AS14-146	177 (Salakati) to Nadanguri	4.5	222.43
95	Kokrajhar	Kokrajhar	AS14-147	177 (Salakati) to Bamunigaon	1.68	77.9
96	Kokrajhar	Kokrajhar	AS14-148	108 (Kamarpara) to Deodoba	1.9	98.08
97	Kokrajhar	Kokrajhar	AS14-149	105(Kakrighola) to Galajharbasti	5.8	304.64
98	Kokrajhar	Chaparsalkocha	AS14-150	T04 (Salkocha Bedlengmari) to Tintila	1.8	126.88
99	Kokrajhar	Kokrajhar	AS14-151	138 (Latagaon) to Laltari	2.3	107.92
100	Kokrajhar	Kokrajhar	AS14-152	177(Salakati) to Benibari	1.73	76.04
101	Kokrajhar	Kokrajhar	AS14-153	18 Barsangaon to Samsingkilla	1.29	46.17
102	Kokrajhar	Kokrajhar	AS14-154	95 (Charaikhala) to Dhupguri *(Choraikola to Harinaguri)*	1.68	83.04
103	Kokrajhar	Gossaigaon	AS14-155	SH-I to Kamarpara *(Dhubri Kachugaon Road to Kamarpara)*	3.1	126.47
104	Kokrajhar	Rupsi	AS14-157	T02 to Singjhora Pondegaon *(Singjhora Pondergaon to Singjhora)*	1.02	48.81
105	Kokrajhar	Rupsi	AS14-159	P-I to Paglijhora *(Bashbari to Paglijhora)*	2.37	108.43
106	Kokrajhar	Kachugaon	AS14-162	Anthaibari(T03) to Joymaguri	3.5	141.75
107	Kokrajhar	Kokrajhar	AS14-163	105 (kakrighola) to Pundibari-II	2.1	102.04
	Sub Total Kokrajhar		**17**	**17**	**44.47**	**2094.53**
108	Lakhimpur	Nowboicha	AS15-93	Christianbosti to Pach No.I Uzani No.II *(Uzzani Khamti MiriGaon Road)*	1.78	76.777
109	Lakhimpur	Nowboicha	AS15-96	Fulbari No.2 to Dhemagarh No.2 Road	1.975	82.096
110	Lakhimpur	Lakhimpur	AS15-97	Hahchara to Damukial NC *(Kapuhuwa Majulial road)*	2.575	113.111
	Sub Total Lakhimpur		**3**	**3**	**6.33**	**271.984**
111	Nagaon	Dalong ghat	AS-19-273	Phulaniati to West phulaniati	1.1	37.23
112	Nagaon	Binnakandi	AS-19-274	NH 36 to Urdhagaon *(Urdhagaon to NH 36 Road)*	0.972	33.77
113	Nagaon	Binnakandi	AS-19-275	Jugijan Binnakandi road *(Binakandi Road via Jugijan)*	1.56	52.67
114	Nagaon	Khagarijan	AS-19-276	Simaluguri Boragaon Road to Uttar Kawaiman *(Simaluguri to Uttar Kawaimari Road)*	1.44	45.42
115	Nagaon	Khagarijan	AS-19-277	Nagaon Juria Road at Herapatty to West Herapatty No. 1 up to Amtola Bridge	1.33	45.74
116	Nagaon	Pakhimaria	AS-19-280	Nonoi Dakhipat Road to Rangalumukh *(Tulshimukh to Rangaloomukg Road)*	1.68	52.48
117	Nagaon	Khagarijan	AS-19-281	Nagaon juria road to West katimari no. 2 *(Katimari grant Road)*	1.114	35.44
118	Nagaon	Khagarijan	AS-19-285	Borbheti kachamari road to West Tokobari *(NH 37 Sensowa to Lalung Gaon Road)*	1.42	52.5
119	Nagaon	Khagarijan	AS-19-286	Nagaon juria road to West Katimari no.1 *(Chalchali Katimari Road to Haibargaon Katimari Road)*	1.06	33.96
120	Nagaon	Pakhimaria	AS-19-287	NH-36 to Pakhimaria Muslim Gaon East	1.272	47.31
121	Nagaon	Pakhimaria	AS-19-289	Maz pathori to Mazpathori Chakarigaon *(Majpathori to Chakarigaon Borpathori Road)*	0.979	34.78
122	Nagaon	Raha	AS-19-290	Katahguri to NH37 *(Roha to Baruakhat Road)*	1.029	33.39
123	Nagaon	Pakhimaria	AS-19-292	Dakhinpat Kampur road to Borkula Pachim *(Dakhinpar Kampur Road to Pachim Bakelagaon Rd)*	0.686	23.99
124	Nagaon	Pakhimaria	AS-19-293	Nagaon Morikallong Nonoi to Uzara Panigaon *(Nagaon Morikolong Nonoi Road to NH 37 via Morikolong Borghat)*	1.513	44.68
125	Nagaon	Pakhimaria	AS-19-295	Buragohainthan to Buragohainthan Pub *(Buragohainthan vill to Rangalumukh Road)*	0.885	27.58
126	Nagaon	Pakhimaria	AS-19-296	Dakhinpat Kampur road to Borkula Pub *(Dakhinpat Kampur Road to Nonoi Dakhinpat Rd via Pub Borkala and Buragohaithan)*	1.501	47.94
127	Nagaon	Kathiatoli	AS-19-297	Nibukali to Kuarichuk	1.565	43.04
128	Nagaon	Raha	AS-19-298	Niz Narikali to Kampur Chaparmukh *(Road from KL road to Kuwariati Dhamajigaon Road)*	1.564	53.97
129	Nagaon	Raha	AS-19-299	Kholihamari to Bamunijan *(Ghai to Mulanka via Niz Jagial Deobali Road)*	2.029	64.61
130	Nagaon	Dhalpukhuri	AS-19-304	NH54 to Uttar Bhalluhander *(Uttar Balubhandar to NH 54 at Lanka)*	1.575	50.44
131	Nagaon	Kathiatoli	AS-19-305	Pachim Tetelisara to Kallakhowa *(KK Road to*	1.848	49.65

S. No.	District	Block	Package No.	Road Name	Length in Km	Cost Rs in Lakh
				Kalaikhowa via Paschim Tetalichora Rd)		
	Sub Total Nagaon		**21**	**21**	**28.1215**	**910.59**
132	Nalbari	Pub Nalbari	AS-20-97	Sandha LP School to Katra HE school *(Barpipla Kendukuchi)*	2.2	89.21
133	Nalbari	Borigog Banbhag	AS-20-98	Bar Bistupur to Khudra Bistupur *(Khudrabitupur to Barbitupur Road)*	2.61	99.5
134	Nalbari	Borigog Banbhag	AS-20-99	Punarkunia to Hablakha *(Hablakha to Ponarkunia Road)*	1.0	35.94
135	Nalbari	Barbhag	AS-20-100	Raikuchi to GDB road at Kamarkuchi	1.0	39.85
136	Nalbari	Barbhag	AS-20-101	Pandula on GDB to Nonoi *(Borbori Nonoi to Narapara road)*	3.0	107.09
	Sub Total Nalbari		**5**	**5**	**9.81**	**371.59**
137	Sibsagar	Amguri	AS-21-145	NH 61 to K K Barua Ali *(Kaliapani MV school to Abhoipuriagaon)*	2.4	100.14
138	Sibsagar	Amguri	AS-21-146	NH 61 to NH 61 via Mirichutia *(Godhulibazar Mising gaon road)*	2.9	122.435
139	Sibsagar	Amguri	AS-21-147	Namati ali to Dhodar Ali *(Namti Veterinary feeder Road)*	3.2	134.32
140	Sibsagar	Amguri	AS-21-148	NH 61 to Ladoigarh *(Kapahtoli Mising Gaon road)*	1.2	50.59
141	Sibsagar	Amguri	AS-21-149	NH 61 to Extn Seuni Ali *(Extension Seuni Ali to Saudgaon Ali connecting NH 61)*	4.2	179.78
142	Sibsagar	Amguri	AS-21-150	Dhodar ali to Mehgarh ali	1.0	42
143	Sibsagar	Amguri	AS-21-152	Namti Ali to Extn Kharikatia ali *(From Extension Kharikatia Ali to Lunpuria Sensua road connecting)*	1.7	70.745
144	Sibsagar	Amguri	AS-21-153	NH 61 to Extn Kharikatia ali *(Buragaon Ali)*	9.85	420.847
145	Sibsagar	Amguri	AS-21-154	NH 61 to Seuni ali *(Amguri level crossing road)*	2.7	114.655
146	Sibsagar	Gaurisagar	AS-21-156	Tikha Belimukhia to Bharalua *(Kerai Ali)*	2.5	103.795
147	Sibsagar	Gaurisagar	AS-21-157	Bor ali road cum Bund to Teliadonga *(Teliadunga to Brahmaputra Mathari)*	2.0	84.52
148	Sibsagar	Gaurisagar	AS-21-158	Bor ali road cum Bund to Dhanekhowa *(Dhanchowa Raghubari Ali)*	1.0	42.38
149	Sibsagar	Gaurisagar	AS-21-159	NH 37 to Saraguri *(Saraguri Ali)*	1.0	44.07
150	Sibsagar	Gaurisagar	AS-21-160	NH 37 to Khola Grazing *(Kaibatra Lahon gaon Ali)*	1.0	42.35
151	Sibsagar	Gaurisagar	AS-21-161	Tikha Belimukhia to Chetia Changmai *(Chetia Phukan Ali)*	2.0	82.66
152	Sibsagar	Gaurisagar	AS-21-162	Naga ali Singibill *(Sontali Chiga Duwarah Ali)*	1.0	41.6
153	Sibsagar	Gaurisagar	AS-21-164	Bor ali road cum Bund to Maglow *(Thekeratol Mising Gaon Ali)*	1.0	42.12
154	Sibsagar	Demow	AS-21-168	Athabari High School to Hiloidhari *(Hiloi bari Ali)*	1.0	43.32
155	Sibsagar	Demow	AS-21-169	Bahuabari to Jamira *(Nemukur Jamira Ali)*	2.9	128.925
156	Sibsagar	Demow	AS-21-170	Kalitagaon to Saragua Gaon *(Kolitagaon Ali)*	1.0	42.73
157	Sibsagar	Demow	AS-21-172	Nathgaon to Maliachuk	0.9	38.335
158	Sibsagar	Demow	AS-21-173	Patsaku to Khamunghat ali	9.9	426.715
	Sub total Sibsagar		**22**	**22**	**56.35**	**2399.032**
159	Sonitpur	Balipara	AS22-136	Paramai Ghuli to Samdhara (T01 to Paramai ghuli)	2.21	83.919
160	Sonitpur	Naduar	AS22-137	Dholaibil to Borpather	2.476	106.28
161	Sonitpur	Naduar	AS22-138	Borbamgaon to Bamunipam	0.727	32.03
162	Sonitpur	Naduar	AS22-140	Padmapur to Bhakatram	0.96	40.59
163	Sonitpur	Balipara	AS22-141	NH 52 to Chapaguri (T02 to Chapaguri)	0.93	42
164	Sonitpur	Balipara	AS22-142	Ghoramari Buragaon to NH 52 (T02 to Ghoramari Buragaon)	1.2	54.76
165	Sonitpur	Balipara	AS22-143	Ghora TE to NH 52 (T02 to Tezpur Ghora)	3.0	136.66
166	Sonitpur	Dhekiajuli	AS22-147	Gorpar Pather to Panbari-I (T06 to Gorpar Pathar)	0.8	35.18
167	Sonitpur	Dhekiajuli	AS22-148	Majgaon Pather to Hugrajuligaon (T09 to Majgaon Pathar)	1.8	79.96
168	Sonitpur	Dhekiajuli	AS22-149	Dighalijuli to Rikamari Bengali (T01 to Dhighalijuli NK)	2.46	127.05
169	Sonitpur	Borchala	AS22-151	Mahkhowajan to Amguri Kachari (T04 to Mahkhowajan gaon)	2.0	97.54
	Sub Total Sonitpur				**18.563**	**894.221**
170	Tinsukia	Guijan	AS-23-84	DRT Road - to Dihingia vill (Makum Dhelakhat road)	3.5	150.01
	Sub Total Tinsukia		**1**	**1**	**3.5**	**150.01**
171	Baska	Gobardhana	AS-24-76	Bajegaon Pather Approach Road (T01 to Bajegaon)	1.2	47.04
172	Baska	Gobardhana	AS-24-77	Kalpani to Khagrabari *(Kalpani to Khagrabari via Bishpani)*	2.0	70.22
173	Baska	Tamulpur	AS-24-79	T08 to Kumarpara (Kumarpara Chechapani)	1.67	68.31
174	Baska	Tamulpur		T08 to Darrangapar No2 (Angarkata Darangapar road)	3.7	125.2

S. No.	District	Block	Package No.	Road Name	Length in Km	Cost Rs in Lakh
175	Baska	Tihu Barama	AS-24-80	Haramjan to Dakhania	1.68	64.64
176	Baska	Tihu Barama		Debichara to Dangarmakha	2.0	67.2
177	Baska	Goreswar	AS-24-83	Boitamari Chowk to Dologdia	2.5	132.276
178	Baska	Jalah	AS-24-86	Ramchartari to Soudarvitha (Saudar Vitha Maharani road)	2.041	99.93
179	Baska	Tamulpur	AS-24-87	T01 to Ulubari no1 (Ulubari to Banguri)	1.8	60.93
180	Baska	Tamulpur	AS-24-88	T01 to Rangapani (Sirishghutu to Fuhurabari)	3.7	129.68
181	Baska	Tamulpur	AS-24-89	T01 to Jamuguri No1 (Jamuguri1toJamuguri2)	2.15	77.7
182	Baska	Jalah	AS-24-91	Dangrigaon NC to Batabari (Batabari to Bongoan road)	1.514	64
183	Baska	Jalah	AS-24-92	Rupahi Khursatari (Bhabasingpathar via Baghmara to Hachara road)	3.258	169.87
184	Baska	Gobardhana	AS-24-93	Barbarijhar to Ganakpara	1.0	42.4
185	Baska	Gobardhana	AS-24-94	Khuduabari to Bhatemaritup	2.0	91.25
186	Baska	Nagrijuli	AS-24-101	T01 to Kalipur No1 (Kalipur no 1 to Kalipur No2)	2.2	78.85
187	Baska	Nagrijuli		T04 to Ghilajhari (Ghilazari Road)	2.55	90.61
	Sub total Baska		**14**	**17**	**36.963**	**1480.106**
188	Chirang	Borobazar	AS-25-96	Dagarpara-I to Dagarapara-II	2.5	109.615
189	Chirang	Manikpur	AS-25-98	Gerukabari to Jamdoha-III (Gerukabari Jamdoha to Jamdoha I)	2.8	122.22
190	Chirang	Borobazar	AS-25-101	L79 to Sikhajora (Chikajhora II to Chikajhora III)	4.5	200.195
191	Chirang	Borobazar	AS-25-103	Panbari to Chourang (Panbari to Chowrang I)	8.0	354.31
192	Chirang	Dangtol	AS-25-108	Kakragaon to Kamandanga	1.0	43.08
193	Chirang	Sidli	AS-25-109	NH 31 C to Gendergaon	1.1	48.81
194	Chirang	Borobazar	AS-25-110	Tangabari to Choto Amguri (Tangabari I to Tangabari II)	3.85	160.73
195	Chirang	Sidli	AS-25-111	Amguri to Boripara (Amguri Bhirangaon to Hasraobari via Borigara)	1.7	74.975
196	Chirang	Dangtol	AS-25-112	Kakragaon to Dubli	2.55	114.382
197	Chirang	Borobazar	AS-25-114	Kharpara Amteka road (T02) to Koila Moila (Amteka road to Koilamoila)	1.35	58.452
198	Chirang	Sidli	AS-25-115	Kolabari to Solmari	1.0	45.6
199	Chirang	Sidli	AS-25-116	Samthaibari to Dologaon	1.0	44.65
200	Chirang	Sidli	AS-25-120	NH 31 C to Rajajan	0.75	34.602
	Sub Total Chirang		**13**	**13**	**32.1**	**1411.621**
201	Udalguri	Kalaigaon	AS-26-59	Batabari No.1 to Hatibandha Road	1.7	85.14
	Sub Total Udalguri		**1**	**1**	**1.7**	**85.14**
Grand Total			**196**	**202**	**495.569**	**25238.498**

Appendix 1.2: Sample Rural Roads: Environmental Checklist

Road Name	:	Batgaon to Kadamtola Road
Block Name	:	Chenga
District Name	:	Barpeta
Total Length of the Road	:	1.00 km

A. Climatic Conditions

Temperature	High: 36°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	1000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain—(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain – Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		From: 0+000, To: 0+030, Side: LHS From: 0+230, To: 0+340, Side: LHS From: 0+370, To: 0+410, Side: LHS From: 0+440, To: 0+450, Side: LHS From: 0+610, To: 0+730, Side: LHS From: 0+760, To: 1+000, Side: LHS From: 0+490, To: 1+000, Side: RHS

No.	Type of Ecosystem	Yes	No	Explanation
7.	Agricultural Land	✓		From / To / Side 0+060 / 0+200 / LHS 0+350 / 0+360 / LHS 0+420 / 0+430 / LHS 0+460 / 0+530 / LHS 0+740 / 0+730 / LHS 0+000 / 0+200 / RHS 0+280 / 0+310 / RHS 0+340 / 0+470 / RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*	✓		Erosion prone areas are identified at 0+010 km(LHS), 0+580 km(LHS), 0+890 km(LHS), 0+200 km(RHS), 0+240 km(RHS), 0+260 km(RHS), 0+580 km(RHS), 0+630 km(RHS), 0+740 km(RHS), 0+800 km(RHS) and 0+870 km(RHS). ( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. Along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*	✓		Entire area along the road is flood prone. ( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		56 trees are located within 10 m on either side of the CL. [Enclosed list Refer: E.1]
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		19 electric poles are located within 10 m on either side of road.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 school and 1 temple are located within 10 m on either side of the alignment. (Refer E.3).

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 33 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The existing alignment should be finalized
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+010	LHS	Comari
2	0+020	LHS	Comari
3	0+025	LHS	Comari
4	0+030	LHS	Comari
5	0+040	LHS	Comari
6	0+170	LHS	Mandar
7	0+175	LHS	Mandar
8	0+180	LHS	Mandar
9	0+210	LHS	Khejur
10	0+220	LHS	Khejur
11	0+225	LHS	Khejur
12	0+230	LHS	Coconut
13	0+290	LHS	Khejur
14	0+330	LHS	Coconut
15	0+360	LHS	Simolu
16	0+630	LHS	Coconut
17	0+660	LHS	Mango
18	0+665	LHS	Mango
19	0+670	LHS	Coconut
20	0+680	LHS	Jamu
21	0+690	LHS	O Tenga
22	0+720	LHS	Mango
23	0+800	LHS	People
24	0+810	LHS	Coconut
25	0+820	LHS	Kadam
26	0+850	LHS	Krishna Mandir
27	0+930	LHS	Coconut
28	0+020	RHS	Comari
29	0+025	RHS	Comari
30	0+030	RHS	Comari
31	0+035	RHS	Comari
32	0+040	RHS	Comari
33	0+150	RHS	Jiya
34	0+170	RHS	Mandar
35	0+190	RHS	Mandar
36	0+370	RHS	People
37	0+540	RHS	Mango
38	0+550	RHS	Coconut
39	0+600	RHS	Simolu
40	0+610	RHS	Koroi
41	0+630	RHS	Sishu
42	0+640	RHS	Sishu
43	0+650	RHS	Bogori
44	0+650	RHS	Kadam
45	0+660	RHS	Mango
46	0+760	RHS	Coconut
47	0+790	RHS	Kadam

Sl. No.	Chainage	Side	Name of Trees
48	0+830	RHS	Coconut
49	0+850	RHS	Amara
50	0+860	RHS	Mango
51	0+870	RHS	Sishu
52	0+875	RHS	Sishu
53	0+890	RHS	Taal
54	0+890	RHS	Bel
55	0+900	RHS	Coconut
56	1+000	RHS	Coconut

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Utility Type
1	0+180	LHS	Electric Pole
2	0+270	LHS	Electric Pole
3	0+330	LHS	Electric Pole
4	0+400	LHS	Electric Pole
5	0+630	LHS	Electric Pole
6	0+700	LHS	Electric Pole
7	0+750	LHS	Electric Pole
8	0+820	LHS	Electric Pole
9	1+000	LHS	Electric Pole
10	0+010	RHS	Electric Pole
11	0+060	RHS	Electric Pole
12	0+100	RHS	Electric Pole
13	0+140	RHS	Electric Pole
14	0+220	RHS	Electric Pole
15	0+310	RHS	Electric Pole
16	0+360	RHS	Electric Pole
17	0+870	RHS	Electric Pole
18	0+910	RHS	Electric Pole
19	0+960	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties	Distance from center line (m)
0+920	LHS	School	8
0+370	RHS	Temple	3

Road Name	:	Baitamari Chowk to Dallongdia Road
Block Name	:	Goreswar
District Name	:	Baksa
Total Length of the Road	:	2.50 km

A. Climatic Conditions

Temperature	High: 36°o Low: 9°o
Humidity	High: : 95% Low: 40%
Rainfall	1000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain – Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Part I From 0+040 To 0+090 Side LHS 0+160 0+320 LHS 0+390 0+400 LHS 0+850 0+910 LHS 1+210 1+260 LHS 0+030 0+410 RHS 0+900 0+920 RHS

No.	Type of Ecosystem	Yes	No	Explanation
				Part II From: 0+510, 0+000, 1+030 To: 1+000, 0+140, 1+050 Side: LHS, RHS, RHS
7.	Agricultural Land	✓		Part I From: 0+430, 0+920, 0+480, 0+930 To: 0+840, 1+200, 0+900, 1+090 Side: LHS, LHS, RHS, RHS Part II From: 0+430, 1+010, 0+380 To: 0+500, 1+240, 0+500 Side: LHS, LHS, RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. **Specific description of the Road Environment**

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. Along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter

E. Annexure

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Chainage	Side	Name of Trees
Part I		
0+020	LHS	Koras
0+050	LHS	Koras
0+100	LHS	Segun
0+150	LHS	Latum
0+210	LHS	Cocconut
0+230	LHS	Cocconut
0+240	LHS	Cocconut
0+300	LHS	Kadam
0+310	LHS	Jackfruit
0+320	LHS	Sajana
0+530	LHS	People
0+880	LHS	Latum
1+220	LHS	Jackfruit
0+010	RHS	Peepal
0+030	RHS	Cocconut
0+110	RHS	Latum
0+120	RHS	Koras
0+140	RHS	Jackfruit
0+210	RHS	Cocconut
0+390	RHS	Latum
0+394	RHS	Latum
0+398	RHS	Latum
0+402	RHS	Latum
0+408	RHS	Latum
0+540	RHS	Peepal
0+590	RHS	Peepal
0+700	RHS	Peepal
0+710	RHS	Peepal
0+720	RHS	Mango
0+760	RHS	Ahat
0+820	RHS	Peepal
0+830	RHS	Ahat
0+900	RHS	Mango
1+120	RHS	Peepal
1+130	RHS	Peepal
1+160	RHS	Taal
1+240	RHS	Jackfruit
Part II		
0+110	LHS	Segun
0+120	LHS	Kadam
0+270	LHS	Mango
0+300	LHS	Cocconut
0+310	LHS	Cocconut
0+370	LHS	Neem
0+390	LHS	Cocconut
0+660	LHS	Jackfruit
0+690	LHS	Neem
0+700	LHS	Cocconut
0+720	LHS	Cocconut
0+725	LHS	Cocconut
0+890	LHS	Jamun

Chainage	Side	Name of Trees
0+900	LHS	Cocoonut
0+900	LHS	Eucalyptus
0+930	LHS	Mango
0+940	LHS	Jamun
0+960	LHS	People
1+230	LHS	Satiana
0+070	RHS	Cocoonut
0+075	RHS	Cocoonut
0+130	RHS	Cocoonut
0+170	RHS	Cocoonut
0+175	RHS	Cocoonut
0+180	RHS	Cocoonut
0+185	RHS	Cocoonut
0+200	RHS	Peepal
0+250	RHS	Mango
0+255	RHS	Mango
0+270	RHS	Mango
0+350	RHS	Jackfruit
0+890	RHS	Kadam
0+900	RHS	Mango
1+040	RHS	Cocoonut
1+240	RHS	Peepal

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Utility Type
		Part II	
1	0+010	LHS	Electric Pole
2	0+910	LHS	Electric Pole
3	1+000	LHS	Electric Pole
4	1+080	LHS	Electric Pole
5	1+130	LHS	Electric Pole
6	1+180	LHS	Electric Pole
7	1+230	LHS	Electric Pole
8	1+260	LHS	Electric Pole
9	0+040	RHS	Electric Pole
10	0+060	RHS	Electric Pole
11	0+090	RHS	Electric Pole
12	0+120	RHS	Electric Pole
13	0+170	RHS	Electric Pole
14	0+220	RHS	Electric Pole
15	0+280	RHS	Electric Pole
16	0+320	RHS	Electric Pole
17	0+380	RHS	Electric Pole
18	1+190	RHS	Electric Pole
19	1+260	RHS	Electric Pole
1	0+300	LHS	Electric Pole
2	0+330	LHS	Electric Pole
3	0+370	LHS	Electric Pole
4	0+400	LHS	Electric Pole
5	0+470	LHS	Electric Pole
6	0+500	LHS	Electric Pole

Sl. No.	Chainage	Side	Utility Type
7	0+340	LHS	Electric Pole
8	0+390	LHS	Electric Pole
9	0+630	LHS	Electric Pole
10	0+040	RHS	Electric Pole
11	0+090	RHS	Electric Pole
12	0+150	RHS	Electric Pole
13	0+190	RHS	Electric Pole
14	0+260	RHS	Electric Pole
15	0+290	RHS	Electric Pole
16	0+960	RHS	Electric Pole
17	1+000	RHS	Electric Pole
18	1+030	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties	Distance from center line (m)
Part I			
0+010	LHS	Temple	6.5
Part II			
0+880	LHS	Temple	4
0+880	RHS	Temple	3.5
0+910	RHS	School	8
0+920	RHS	Anganbadi	6

Road Name	:	Garoimari to Garoimari I
Block Name	:	Boitamari
District Name	:	Bongaigaon
Total Length of the Road	:	0.810 km

A. Climatic Conditions

Temperature	High: 32°c Low: 13°c
Humidity	High: : 81% Low: 74%
Rainfall	2616.65 mm/year
Rainy Season	June to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain-(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 54m (Average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Affected trees identified are in privately owned land. Legal Status of the Forest Area: Not Applicable *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Chainage From / To / Side: 0+070 – 0+100 LHS 0+205 – 0+230 LHS 0+490 – 0+660 LHS 0+720 – 0+750 LHS 0+000 – 0+110 RHS 0+210 – 0+240 RHS 0+370 – 0+390 RHS 0+460 – 0+480 RHS

No.	Type of Ecosystem	Yes	No	Explanation
				0+590 0+600 RHS 0+780 0+800 RHS
7.	Agricultural Land	✓		Chainage From / To / Side: 0+000 0+060 LHS 0+110 0+200 LHS 0+290 0+320 LHS 0+360 0+400 LHS 0+670 0+710 LHS 0+780 0+800 LHS 0+120 0+160 RHS 0+260 0+280 RHS 0+400 0+430 RHS 0+500 0+580 RHS 0+670 0+720 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*	✓		Erosion prone areas are identified at Ch 0+430km, Ch 0+630 km ( ) No Secondary information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*	✓		2 Ponds are located alongside the corridor. Slope protection measures should be considered at respective locations.
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	

No.	Parameter/ Component	Yes	No	Explanation
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*	✓		The road section between Ch 0+190km and Ch 0+800km is flood prone. HFL is 4 ft as informed by the local people.
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		75 trees are located within 10m on either side of the road from CL.21 trees (including areca palms) will be affected due to the proposed road improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[3] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		16 Electric poles and 3 stand posts are located within a distance of 10 m on either side of the corridor [Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[4] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 school, 1 mosque and 1 anganwadi center are located within 10 m on either side of the road centre line.[Refer E.3]

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 22 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents.

[3] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[4] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

No.	Consultation Activities	Yes	No	Remarks
				• All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Please attach the following

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6

Sl. No.	Chainage	Side	Name of trees
1	0+090	LHS	Kadam
2	0+100	LHS	Kadam
3	0+290	LHS	Kadam
4	0+310	LHS	Kadam
5	0+330	LHS	Bhel
6	0+340	LHS	Kadam
7	0+380	LHS	Bhel
8	0+385	LHS	Bhel
9	0+390	LHS	Bhel
10	0+395	LHS	Bhel
11	0+400	LHS	Bhel
12	0+405	LHS	Bhel
13	0+410	LHS	Bhel
14	0+415	LHS	Bhel
15	0+420	LHS	Bhel
16	0+425	LHS	Bhel
17	0+430	LHS	Bhel
18	0+435	LHS	Bhel
19	0+440	LHS	Bhel
20	0+445	LHS	Bhel
21	0+450	LHS	Bhel
22	0+470	LHS	Bhel
23	0+520	LHS	Kadam
24	0+570	LHS	Kadam
25	0+580	LHS	Kadam
26	0+620	LHS	Kadam
27	0+680	LHS	Bhel
28	0+685	LHS	Bhel
29	0+690	LHS	Bhel
30	0+695	LHS	Bhel
31	0+700	LHS	Bhel
32	0+705	LHS	Bhel
33	0+710	LHS	Bhel
34	0+730	LHS	Bhel
35	0+760	LHS	Mango
36	0+780	LHS	Bhel
37	0+782	LHS	Bhel
38	0+784	LHS	Bhel
39	0+786	LHS	Bhel
40	0+788	LHS	Bhel
41	0+790	LHS	Bhel
42	0+792	LHS	Bhel

Sl. No.	Chainage	Side	Name of trees
43	0+794	LHS	Bhel
44	0+796	LHS	Bhel
45	0+798	LHS	Bhel
46	0+800	LHS	Bhel
47	0+802	LHS	Bhel
48	0+804	LHS	Bhel
49	0+806	LHS	Bhel
50	0+808	LHS	Bhel
51	0+060	RHS	Kadam
52	0+110	RHS	Kadam
53	0+240	RHS	Kadam
54	0+250	RHS	Simolu
55	0+290	RHS	Kadam
56	0+310	RHS	Kadam
57	0+330	RHS	Kadam
58	0+335	RHS	Kadam
59	0+340	RHS	Coconut
60	0+360	RHS	Kadam
61	0+670	RHS	Bhel
62	0+675	RHS	Bhel
63	0+680	RHS	Bhel
64	0+685	RHS	Bhel
65	0+690	RHS	Bhel
66	0+695	RHS	Bhel
67	0+700	RHS	Bhel
68	0+705	RHS	Bhel
69	0+710	RHS	Bhel
70	0+715	RHS	Bhel
71	0+720	RHS	Bhel
72	0+725	RHS	Bhel
73	0+730	RHS	Bhel
74	0+735	RHS	Bhel
75	0+740	RHS	Bhel

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures (left or right side of the road) with locations (as required under C. 9)

Sl. No.	Chainage	Side	Utility Structures
1	0+002	RHS	Electric Pole
2	0+050	RHS	Electric Pole
3	0+090	RHS	Electric Pole
4	0+140	RHS	Electric Pole
5	0+190	LHS	Electric Pole
6	0+262	LHS	Electric Pole
7	0+265	LHS	Stand Post
8	0+295	LHS	Electric Pole
9	0+337	RHS	Stand Post
10	0+355	LHS	Electric Pole
11	0+395	RHS	Electric Pole
12	0+450	RHS	Electric Pole
13	0+475	RHS	Electric Pole
14	0+598	RHS	Electric Pole
15	0+600	RHS	Stand Post

Sl. No.	Chainage	Side	Utility Structures
16	0+650	RHS	Electric Pole
17	0+690	RHS	Electric Pole
18	0+770	LHS	Electric Pole
19	0+790	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Sl. No.	Chainage	Side	Community Structures
1	0+260	LHS	School
2	0+350	RHS	Mosque
3	0+360	RHS	Anganwadi Centre

Road Name	:	T01 to Bishnupur FV
Block Name	:	Narsingpur
District Name	:	Cachar
Total Length of the Road	:	2.500 km

A. Climatic Conditions

Temperature	High: 35°c Low: 12°c
Humidity	High: : 98% Low: 43%
Rainfall	3000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 36.5m (average) The entire section of the alignment fall in the plain terrain exoept a hill section from 0+070 to 0+200 (LHS)
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		• 1+920 to 2+140 LHS • 2+000 to 2+480 LHS • 1+910 to 2+000 RHS
7.	Agricultural Land	✓		• 0+000 to 0+070 LHS • 0+200 to 1+920 LHS • 2+140 to 2+200 LHS • 2+480 to 2+500 LHS • 0+000 to 1+910 RHS • 2+000 to 2+500 RHS

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***	✓		Erosion prone locations are identified at 0+330 (LHS), 0+382(LHS) and 0+440 (LHS). ( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		✓	 ( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? ***(If yes attach list of trees indicating the location (right or left side)and the chainage)***	✓		33 trees are identified within 10 m on either side of the CL. 143 trees which include areca palm and bamboo grove would be affected by the project (Enclosed list Refer: E.1)

No.	Parameter/ Component	Yes	No	Explanation
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[3] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		18 electric poles, 4 stand posts, 2 transformers and 2 wells are located within 10 m on either side of road. Out of these, 3 electric poles, 3 stand posts, 1 transformer and 1 well will be affected by the project [Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[4] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		There is one temple located within 10 m either side from the centreline of road alignment. [Refer E.3]

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held and 27 persons were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• Road safety measures near curves and road intersection location.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Chainage	Side	Tree	DCL
0+110	RHS	Mango Tree	3
0+120	LHS	Mango Tree	2
0+160	LHS	Segun	2
0+190	LHS	Segun	3
0+260	LHS	Peepal	4
1+910	RHS	Bogori	2.2
1+930	RHS	Arjun	2.5
1+940	LHS	Poma	3
1+940	RHS	Jackfruit Tree	2.5
1+962	RHS	Mango Tree	2.2
1+990	RHS	Mango Tree	3
2+020	LHS	Coconut Tree	4
2+030	LHS	Mango Tree	3
2+070	RHS	Arjun	1
2+080	RHS	Arjun	1
2+091	RHS	Poma	1
2+102	RHS	Arjun	1
2+140	LHS	Coconut Tree	1.5
2+230	LHS	Mango Tree	1.5
2+241	LHS	Mango Tree	1.5
2+249	LHS	Mango Tree	1.5
2+301	LHS	Mango Tree	4.2
2+310	LHS	Mango Tree	4
2+320	LHS	Jackfruit Tree	2
2+360	LHS	Mango Tree	5.1
2+370	LHS	Mango Tree	4.5
2+380	LHS	Amala	2.5
2+400	LHS	Khilikha	1.5
2+420	LHS	Azar	1.5
2+422	RHS	Mango Tree	2
2+430	LHS	Jamul Tree	1.6
2+440	LHS	Mango Tree	2
2+470	LHS	Mango Tree	3

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Chainage	Side	Utility Structures	DCL
0+005	LHS	Electric Pole	3.5
0+380	LHS	Stand Post	3
0+430	LHS	Stand Post	2.2
0+590	RHS	Transformer	3
0+670	RHS	Electric Pole	3.2
0+740	RHS	Electric Pole	3.2
0+800	RHS	Electric Pole	3
0+880	RHS	Electric Pole	3
0+970	RHS	Electric Pole	3
1+070	RHS	Electric Pole	2.5
1+160	RHS	Electric Pole	3.2
1+250	RHS	Electric Pole	3

Chainage	Side	Utility Structures	DCL
1+340	RHS	Electric Pole	3
1+440	RHS	Electric Pole	3
1+520	RHS	Electric Pole	2.5
1+600	RHS	Electric Pole	2.6
2+005	LHS	Well	2.5
2+010	LHS	Stand Post	1.5
2+050	RHS	Transformer	2.2
2+100	LHS	Electric Pole	2.5
2+101	LHS	Electric Pole	2.5
2+160	RHS	Electric Pole	3
2+190	RHS	Electric Pole	3.3
2+230	RHS	Electric Pole	3
2+390	LHS	Well	12
2+450	LHS	Stand Post	2.5

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10):

Chainage	Side	Distance from CL (m)	Type
2+270	LHS	Temple	9

Road Name	:	Dangarpara I to Dangarpara II
Block Name	:	Borobazar
District Name	:	Chirang
Total Length of the Road	:	2.50 km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	2620mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		• 0+200-0+400(RHS) • 0+600-0+800(RHS) • 1+400-1+600(Both Side)
7.	Agricultural Land	✓		• 0+000-0+200(Both Side) • 0+200-0+400(LHS) • 0+400-0+600(Both side) • 0+600-0+800(LHS) • 0+800-1+400 (Both Side) • 1+600-2+500 (Both Side)

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	No any erosion Prone area has been identified along the road. ( ) No Secondary information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	Corridor is not affected by flood. ( ) No Secondary information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		40trees are located within 10 m on either side of the CL.Out of these, 34 trees would be affected due to the project. (Refer: E.1).
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	( ) No Secondary information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	[ ] No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		11electric poles and 2 transformerscare located within 10 m on either side of road. Out of these, 3 electric poles would be affected due to the project.(Refer E.2)
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*		✓	No any Cultural/Community structure is identified within 10m from CL of the road.(Refer E.3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 15 participants were present at time of consultation. The list of participants is attached in Annexure D5.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

SL No.	Chainage	Side	Particulars	Number
1	0+000	LHS	Ahot	1
2	0+010	LHS	Bogori	1
3	0+015	LHS	Bogori	1
4	0+530	LHS	jackfruit	1
5	0+900	LHS	Comari	1
6	1+370	LHS	Ahot	1
7	1+390	LHS	Mango	1
8	1+920	LHS	Bogori	1
9	1+330	RHS	Titaliup	1
10	1+331	RHS	Titaliup	1

[1]Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2]Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Sl No.	Chainage	Side	Particulars	Number
11	1+332	RHS	Thatched hut	1
12	1+333	RHS	Thatched hut	1
13	1+334	RHS	Thatched hut	1
14	1+335	RHS	Thatched hut	1
15	1+336	RHS	Thatched hut	1
16	1+337	RHS	Thatched hut	1
17	1+338	RHS	Thatched hut	1
18	1+339	RHS	Thatched hut	1
19	1+340	RHS	Thatched hut	1
20	1+341	RHS	Thatched hut	1
21	1+342	RHS	Thatched hut	1
22	1+343	RHS	Thatched hut	1
23	1+344	RHS	Thatched hut	1
24	1+345	RHS	Thatched hut	1
25	1+346	RHS	Thatched hut	1
26	1+347	RHS	Thatched hut	1
27	1+348	RHS	Thatched hut	1
28	1+349	RHS	Thatched hut	1
29	1+350	RHS	Thatched hut	12
Total				40

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.8)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl No.	Chainage	Side	Particulars	Number
1	0+090	LHS	Electric Pole	1
2	0+140	LHS	Electric Pole	1
3	0+160	LHS	Electric Pole	1
4	0+210	LHS	Electric Pole	1
5	0+610	LHS	Electric Pole	1
6	1+310	LHS	Electric Pole	1
7	1+850	LHS	Transformer	1
8	1+860	LHS	Electric Pole	1
9	0+010	RHS	Transformer	1
10	0+060	RHS	Electric Pole	1
11	0+270	RHS	Electric Pole	1
12	1+230	RHS	Electric Pole	1
13	1+000	LHS	Electric Pole	1
Total				13

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10).

- No any Cultural/Community structure is identified within 10m from CL of the road.

Road Name	:	Bezpara No. 2 (B. J. Road, part) to MPK Road
Block Name	:	Paschim Mangaldoi
District Name	:	Darrang
Total Length of the Road	:	0.824km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	3000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain—(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		LHS: • 0+000 - 0+410 • 0+450 – 0+610 RHS: • 0+000 – 0+600
7.	Agricultural Land	✓		LHS: • 0+640 - 0+824 RHS: • 0+600 - 0+824

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. pecific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? ***(If yes attach list of trees indicating the location (right or left side)and the chainage)***	✓		24 trees are identified within 10 m on either side of the CL. 16 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.

No.	Parameter/ Component	Yes	No	Explanation
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[5] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		Although 11 electric poles, 1 hand pump and 2 stand post are located within 10 m on either side of road, 7 electric poles, 1 hand pump and 1 stand post will be affected by the project [Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[6] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		4 temples are identified within 10 m on either side of the CL. None of these structures would be affected due to the proposed improvement. Enclosed list Refer: E.3.

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A consultation was held with PIU and community members, it was attended by 18 persons. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• Reconstruction of the existing culverts. • Safety measures should be taken to avoid accidents at road intersection.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Chainage	Side	Name of Tree	DCL
0+130	LHS	Kadam Tree	4
0+180	LHS	pakori Tree	2.5
0+130	RHS	Coconut tree	3.5
0+180	RHS	Sajana Tree	2.5

[5] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures

[6] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures

Chainage	Side	Name of Tree	DCL
0+310	LHS	Kadam Tree	3
0+400	LHS	banyan tree	2.5
0+290	RHS	Coconut tree	3.5
0+420	LHS	mango tree	4
0+480	LHS	mango tree	5
0+510	LHS	gulmohar tree	3
0+530	LHS	Coconut tree	2.5
0+590	LHS	neem tree	2.75
0+590	LHS	Coconut tree	3
0+430	RHS	Coconut tree	4
0+470	RHS	mango tree	2.5
0+480	RHS	mango tree	3
0+500	RHS	mango tree	2.5
0+510	RHS	Kadam Tree	2.75
0+540	RHS	mango tree	2.75
0+550	RHS	Coconut tree	2.75
0+640	LHS	bakul tree	2.75
0+670	LHS	mango tree	3
0+680	LHS	mango tree	2.75
0+700	LHS	vad tree	3
Total no of trees	24		

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Chainage	Side	Type	Distance from center line (m)
0+030	LHS	Electric pole	3
0+150	RHS	Electric pole	2.5
0+300	LHS	Electric pole	2.5
0+350	LHS	Electric pole	3
0+200	RHS	Electric pole	2.5
0+210	RHS	Electric pole	2.5
0+260	RHS	Electric pole	2.5
0+400	RHS	Electric pole	2.5
0+470	LHS	Stand post	4
0+500	LHS	hand pump	2.75
0+570	RHS	Electric pole	2.5
0+610	LHS	Stand post	1.5
0+620	LHS	Electric pole	2
0+660	LHS	Electric pole	3
Total number of electric poles: 11			
Total number of Stand posts: 2			
Total number of hand pump: 1			

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10):

Chainage	Side	Sensitive Structures	Distance from center line (m)
0+270	LHS	Temple (Namghar)	4.5
0+290	LHS	School (Anganwadi)	3.75
0+460	LHS	Temple (Namghar)	3

Road Name	:	Dehingia Caon – Changmai Caon
Block Name	:	Khowang
District Name	:	Dibrugarh
Total Length of the Road	:	1.140 Km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	2620mm/year
Rainy Season	May to September

B. Location of the Road and Ceneric description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.0m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		• 0+000-0+020(LHS) • 0+050-0+200(LHS) • 0+000-0+020(RHS) • 0+170-0+310(RHS) • 0+400-0+910(LHS) • 0+400-0+590(RHS) • 0+700-0+710(RHS) • 0+930-0+970(RHS) • 1+040-1+140(RHS)

No.	Type of Ecosystem	Yes	No	Explanation
7.	Agricultural Land	✓		• 0+020-0+050(LHS) • 0+200-0+310(LHS) • 0+330-0+390(LHS) • 0+910-1+000(LHS) • 1+000-1+100(LHS) • 0+020-0+170(RHS) • 0+310-0+400(RHS) • 0+590-0+700(RHS) • 0+710-0+930(RHS) • 0+970-1+040(RHS)
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	( ) No Secondary information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	( ) No Secondary information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		31 trees are located within 10 m on either side of the CL. Out of these, 5 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		7 electric poles and 1 well are located within 10 m on either side of road. No utility structures would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		No religious, cultural or community structures/buildings[3] are located within 10 m on either side from the center line of the road alignment

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 24 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

[3] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+100	LHS	Mango
2	0+110	LHS	Mango
3	0+110	LHS	Jamu
4	0+120	LHS	Chatiana
5	0+170	LHS	Amla
6	0+170	LHS	Mango
7	0+410	LHS	Amla
8	0+580	LHS	Mango
9	0+590	LHS	Gulmohar
10	0+610	LHS	Mango
11	0+640	LHS	Mango
12	0+680	LHS	Bowal
13	0+710	LHS	Ahat
14	0+740	LHS	Mango
15	0+750	LHS	Mango
16	0+770	LHS	Mango
17	0+800	LHS	Raghu
18	0+800	LHS	Ahat
19	0+810	LHS	Bogori
20	0+000	RHS	Ahat
21	0+190	RHS	Mango
22	0+190	RHS	Mango
23	0+290	RHS	Mango
24	0+590	RHS	Mango
25	0+950	RHS	Bowal
26	1+110	RHS	Kadam
27	1+130	RHS	Kadam
28	1+135	RHS	Kadam
29	1+140	RHS	Kadam
30	1+145	RHS	Kadam
31	0+800	LHS	Kadam

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as girth is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type
1	0+320	LHS	Electric Pole
2	0+580	LHS	Electric Pole
3	0+740	LHS	Electric Pole
4	0+860	LHS	Electric Pole
5	0+900	LHS	Electric Pole
6	0+100	RHS	Electric Pole
7	0+690	RHS	Electric Pole
8	0+640	LHS	Well

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

- No religious, cultural or community structures/buildings* are located within 10 m on either side from the center line of the road alignment

* Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Road Name	:	Henevi to Milongaon Road
Block Name	:	Colaghat South
District Name	:	Colaghat
Total Length of the Road	:	9.150 km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	2620mm/year
Rainy Season	May to September

B. Location of the Road and Ceneric description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)If*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclass/fied, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		From / To / Side 0+000 / 0+600 / LHS 0+890 / 0+970 / LHS 1+070 / 1+090 / LHS 1+130 / 1+300 / LHS 1+450 / 1+490 / LHS 1+910 / 2+300 / LHS 2+930 / 3+400 / LHS 3+530 / 3+600 / LHS 3+730 / 3+830 / LHS

C. specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		75 trees are located within 10 m on either side of the CL. Out of this, 15 trees would be affected due to the proposed improvement Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary information Available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		142 electric poles, 1 hand pump, 4 transformers, 1 passenger shelter and 2 stand posts are located within 10 m on either side of road. Out of these, 5 electric poles and 1 stand post would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		2 schools and 4 namghars[3] is located within 10m from CL of the road (Refer E.3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 40 participants were present at time of consultation. The list of participants is attached in Annexure D6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+090	LHS	Ajar
2	0+100	LHS	Ajar
3	0+390	LHS	Korol
4	0+540	LHS	Radhasura
5	0+600	LHS	Ajar
6	0+810	LHS	Sonaru
7	1+390	LHS	Jackfruit
8	1+400	LHS	Sonaru
9	1+410	LHS	Sonaru
10	1+420	LHS	Sonaru
11	1+430	LHS	Sonaru

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

[3] Namghars (literally: Name House) are places for congregational worship associated with the Ekasarana religion of Assam. Besides forming the primary structure used for worship, they also function as meeting houses for congregations, as well as theaters for dramatic performances (bhaona).

Sl. No.	Chainage	Side	Name of Trees
62	3+290	RHS	Maj
63	3+292	RHS	Maj
64	3+295	RHS	Maj
65	3+380	RHS	Maj
66	3+382	RHS	Maj
67	3+385	RHS	Maj
68	3+390	RHS	Maj
69	3+392	RHS	Maj
70	3+395	RHS	Maj
71	3+400	RHS	Maj
72	3+590	RHS	Mango
73	4+430	RHS	Ajar
74	6+640	RHS	Neem
75	6+650	RHS	Sagun

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 10cm (Refer C.8)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type
1	0+315	LHS	Electric pole
2	0+340	LHS	Electric pole
3	0+400	LHS	Electric pole
4	0+440	LHS	Electric pole
5	0+500	LHS	Electric pole
6	0+600	LHS	Electric pole
7	0+720	LHS	Electric pole
8	0+750	LHS	Electric pole
9	0+800	LHS	Electric pole
10	0+850	LHS	Electric pole
11	0+890	LHS	Electric pole
12	0+920	LHS	Electric pole
13	0+480	LHS	Electric pole
14	1+220	LHS	Electric pole
15	1+270	LHS	Electric pole
16	2+480	LHS	Hand pump
17	2+650	LHS	Electric pole
18	2+790	LHS	Electric pole
19	2+850	LHS	Electric pole
20	3+130	LHS	Electric pole
21	3+180	LHS	Electric pole
22	3+230	LHS	Electric pole
23	3+280	LHS	Electric pole
24	3+310	LHS	Electric pole
25	3+390	LHS	Electric pole
26	3+440	LHS	Electric pole
27	3+490	LHS	Electric pole
28	3+540	LHS	Electric pole
29	3+600	LHS	Electric pole
30	3+650	LHS	Electric pole

Sl. No.	Chainage	Side	Type
131	6+550	RHS	Electric pole
132	6+610	RHS	Electric pole
133	7+240	RHS	Electric pole
134	7+310	RHS	Electric pole
135	8+100	RHS	Electric pole
136	8+270	RHS	Electric pole
137	8+630	RHS	Electric pole
138	8+660	RHS	Transformer
139	8+680	RHS	Electric pole
140	8+730	RHS	Electric pole
141	8+810	RHS	Electric pole
142	8+860	RHS	Electric pole
143	8+890	RHS	Electric pole
144	8+930	RHS	Electric pole
145	8+970	RHS	Electric pole
146	9+020	RHS	Electric pole
147	9+040	RHS	Electric pole
148	9+080	RHS	Electric pole
149	9+120	RHS	Electric pole
150	9+160	RHS	Electric pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties
2+490	LHS	Namghar
4+560	LHS	School
5+670	LHS	Namghar
1+990	RHS	School
4+580	RHS	Namghar
8+120	RHS	Namghar

Road Name	:	T06 to Bhakatchuk Road
Block Name	:	Kaliapani
District Name	:	Jorhat
Total Length of the Road	:	4.10 km

A. Climatic Conditions

Temperature	High: 30°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	2244 mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		• 0+130 - 0+200 (LHS) • 0+390 - 0+420 (LHS) • 0+710 - 0+780 (LHS) • 1+310 - 1+340 (LHS) • 2+700 - 2+720 (LHS) • 2+770 - 2+840 (LHS) • 3+090 - 3+100 (LHS) • 3+230 - 3+240 (LHS) • 3+270 - 3+300 (LHS) • 3+430 - 3+450 (LHS) • 3+570 - 3+610 (LHS) • 3+930 - 3+970 (LHS) • 0+510 - 0+700 (RHS)

No.	Type of Ecosystem	Yes	No	Explanation
				• 0+810 - 0+840 (RHS) • 1+070 - 1+130 (RHS) • 1+310 - 1+380 (RHS) • 2+210 - 2+240 (RHS) • 2+310 - 2+330 (RHS) • 2+870 - 2+880 (RHS) • 3+000 - 3+260 (RHS) • 3+450 - 3+470 (RHS) • 3+640 - 3+660 (RHS) • 3+800 - 3+820 (RHS) • 3+870 - 3+900 (RHS) • 3+920 - 3+970 (RHS)
7.	Agricultural Land	✓		• 2+240 - 2+300 (LHS) • 2+350 - 2+400 (LHS) • 3+120 - 3+180 (LHS) • 3+510 - 3+550 (LHS) • 3+630 - 3+700 (LHS) • 3+750 - 3+880 (LHS) • 3+980 - 4+000 (LHS) • 2+250 - 2+300 (RHS) • 2+350 - 2+400 (RHS) • 3+270 - 3+400 (RHS) • 3+520 - 3+550 (RHS) • 3+670 - 3+740 (RHS)
8	Tea Carden	✓		• 0+210 - 0+380 (LHS) • 0+430 - 0+700 (LHS) • 0+790 - 1+030 (LHS) • 1+350 - 1+900 (LHS) • 1+930 - 2+240 (LHS) • 2+510 - 2+680 (LHS) • 0+710 - 0+780 (RHS) • 0+860 - 0+920 (RHS) • 0+970 - 1+020 (RHS) • 1+250 - 1+300 (RHS) • 1+510 - 1+870 (RHS) • 2+150 - 2+210 (RHS) • 2+780 - 2+810 (RHS) • 2+810 - 2+860 (RHS)
9.	Crazing grounds		✓	
10.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	

No.	Parameter/ Component	Yes	No	Explanation
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		22 trees are located within 10 m on either side of the CL. Out of these, 4 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		61 electric poles and 1 transformer are located within 10 m on either side of road. Out of this 32 electric poles and would be affected due to the project.(Refer E.2)
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		2 namghar ,2 schools and 2 temples are located within 10m from CL of the road (Refer E.3)

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 24 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees	No. of Trees
1	0+010	LHS	Ahat	1
2	0+020	LHS	Ahat	1
3	3+620	LHS	Ahat	1
4	3+630	RHS	Ahat	1
5	3+360	LHS	Ahat	1
6	1+430	RHS	Ahat	1
7	3+830	RHS	Ahat	1
8	3+840	RHS	Ahat	1
9	2+690	LHS	Bor Tree	1
10	2+430	LHS	Bor Tree	1
11	3+220	LHS	Jackfruit	1
12	0+300	RHS	Jamu	1
13	0+330	LHS	Jamu	1
14	0+490	RHS	Jon	1
15	3+400	LHS	Mango	1
16	2+990	RHS	Mango	1
17	0+070	RHS	Mango	1
18	0+480	RHS	Mango	1
19	3+140	RHS	Nahar	1
20	0+690	LHS	Simolu	1
21	0+540	LHS	Simolu	1
22	3+710	LHS	Sunaru	1
Total no. of Trees				22

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type	No. of Utilities
1	1+010	LHS	Electric Pole	1
2	1+990	LHS	Electric Pole	1
3	2+170	LHS	Electric Pole	1

Sl. No.	Chainage	Side	Type	No. of Utilities
60	3+520	RHS	Electric Pole	1
61	2+940	RHS	Transformer	1
Total				61

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Particulars	DCL
3+590	RHS	School	5
0+130	RHS	School	4.5
3+480	RHS	Namghar	3
3+500	RHS	Namghar	3
0+470	LHS	Temple	4
1+920	RHS	Temple	4.75

Road Name : T08 to Rewa Pathar Road

Block Name : Dimoria

District Name : Kamrup

Total Length of the Road : 3.60 km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	2626mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		

From	To	Side
0+000	0+400	LHS
0+550	1+230	LHS
1+630	2+000	LHS
2+270	2+540	LHS
2+540	2+610	LHS
2+610	2+640	LHS
2+660	2+720	LHS
2+960	3+060	LHS
3+180	3+380	LHS
3+420	3+855	LHS

No.	Type of Ecosystem	Yes	No	Explanation
				0+200 0+270 RHS 0+420 0+620 RHS 0+700 1+320 RHS 1+480 1+600 RHS 1+930 2+120 RHS 2+270 2+350 RHS 2+480 2+960 RHS 3+050 3+420 RHS 3+550 3+585 RHS
7.	Agricultural Land	✓		From To Side 0+400 0+550 LHS 2+000 2+270 LHS 2+640 2+660 LHS 2+720 2+960 LHS 3+060 3+180 LHS 3+380 3+420 LHS 0+000 0+200 RHS 0+270 0+400 RHS 0+620 0+700 RHS 1+630 1+930 RHS 2+120 2+270 RHS
8.	Crazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***	✓		Erosion prone areas are identified at ch 0+130 km (LHS), 0+390 km (RHS), 0+660 km (LHS), 1+030 km (LHS), 1+240 km (LHS), 1+310 (LHS), 1+430 (LHS), 1+530 (LHS), 1+400 (RHS), 1+600 (LHS), 1+610 (RHS), 3+260 km (LHS), 3+310 km (LHS) and 3+530 km (LHS). ( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	

No.	Parameter/ Component	Yes	No	Explanation
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		30 trees are identified within 10 m on either side of the CL. Out of these, 4 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		61 electric poles, 2 transformers and 1 well pole are located within 10 m on either side of road. Out of this, 4 electric poles would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 temple and 1 school are located within 10m from CL of the road (Refer E.3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 12 participants were present at time of consultation. The list of participants is attached in Annexure E6.

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

No.	Consultation Activities	Yes	No	Remarks
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees	No. of Trees
1	0+200	LHS	Sirish	1
2	0+230	RHS	Hunkhun	1
3	0+240	RHS	Hunkhun	1
4	0+260	RHS	Hunkhun	1
5	0+270	RHS	Hunkhun	1
6	0+420	RHS	Sirish	1
7	0+450	RHS	Bodh	1
8	0+460	RHS	Bodh	1
9	0+470	RHS	Mango	1
10	0+570	RHS	Ahat	1
11	0+590	RHS	Bodh	1
12	0+610	RHS	Korai	1
13	0+810	RHS	Koras	1
14	0+820	RHS	Koras	1
15	0+830	RHS	Koras	1
16	0+840	RHS	Koras	1
17	1+340	LHS	Mango	1
18	2+290	LHS	Krishnasura	1
19	2+610	LHS	Simolu	1
20	2+630	RHS	Sajina	1
21	2+640	RHS	Simolu	1
22	2+680	RHS	Segun	1
23	2+690	RHS	Segun	1
24	2+700	RHS	Segun	1
25	2+750	RHS	Poma	1
26	2+800	RHS	Poma	1
27	2+930	LHS	Jackfruit	1
28	2+940	LHS	Jackfruit	1
29	2+940	RHS	Jackfruit	1
30	3+200	RHS	Simolu	1

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type	No. of Utilities
1	0+050	LHS	EP	1
2	0+100	LHS	EP	1

Sl. No.	Chainage	Side	Type	No. of Utilities
60	3+280	RHS	EP	1
61	3+330	RHS	EP	1
62	3+450	LHS	EP	1
63	3+470	LHS	EP	1
64	3+520	LHS	EP	1

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Particulars	DCL
2+090	RHS	Temple	3
3+370	LHS	School	5

Road Name	:	T03 to Mekwe Pather Road
Block Name	:	Rongkhang
District Name	:	Karbi Anglong
Total Length of the Road	:	4.00 km

A. Climatic Conditions

Temperature	High: 36°o Low: 9°o
Humidity	High: : 95% Low: 40%
Rainfall	1000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain – Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		From / To / Side 0+000 / 0+070 / LHS 0+410 / 0+740 / LHS 0+960 / 1+070 / LHS 1+290 / 1+790 / LHS 2+430 / 2+860 / LHS 3+660 / 3+730 / LHS 3+760 / 3+830 / LHS 0+580 / 0+600 / RHS 0+780 / 0+800 / RHS 0+870 / 0+890 / RHS

No.	Type of Ecosystem	Yes	No	Explanation
				0+990 1+080 RHS 1+280 1+800 RHS 2+600 2+980 RHS
7.	Agricultural Land	✓		From To Side 0+070 0+410 LHS 0+740 0+960 LHS 1+070 1+290 LHS 1+790 2+430 LHS 2+930 3+660 LHS 3+730 3+760 LHS 3+830 3+920 LHS 0+000 0+380 RHS 0+600 0+670 RHS 0+670 0+700 RHS 0+700 0+780 RHS 0+800 0+870 RHS 0+890 0+990 RHS 1+080 1+280 RHS 1+800 2+300 RHS 2+980 4+000 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. Along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	

No.	Parameter/ Component	Yes	No	Explanation
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		224 trees are located within 10 m on either side of the CL. [Enclosed list Refer: E.1]
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		43 electric poles, and 1 transformer are located within 10 m on either side of road.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 temple is located within 10 m on either side of the alignment. (Refer E.3).

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 15 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The existing alignment should be finalised

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

No.	Consultation Activities	Yes	No	Remarks
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+020	LHS	Jackfruit
2	0+050	LHS	Segun
3	0+055	LHS	Segun
4	0+220	LHS	Mox
5	0+230	LHS	Ajar
6	0+455	LHS	Koroi
7	0+620	LHS	Mandar
8	0+730	LHS	Mandar
9	0+745	LHS	Mahaneem
10	0+790	LHS	Krishnasura
11	0+810	LHS	Kadom
12	0+980	LHS	Koroi
13	0+985	LHS	Krishnasura
14	1+015	LHS	Krishnasura
15	1+030	LHS	Krishnasura
16	1+310	LHS	Mox
17	1+340	LHS	Coconut
18	1+410	LHS	Mox
19	1+430	LHS	Amra
20	1+450	LHS	Amra
21	1+470	LHS	Amra
22	1+490	LHS	Mox
23	1+500	LHS	Simolu
24	1+550	LHS	Karanj
25	1+555	LHS	Karanj
26	1+570	LHS	Karanj
27	1+640	LHS	Sajna
28	1+660	LHS	Segun
29	1+670	LHS	Segun
30	1+680	LHS	Segun
31	1+700	LHS	Segun
32	1+702	LHS	Segun
33	1+704	LHS	Segun
34	1+710	LHS	Khejur
35	1+715	LHS	Segun
36	1+720	LHS	Segun
37	1+722	LHS	Segun
38	1+724	LHS	Segun
39	1+730	LHS	Segun
40	1+740	LHS	Segun
41	1+745	LHS	Segun
42	1+750	LHS	Segun
43	1+755	LHS	Segun
44	1+760	LHS	Segun
45	1+765	LHS	Segun
46	1+770	LHS	Segun
47	1+780	LHS	Jackfruit

Sl. No.	Chainage	Side	Name of Trees
219	3+820	RHS	Kondi
220	3+825	RHS	Kondi
221	3+830	RHS	Kondi
222	3+835	RHS	Kondi
223	3+850	RHS	Kondi
224	3+950	RHS	Kondi

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Utility Type
1	0+010	LHS	Electric Pole
2	0+450	LHS	Electric Pole
3	0+500	LHS	Electric Pole
4	0+540	LHS	Transformer
5	0+545	LHS	Electric Pole
6	0+590	LHS	Electric Pole
7	0+600	LHS	Electric Pole
8	0+630	LHS	Electric Pole
9	0+690	LHS	Electric Pole
10	0+740	LHS	Electric Pole
11	0+805	LHS	Electric Pole
12	0+855	LHS	Electric Pole
13	0+890	LHS	Electric Pole
14	0+970	LHS	Electric Pole
15	1+010	LHS	Electric Pole
16	1+070	LHS	Electric Pole
17	1+110	LHS	Electric Pole
18	1+160	LHS	Electric Pole
19	1+200	LHS	Electric Pole
20	1+210	LHS	Electric Pole
21	1+290	LHS	Electric Pole
22	1+330	LHS	Electric Pole
23	1+390	LHS	Electric Pole
24	1+440	LHS	Electric Pole
25	1+600	LHS	Electric Pole
26	2+630	LHS	Electric Pole
27	2+730	LHS	Electric Pole
28	2+830	LHS	Electric Pole
29	3+050	LHS	Electric Pole
30	3+450	LHS	Electric Pole
31	3+520	LHS	Electric Pole
32	3+720	LHS	Electric Pole
33	3+790	LHS	Electric Pole
34	2+500	RHS	Electric Pole
35	3+120	RHS	Electric Pole
36	3+190	RHS	Electric Pole
37	3+290	RHS	Electric Pole
38	3+350	RHS	Electric Pole
39	3+390	RHS	Electric Pole
40	3+500	RHS	Electric Pole
41	3+630	RHS	Electric Pole
42	3+665	RHS	Electric Pole

Sl. No.	Chainage	Side	Utility Type
43	3+710	RHS	Electric Pole
44	3+770	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties	Distance from center line (m)
3+800	LHS	Temple	8

Road Name	:	NH 151- Suprakandi
Block Name	:	North Karimganj
District Name	:	Karimganj
Total Length of the Road	:	1 Km

A. Climatic Conditions

Temperature	High: 31°c Low: 10°c
Humidity	High: : 96% Low: 77%
Rainfall	2457.5mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain (Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 13m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Chainage From / To: 0+110 / 0+150 (LHS); 0+200 / 0+260 (LHS); 0+480 / 0+500 (LHS)
7.	Agricultural Land	✓		Chainage From / To / Side: 0+000 / 0+110 / LHS; 0+150 / 0+200 / LHS; 0+260 / 0+480 / LHS; 0+500 / 1+000 / LHS; 0+050 / 1+000 / RHS

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	✓		The road section between Ch 0+600 and Ch 1+000 km is flood prone. HFL is 1.5 ft as informed by the local people. ( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? ***(If yes attach list of trees indicating the location (right or left side)and the chainage)***	✓		23 trees are located within 10 m on either side of the CL. Out of these, 17 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird		✓	

No.	Parameter/ Component	Yes	No	Explanation
	migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	 ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[3] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		2 electric poles and 1 transformer are located within 10 m on either side of road. Out of these 2 electric poles would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[4] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		No religious, cultural or community structures/buildings[4] are located within 10 m on either side from the center line of the road alignment

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 7 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+130	LHS	Kadam
2	0+260	LHS	Kadam
3	0+262	LHS	Kadam

[3] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[4] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

[4] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Sl. No.	Chainage	Side	Name of Trees
4	0+264	LHS	Kadam
5	0+266	LHS	Kadam
6	0+268	LHS	Kadam
7	0+270	LHS	Kadam
8	0+272	LHS	Kadam
9	0+274	LHS	Kadam
10	0+276	LHS	Kadam
11	0+278	LHS	Kadam
12	0+280	LHS	Kadam
13	0+282	LHS	Kadam
14	0+284	LHS	Kadam
15	0+350	LHS	Sims
16	0+360	LHS	Mango
17	0+365	LHS	Kadam
18	0+040	RHS	Mango
19	0+045	RHS	Kadam
20	0+500	RHS	Kadam
21	0+502	RHS	Kadam
22	0+504	RHS	Kadam
23	0+506	RHS	Kadam

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type
1	0+040	LHS	Electric Pole
2	0+110	LHS	Electric Pole
3	0+005	RHS	Transformeer

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

- No religious, cultural or community structures/buildings[5] are located within 10 m on either side from the center line of the road alignment

Road Name	:	13s (Latagaon) to Lahari road
Block Name	:	Kokrajhar
District Name	:	Kokrajhar
Total Length of the Road	:	2.30 km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 42%
Rainfall	2626mm/year
Rainy Season	May to September

B. Location of the Road and Ceneric description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species: (if any):
6.	Inhabited Area	✓		• 0+000-0+100 (RHS) • 0+400-0+600 (Both Side) • 0+700-0+900 (Both side) • 2+100-2+200 (RHS) • 2+200-2+300 (Both side)
7.	Agricultural Land	✓		• 0+000-0+400 (Both Side) • 0+600-0+700 (Both side) • 0+900-2+100 (Both side) • 2+100-2+200 (LHS)

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		43 trees are located within 10 m on either side of the CL. Out of these, 12 trees (including areca nut and bamboo) would be affected due to the proposed improvement. Enclosed list Refer: 8.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		18 electric poles, 3 stand posts, 1well, 1 transformer and 1 hand pump are located within 10 m on either side of road. Out of this, 2 electric poles and 2 stand posts would be affected due to the project.(Refer E.2)
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		One temple is located within 10m from CL of the road (Refer E.3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and community members. About 13 participants were present at time of consultation. The list of participants is attached in Annexure D5.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees	No. of Trees
1	0+295	RHS	Jam	1
2	0+350	LHS	Kadam	1
3	0+355	LHS	Kadam	1
4	0+390	RHS	Ashok	1
5	0+430	RHS	Sashi	1
6	0+470	RHS	Sashi	1
7	0+560	RHS	Silikha	1
8	0+320	LHS	Mango	1

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Sl. No.	Chainage	Side	Name of Trees	No. of Trees
9	0+322	LHS	Jackfruit	1
10	0+325	LHS	Jaya	1
11	0+330	LHS	Kadam	1
12	0+350	LHS	Kadam	1
13	0+355	LHS	Kadam	1
14	0+380	LHS	Titashap	1
15	0+500	LHS	Bogori	1
16	0+560	LHS	Jackfruit	1
17	0+565	LHS	Jackfruit	1
18	1+150	LHS	Bogori	1
19	1+500	LHS	Mango	1
20	2+010	LHS	Valkar	1
21	2+110	LHS	Jaya	1
22	2+110	LHS	Jaya	1
23	0+280	RHS	Ashot	1
24	0+510	RHS	Jackfruit	1
25	0+520	RHS	Coconut	1
26	0+522	RHS	Coconut	1
27	0+524	RHS	Coconut	1
28	0+610	RHS	Jackfruit	1
29	0+620	RHS	Khajur	1
30	0+640	RHS	Jackfruit	1
31	0+700	RHS	Titashap	1
32	0+740	RHS	Khajur	1
33	1+300	RHS	Jaya	1
34	1+320	RHS	Cameri	1
35	1+470	RHS	Jaya	1
36	1+400	RHS	Jaya	1
37	2+150	RHS	Ashot	1
38	0+300	RHS	Sarsi	1
39	0+350	RHS	Coconut	1
40	0+410	RHS	Ahat	1
41	0+420	RHS	Amlokhi	1
42	0+430	RHS	Sashi	1
43	0+435	RHS	Coconut	1
Total no. of Trees:				43

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 10cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type	No. of Utilities
1	0+000	LHS	Electric Pole	1
2	0+510	LHS	Stand Post	1
3	0+775	LHS	Electric Pole	1
4	0+670	LHS	Electric Pole	1
5	0+710	LHS	Electric Pole	1
6	0+745	LHS	Stand Post	1
7	0+790	LHS	Electric Pole	1

Sl No.	Chainage	Side	Type	No. of Utilities
8	0+820	LHS	Electric Pole	1
9	0+870	LHS	Electric Pole	1
10	0+920	LHS	Electric Pole	1
11	1+260	LHS	Electric Pole	1
12	1+410	LHS	Electric Pole	1
13	0+220	RHS	Stand post	1
14	0+320	RHS	Electric Pole	1
15	0+440	RHS	Electric Pole	1
16	0+505	RHS	Electric Pole	1
17	0+980	RHS	Electric Pole	1
18	1+030	RHS	Electric Pole	1
19	1+130	RHS	Electric Pole	1
20	1+290	RHS	Electric Pole	1
21	2+270	RHS	Hand pump	1
22	2+280	RHS	Well	1
23	0+290	RHS	Transformer	1
24	0+400	RHS	Electric Pole	1
Total				24

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10).

Chainage	Side	Distance from Center Line	Particulars
2+110	RHS	6	Temple

Road Name	:	Fulbari No.2 to Dhemagarh No.2
Block Name	:	Nowboicha
District Name	:	Lakhimpur
Total Length of the Road	:	1.975 Km

A. Climatic Conditions

Temperature	High: 35°c Low: 8°c
Humidity	High: : 89% Low: 74%
Rainfall	2830mm/year
Rainy Season	June to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 88m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Chainage From / To: 0+000 – 0+130; 0+160 – 0+400; 0+430 – 1+000; 1+040 – 1+060; 1+100 – 1+140; 1+180 – 1+200; 1+290 – 1+340; 1+480 – 1+540; 1+570 – 1+680 — Side: LHS

No.	Type of Ecosystem	Yes	No	Explanation
				1+800 1+980 LHS 0+000 0+090 RHS 0+460 0+510 RHS 1+050 1+130 RHS 1+200 1+350 RHS 1+600 1+710 RHS 1+800 1+850 RHS
7.	Agricultural Land	✓		Chainage From / To — Side: 0+400 0+430 LHS 1+000 1+040 LHS 1+060 1+100 LHS 1+140 1+180 LHS 1+200 1+290 LHS 1+340 1+480 LHS 1+540 1+570 LHS 0+130 0+460 RHS 0+510 1+050 RHS 1+130 1+200 RHS 1+500 1+600 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	

No.	Parameter/ Component	Yes	No	Explanation
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		162 trees are located within 10 m on either side of the CL. Out of these, 1 tree would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		36 electric poles, 1 passenger shelter, 2 transformers and 3 wells are located within 10 m on either side of road. 6 electric poles would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 namghar[3], is located within 10 m on either side from the center line of the road alignment

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 16 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved.

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

[3] Namghars (literally: Name House) are places for congregational worship associated with the Ekasarana religion of Assam. Besides forming the primary structure used for worship, they also function as meeting houses for congregations, as well as theaters for dramatic performances (bhaonas).

No.	Consultation Activities	Yes	No	Remarks
				• Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+010	LHS	Jiya
2	0+020	LHS	Mango
3	0+025	LHS	Mango
4	0+035	LHS	Coconut
5	0+120	LHS	Coconut
6	0+140	LHS	Jiya
7	0+142	LHS	Jiya
8	0+144	LHS	Jiya
9	0+146	LHS	Jiya
10	0+180	LHS	Vaja
11	0+200	LHS	Modar
12	0+210	LHS	Jiya
13	0+240	LHS	Vaja
14	0+245	LHS	Vaja
15	0+260	LHS	Vaja
16	0+262	LHS	Vaja
17	0+264	LHS	Vaja
18	0+280	LHS	Vaja
19	0+310	LHS	Vaja
20	0+330	LHS	Sirs
21	0+340	LHS	Vaja
22	0+370	LHS	Ahot
23	0+380	LHS	Shap
24	0+390	LHS	Jackfruit
25	0+430	LHS	Vaja
26	0+435	LHS	Vaja
27	0+450	LHS	Vaja
28	0+460	LHS	Vaja
29	0+480	LHS	Nahor
30	0+500	LHS	Ajar
31	0+530	LHS	Mango
32	0+540	LHS	Vaja
33	0+550	LHS	Jamu
34	0+590	LHS	Mango
35	0+600	LHS	Vaja
36	0+610	LHS	Krishnasura
37	0+620	LHS	Vaja
38	0+640	LHS	Comari
39	0+650	LHS	Vaja
40	0+670	LHS	Vaja
41	0+680	LHS	Ajar
42	0+700	LHS	Vaja

Sl. No.	Chainage	Side	Name of Trees
157	1+660	RHS	Kesari
158	1+670	RHS	Kesari
159	1+680	RHS	Jamu
160	1+710	RHS	Bel
161	1+740	RHS	Simalu
162	1+980	RHS	Kesari

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type
1	0+820	LHS	Electric pole
2	0+890	LHS	Electric pole
3	0+940	LHS	Electric pole
4	1+000	LHS	Electric pole
5	1+005	LHS	Passenger shelter
6	1+050	LHS	Electric pole
7	1+110	LHS	Electric pole
8	1+130	LHS	Electric pole
9	1+580	LHS	Well
10	0+040	RHS	Electric pole
11	0+110	RHS	Electric pole
12	0+160	RHS	Electric pole
13	0+210	RHS	Electric pole
14	0+400	RHS	Electric pole
15	0+470	RHS	Electric pole
16	0+540	RHS	Well
17	0+550	RHS	Electric pole
18	0+600	RHS	Electric pole
19	0+605	RHS	Well
20	0+660	RHS	Electric pole
21	0+690	RHS	Electric pole
22	0+770	RHS	Transformer
23	1+130	RHS	Electric pole
24	1+170	RHS	Electric pole
25	1+240	RHS	Electric pole
26	1+290	RHS	Electric pole
27	1+300	RHS	Electric pole
28	1+340	RHS	Electric pole
29	1+410	RHS	Electric pole
30	1+430	RHS	Electric pole
31	1+480	RHS	Electric pole
32	1+500	RHS	Transformer
33	1+520	RHS	Electric pole
34	1+550	RHS	Electric pole
35	1+580	RHS	Electric pole
36	1+610	RHS	Electric pole
37	1+700	RHS	Electric pole
38	1+750	RHS	Electric pole
39	1+820	RHS	Electric pole
40	1+900	RHS	Electric pole
41	1+930	RHS	Electric pole
42	1+970	RHS	Electric pole

Road Name	:	Nonoi Dakhipat Road to Rangalumukh
Block Name	:	Pakhimaria
District Name	:	Nagaon
Total Length of the Road	:	1.68 Km

A. Climatic Conditions

Temperature	High: 32.9°c Low: 11.2°c
Humidity	High: : 95% Low: 40%
Rainfall	1760 mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 61m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Chainage From: 0+000 To: 0+260 Side: LHS Chainage From: 0+000 To: 0+050 Side: RHS
7.	Agricultural Land	✓		Chainage From: 0+270 To: 1+500 Side: LHS Chainage From: 0+300 To: 0+500 Side: RHS Chainage From: 0+700 To: 1+400 Side: RHS Chainage From: 1+480 To: 1+670 Side: RHS

No.	Type of Ecosystem	Yes	No	Explanation
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	✓		The road is flood prone. HFL is 2 to 3 ft. as informed by the local community.
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? ***(If yes attach list of trees indicating the location (right or left side)and the chainage)***	✓		91 trees are located within 10 m on either side of the CL. Out of these, 9 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[7] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		5 electric poles are located within 10 m on either side of road. All the electric poles would be affected due to the project.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[8] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*		✓	No religious, cultural or community structures/buildings[9] are located within 10 m on either side from the center line of the road alignment

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 14 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The condition of the existing culverts should be improved. • Safety measures should be taken to avoid accidents. • All the relevant project information should be disclosed to the community before the start of civil works.
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+010	LHS	Silikha
2	0+020	LHS	Cocoonut
3	0+030	LHS	Cocoonut
4	0+040	LHS	Mango
5	0+060	LHS	Ou Tenga
6	0+070	LHS	Comari
7	0+080	LHS	Thuthmora
8	0+130	LHS	Toun

[7] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[8] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

[9] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Sl. No.	Chainage	Side	Name of Trees
66	0+640	RHS	Bel
67	0+640	RHS	Comari
68	0+650	RHS	Comari
69	0+660	RHS	Comari
70	0+690	RHS	Simolu
71	0+690	RHS	Sonaru
72	0+690	RHS	Axar
73	0+700	RHS	Comari
74	0+940	RHS	Ahat
75	1+120	RHS	Simolu
76	1+120	RHS	Simolu
77	1+130	RHS	Comari
78	1+230	RHS	Mango
79	1+230	RHS	Sonaru
80	1+250	RHS	Modar
81	1+270	RHS	Mango
82	1+340	RHS	Sonaru
83	1+400	RHS	Krishnasura
84	1+420	RHS	Jackfruit
85	1+430	RHS	Coconut
86	1+440	RHS	Comari
87	1+440	RHS	Ketkora
88	1+440	RHS	Ketkora
89	1+450	RHS	Simolu
90	1+510	RHS	Ahat
91	1+660	RHS	Krishnasura

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type
1	0+020	RHS	Electric Pole
2	0+050	RHS	Electric Pole
3	0+100	RHS	Electric Pole
4	0+160	RHS	Electric Pole
5	0+210	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

- No religious, cultural or community structures/buildings[1] are located within 10 m on either side from the center line of the road alignment

Road Name	:	Sandha LP School to Katra HE School Road
Block Name	:	Pub Nalbari
District Name	:	Nalbari
Total Length of the Road	:	2.20 km

A. Climatic Conditions

Temperature	High: 38°o Low: 9°o
Humidity	High: : 95% Low: 40%
Rainfall	2626mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain—(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		Chainage — Side 0+980 LHS 1+160 LHS 1+420 LHS 1+470 LHS 1+620 LHS 1+640 LHS 0+090 RHS 0+130 RHS 0+180 RHS 0+370 RHS 1+150 RHS

No.	Type of Ecosystem	Yes	No	Explanation
				1+290 RHS 1+610 RHS 1+640 RHS
7.	Agricultural Land	✓		From To Side 0+350 0+560 LHS 0+700 0+910 LHS 1+200 1+330 LHS 1+830 2+060 LHS 0+640 0+950 RHS 1+210 1+270 RHS 1+360 1+440 RHS 1+450 1+600 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. **Specific description of the Road Environment**

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***	✓		Erosion prone areas are identified at ch 0+055 km(LHS), 0+290 km(RHS), 0+660 km(LHS), 1+440 km(LHS), 1+730 km(LHS) and 1+760 km(LHS) ( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	✓		Flood prone area is identified between ch. 1+670 km and ch. 2+100 km. HFL is 2 to 3 ft as informed by the community. ( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		15 trees are located within 10 m on either side of the CL. Out of these, 6 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		✓	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		9 electric poles and 1 transformer are located within 10 m on either side of road.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 namghor and 2 schools are located within 10m on either side of the CL of the road (Refer E.3).

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 13 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		The existing alignment should be finalised
3.	If suggestions received, were they incorporated into the design?	✓		

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees	No. of Trees
1	0+010	LHS	Krishna Sura	1
2	0+050 to 0+100	LHS	Kadam	10
3	0+550	RHS	Coconut	4
Total no. of Trees:				15

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as girth is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Type	No. of Utilities
1	0+070	LHS	Electric Pole	1
2	0+110	LHS	Electric Pole	1
3	0+190	LHS	Electric Pole	1
4	0+250	LHS	Electric Pole	1
5	0+320	LHS	Electric Pole	1
6	1+120	LHS	Electric Pole	1
7	1+550	LHS	Electric Pole	1
8	0+070	RHS	Electric Pole	1
9	0+320	RHS	Electric Pole	1
10	0+400	RHS	Transformer	1
Total				10

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Distance from Center Line	Particulars
0+030	RHS	4	Namghar
0+180	RHS	5	School
0+970	RHS	10	School

Road Name	:	Mahkhowajan to Amguri Kachari Road
Block Name	:	Borchala
District Name	:	Sonitpur
Total Length of the Road	:	2.00 km

A. Climatic Conditions

Temperature	High: 36°o Low: 9°o
Humidity	High: : 95% Low: 40%
Rainfall	1000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain – Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		

From	To	Side
0+030	0+400	LHS
0+430	0+705	LHS
0+732	0+785	LHS
0+890	1+170	LHS
1+420	1+680	LHS
1+700	1+780	LHS
1+860	1+920	LHS
1+980	2+000	LHS
0+040	0+110	RHS
0+140	0+150	RHS
0+190	0+210	RHS

No.	Type of Ecosystem	Yes	No	Explanation
				0+420 0+650 RHS 0+730 0+800 RHS 0+850 1+000 RHS 1+040 1+210 RHS 1+370 1+720 RHS 1+760 1+850 RHS 1+980 2+000 RHS
7.	Agricultural Land	✓		From To Side 1+680 1+700 LHS 1+780 1+830 LHS 1+350 1+370 RHS 1+850 1+980 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. Along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		229 trees are located within 10 m on either side of the CL. [Enclosed list Refer: E.1]
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		38 electric poles, and 2 stand posts are located within 10 m on either side of road.[Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 mosque is located within 10 m on either side of the alignment. [Refer E.3].

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 21 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The existing alignment should be finalised
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+000	LHS	Sahura
2	0+050	LHS	Cocoonut
3	0+070	LHS	Cocoonut
4	0+090	LHS	Debodaru

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar strucutures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Utility Type
1	0+475	LHS	Electric Pole
2	0+510	LHS	Electric Pole
3	0+720	LHS	Electric Pole
4	0+765	LHS	Electric Pole
5	0+810	LHS	Electric Pole
6	0+905	LHS	Electric Pole
7	0+960	LHS	Electric Pole
8	1+045	LHS	Electric Pole
9	1+115	LHS	Electric Pole
10	1+170	LHS	Electric Pole
11	1+250	LHS	Electric Pole
12	1+300	LHS	Electric Pole
13	1+330	LHS	Electric Pole
14	1+430	LHS	Electric Pole
15	1+490	LHS	Electric Pole
16	1+590	LHS	Electric Pole
17	1+640	LHS	Electric Pole
18	1+660	LHS	Electric Pole
19	1+830	LHS	Electric Pole
20	1+890	LHS	Electric Pole
21	0+010	RHS	Electric Pole
22	0+050	RHS	Electric Pole
23	0+095	RHS	Electric Pole
24	0+110	RHS	Electric Pole
25	0+150	RHS	Electric Pole
26	0+180	RHS	Electric Pole
27	0+200	RHS	Electric Pole
28	0+210	RHS	Electric Pole
29	0+320	RHS	Electric Pole
30	0+390	RHS	Electric Pole
31	0+570	RHS	Electric Pole
32	0+620	RHS	Electric Pole
33	0+670	RHS	Electric Pole
34	1+384	RHS	Electric Pole
35	1+490	RHS	Stand Post
36	1+540	RHS	Electric Pole
37	1+630	RHS	Electric Pole
38	1+745	RHS	Electric Pole
39	1+790	RHS	Electric Pole
40	1+830	RHS	Stand Post

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties	Distance from center line (m)
1+845	LHS	Mosque	10

Road Name	:	Kachujan to Gelapukhuri Road
Block Name	:	Guijan
District Name	:	Tinsukia
Total Length of the Road	:	1.890 km

A. Climatic Conditions

Temperature	High: 36°o Low: 9°o
Humidity	High: : 95% Low: 40%
Rainfall	1000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain——(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain – Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		

From	To	Side
0+010	0+030	LHS
0+110	0+170	LHS
0+180	0+200	LHS
0+230	0+260	LHS
0+560	0+580	LHS
0+620	0+640	LHS
0+770	0+800	LHS
1+130	1+160	LHS
1+180	1+200	LHS
1+310	1+400	LHS
1+410	1+440	LHS

No.	Type of Ecosystem	Yes	No	Explanation
				1+610 1+800 LHS 0+010 0+100 RHS 0+280 0+300 RHS 0+760 0+800 RHS 0+810 0+850 RHS 1+060 1+080 RHS 1+220 1+400 RHS 1+610 1+650 RHS 1+710 1+770 RHS
7.	Agricultural Land	✓		From To Side 0+870 0+890 LHS 0+900 0+980 LHS 1+040 1+100 LHS 1+460 1+480 LHS 0+310 0+340 RHS 0+410 0+500 RHS 0+520 0+550 RHS 1+040 1+060 RHS
8.	Grazing grounds		✓	
9.	Barren Land		✓	

C. **Specific description of the Road Environment**

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? ***(If yes, indicate the location (right or left side) and the chainage)***		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		✓	
3.	Are there any nallas/streams/rivers etc. Along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		✓	

No.	Parameter/ Component	Yes	No	Explanation
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		12 trees are located within 10 m on either side of the CL. [Enclosed list Refer: E.1]
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		33 electric poles, 1 hand pump, 5 stand posts and 1 telephone pole are located within 10 m on either side of road.(Refer E.2)
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 school is located within 10 m on either side of the alignment. (Refer E.3).

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A community consultation was held with PIU and Community members. About 48 participants were present at time of consultation. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• The existing alignment should be finalised

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

No.	Consultation Activities	Yes	No	Remarks
3.	If suggestions received, were they incorporated into the design?	✓		

E. Annexures

E-1 List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)

Sl. No.	Chainage	Side	Name of Trees
1	0+100	LHS	Maj
2	0+390	LHS	Kadam
3	0+520	LHS	Mango
4	0+650	LHS	Kadam
5	0+670	LHS	Kadam
6	0+980	LHS	Mango
7	1+250	LHS	Neem
8	1+430	LHS	Kadam
9	0+350	RHS	Maj
10	0+990	RHS	Kadam
11	1+820	RHS	Kadam
12	1+840	RHS	Maj

Note: Areca palms and bamboo bushes within 10 m either side from centreline have not been considered in tree enumeration as dbh is less than 30cm (Refer C.6)

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Sl. No.	Chainage	Side	Utility Type
1	0+070	LHS	Electric Pole
2	0+910	LHS	Electric Pole
3	0+950	LHS	Electric Pole
4	1+050	LHS	Electric Pole
5	1+080	LHS	Electric Pole
6	1+130	LHS	Electric Pole
7	1+170	LHS	Electric Pole
8	1+190	LHS	Electric Pole
9	1+240	LHS	Electric Pole
10	1+340	LHS	Electric Pole
11	1+380	LHS	Electric Pole
12	1+430	LHS	Electric Pole
13	1+510	LHS	Electric Pole
14	1+530	LHS	Electric Pole
15	1+570	LHS	Electric Pole
16	1+580	LHS	Telephone Pole
17	1+610	LHS	Electric Pole
18	1+640	LHS	Electric Pole
19	0+010	RHS	Electric Pole
20	0+090	RHS	Electric Pole
21	0+150	RHS	Electric Pole
22	0+190	RHS	Electric Pole
23	0+200	RHS	Stand Post

Sl. No.	Chainage	Side	Utility Type
24	0+260	RHS	Electric Pole
25	0+370	RHS	Stand Post
26	0+510	RHS	Electric Pole
27	0+650	RHS	Stand Post
28	0+660	RHS	Electric Pole
29	0+740	RHS	Electric Pole
30	0+750	RHS	Stand Post
31	0+870	RHS	Electric Pole
32	0+940	RHS	Stand Post
33	1+260	RHS	Electric Pole
34	1+340	RHS	Electric Pole
35	1+420	RHS	Electric Pole
36	1+450	RHS	Electric Pole
37	1+500	RHS	Electric Pole
38	1+570	RHS	Electric Pole
39	1+660	RHS	Hand Pump
40	1+700	RHS	Electric Pole

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)

Chainage	Side	Properties	Distance from center line (m)
1+890	RHS	School	6.25

Road Name	:	Batabari No1 to Hatibandha Road
Block Name	:	Kalaigaon
District Name	:	Udalguri
Total Length of the Road	:	1.700 km

A. Climatic Conditions

Temperature	High: 38°c Low: 9°c
Humidity	High: : 95% Low: 40%
Rainfall	3000mm/year
Rainy Season	May to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		✓	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain—(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*	✓		Topography of terrain - Plain Altitude: 60.6m (average) The entire section of the alignment fall in the plain terrain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)*:		✓	Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		✓	Name of animals: Endangered species (if any):
6.	Inhabited Area	✓		LHS: 0+080 - 0+170 0+200 - 0+700 0+880 - 1+000 1+130 - 1+170 1+230 - 1+590 RHS: 0+000 - 0+200 0+605 - 0+720 0+820 - 0+850 1+340 - 1+400 1+540 - 1+630

No.	Type of Ecosystem	Yes	No	Explanation
7.	Agricultural Land	✓		LHS: 0+780 - 0+870 1+010 - 1+120 1+180 - 1+220 1+600 - 1+660 RHS: 0+205 - 0+600 0+750 - 0+810 0+860 - 0+980 1+000 - 1+080 1+100 - 1+150 1+190 - 1+330 1+405 - 1+530 1+640 - 1+700
8.	Crazing grounds		✓	
9.	Barren Land		✓	

C. pecific description of the Road Environment

(Note: Questions number 1, 4, 5, 7 and 8 must be answered after discussions with the local community people)

No.	Parameter/ Component	Yes	No	Explanation
1.	Are there any areas with landslide or erosion problems along the road? *(If yes, indicate the location (right or left side) and the chainage)*		✓	( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? *(If yes, list them indicating the location (right or left side)and the chainage)*		✓	
3.	Are there any nallas/streams/rivers etc. along/crossing the road? *(If yes, list them indicating the location (right, left or crossing) and the chainage*		✓	
4.	Are there problems of water stagnation and other drainage issues on or near the road? *(If yes, mention chainage)*		✓	
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		✓	( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side)and the chainage)*	✓		106 trees are identified within 10 m on either side of the CL. Only 17 trees would be affected due to the proposed improvement. Enclosed list Refer: E.1.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		✓	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		✓	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	✓		Although 26 electric poles and 1 transformer are located within 10 m on either side of road, 17 electric poles and 1 transformer will be affected by the project [Refer E.2]
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	✓		1 temple is identified within 10 m on either side of the CL. The structure would be affected due to the proposed improvement. Enclosed list Refer: E.3.

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	✓		A consultation was held with PIU and community members, it was attended by 39 persons. The list of participants is attached in Annexure E6.
2.	Any suggestion received in finalizing the alignment	✓		• Up-gradation of the existing culverts. • Tree cutting and avenue plantation in place of affected trees. • Road safety measures at curves and road intersections locations.
3.	If suggestions received, were they incorporated into the design?	✓		

[1] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures

[2] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures

E-2 List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)

Chainage	Side	Type	Distance from center line (m)	Chainage	Side	Type	Distance from center line (m)
0+090	LHS	Transformer	2.5	0+000	RHS	Electric pole	3
0+140	LHS	Electric pole	3	0+030	RHS	Electric pole	2.5
0+190	LHS	Electric pole	3	0+200	RHS	Electric pole	2.8
0+230	LHS	Electric pole	2.5	0+440	RHS	Electric pole	2.5
0+290	LHS	Electric pole	5	0+550	RHS	Electric pole	2
0+320	LHS	Electric pole	3	1+100	RHS	Electric pole	3
0+350	LHS	Electric pole	2.5	1+180	RHS	Electric pole	2
0+400	LHS	Electric pole	2	1+220	RHS	Electric pole	2.5
0+490	LHS	Electric pole	3	1+270	RHS	Electric pole	2.5
0+590	LHS	Electric pole	2	1+350	RHS	Electric pole	2.3
0+630	LHS	Electric pole	2.5	1+420	RHS	Electric pole	2
0+680	LHS	Electric pole	3	1+510	RHS	Electric pole	2
1+480	LHS	Electric pole	4.5	1+550	RHS	Electric pole	2.5
1+600	LHS	Electric pole	2	-	-	-	-

E-3 List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10):

Chainage	Side	Sensitive Structures	Distance from center line (m)
0+710	LHS	Shiv temple	3.5

Appendix 3.2: Summary of Road wise Key Environmental Features within 10m COI

Sl.No	District	Road Name	No. of affected persons		Passing through Forest Area	Need for utility shifting* (EP, TP, HP etc.)	No. of trees affected	Religious Structures	Presence of Water body (River/Lake)
			Total APs	Vulnerable APs					
1	Barpeta	Batgaon to Kadamtola	32	31	No	EP-15	94	Temple-2	No
2	Baska	T08 to Darrangapar No2	-	-	-	EP-2	10	-	River-1
3	Bongaigaon	Khushlaiguri Kawadi to Kwadi - II Road	3	2	No	EP-2	5	Temple-4, Mosque-1	No
4	Cachar	T01 to Bishnupur FV	68	1	-	EP-6	41	-	-
5	Chirang	Dagarpara-I to Dagarapara-II	-	-	No	EP-3	34	Temple-1	No
6	Darrang	Bezpara No2 to MPK road	7	4	No	EP-7, HP-1, SP-1	12	Temple-2	No
7	Dhubri	NH 31 to Pasuarkhal	6	3	No	EP-8, SP-3	34	-	No
8	Dibrugarh	Dehingia Gaon-Changmai Gaon	4	-	No	No	5	-	No
9	Golaghat	Henevi to Milongaon (T03 at Milongaon to Borholla no1	6	1	No	EP-5, SP-1	15	Namghar-4	No
10	Jorhat	T06 to Bhakatchuk	-	-	No	EP-32	4	Namghar-2, Temple-2	No
11	Kamrup	T06 to Lomati	-	-	No	-	1	Namghar-1	No
12	Karbi Anglong	T03 to Mekwe Pather	7	3	No	EP-3	9	-	No
13	Karimganj	NH151 to Suprakandi	2	1	No	EP-2	13	-	No
14	Kokrajhar	138 (Latagaon) to Laltari	-	-	No	EP-2, SP-2	8	Temple-1	No
15	Lakhimpur	Fulbari No.2 to Dhemagarh No.2 Road	10	5	No	EP-6	1	Namghar-2	No
16	Nagaon	Nonoi Dakhipat Road to Rangalumukh	-	-	No	-	-	Mosque-1	No
17	Nalbari	Sandha LP School to Katra HE school	7	2	No	EP-9, TP-1	6	Namghar-1	No
18	Sonitpur	Mahkhowajan to Amguri Kachari (T04 to Mahkhowajan gaon)	17	7	No	EP-2	5	Mosque-1	No
19	Tinsukia	Kachujan to Gelapukhuri (DRT road to Kokratoli)	-	-	No	EP-5	-	-	No
20	Udalguri	Batabari No.1 to Hatibandha Road	25	12	No	EP-17, TP-1	17	Temple-1	No

Appendix 4.1: Guidelines for Borrow Areas Management

1. SELECTION OF BORROW AREAS

Location of borrow areas shall be finalized as per IRC: 10-1961guidlines. The finalization of locations in case of borrows areas identified in private land shall depend upon the formal agreement between landowners and contractor. If, agreement is not reached between the contractor and landowners for the identified borrow areas sites, arrangement for locating the source of supply of material for embankment and sub-grade as well as compliance to environment requirements in respect of excavation and borrow areas as stipulated from time to time by the Ministry of Environment and Forests, Government of India, and local bodies, as applicable shall be the sole responsibility of the contractor.

The contractor in addition to the established practices, rules and regulation will also consider following criteria before finalizing the locations.

(1) The borrow area should not be located in agriculture field unless unavoidable i.e. barren land is not available.
(2) The borrow pits preferably should not be located along the roads.
(3) The loss of productive and agriculture soil should be minimum.
(4) The loss of vegetation is almost nil or minimum.
(5) The Contractor will ensure that suitable earth is available.

2. CONTRACTOR'S RESPONSIBILITY

The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing program approved by the Engineer. It shall be ensured that the sub-grade material when compacted to the density requirements shall yield the design CBR value of the sub-grade. Contractor shall begin operations keeping in mind following;

(1) Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plants is operating at the place of deposition.
(2) No excavated acceptable material other than surplus to requirements of the Contract shall be removed from the site. Contractor should be permitted to remove acceptable material from the site to suit his operational procedure, then shall make consequent deficit of material arising there from.
(3) Where the excavation reveals a combination of acceptable and un-acceptable materials, the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the un-acceptable materials. The acceptable material shall be stockpiled separately.

3. BORROWING FROM DIFFERENT LAND-FORMS

A. Borrow Areas located in Agricultural Lands

(i) The preservation of topsoil will be carried out in stockpile.
(ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2 m and side slopes not steeper than 1:2 (Vertical: Horizontal).

(iii) Borrowing of earth will be carried out up to a depth of 1.5m from the existing ground level.
(iv) Borrowing of earth will not be done continuously through out the stretch.
(v) Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
(vi) Small drains will be cut through the ridges, if necessary, to facilitate drainage.
(vii) The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal).
(viii) The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.

B. Borrow Areas located in Elevated Lands

(i) The preservation of topsoil will be carried out in stockpile.
(ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
(iii) At location where private owners desire their fields to be levelled, the borrowing shall be done to a depth of not more than 1.5m or up to the level of surrounding fields.

C. Borrow Areas near River side

(i) The preservation of topsoil will be carried out in stockpile.
(ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
(iii) Borrow area near to any surface water body will be at least at a distance of 15m from the toe of the bank or high flood level, whichever is maximum.

D. Borrow Areas near Settlements

(i) The preservation of topsoil will be carried out in stockpile.
(ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
(iii) Borrow pit location will be located at least 0.75 km from villages and settlements. If un-avoidable, the pit will not be dug for more than 30 cm and drains will be cut to facilitate drainage.
(iv) Borrow pits located in such location will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with a layers of stockpiled topsoil in accordance with compliance requirements with respect MOEF/SPCB guidelines.

E. Borrow Pits along the Road

Borrow pits along the road shall be discouraged and if deemed necessary and permitted by the Engineer. The following precautions are recommended:

(i) The preservation of topsoil will be carried out in stockpile.
(ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
(iii) Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
(iv) Small drains shall be cut through the ridges of facilitate drainage.

(v) The depth of the pits shall be so regulated that there bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of bank, the maximum depth of any case being limited to 1.5 m.

(vi) Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10 m.

4. REHABILITATION OF BORROW AREAS

The objective of the rehabilitation program is to return the borrow pit sites to a safe and secure area, which the public should be able to safely enter and enjoy. Securing borrow pits in a stable condition is fundamental requirement of the rehabilitation process. This could be achieved by filling the borrow pit floor to approximately the access road level.

Re-development plan shall be prepared by the Contractor before the start of work inline with the owners will require and to the satisfaction of owner. The Borrow Areas shall be rehabilitated as per following;

- Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original round surface.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post use restoration and Environment Expert of Supervision Consultant will certify the post use redevelopment.

The Contractor will keep record of photographs of various stages i.e., before using materials from the location (pre-project), for the period borrowing activities (construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

Appendix 5.1: Environmental Management Plan

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
	Measures common to all sample roads						
	Design and Pre Construction Stage						
1.	Climate Change Consideration and Vulnerability screening	○ Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required ○ Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchyati Raj Institution)	All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ ASRRDA
2.	Finalization of alignment	○ The road will be part of district core network and will comply with PMGSY guidelines ○ Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance. ○ Subproject will not pass through any designated wildlife sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland	○ All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ ASRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		Convention, and reserve forest area.. o Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009. o Alignment finalization considering availability of right of way and in consultation with local people. o ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. o Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. o The road shall follow natural topography to avoid excessive cut and fill.					
3.	Land acquisition	o Avoid or minimize land acquisition. o Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	o All through the alignment of each rural road	Pre Construction Phase	Land to be made available by the state Government	PIU, Govt. of Madhya Pradesh , and other	Environmental officer under the PIC will also coordinate and ensure implementation

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
4.	Biological environment - Tree planting	○ All efforts shall be taken to avoid tree cutting wherever possible. ○ Requisite permission from forest department shall be obtained for cutting of roadside trees. ○ Provision of Compensatory Afforestation shall be made on 1:3.ratio basis. ○ Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Throughout the project section of the road. ***(Highlight Tree cutting locations & proposed likely plantation location)***				
5.	Planning for land clearing	○ The road land width shall be clearly demarcated on the ground. ○ The utility and community structure shifting shall be planned in consultations and concurrence of the community. ○ Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a prior permission of Forest department. ○ The vegetable cover shall be removed and disposed in consultation with community. ○ All public utilities shifting shall be planned with prior concurrence of respective agencies/authority and	All through the Rural roads excepting in stretches of habitations ***(Attach or Refer to specific sections of DPR for the utilities to be shifted along with chainages for the location of such structures)***	Pre Construction Phase	Necessary cost provisions have been made. All other costs are included under project cost.	PIC, PIU, Forest Department NGOs (shifting of utilities shall be carried out by respective governmental bodies at cost to be reimbursed by project, implementing agency). To increase survival rate of new saplings, a core Tree Management Committee is to be created to ensure complete retrieval of	Environmental officer under the PIC will coordinate and ensure Officials of Forest Department, Contractor and local NGOs and coordinated by Environmental officer of

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		to the adjacent location approved by them				vegetative cover and timely replacement of perished plantations. implementation Unit (PIU) of ASRRDA,	Construction Supervision Consultant for specific package.
8.	Shifting on Common Properties Resources	○ All efforts are made to minimize shifting of common utilities and community structures. ○ The community structures/utilities which can not be saved will be shifted to adjacent area with the concurrence and in consultation with community.	As determined by contractor under approval of PIC /PIU ***(Attach or Refer to specific sections of DPR for community structures to be shifted along with chainages for the location of such structures)***	Construction Phase	Borne by Contractor	Contractor is responsible for ensuring provision of facilities under approval by PIC / PIU	Environmental officer and other team members of PIC will monitor and ensure appropriate implementation Environmental officer will regularly interact with the local people who are likely to be affected to ensure that their interests are protected and no social resentment sets in.
	Cut and Fill and Embankment Construction design & planning	○ The alignment design shall consider options to minimize excessive cuts and fills. ○ The cut and fill quantities shall be used for embankment to minimize	All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ ASRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
6.		barrow earth requirement. o The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. o Adequate provision shall be made for cross drainage structure for maintaining natural drainage pattern in the subproject area and preventing soil erosion. o Side drain for channelizing water to nearby natural drain in water stagnation /logging prone area. o The top soil of the cut and fill area shall be used for embankment slope protection o Embankment will be designed above High Flood Level (HFL) wherever, area is prone to flood.	***(Highlight the high flood level, chainage for action and linkages to DPR section)***				
7.	Hydrology and Drainage	o Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. o Provision of adequate side drainage shall be made in water stagnant/logging areas. o The construction work near water body shall be planned preferably in	Near all drainage crossing , nalas and river crossings etc. ***(indicate HFL Level and Highlight the chainage for action and***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. o Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment to ensure minimum disturbance to natural drainage of surface and subsurface water of the area. o Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides. o Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. o Road level shall be fixed above HFL. Embankment slope stabilization measures shall be planned. Stabilization measures may include vegetative treatment, stone pitching, retaining wall where feasible, low cost options such as bamboo / eucalyptus tree pilling .	***linkages to DPR section)***				
8.	Establishment of	o Construction camp sites shall be	As determined	Pre-	To be	All facilities are to be	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
	Construction Camp, temporary office and storage area	located away from any local human settlements (minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently. o Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m). o The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. o The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas. o The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. o All construction camps shall have provision of rationing facilities	by contractor under approval of PIC/PIU/ (ref- Labelled: WASTE OIL; and hazardous sign be displayed at oil handling areas and sold off to SPCB/ MoEF authorized re-refiners). ***(Contractor to specify the cost provision made for PPE and other environmental sanitation measures required per construction camp / temporary***	construction and construction stage	included in contractor's cost	planned and implemented by contractor under approval by PIU / PIC	

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible. o The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. o Personal Protective Equipments (PPEs) like helmet, boots, earplugs for workers, first aid and fire fighting equipments shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. o Provision shall be made for domestic solid waste disposal in a control manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. o Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.	***office / storage area)***				
	Traffic Movement	o The contractor will identify the areas were temporary traffic diversion may be required. He	As proposed under DPR and	Pre-construction and	To be included in contractor'	All facilities are to be planned and implemented by	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
9.		would prepare appropriate traffic movement plan for ensuring continued flow of traffic during construction phase. This may include movement of the traffic from the site of the construction area. This kind of a temporary diversion shall be finalized with the concurrence of respective PIU. o Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU / DPR Consultant shall define appropriate measures for traffic diversion before the start of the construction. o The diversion plan should ensure smooth flow of traffic, minimize accidents to road users during construction works. o Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility in day and night both.	determined by contractor and approved by PIC/PIU/ ***(Highlight the chainages which may require traffic diversions)***	construction stage	s cost	contractor under approval by PIU / PIC	
10.	Occupational Health and Safety	o Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is	Throughout the project section at the location				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		less than 40 km per hour in plain and rolling terrain. o Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation and near schools or religious places. o The speed breakers shall be provided and directional sign boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required. o Provision shall be made for Hazard markers at each end of all box culverts, river crossing causeways and similar CD structures o Shoulder side slopes shall not be steeper than 2h:1V unless stone pitching of the slopes is provided. o Cement concrete pavement and V-shaped drain shall be constructed to the full width of the available roadway within densely populated habitation and as per feasibility. o Provision shall be made for Directional sight board shall be installed on all sharp curves and bends	determined by contractor and approved by PIU ***(Highlight the location with chainage for such requirements)***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ At a main road, intersection or crossing "STOP" sign and 'T-intersection' warning sign shall be installed on the village road. ○ It is proposed to approach railways for adequate safety at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both side of the railway crossing					
	Construction Stage						
11.	Sourcing and transportation of construction material (aggregates , earth)	**Borrow Earth:** ○ The borrow earth shall be obtained from identified locations and with prior permission for landowner and clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. ○ Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. ○ A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated	As Borrow sites and quarries (if required) location. ***(List the probable locations for borrow areas. (Highlight the identified quarries, if already identified. Contractors should also indicate the***	During Design and construction Stage	Engineering cost	The selection of quarries and material selection will be the responsibility of contractor under approval of PIC /PIU/TSC Environmental officer and other team members of PIC will ensure appropriate implementation of mitigation actions.	PIC /PIU/TSC Environmental officer and other team members of PIC will monitor

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). o Borrowing of earth will not be done continuously through out the stretch. o Ridges of not less than 8m widths will be left at intervals not exceeding 300m. o Small drains will be cut through the ridges, if necessary, to facilitate drainage. o The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). o The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. o Fly ash will also be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. o The borrow area shall be rehabilitated as per the understanding arrived with the land-owner. The re-habilitation plan may include the following: ▪ Borrow pits shall be backfilled with rejected construction	***quarry they are likely to use if not already identified at DPR stag)***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. ▪ Borrow areas might be used for aquaculture in case landowner wants such development. **Aggregate :** o The stone aggregate shall be sourced from existing licensed quarries o Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. o Topsoil to be stockpiled and protected for use at the rehabilitation stage **Transportation of Construction Material** o Existing tracks / roads are to be used for hauling of materials to the extent possible. o Prior to construction of roads, topsoil shall be preserved or at					

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		least shall be used for any other useful purposes like using in turfing of embankment rather than allowing its loss by construction activities. o The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation links are to be inspected at least twice daily to clear accidental spillage, if any.					
12.	Loss of Productive Soil, erosion and land use change	o It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities is restored back to its original land use before handing it over back to land owner. o The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. o It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. o Cut and fill shall be planned as per IRC provisions and rural road manual. o All steep cuts shall be flattened and	Thought out the road section ***(The contractor shall include the cost for the measures as part of the construction cost)***	During the Construction stage	Included in project cost	Design Consultant and Contractor	PIU / ASRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		benched. o Shrubs shall be planted in loose soil area. o IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. o Soil erosion shall be visually checked on slopes and embankment areas. In case soil erosion is found, suitable measures shall be taken to control the soil erosion					
13.	Compaction and Contamination of Soil	o To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. o The productive land shall be reclaimed after construction activity. o Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. o Domestic solid waste at construction camp shall be segregated into biodegradable and	Throughout the project section of the road s ***(The contractor shall include the cost for the measures as part of the construction cost)***	• Design and construction stage	• Project preparation cost and construction cost •	• Design consultant and Contractor,	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		non-biodegradable waste. o The non-biodegradable and recyclable waste shall be sold off. o Fuel and lubricants shall be stored at the predefined storage location. o The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. o All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. o To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.					
	Construction Debris and waste	o All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. o Unusable debris material should be	• Throughout the project section of the road	• Design and construction stage	• Project preparation cost and construction	• Design consultant and Contractor,	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
14.		suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. o The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. o For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.			cost		
15.	Air and Noise Quality	o Vehicles delivering loose and fine materials like sand and aggregates shall be covered. o Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas.	• Near all drainage crossing , nalas and river crossings etc. ***(The***	• During Construction stage	• Included in engineering cost	Contractor	PIU/ ASRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. ○ Material storage areas shall also be located downwind of the habitation area. ○ Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. ○ Diesel Generating (DG) sets shall also be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the Dg set). . Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained. ○ The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall	***contractor shall include the cost for the measures as part of the construction cost)***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		be provided to the construction workers. o Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly.					
16.	Biological environment - Tree planting	o Compensatory Afforestation shall be made on 1:3.ratio basis as per the planning. o Additional trees shall be planted wherever feasible.	Throughout the project section of the road ***(Highlight Tree cutting locations & proposed likely plantation location)***	during the design and Construction stage	Part of engineering work cost included	ASRRDA	PIU and ASRRDA
17.	Ground Water and Surface Water Quality and Availability	o Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable. o The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. o Water intensive activities shall not be undertaken during summer period to the extent feasible.	Throughout the project section of the road ***(The contractor shall include the cost for the measures as part of the construction cost)***	construction stage	construction cost	Contractor,	PIC/PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible ○ Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. ○ Preventive measures like slop stabilisation, etc shall be taken for prevention of siltation in water bodies.					
19.	Occupational Health and Safety	○ Verification of implementation of provision made at planning stage. ○ Each worker is provided with requisite PPE ○ Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing "STOP" sign and 'T-intersection' warning sign shall be installed on the village road. ○					
	Operation Stage						
19.	Air and Noise Quality	○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due vehicle movement.. Speed limitation and honking	Throughout the project section at the location determined by	Operation stage stage	construction cost	Contractor,	PIC/PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		restrictions may be enforced near sensitive locations.	contractor and approved by PIU				
	Site restoration	○ All construction camp/temporary office/material storage areas are to be restored to its original conditions. ○ The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. ○ Obtained clearance from PIU before handling over the site to SRRDA. ○ PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required	***(The contractor shall include the cost for the measures as part of the construction cost)***				
20.	Hydrology and Drainage	○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. ○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted	Throughout the project section at the location determined by contractor and approved by PIU	Operation stage stage	construction cost	Contractor,	PIC/PIU
21.	Occupational Health and Safety	○ Directional sight board shall be installed on all sharp curves and	Throughout the project	Operation stage	construction cost	Contractor,	PIC/PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		bends o At a main road, intersection or crossing "STOP" sign and 'T-intersection' warning sign shall be installed on the village road.	section at the location determined by contractor and approved by PIU	stage			

Note :

1. Road specific measures may vary depending on its location and environmental setting around. The exact extent of activities and related measures requires will depend on final alignment selection. Table 1 provides the list of common utilities, ponds, or community structures falling within 2-4 M of the road and may require shifting. Efforts shall be made to adopt the mitigative measures listed under respective section above including measures of aligning road on one end to save the the structures/trees as much as possible. The PIU will update this EMP before attaching it with the DPR and either list or refer to the section of DPR for highlighting the exact location with chainage of action areas (regarding shifting of common utilities, community structures, location of CD structures, embankment height in the flood prone areas, slope stabilization measures with locations near ponds or water bodies, tree cutting locations).
2. The information to be updated in the standard EMP before attaching it with DPR is highlighted under location column of the standard EMP.

Appendix 5.2: Environmental Monitoring Plan

I. ENVIRONMENTAL MONITORING DURING DESIGN AND PRE-CONSTRUCTION STAGE

Monitoring Responsibility: PIU with Support from PIC
Monitoring Frequency: Once prior to start of construction
Road Name with Block and District Name:……..
Road Length: ……
Report No.: …….

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Additional Monitoring Indicator if applicable	Compliance status	Corrective action proposed in case of delay
1.	Climate Change Consideration and Vulnerability screening	○ Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required ○ Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchyati Raj Institution)	All through the alignment	No. of Additional Tree plantation Proposed		
2.	Finalization of alignment	○ The road will be part of district core network and will comply with PMGSY guidelines ○ Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance. ○ Subproject will not pass through any designated wildlife sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area.. ○ Subproject to comply with local and National legislative requirements such as forest clearance for diversion of	All through the alignment of each rural road	Compliance to Conditions of Forest Clearance if applicable		

		forestland and ADB's Safeguard Policy Statement 2009. o Alignment finalization considering availability of right of way and in consultation with local people. o ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. o Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. o The road shall follow natural topography to avoid excessive cut and fill.				
3.	Land acquisition	o Avoid or minimize land acquisition. o Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	All through the alignment of each rural road			
4.	Biological environment - Tree planting	o All efforts shall be taken to avoid tree cutting wherever possible. o Requisite permission from forest department shall be obtained for cutting of roadside trees. o Provision of Compensatory Afforestation shall be made on 1:3.ratio basis. o Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Throughout the project section of the road			
5.	Planning for land clearing	o The road land width shall be clearly demarcated on the ground. o The utility and community structure shifting shall be planned in consultations and concurrence of the community. o Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a prior permission of Forest department. o The vegetable cover shall be removed and disposed in consultation with community. o All public utilities shifting shall be planned with prior	All through the Rural roads excepting in stretches of habitations	Tree cutting permission from Forests or Revenue department as applicable Permission of concerned utility Authorities No and proposed location of		

		concurrence of respective agencies/authority and to the adjacent location approved by them		compensatory trees plantation, Concurrence from community for utility, community structure, and vegetation cover removal		
6.	Shifting on Common Properties Resources	○ All efforts are made to minimize shifting of common utilities and community structures. ○ The community structures/utilities, which can not be saved, will be shifted to adjacent area with the concurrence and in consultation with community.	As determined by contractor under approval of PIC /PIU			
7.	Cut and Fill and Embankment Construction design and planning	○ The alignment design shall consider options to minimize excessive cuts and fills. ○ The cut and fill quantities shall be used for embankment to minimize barrow earth requirement. ○ The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. ○ Adequate provision shall be made for cross drainage structure for maintaining natural drainage pattern in the subproject area and preventing soil erosion. ○ Side drain for channelizing water to nearby natural drain in water stagnation /logging prone area. ○ The top soil of the cut and fill area shall be used for embankment slope protection ○ Embankment will be designed above High Flood Level wherever, area is prone to flood.	All through the alignment of each rural road			
8.	Hydrology and Drainage	○ Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. ○ Provision of adequate side drainage shall be made in water stagnant/logging areas.	Near all drainage crossing , nalas and river crossings etc.			

		○ The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. ○ Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment to ensure minimum disturbance to natural drainage of surface and subsurface water of the area. ○ Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides. ○ Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. ○ Road level shall be fixed above HFL. Embankment slope stabilization measures shall be planned. Stabilization measures may include vegetative treatment, stone pitching, retaining wall where feasible, low cost options such as bamboo / eucalyptus tree pilling .				
9.	Establishment of Construction Camp, temporary office and storage area	○ Construction camp sites shall be located away from any local human settlements (minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently. ○ Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m). ○ The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. ○ The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas. ○ The construction camps, office and storage areas shall have	As determined by contractor under approval of PIC/PIU/ (ref- Labelled: WASTE OIL; and hazardous sign be displayed at oil handling areas and sold off to SPCB/ MoEF authorized re-refiners).	Location of Construction camp with planning of requisite facilities and making provision of such facilities prior to start of construction. Availability of consent to establish from pollution control board for setting up the camp.		

		provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. o All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible. o The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. o Personal Protective Equipments (PPEs) like helmet, boots, earplugs for workers, first aid and fire fighting equipments shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. o Provision shall be made for domestic solid waste disposal in a control manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. o Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.				
10.	Traffic Movement	o The contractor will prepare appropriate traffic diversion scheme approved by respective PIU. This shall be implemented prior to start of construction to avoid any inconvenience to the present road users. This shall be implemented in other stretches of the road as per the progress of the construction work. o The diversion plan should ensure smooth flow of traffic, minimize accidents to road users during construction works. o Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility in day and night both.	As proposed under DPR and determined by contractor and approved by PIC/PIU/			

11.	Occupational Health and Safety	○ Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain and rolling terrain. ○ Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation. ○ The speed breakers shall be provided and directional sign boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required. ○ Provision shall be made for Hazard markers at each end of all box culverts, river crossing causeways and similar CD structures ○ Shoulder side slopes shall not be steeper than 2h:1V unless stone pitching of the slopes is provided. ○ Cement concrete pavement and V-shaped drain shall be constructed to the full width of the available roadway within densely populated habitation and as per feasibility. ○ Provision shall be made for Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road. ○ It is proposed to approach railways for adequate safety at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both side of the railway crossing	Throughout the project section at the location determined by contractor and approved by PIU			
12.	Grievance Redress	○ Obtaining information from Village level Grievance redress committee, PIU as applicable	Each Sample road once.			

NOTE: Each report must enclose Photograph to the maximum possible action points, even if work is in progress.

II. ENVIRONMENTAL MONITORING DURING CONSTRUCTION STAGE

Monitoring Responsibility : PIU with Support from PIC
Monitoring Frequency : (First Report after third month of start of construction or 25% construction . Second report after ninth month of construction or 75% construction).
Project Details:……..
Road Stretch Name : …….
Monitoring Report Quarter No.: ……..

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Additional Monitoring Indicator if applicable	Compliance status	Corrective action proposed in case of delay
1.	Sourcing and transportation of construction material (aggregates , earth)	**Borrow Earth:** o The borrow earth shall be obtained from identified locations and with prior permission for landowner and clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. o Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. o A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). o Borrowing of earth will not be done continuously through out the stretch. o Ridges of not less than 8m widths will be left at intervals not exceeding 300m. o Small drains will be cut through the ridges, if necessary, to facilitate drainage.	At Borrow sites and quarries (if required) location.	Compliance to IRC guidelines and stated criteria, Permission from land owners, Rehabilitation of borrow areas Availability of valid consent of quarries		

		○ The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). ○ The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. ○ Fly ash will also be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. ○ The borrow area shall be rehabilitated as per the understanding arrived with the land-owner. The re-habilitation plan may include the following: ▪ Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. ▪ Borrow areas might be used for aquaculture in case landowner wants such development. **Aggregate :** ○ The stone aggregate shall be sourced from existing licensed quarries ○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage **Transportation of Construction Material** ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. ○ Prior to construction of roads, topsoil shall be preserved or at least shall be used for any other useful purposes like using in turfing of embankment rather than allowing its loss by construction activities.				

		○ The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation links are to be inspected at least twice daily to clear accidental spillage, if any.				
2.	Loss of Productive Soil, erosion and land use change	○ It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities is restored back to its original land use before handing it over back to land owner. ○ The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. ○ It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. ○ Cut and fill shall be planned as per IRC provisions and rural road manual. ○ All steep cuts shall be flattened and benched. ○ Shrubs shall be planted in loose soil area. ○ IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. ○ Soil erosion shall be visually checked on slopes and embankment areas. In case soil erosion is found, suitable measures shall be taken to control the soil erosion	Thought out the road section			
3.	Compaction and Contamination of Soil	○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. ○ The productive land shall be reclaimed after construction activity. ○ Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas.	• Throughout the project section of the road s			

		○ Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. ○ The non-biodegradable and recyclable waste shall be sold off. ○ Fuel and lubricants shall be stored at the predefined storage location. ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.				
4.	Construction Debris and waste	○ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ○ Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. ○ The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. ○ For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m	• Throughout the project section of the road			

		away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.				
5.	Air and Noise Quality	○ Vehicles delivering loose and fine materials like sand and aggregates shall be covered. ○ Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas. ○ Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. ○ Material storage areas shall also be located downwind of the habitation area. ○ Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. ○ Diesel Generating (DG) sets shall also be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the Dg set). . Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained. ○ The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. ○ Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly.	• Near all drainage crossing , nalas and river crossings etc.			

6.	Biological environment - Tree planting	○ Compensatory Afforestation shall be made on 1:3.ratio basis as per the planning. ○ Additional trees shall be planted wherever feasible.	Throughout the project section of the road			
7.	Ground Water and Surface Water Quality and Availability	○ Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable. ○ The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. ○ Water intensive activities shall not be undertaken during summer period to the extent feasible. ○ Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible ○ Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. ○ Preventive measures like slop stabilisation, etc shall be taken for prevention of siltation in water bodies.	Throughout the project section of the road			
8.	Occupational Health and Safety	○ Verification of implementation of provision made at planning stage. ○ Each worker is provided with requisite PPE ○ Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road.	Throughout the project section at the location determined by contractor and approved by PIU			
9.	Grievance Redress	○ Obtaining information from Village level Grievance redress committee, PIU as applicable	Each Sample road once.			

NOTE: Each report must enclose Photograph to the maximum possible action points, even if work is in progress.

III. ENVIRONMENTAL MONITORING DURING OPERATION STAGE

Monitoring Responsibility: PIU with Support from PIC
Monitoring Frequency: (On completion of construction and after one month of first and second year of maintenance period) construction
Project Details :…….
Road Stretch Name: …….
Monitoring Report No.: ……..

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Additional Monitoring Indicator if applicable	Compliance status	Corrective action proposed in case of delay
1.	Air and Noise Quality	○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due vehicle movement.. Speed limitation and honking restrictions may be enforced near sensitive locations.	Throughout the project section at the location determined by contractor and approved by PIU			
2.	Site restoration	○ All construction camp/temporary office/material storage areas are to be restored to its original conditions. ○ The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. ○ Obtained clearance from PIU before handling over the site to SRRDA. ○ PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required	Throughout the road stretch	Survivability report, land owner concurrence of land reversal		
	Hydrology and Drainage	○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. ○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted	Throughout the project section at the location determined by contractor and approved by PIU			

3.	Occupational Health and Safety	○ Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road.	Throughout the project section at the location determined by contractor and approved by PIU			
4.	Grievance Redress	○ Obtaining information from Village level Grievance redress committee, PIU as applicable	Each Sample road once.			

NOTE: Each report must enclose Photograph to the maximum possible action points, even if work is in progress.

Appendix 6.1: Public Consultation in Assam

District	Name	Designation
Golaghat	Mr. F Rahman	Executive Engineeer
	Mr. Mahendra Saikia	Assistant Executive Engineer
	Mr. Mridul Kakoti	Assistant Engineer
	Mr. Pradip Konwar	Junior Engineer
	Mr. D. Saikia	VAP
	Mr. Keshab Saikia	VAP
	Mr. Dipendra Saikia	Member, Koliapani GP
Jorhat	Mr. Jayanta Medhi	Executive Engineer
	Mr. Udayan Borthakur	Assistant Executive Engineer
	Mr. Jiten Barua	Junior Engineer
	Mr. Pabitra Dutta	Section Assistant
	Mr. Purnakanta Borgohain	GP Member
	Mr. Uttam Ballunar	VAP
	Mr. Tutu Kachari	VAP
	Ms. Mohada Hazarika	VAP (WHH)
Tinsukia	Mr. B. C. Panging	Assistant Executive Engineer
	Mr. Rajen Bora	Junior Engineer
	Mr. L. Moran	Village Headman
	Mr. B. Moran	President, GRC Committee
	Mr. Bimal Moran	VAP
	Mr. Golap Moran	VAP
Dibrugarh	Mr. V.K. Singh	Assistant Executive Engineer
	Mr. Subhas Phukan	Junior Engineer
	Mr. Krishnakanta Lahon	Section Assistant
	Mr. Rebo Phukon	President, Modarkhat GP
	Mr. Diganta Hazarika	AP
Nagaon	Mr. S Talukdar	Executive Engineer
	Mr. Rajib Dutta	Assistant Executive Engineer
	Mr. Prafulla Saikia	Junior Engineer
	Mr. D Daimari	Village Headman
	Ms. Pushpanjalli Debi	President, Dakshin Nonoi GP
Shibsagar	Mr. Tutu Barua	Member, Hahsora GP
	Mr. Jahnu Moran	VAP
	Mr. Satya Neog	VAP
	Mr. Purneswar Gogoi	VAP
Barpeta	Mr. Ratul Bora	Executive Engineer
	Mr. Kamaleswar Deka	Assistant Executive Engineer
	Mr. Biren Das	VAP
Nalbari	Mr. Bijoy Kalita	Executive Engineer
	Mr. P.C. Kakoti	Assistant Executive Engineer
	Ms. Kanmay Barman	VAP