Initial Environmental Examination (Draft)

August 2013

Rural Connectivity Investment Program – Project II

Prepared by Chhattisgarh 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	–	Nongovernmental 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
CGRRA	–	Chhattisgarh Rural Road Development Agency
ZP	–	Zilla Parishad

WEIGHTS AND MEASURES

km	–	kilometer
m	–	meter

NOTE

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

TABLE OF CONTENTS

List of Appendixes

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 nationwide 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 429.06 km of rural roads in the state of Chhattisgarh. CGRRDA 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. 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 ADB loan assistance.

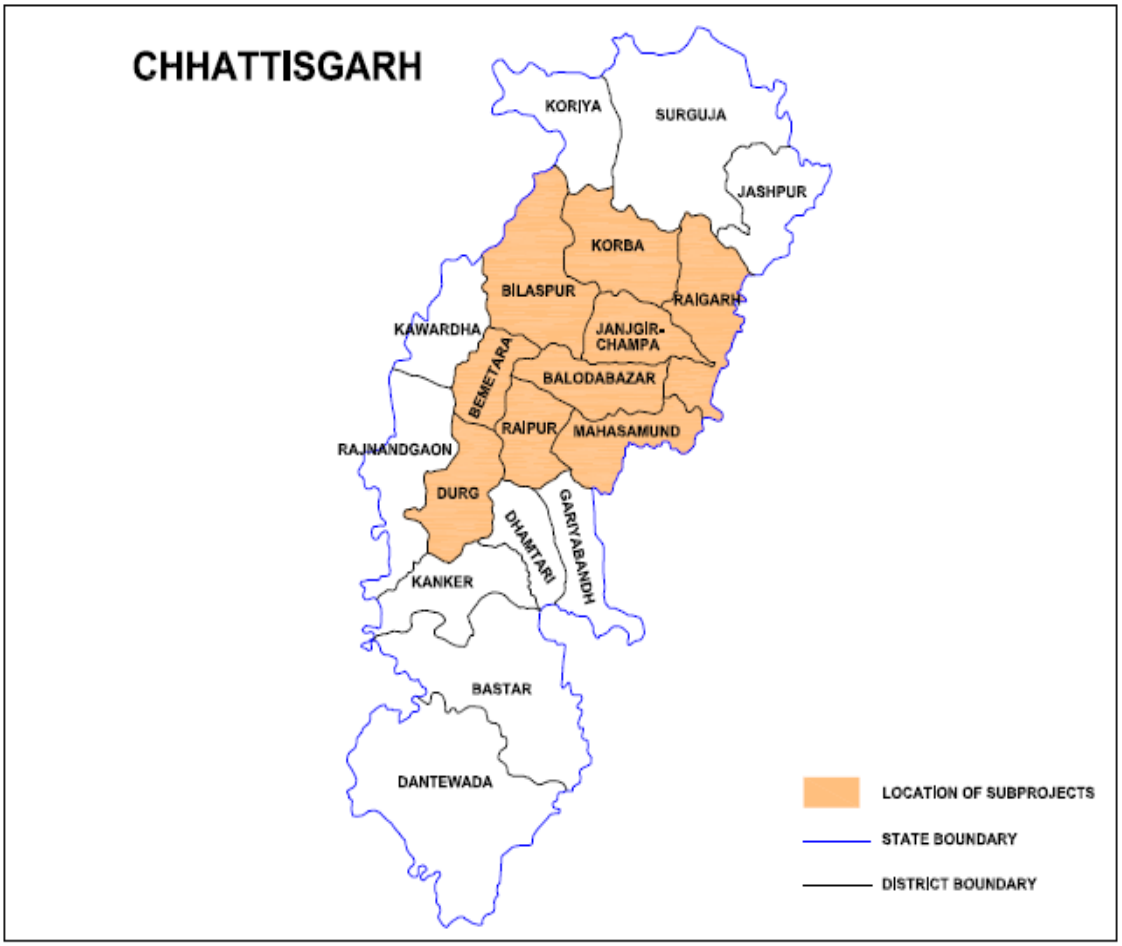
B. Project Roads Identification and Location

4. PMGSY has prepared specific guidelines for the selection of roads under this program. The key requirements, for any road to be eligible for construction or upgradation, are to be part of the Core Network[1] 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 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.

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 road shall not pass through any designated wildlife sanctuaries, national parks, notified ecological sensitive areas or area of international significance (e.g., protected wetland designated by the Wetland Convention); and
iii. The subprojects shall only involve activities that follow Government of India laws and regulations and meets funding agency safeguard policies.

5. The CGRRDA has selected about 429.06 km of rural roads for inclusion under RCIP Batch 2 in Chhattisgarh. The 429.06 km of roads comprises 132 different stretches spread over 10 districts of the State. These districts are located in the central and eastern parts of the state. In this batch of subprojects, the longest road is 9.55 km in Mahasamund district, while the shortest road is 0.75 also in the same district. The average length of roads works out to 3.25 km. The list of 429.06 km roads with location and length is given in ***Appendix 1.1*** and the location map of the districts is shown in ***Map 1.***



Map 1: Location of Districts with Batch 2 Subprojects

C. Rural Road Construction Proposal

6. 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.

7. 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

8. 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 classifies a project into category A, B or C depending on potential adverse environmental impacts.

9. All environmentally-sensitive components along each subproject is critically analysed to assess the magnitude and extent of likely impacts. These sample subproject roads stretches do not pass through any protected areas nor located near any archeologically important monument. As per selection guidelines, none of the selected subproject passes through reserved forests either. Few trees cutting though may be involved. The roads primarily pass through agricultural and residential areas. Most of the sample roads aligned along existing village roads and unpaved movement paths. As such, there is no land acquisition as the additional land required for the project is availed through voluntary donation from the affected persons. Hence, the project will fall under category B as per ADB Safeguard Policy Statement 2009.

10. No categorization 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

11. 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.

12. Since there is large number of subproject roads involved under RCIP and magnitude of each road is small, preparation of individual IEE 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. A sample completed ECOP checklist with annexures on

tree, utility and community structures, strip maps and photographs for each selected sample road is enclosed as ***Appendix 1.2*****.**

13. 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. This IEE approach will be followed for conducting environmental assessment for subprojects of forthcoming batches under RCIP in the state.

F. IEE Methodology and Content

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

15. **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.

16. **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.

17. **Data Analysis, Impact identification and Mitigation Measures**: Information collected was analysed. The impacts were identified using expert's assessment and following established practices. Mitigative measures are proposed common to all roads under RCIP and specific to the roads. EMP is prepared considering mitigative measures and institutional framework of SRRDA.

18. 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

19. 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 a signatory to various international conventions and protocols.

20. 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.

21. In addition to above, new road construction or road improvement work attract many legislation including 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 batch 1 roads are listed below:

Sl. No.	**Legislation**	**Applicability**
1.	Environment (Protection) Act 1986-EIA Notification 2006 (Amended 2009)	Not applicable to rural roads. It is applicable only to National and State highways**.**
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 this case. Since No roads will be selected passing through protected areas or sanctuaries	Not Applicable, as no road passing through protected areas is selected
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	

Sl. No.	Legislation	Applicability
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

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

H. Acknowledgement

23. The Technical Support consultants (TSC) gratefully acknowledge the support received from NRRDA and CGRRDA 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

24. 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 Chhattisgarh 429.06 Km roads have been identified for implementation. The broad specifications for road alignment selection, pavement design, construction methodology, geometric design etc. are same and are 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.

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

B. Sample Roads Selected in Chhattisgarh State

26. The Chhattisgarh state has selected 132 roads with a total length of 429.06 km spread over ten districts as summarized 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	Bilaspur	28	94.76	6.72	1.44	3.38
2	Durg/Bemetra	2	8.13	6.00	2.13	4.065
3	Janjgir-Champa	10	22.81	3.50	1.10	2.28
4	Korba	6	18.35	6.00	1.60	3.06
5	Mahasamund	15	48.70	9.55	0.75	3.40
6	Raigarh	27	82.16	9.53	1.00	3.06
7	Raipur	7	11.72	2.20	1.15	1.67
8	Baloda Bazar	10	41.55	10.8	1.20	4.155
9	Gariyaband	2	8.88	5.10	3.78	4.44
10	Jashpur	25	89.30	6.85	1.2	3.57
Total		**132**	**429.06**	**10.80**	**0.75**	**3.25**

C. Project Description

II.1.2. Rural Road Construction Proposals

27. 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

[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.

bridges are also proposed for construction. **Figure 2.1** shows the typical cross section of the rural roads.

28. 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.

II.1.3. Present Condition

29. 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 will not be affected due to the proposed subprojects. There are also some utilities besides the roads. Some of these may need shifting.

II.1.4. Alignment and Profile

30. 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.

II.1.5. Design Considerations

31. **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.

32. 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.

33. **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.

34. **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.

35. **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.

36. **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.

37. **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.

38. **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

II.1.6. Construction Methods

39. 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.

II.1.7. Available Right of Way

40. As per the information available with Chhattisgarh Rural Road Development Agency (CGRRDA), ROW is largely available for all the sample 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

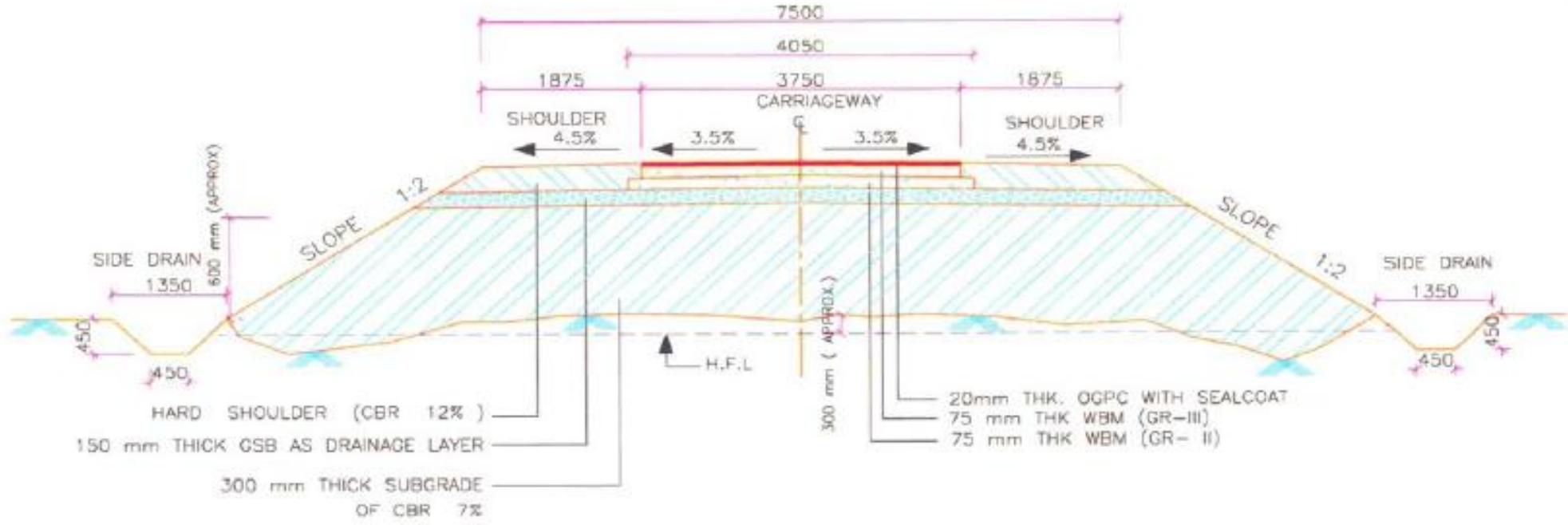
by the adjacent landowners. The private landowners along the proposed right of way (ROW) however, are voluntarily parting the encroached land and in some cases parted even their own private land without any compensation, anticipating the developmental benefits from the road construction works.

II.1.8. Traffic

41. 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 motor cycles/two wheelers, tractors, light commercial vehicles, animal drawn carts and bicycles.

II.1.9. Economic Assessment

42. 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.



Note :- All Dimensions are in mm

Figure II.1 : Typical Cross-section of Rural Roads

III. DESCRIPTION OF THE ENVIRONMENT

A. Background

43. Baseline environmental conditions about all facets of environment viz. physical, biological and socioeconomic have been established using both primary and secondary sources, consultation with local people, and interaction with forests officials and other Government officials. Efforts have been made to collect the latest information both at regional as well as local level especially along the project roads alignment. This will help to predict likely changes in the environment due to the RCIP road construction and will serve as performance indicators for various components.

44. The baseline information is presented below at state level and district level. Road specific environmental salient features has also been summarised in this chapter.

45. Located between the Northern latitude of 17°52' and 24° & East longitude 78°58' and 84°28', the state of Chhattisgarh was carved out of the state of Madhya Pradesh on 1st November 2000 to give a fillip to developmental activities and fulfil the long cherished aspirations of the local populace. Spread over an area of 1,35,194 sq km it consists of 16 districts and 146 blocks. Earlier known as the rice bowl of Madhya Pradesh, it is a major rice-producing region of India. The state boundary touches six states of the country, namely Madhya Pradesh, Maharashtra, Andhra Pradesh, Orissa, Jharkhand & Uttar Pradesh. The Batch I roads in the state fall in Raipur, Durg, Bilaspur, Jaspur, Janjgir-Champa, Kawardha, Raigarh, Korba, Koriya and Mahasamund districts of the state. A summary key environmental features of these districts are given in ***Table 3.1***.

Table III.1 : Summary Key Environmental Features of the Sample Roads Districts

District	Description of Environmental Parameters
Raipur/ Baloda Bazar	Undivided Raipur district including the newly created Baloda bazaar district covered an area of 13083 sq. km and lies between 19°46' N and 21°50' N and 81°25'E to 83°16' E with population of 3016930 as per 2011 census. The district is surrounded by Bilaspur and Janjgir-Champa in north, Dhamtari in south, Mahasamund in east and Durg in west. The district occupies the south eastern part of the upper Mahanadi valley and the bordering hills in the south and the east. The district has a tropical climatic condition. Summers are extremely hot and at times the mercury may rise to 42°C while winters are mild and lows can fall to 13.2 °C. The district receives a normal rainfall of about 1300 mm. Udanti Sanctuary in Gariaband Tehsil is about 170 km from Raipur. Physiographically, it is divided into three units viz. Chhattisgarh plain, eastern and south eastern undulating, hilly tract, and southern hilly range. Major land use is agriculture. The entire district falls under Mahanadi Basin- main tributaries being Seonath, Jok & Tel. Major soil types in the district are Black Cotton, Red-Yellow Loamy. Principal crops grown in the district are wheat, gram, and cotton. The major geological formations in the district are high-grade gneisses and unclassified metamorphic of Achaean Age.
Durg	Undivided Durg district including the newly created Bemetera district covered an area of 8708 sq. Km, lies between- 20°23'N and

	22°02' N & 80°46' and 81°58 E with a population of 28,10,436 as per 2011 census. The district occupies the south-western part of the Upper Sheonath-Mahanadi valley and the bordering hills in the south and southwest. It is located at an elevation of 317 m above MSL. The district has subtropical climate characterized by hot summer and monsoon rainfall followed by dry and cold winter season. The annual temperature varies from 42.2 °C (summer) to 11°C (winter). The average rainfall of the district is 1270 mm. Physiographically, it is divided into two divisions, viz. the Chhattisgarh plain and the Southern plateau. The Chhattisgarh plain occupies the largest area in the district. Major land use is agriculture. Major part of the district is drained by Seonath, Hamp, Kharr and Tendula river. Major soil types are Laterite, Red-Yellow Loamy, The principal crops grown are Paddy, jowar, bajra. Geologically, 87 % of the total geographical area of the district is covered by sedimentary formations of Chhattisgarh Super group comprising gypsiferous sale, Chandi limestone, Gunderdehi shale, Charmuria limestone, Chandarpur sandstone and Archaean granite gneisses.
Bilaspur	The district covers an area of 8570 sq. km and lies within latitude 21° 43'N & 23 ° 7' N and longitude 81° 29'E to 82° 29'E with a population of 19,98,358 as per 2011 census. The district is bounded by Shahdol and Dindori of Madhya Pradesh on north and northwest side; Korba and Janjgir-Champa on the east; Raipur and Durg on the south; and Kawardha on the southwest. It is located at an elevation of 424 m above MSL The climate of the district is sub-tropical, semi arid, continental and monsoon type characterised by hot summers, cool winters and small rainy season. The summer temperature reaches a maximum of 45°C whereas it drops to about 10 °C in winter season. The average rainfall of the district is about 580 mm. Physiographically it is a part of Chhattisgarh Plain locally called the Bilaspur Plain. Major land use is agriculture. The soil is Red-Yellow Loamy. Major crop grown is paddy. The district is mainly underlain by sedimentary formations of Chhattisgarh super group and crystalline rocks of Achaean age except along river banks, where recent alluvium deposits are found in isolated patches.
Mahsamund	Mahasamund district is spread out in an area of 3902.39 Sq. Km in the Central-East of Chhattisgarh State with a population of 860257 as per 2011 census. The district lies between 20°47'N to 21°31'30"N latitude and 82°00'E to 83°15'45" E longitude, surrounded by districts of Raigarh and Raipur of Chhattisgarh y State and Nawapara and Bargarh of Orissa. Mahanadi and its tributaries like Kodar etc. Granite rocks can be found in the Bagbahra, Basna and Pithora region. Rocks are predominantly Limestone of the Chhattisgarh group contemporary to the Cuddapah group of the Upper Pre-Cambrian age, consisting of limestone layers, shale, sandstone, or quartzite. Neo-granite, dolerite, and quartz in intrusive forms are also found in the district. Hence there is a great scope of intense mining activity. From

	granite rocks of the Achaean period to stratified rocks of Cuddupah group of Upper Cambrian age are and alluvial soil and sand of recent age are found in abundance in the district. Also found in this region are Neo-granite, Dolerite and Quartz in intrusive forms. Major crops grown are Paddy, Wheat and Kodu.
Raigarh	Raigarh city the capital of Raigarh district is located at 21.9°N 83.4°E. The district has a population of 1265529 as per 2011 Census. It has an average elevation of 215 metres (705 feet). The Kelo river flows through the district which is one of its main water sources. The minimum - maximum temperature range is 29.5 - 49 °C in summer and 8 - 25 ° C in winter.
Korba	Korba district is situated in the northern half of the Chhattisgarh state and surrounded by the districts Korea, Surguja, Bilaspur, Janjgir etc. The district spreads between 220 01' N to 230 01' N and 820 08' E To 830 09' E with a population of 1011823 as per 2011 Census. It is located at an elevation of 304.8 m above MSL, Korba District falls under the hot temperate climate zone and hence the district experiences very hot and dry. Summer season starts from April to mid June. Rainy season due to the South-West Monsoon is from mid June till the end of September. The average rainfall in the district is 1506.7 mm. and normal rainfall is 1287.6 mm. The district's total area is 7,14,544 hectare out of which 2,83,497 hectares is forest land.
Janjgir-Champa	Janjgir-Champa district is situated in the east central part of the Chhattisgarh state and surrounded by the districts Raigarh in east, Bilaspur in west, Korba and Bilaspur districts in the north and Raipur and Raigarh districts in the south. The district spreads between 21.60 N to 22.40 N and 82.30 E to 83.20 E with a population of 1317431 as per 2011 Census. It is located at an elevation of 294.4 m above MSL. Janjgir-Champa District falls under the hot temperate climate zone and hence the district experiences very hot and dry. Summer season starts from April to mid June. Rainy season due to the South-West Monsoon is from mid June till the end of September. The average rainfall in the district is 1157.1 mm. and normal rainfall is 1478.0 mm. The average maximum temperature is 49.00 C and average minimum temperature is 80C. The district's total area is 4, 46,674 hectare.

B. Physical Environment

III.1.2. Meteorology and Climate

46. The climate of Chhattisgarh is mainly tropical, humid and sub-humid. The climate is hot because of its position on the tropic of cancer. May is the hottest month and December-January is the coldest. The maximum temperature during summers ranges from 33ºC to 46ºC while minimum temperature from 30ºC to 19ºC. The Temperature during the winter season ranges between of 27ºC to 9ºC. The state receives an annual average rainfall of 1,524 mm. The vagaries of monsoon and uneven distribution of rainfall causes at times severe drought conditions. The winter rainfall is meagre.

III.1.3. Air Quality

47. Most of the project area lies in vast open agricultural land and is largely free from air pollution sources other than traffic and few brick-kilns existing in the area. These were located in open area and operate only for few months. 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 .

Table III.2 : Ambient Air Quality during 2008

Area Classification	**SO_2 ($\mu g/m^3$)**	**NO_2 ($\mu g/m^3$)**	**RSPM ($\mu g/m^3$)**
Industrial	17	42	212
Residential	16	28	126
National Ambient Air Quality Standards for Industrial and Residential Areas	80	80	100

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

48. The above **Table 3.2** reveals that the concentration of all the pollutants are higher in industrial areas especially nitrogen dioxide and 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 inferred from **Table 3.3** that provides a comparison of the air quality at different locations.

III.1.4. Noise

49. 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 at nighttime. Therefore, the ambient noise levels are expected to stay within the National Ambient Noise Standards.

III.1.5. Topography and Geomorphology

50. Based on regional topography Chhattisgarh region is divided into three regions, the Northern Hills, the Central Plains and the Bastar Plateau. The central Chhattisgarh basin is characterised by two major landform types, the gently sloping Chhattisgarh Plain and the undulating Rimland. The elevation of the plain ranges from about 250 m on the eastern margin to about 330 m in the west. The gentle gradient of the Chhattisgarh Plain is largely due to its geological structure with flat to gently dipping Cuddapah sedimentary formations. About 18 per cent of the state comes under the flat or level topography, which is largely found in the Chhattisgarh Basin in the central belt of the state.[3] These plains mainly adjoin the river valleys of Godavari, Mahanadi and Sabri River.

51. Ground elevation of the project districts vary from 250 to 450 m above mean sea level, but the topography of the project region is mostly flat.

[3] *Water Policy for Drought Proofing Chhattisgarh, S. Gupta, Institute for Human Development, 2002*.

Table III.3 : Ambient Air Quality Status of Chhattisgarh in Previous Years

City	Location	Type of Area	SO2			NO2			RSPM			SPM		
			2004	2007	2008	2004	2007	2008	2004	2007	2008	2004	2007	2008
Korba	Pragati Nagar	R	13	13	26	19	21	32	132	94	157	139	193	264
	HIG 21, 22, MP Nagar (Extn)	R	13	13	6	21	21	16	176	103	79	209	212	163
	ITI Rampur	R	14	13	21	21	21	26	207	103	90	210	215	179
Bhilai	Laghu Udyog Nigam I.A.	I	24	25	14	29	31	22	148	164	113	264	259	236
	Vishak Hostel	R	21	21	13	26	26	21	128	97	107	234	182	226
	Regional Office Bunglow Office Bldg.	R	BDL	5	13	19	16	21	107	79	102	193	160	213
Raipur	M/s Wool Worth (I) Ltd	I	11	14	17	38	35	42	292	177	212	416	304	385
	New HIG - 9, Hirapur	R	10	15	20	37	36	44	275	134	181	402	241	381
	Yatayat Thana	R	-	14	19	-	35	44	-	115	182	-	205	337
National Ambient Air Quality Standards	Industrial Area (I) & Residential Area (R) (24 hourly average)	80	80			80			100			Not Prescribed		

Source: National Ambient Air Quality Monitoring Series, CPCB

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)

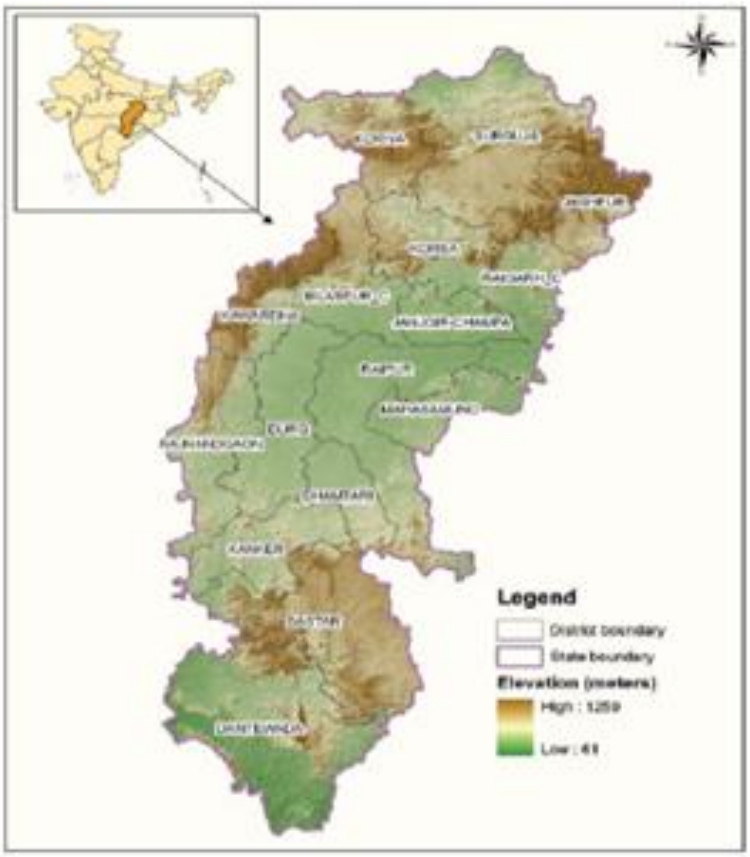


Figure III.1 : Elevation Map of Chhattisgarh

III.1.6. Geology/Soil

52. Physiographically, the state of Chhattisgarh can be divided into 3 distinct zones:

i. **Bastar plateau**: This region covering the districts of Baster, Dantewada and Kanker is mostly covered with forests. The hills forming the plateaus achieve heights between 700 and 800 m.

ii. **Chhattisgarh Plain**: It represents mature pediplain and is characterised by a gently undulating and flat terrain. High mounds or hillocks altitude of 700 m above MSL distinguish the fringe area. The average relief is of about 400 m.

iii. **Northern Hill region**: It covers part of Sarguja, Koriya, Korba, Bilaspur, Jashpur and Raigarh districts. It is a part of Maikhal and Hazaribagh ranges of central India.

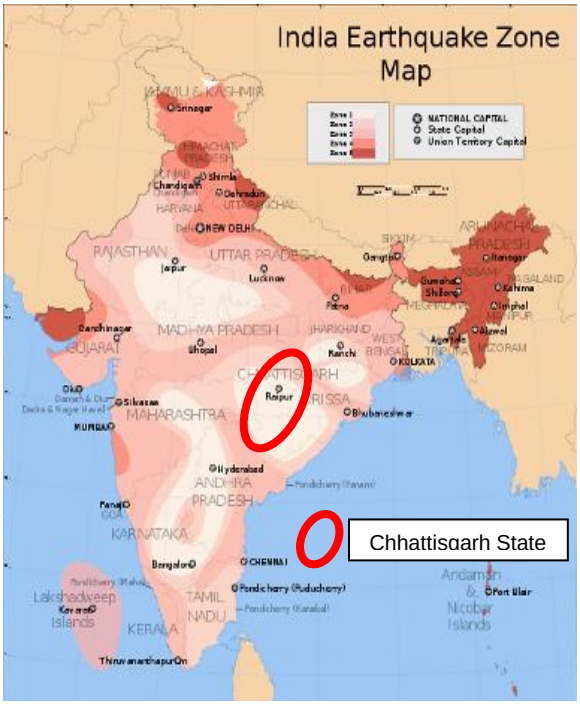
53. The soils of the Chhattisgarh Plain are considered its principal natural resource, and are the mainstay of the predominantly agricultural population of the region. The following types of soils are found in the region: Kanhar (clayey), Matasi (sandy loamy), Dorsa (clay-loam), and Bhata (laterite).

54. These soils are deficient in important mineral nutrients like calcium and magnesium, nitrogen, phosphorous, lime and potash, which are concentrated in the lower parts of the soil layer. However, the tropical red and yellow soils or the red sandy soils of the region possess texture suitable for growing rice and millet crops.

III.1.7. Earthquake & Seismicity

55. Chhattisgarh has very low rates of seismic activity. In recent years, tremors from earthquakes in neighbouring states have been felt, most notably in 1969. The Bureau of Indian Standards (BIS) updated The seismic hazard map of India in 2000.[4] The main change was merging of Zones I & II. As per this updation, the entire Chhattisgarh state falls in Zone II as shown in **Figure 3.2**. It reveals that the project region falls in Zones II low to moderate risk zone.

According to Global Seismic Hazard Assessment Program (GSHAP) data, the state of Chhattisgarh falls in a region of low seismic hazard with the exception being moderate hazard in areas along the Maharashtra and Andhra Pradesh state borders. Historically, parts of this state have experienced seismic activity in the M4.0 range. The hazard-zoning map is shown in **Figure 3.3.**

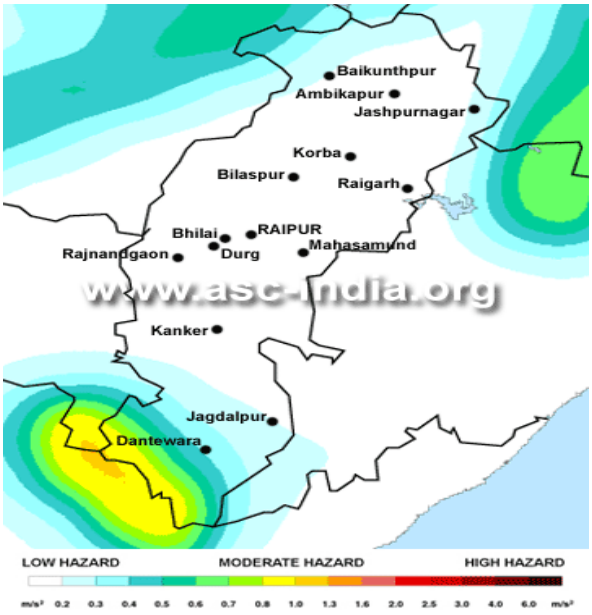


Source: IS 1893 (Part 1) 2002

Fig 3.2 : Seismic Zone Map

III.1.8. Land use

56. The area under various land uses in the state is presented in Table 3.4. It shows that the state records a forest area of 59,772 sq km (44.2% of the total State area). Reserved Forest, Protected Forest and Unclassified Forest constitute 43.1%, 40.2% and 16.7% of the total forest area respectively (55,863 sq km and 41.3% of the total geographic area). With 35.4% of Net Sown Area, it is one of the most intensely cultivated regions in the country, with paddy being the main crop. The Table shows that the major portion of the land use is under agriculture (48.7%) followed by forest cover (28%).



Source: Amateur Seismic Centre, Pune

Fig 3.3 : Hazard Zone Map

[4] IS 1893 (Part 1): 2002 Indian Standard Criteria for Earthquake Resistant Design of Structures Part 1 General Provisions and Buildings (Fifth Revision).

Table III.4 : Land Use Pattern in the State

Land Use	Area in '000 ha	Percentage
Total Geographical area	13,519	
Reporting area for land Utilization	13,468	99.6
Forests	5,977	44.2
Not Available for cultivation	1,039	7.7
Permanent pastures and other grassing land	848	6.3
Land under miscellaneous tree crops & groves	1	0.0
Culturable wasteland	344	2.5
Fallow lands other current fallows	232	1.7
Current fallows	248	1.8
Net area sown (as per agriculture census 1995-96 expect total cropped area)	4,779	35.4

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

57. The land use pattern within the project districts can be broadly classified into Land use pattern along the project road is also mixed type dominated by agriculture, barren land and residential areas.

III.1.9. Hydrology and Water Quality

58. The main rivers that flow in the state are Mahanadi and its tributaries like Seonath, Hasdeo, Mand, Arpa etc, which drains part of Raipur, Durg, Rajnandgaon, Bilaspur, Raigarh and Surguja districts. Most of the rivers are perennial in nature. Generally the drainage patterns are of dendritic, parallel, angular and radial types. Son, the tributary of Ganga drains part of Sarguja and Koriya districts.

59. Hydro-geologically, the area is underlain by diverse rock types of different geological ages from Azoic to Quaternary. These geological formations have their particular hydrological characteristics, which control groundwater occurrence, movement and availability. The Archaean crystallines comprising granites, gneisses form the major litho units of the area. They form discontinuous, unconfined and semi-confined aquifers. Weathered mantle and fractures form the main repository of ground water in these aquifers. The unconsolidated formation of Quaternary age comprising alluvium, clay, silt, laterite etc. form thin and extensive unconfined aquifers in several isolated patches and near major river courses with thickness up to 30m bgl along Mahanadi, Arpa, Hasdeo, Seonath, Kharun, Mand, Kelo, etc.

60. The rural road construction proposals are normally cross small drainage channels, which eventually join the major channels/rivulets. All of these channels generally remain dry for most part of the year and drain the storm water for few weeks only during or after the monsoon.

61. Several hand operated tube wells/wells are seen alongside of the existing tracks in many of the proposed road construction proposals. These tube wells appear to be serving as the main source of drinking water for rural communities in the region.

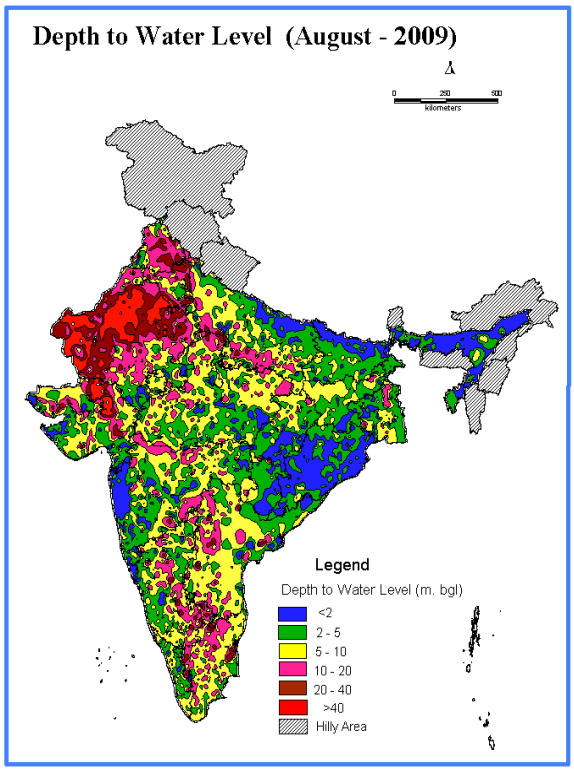
62. **Surface water Quality**: In Chhattisgarh, surface water is mostly of good quality, but pollution is increasing in major towns due to increasing urbanization. The estimated surface water available for use is around 41,720 Million Cubic Meter (MCM). None of the water sources are safe for drinking or bathing without conventional water treatment. Rivers such as Shivnath, Hasdeo, Indrawati, Kharoon etc. are found to be polluted at different stretches due to industrial,

domestic and agricultural pollution. Among all the rivers, Hasdeo River is the most polluted. No perennial River crosses the sample project roads.

63. **Groundwater Quality and Availability:** In the past, drinking water was obtained from wells, natural springs, streams, rivers, tanks and lakes. In the plains, where drinking water has been generally insufficient, wells, tanks and small rivers have been the main sources. In hilly and undulating regions, springs, rivulets and wells provide drinking water. Most households in rural areas now rely on hand pumps for their supply of drinking water. Despite their increasing density, there are still places where hand pumps are not available or functioning. In these locations drinking water is sourced from tube wells or even rivers. Piped and tap water is still not common.

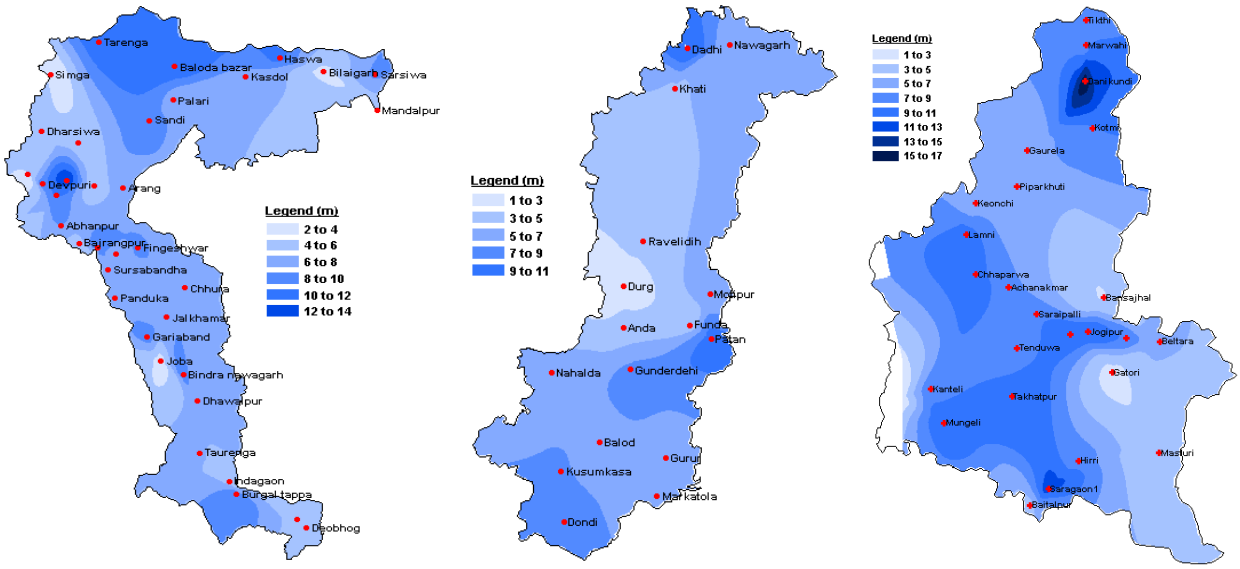
Figure I.1 : River Basin Map of Chhattisgarh

64. Largely, the groundwater of the state is potable and meets the quality requirement for irrigation. Groundwater is generally moderately alkaline to near neutral in nature. The pH of Water in general ranges from 6.5 to 8.5, which is regarded as safe and potable. The electrical conductivity was well below 1000μS/cm, which is indicative of fresh water circulation in the shallow zone. In few places such as northern part of Durg, parts of Bilaspur and Raigarh the ground water is high in sulphate content. Occasional high TDS values have been recorded in groundwater in parts of Raigarh and Bilaspur districts. The highest value of electrical conductivity (12000μ S/cm) was recorded in the Bodri Exploration well in Belha block of Bilaspur District[5]. As per the central ground water board (CGWB) report, the groundwater quality of all the ten project districts in both shallow and deeper aquifers is good



[5] Mishra A K, Mohapatra P K (2002), Ground water scenario in Chhattisgarh, National Seminar on Science, Technology and Water, Ravishankar Shukla University, Raipur. pp.1-13.

and suitable for drinking, irrigation and industrial purposes. Belha block in Bilaspur and Saja in Durg are notified as semi-critical with respect to groundwater availability by CGWA. The Decadal (1995-2005) water table conditions during pre-monsoon is shown in **Figure 3.5**.



Raipur Durg Bilaspur

Figure III.2 : Decadal Water Table Conditions in some Sample Project Districts

C. Ecological Resources

65. Chhattisgarh is extremely rich in biodiversity. The State's forests are of two major types: Tropical Moist Deciduous and the Tropical Dry Deciduous. Composition wise, there are four important formations: Teak forests, Sal forests, miscellaneous forests and Bamboo forests. The chief NTFPs (non-timber forest produce) of the State are tendu leaves (Diospyros melanoxylon), sal seeds (Shorea robusta), harra (Terminalia chebula), gum, chironji (Buchanania lanzan), etc.

66. The floral biodiversity is complex comprising of different species including Aonla, Neem, Imli, Harra, Bel, Baheda, Baibidang, Baichandi, Adusa, Kalihari, Safed Mulsi, Kali musli, Aloe vara, Lemon grass, Bixa orellana, Ashwagandha, Isabghol, Sarpa gandha, Malkangni, Kali haldi, Nirmali, Kuchla, Tikhur, Keokand, Kiwanch, Sarphokha Bhuai amla, Giloy, Nagar motha, Kalmegh , Satabar , Bidarikand, Ananth Mul, Brahmi, Bach, Jangli haldi, Jangli piaj, Rasna, Chitrak, Shankpuspi, Ratti, Tejraj, Bhojraj, Gokhaur, Bavachi, Bhragnraj, Salparni and senna. In Chhattisgarh 1,685 specimens of different plant species have been collected. Until now 1685 species belonging to 785 genera and 147 families have been identified and preserved in the herbarium. Ten dominant families of the state are Fabaceae, Poaceae, Cyperaceae, Asteraceae, Euphorbiaceae, Acanthanaceae, Convulvulaceae, Malvaceae, Rubiacaeae, Scorphulariaceae.The dominant species seen along the project roads are – babool (Acacia spp.), peepal (Ficus religiosa), Bargad (Ficus benghalensis), neem (Azadirachta indica), mahua (Madhuca longifolia), shisam (Dalbergia sissoo), Imli (Tamarindus indica), Gulmohar (Delonix regia), etc.

67. The project area lies in tropical climate zone; it has a medium range of flora and fauna. However, none of the roads consists of any rare, endangered or threatened floral species**.**

68. Although, none of the road stretches passes through any forest land/area but still has trees, which might require felling during clearing up operations and construction of rural roads.

In most of cases, tree cutting has been minimized by suitably modifying the alignment .The list of commonly found flora and fauna in the sample road districts is given at

Table III.5 : List of common Flora & fauna of Project Districts

Vernacular Name	Botanical Name	Family
LARGE TREES		
Aam	*Mangifera indica*	Anacardiacea
Amera	*Spoindias pinnata*	Anacardiaceae
Anjan	*Hardwickia binnata*	Leguminioceae
Aonla	*Emblica officinalis*	Euphorbiaceae
Arjun	*Terminalia arjuna*	Combretaceae
Babul	*Acacia arabica*	Leguminioceae
Behara	*Terminalia belerica*	Combretaceae
Bargad	*Ficus benghalensis*	Utricaceae
Bhorsal	*Hymenodictylon excelsum*	Rubiaceae
Bel	*Aegle marmelos*	Rutaceae
Bijasal	*Petrocarpus marsupium*	Leguminoceae
Chichwa	*Albizzia Odoratissima*	Leguminoceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Dhaora	*Anogeissus latifolia*	Combretaceae
Dhobin	*Delbergia Paniculata*	Papilionaceae
Domsal	*Miliusa velutina*	Anonaceae
Garari (Karra)	*Cleistanthus collinus*	Euphorbiaceae
Gamari	*Gmelina arborea*	Verbenaceae
Gular	*Ficus recemosa*	Utricacea
Haldu	*Adina cordifolia*	Rubicaeae
Harra	*Terminalia chebula*	Combretaceae
Imli	*Tamarindus indica*	Leguminoseae
Jamun	*Syzygium cumini*	Myrtaceae
Kaith	*Feronia Limonia*	Rutaceae
Kala siris	*Albezzia Lebbek*	Leguminiosae
Kalla	*Dillenia Pentagyna*	Dillinaceae
Karanj	*Pongamia pinnata*	Leguminiosae
Kardhai	*Angessus pendula*	Combretaceae
Kadam	*Anthocephalus cdamba*	Rubiaceae
Kasai	*Bridlia retusa*	Euphorbiaceae
Kekad	*Garuga pinnata*	Bursersceae
Khair	*Aacia catechu*	Mimoceae
Kullu	*Sterculia urens*	Sterculiaceae
Kumbi	*Careya aeborea*	Myrtaceae
Kusum	*Schleeichera oleesa*	Sapindaceae
Lasora	*Codia dhohoma*	Boroginaceae
Lendia	*Lagerstroemin parviflora*	Lythraceae
Maharukh	*Ailanthus excels*	Simarubaceae
Mahua	*Madhuka indica*	Sapotaceae
Mokha	*Schrebera swietenioides*	Oleaceae
Moyen,Gunga	*Lannea coromandelica*	Anacardiaceae
Mundi	*Mitragyna parvifolia*	Rubaceae
Neem	*Azardicachta indica*	Meliaceae
Padar	*Stereopermum personatum*	Bignoniaceae
Palas	*Butea monosperma*	Leguminaceae
Pasi	*Anogeissus acuminata*	Combertaceae
Pipal	*Ficus religiosa*	Legumenosae

Vernacular Name	Botanical Name	Family
Pulu	*Kydia calycina*	Malvaceae
Rohan	*Soymidia febrifuga*	Meliaceae
Sagon	*Tectona grandis*	Verbenaceae
Saja	*Terminalia tomentosa*	Combretaceae
Sal	*Shorea robusta*	Depterocarpaceae
Salai	*Boswellia serreta*	Burserace
Safed siris	*Albizzia procera*	Legumenoceae
Semal	*Slamalia malabaricum*	Malvaceae
Senha	*Largerstroemia parviflora (Roxb)*	Lythraceae
Shisham	*Delbergia latifolia*	Legumenoceae
Sisso	*Delbergia sisso*	Legumenoceae
Suria	*Xylia dolaeriformis*	Legumenoceae
Tendu	*Diospyros melanoxylon*	Ebenaceae
SMALL TREES		
Achar	*Buchanania lanzan*	Anacardiaceae
Amaltas	*Cassia fistula*	Leguminoceae
Amti	*Bauhinina malabarica*	Leguminoceae
Ber	*Zizyphus mauratiana*	Rhamnaceae
Bhilwa	*Semecarpus anacardium*	Anacardiaceae
Dikamali	*Gardeniaresinifera*	Rubaceae
Galagal	*Cochlospermum gossypium*	Bixaceae
Ghont	*Zizyphus xylophyra*	Rhamnaceae
Jamrasi	*Elaeodendron glaucum*	Celastraceae
Kachnar	*Bauhinia variagata*	Leguminosae
Kakai	*Flacourtia ramontchi*	Bixaceae
Katul	*Randia uliuginosa*	Rubiaceae
Karra	*Cheistanthus collinus*	Euphorbiaceae
Katmoh	*Bauhinia variegata*	Leguminoceae
Lokhandi	*Ixora arborea*	Rubiaceae
Maida lakri	*Litsae sebifera*	Lauraceae
Mainphal	*Reandia dumetorum*	Rubiaceae
Thuar	*Euphorbia tirucalli*	Euphorbiaceae
Kharhar	*Gardinia turgida*	Rubiaceae
Tilwah	*Wendlendia exserta*	Rubiaceae
Bairi	*Casearia tomentosa*	Samydaceae
SHURBS & UNDER SHURBS		
Apamarg	*Achyranthes aspera*	Amarenthaceae
Arhar	*Cajanus indicus*	Leguminoceae
Baibirang	*sambelia robusta*	Myrsinaceae
Ban rahar	*Flemingia semialata*	Leguminoceae
Bansuli	*Grewia rothii*	Tiliaceae
Bantulsi	*Eranthamum Pulchellum*	Acanthaceae
Barna	*Heptaplenrum venulosum*	Araliaceae
Chipti	*Desmodium pulchellum*	Leguminiosae
Chhind	*Phoenix acaulis*	Palmaceae
Dhawai	*Woodfordia floribanda*	Lytharaceae
Gursukri	*Grewia hirsute*	Tiliaceae
Harsingar	*Nyctanthus arbortristis*	Oleaceae
Kalabansa	*Colebrookia opyositifolia*	Labiatae
Karonda	*Carissa spinarum*	Apocynaceae
Kath Jamu	*Eugenia heyneana*	Myrtaceae
Kela	*Musa sapientum*	Scitaminaceae

Vernacular Name	Botanical Name	Family
Karantha	*Dedonia viscose*	Sapindaceae
Koria	*Holarrhena antidysentrica*	Apocynaceae
Lokhandi	*Ixora Parviflora*	Rubiaceae
Madukamani	*Murraya exotica*	Rutaceae
Marorphali	*Helicteres isora*	Sterculiaceae
Mothi	*Veronia roxburghii*	Compositeae
Nirgudi	*Vitex negundo*	Verbenaceae
Tarota	*Casia tora*	Leguminioseae
Raimunia	*Lantana acculeata*	Verbenaceae
Safed musli	*Chlorophytum tubersum*	Liliaceae
Jogilati	*Asparagus racemosus*	Liliaceae
Tikhur	*Curcuma longa*	Zingibcraceae
CLIMBERS		
Dokarbel	*Cissus Repanda*	Ampelidaceae
Gauj	*(syn -vitis repanda)*	
Gurar or gubari	*Millerria auriculare*	Legumiinosae
Harjuri	*Vitis quadrangularis*	Vitacae
Mahul	*Bauhinia vahlii*	Leguminosae
Mallkangni	*Celastrus paniculata*	Celastraceae
Nagbel	*Cryptalepis buchanani*	Asclepirdaceae
Pslasbel	*Butea superba*	Leguminosae
Pivar bel	*Combretum decandrum*	Comb
Raoni	*Acacia pennata*	Liliaceae
Kewanch	*Mucuna pruriens*	Leguminosae
Ramdatoon	*Smilas macraphilla*	Leguminosae
EPHIPHYTES		
Banda	*Vanda terres*	Orchidaaceae
Banda	*Dedrobium*	Orchidaaceae
Banda	*Dendrobium regium*	Orchidaaceae
Banda	*Vanda parviflora*	Orchidaaceae
Banda	*Vonda roxbudrghii*	Orchidaaceae
PLANT PARASITES		
Amarbel	*Cuscuta reflexa*	
Banda	*Loranthus falcate*	Loranthaceae
Gurbel	*Viscum orientale*	Loranthaceae
GRASSES & BAMBOOS		
Bans	*Dendrocalamus strictus*	Gramineac
Bhurbhusi	*Eragrostis tenella*	Gramineac
Chhir	*Imperata cyclindrica*	Gramineac
Doob	*Cynodon dyctylon*	Gramineac
Gunher / Chhirra	*Themeda Quadrivaluis*	Gramineac
Kantangbans	*Bambusa arundinacea*	Gramineac
Khus	*Vetiveria Zizanioides*	Gramineac
Kusal	*Heteropogon contours*	Gramineac
Madia	*Eleusine corcana*	Gramineac
Mushan	*Iseilema laxum*	Gramineac
Tikari (Rusa)	*Cymbopogon martini*	Gramineac
Sabai (Bagai)	*Eulaliopsis binnata*	Gramineac
OTHER PLANTS		
Eucalyptus	*Eucalyptus camaldulensis*	Myrtaceae
Eucalyptus	*Eucalyptus citriodora*	Myrtaceae

Fauna

Local name	English name	Scientific name
ANIMALS		
Bhalu	Sloth bear	*Melursus urcinus*
Bherki	Barking deer	*Muntiasus muntjak*
Bijjoo	Indian ratel	*Millivora capensis*
Chital	Spotted deer	*Carvus axis*
Gaur	Bison	*Bos gourus*
Jangli billi	Common jangle cat	*Felis chaus*
Khargosh	Hare	*Lepus ruficaudatus*
Kutta jungli	Wild dog	*Cuon alpinus*
Langur	Monkey	*Presbytis entellus*
Lakkar bagha	Hyena	*Hyaena hyaena*
Nilgai	Blue bull	*Boselaphus tragocamelus*
Sahi	Porcupine	*Hystrix indica*
Sambhar	Sambhar	*Cervus unicolor*
Shiar (Gidhar)	Jackal	*Canis aureus*
Suar (Barha)	Indian wild boar	*Sus cristatus*
BIRDS		
Bater	Bush quail	*Perdicula asiatica*
Cheel	Common parah Kite	*Milvus migrans*
Chitta fakata	Spotted Dove	*Sterptopelia chinensis*
Gidh	Benbal vulture	*Gyps bengalensis*
Harial	Green pigeon	*Treron phoenicoptera*
Kabutar	Blue rok pigeon	*Columba livia*
Koel	Koel	*Eudyanamys*
Mor	Fea fowl	*Pavo cristatus*
Murgi jungli	Red jungl fowl	*Gallus gallus*
Murgi jungli	Grey jungli fowl	*Gallus sonneratii*
Nilkanth	Blue jay or Roller	*Coracias banghalensis*
Gidh	Vulture	*Neophron peronopterus*
Sarus	Crane Sarus	*Grus antigona*
Teetar (safed)	Grey patridge	*Francolinus pondicerianus*
Teetar (kala)	Painted patridge	*Francolinus Pictus*
Tota (Jungli)	Parrot	*Taccocua leschenaur*
REPTILES		
Ajagar	Indian python	*Python molurus*
Chhipkali	Monitor lizard	*Varanus monitor*
Dhaman	Oriental rat snake	*Plyas mucosus*
Kacchawa	Turtle	*Tustudo sp.*
Kekra	Crab	*Paratelphusa baratelphusa*
Nag	Indian cobra	*Naja naja*
FISHES		
Bam	Bam	*Mastocembelus armatus*
Katla	Catlo	*Catle catle*
Mahaseer	Mahaser	*Tor putitora*
Rohu	Rohu	*Labeo rohita*

69. **Amphibians:** Among amphibians toad *(Bufo sp.)* and frog *(Rana tigrina)* are reported.

70. **Reptiles:** Among reptiles Indian garden lizards (*Calotes versicolor*), house lizards (*Hemidactylus sp.)* are generally reported while cobra *(Naja naja*) and viper (*Vipera sp.)* are rarely reported.

71. **Mammals:** Among mammals Indian palm squirrel (*Fumambulus pennanti*), cat, dog (*Cuon sp.*), cow, Buffalo, rat (*Rattus rattus*) etc. are reported.

72. **Aves:** Among aves common birds like crow (*Corves splendens*), sparrow (*Passer domesticus*), parrot (*Psittacula krameri*), baya *(Ploceus philippinus*), peafowl *(Pavo cristatus*), pigeon (*Columba livia*), *Egretta sp*. etc. are reported.

73. **Arthropods:** Among arthropods common insects viz Butterflies, Dragonflies, Wasps; Grasshopper, Cockroach, House fly, Beetles, Mosquitoes etc are reported

III.1.10. Forests

74. The state of Chhattisgarh being placed in Deccan bio-geographical area , houses an important part of that rich and unique biological diversity . What is amore conspicuous is that the state is significantly rich in endemism with respect to many plants having medicinal importance. The forests of the state fall under two major forest types, i.e., Tropical Moist Deciduous forest and the Tropical Dry Deciduous forest. The state of Chhattisgarh is endowed with about 22 varied forest sub-types existing in the state. The forest map of Chhattisgarh indicates that central and west districts like Raipur, Durg are having low forest areas while south and western parts have a mix of dense and open forest areas.

75. No forest land diversion is involved in any of the project districts under this project.

III.1.11. Wildlife and Protected Areas

76. The state falls under the Decan Bio-geographical Zone. It has 10.88% of its forests under Protected Area (PA) network. There are 03 National Parks, 03 Project Tiger Reserves and 08 Sanctuaries as given in **Table 3.6**. The Indravati National Park is the only Tiger Reserve in the state located in Dantewada District. The wild fauna in the state consists of Tiger, Sambhar, Blue bull (Nilgai), Chinkara, Chital, Hanuman, Langoor, Rhesus monkey, Porcupine, Hare, Wild dogs, Jungle cat, Jackals, Hyena, Fox, Wild cat, Cheetal. Barking deer, Jackal, Sloth bear, Crocodile, Otter and Civet. The important avifauna consists of wagtails, Munias, Blue king fisher, Jangli murgi, Red Spur fall, Phakta, Ducks, Baj, Harial, Neelkanth Kabootar, Koel, Bhura Teetar, Kala Teetar, Tree pie, Drongo, Shikara, Giddha, Bagula, Dubchick, Wild pig, Peacock, Barlets, Bulbulis, Minivets oriolets.

Table III.6 : List of Protected Areas in Chhattisgarh

S.No.	National Park	District	Area in Sq.Km.
1	Indravati	Dantewada	1258.000
2	Kanger Ghati	Bastar	200.000
3	Guru Ghasidas	Sarguja/Koriya	2898.705
Sanctuaries			
1	Achanakmar	Bilaspur	551.55
2	Badalkhol	Jashpur	104.55
3	Bhairamgarh	Dantewada	139.00
4	Barnawapara	Raipur	244.66
5	Gomarda	Raigarh	411.20
6	Pameda	Dantewada	262.00
7	Semarsot	Sarguja	608.52
8	Sitanadi	Dhamtari	553.36
9	Tamor Pingala	Sarguja	608.52
10	Udanti	Raipur	247.59
11	Bhoramdev	Kawardha	163.80

77. Among the project districts part of Guru Ghasidas National Park falls in Koriya district, while Achanakmar, Badalkhol, Barnawapara, Udanti, Gomarda and Bhoramdev sanctuaries fall in Bilaspur, Jaspur, Raipur, Raigarh and Kawardha districts respectively. However, none of the project roads pass through any of these protected areas (Figure 3.3).

78. Endangered and threatened animals of India have been listed in the Schedule I and Schedule II of the Wildlife (Protection) Act, 1972 (amended in 2001). No threatened, rare, endangered or endemic species were found in COI of the sample roads.

III.1.12. Aquatic Biology and Fisheries:

79. No wetland or important water bodies exists in and around the selected project roads area. None of the sample project roads area is having any fish culture ponds.

D. Socioeconomic Environment

III.1.13. Demography

80. Chhattisgarh, earlier a part of Madhya Pradesh, became a separate state on 1st November 2000. It is a state with several unique features, such as abundant natural resources, rich biodiversity, and rich cultural diversity. The population of about 21 million is largely rural (79%). Tribals constitute about 33% of the population, and scheduled castes form about 12%. The welfare and development of tribals is an important focus area for the state government. The gender ratio of the state is higher than the national average as shown in **Table 3.7.**

Table III.7 : Demographic Profile

Indicators	Year	Unit	Chhattisgarh	All India
Area	2011	'000 Sq. Km.	550.58	3287.26
Population	2011	Million	25.54 (2.0)	1210.20
Rural population	2011	Percent	76.76	68.84
Urban population	2011	Percent	23.24	31.16
Population density	2011	Persons/Km^2	189	382
Gender Ratio	2011	Per '000 males	964	914

Note: Figures in bracket indicate percentage Source: Census, 2001.

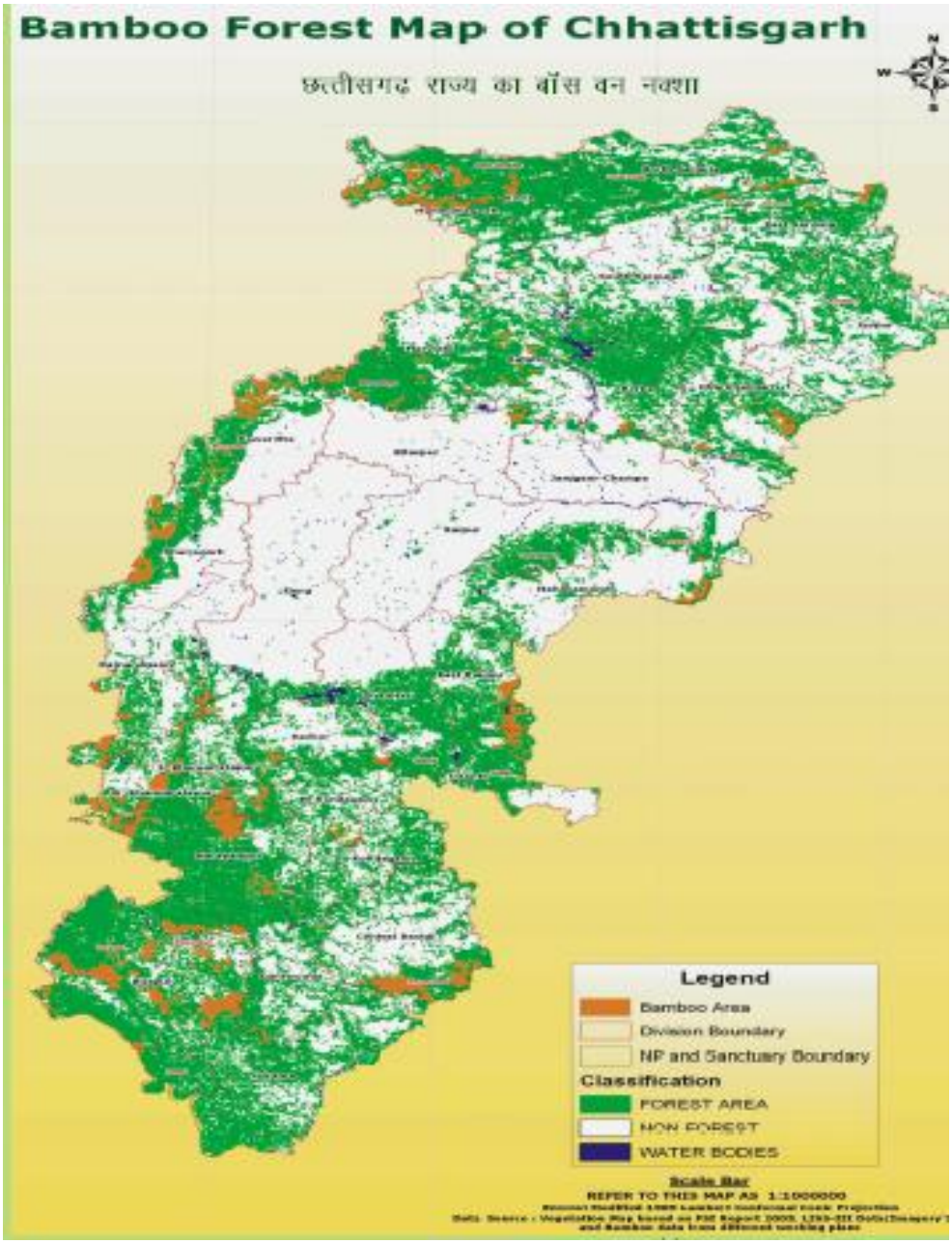


Figure III.3 : Forest Map of Chhattisgarh State

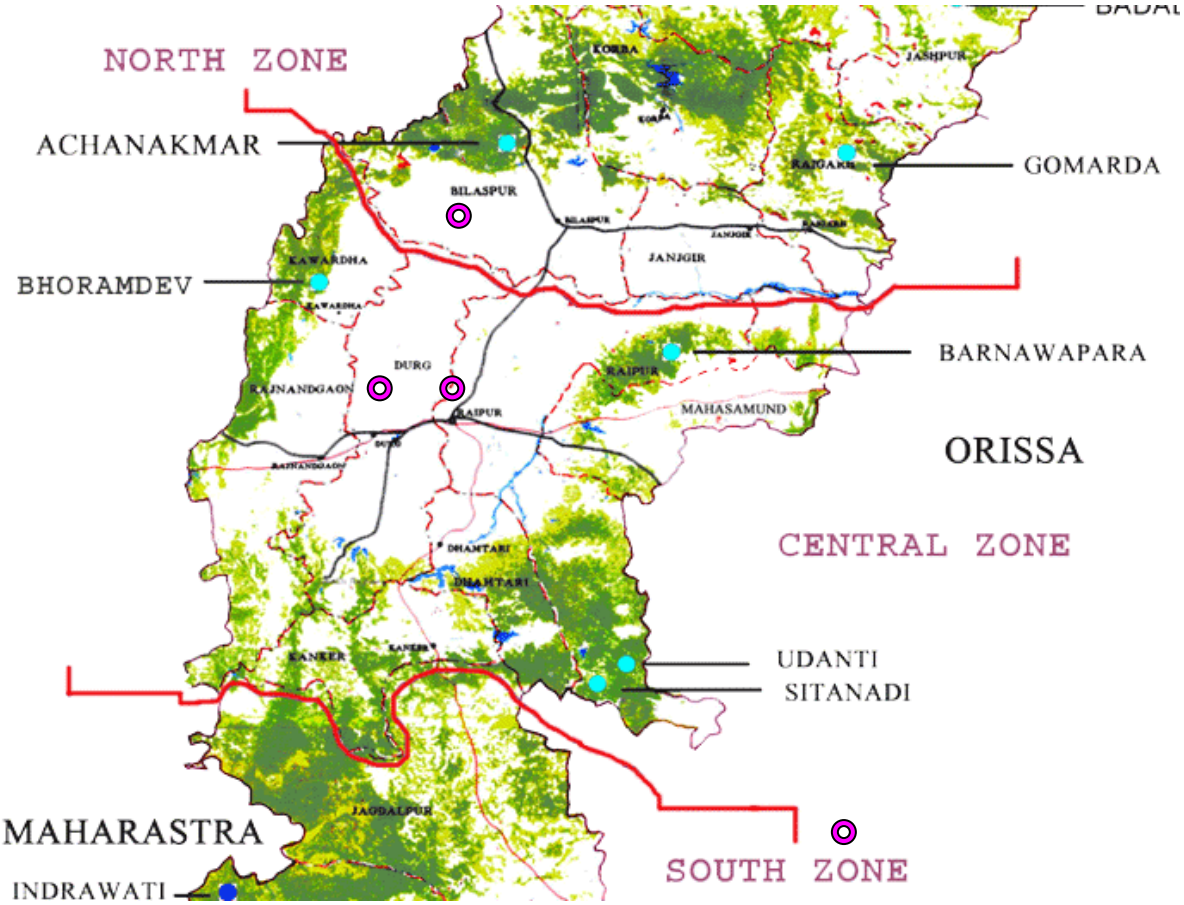


Figure III.4 : Protected Areas/Wildlife Sanctuaries of Chhattisgarh State

III.1.14. Healthcare

81. The state suffers from a lack of healthcare facilities and a lack of trained medical personnel. There was only one medical college serving a population of more than twenty millions at the time of formation of the State. The infant mortality rate and death rate of Chhattisgarh are among the highest in the country. The life-expectancy at birth is also much lower than the all-India average **(Table 3.8)**. Villagers of the project district depend on ayurvedic pharmacy, district hospitals, health posts and primary health care centres of the district.

III.1.15. Literacy and Education

82. The state has made considerable progress in the literacy (**Table 3.8**). However, the literacy level is particularly low among the scheduled castes and scheduled tribes population, especially among tribal women. The number of primary schools per 0.1 million people is above the average all-India level. However, the primary schools lack facilities and trained teaching staff. Tribals, in particular, lack access to educational facilities. Several enrolment campaigns and welfare programs run in the state to improve enrolment and reduce the dropout rates. The number of recognized professional education institutions is low in Chhattisgarh compared to the all-India situation.

Table III.8 : Human Development Indicators of Chhattisgarh

Indicators		Year	Unit	Chhattisgarh	All India
Infant Mortality Rate		**2002**	**Per'000 live birth**	**73**	**63**
Life Expectancy at Birth	Male	2003	Years	59.2	63.87
	Female	2003	Years	58.0	66.91
Death Rate		2002	Per '000 pop.	10.3	8.1
Literacy Rate	Male	2011	Per cent	81.45	82.14
	Female	2011	Per cent	60.59	65.46
	Person	2011	Per cent	71.04	74.04
Gross Enrolment Ratio (Classes I-IV)	Boys	2002-03	Per cent	107.3	97.53
	Girls	2002-03	Per cent	101.6	93.07
	Total	2002-03	Per cent	104.4	95.39
Primary School		2002-03	Per Lakh Pop.	115.2	63.42
Professional Edu. Inst.*		2002-03	Per Million Pop.	0.2	2.54

** Professional educational institutions include engineering, technology, architecture, medical and teacher training colleges.*

III.1.16. Affluence

83. The percentage of population below the poverty line is high at 44%. On an average, the level of affluence of a household in Chhattisgarh is lower than that of a household in the rest of the country (**Table 3.9**). There are proportionately less number of households in houses with concrete roof, drinking water in premises and open drainage system for waste water in comparison with the all-India level. In both rural and urban areas of Chhattisgarh, the proportion of households having access to safe drinking water is also less compared to the all-India scenario.

Table III.9 : Indicators of Affluence

Indicators		Year	Unit	Chhattisgarh	All India
HH in houses with concrete roof		2001	Per cent	10.9	19.8
HH with drinking water in premises		2001	Per cent	19.0	39.0
HH with open drainage for waste water		2001	Per cent	16.7	33.9
HH having access to safe drinking water	Rural	2001	Per cent	66.2	73.2
	Urban			88.8	90.0
	Total			70.5	77.9

III.1.17. Economy

84. The State's economy is highly dependent on the primary sector with agriculture as the main source of livelihood of the population. The per capita income (measured by per capita State Domestic Product) of Chhattisgarh is much below the national average as seen from **Table 3.10**. The share of the primary sector in the State Domestic Product (SDP) of the State is 37.3% whereas at the all India level this share, on an average, is 26.3%. At the all India level,

the share of the service sector is 49.3% of GDP (Gross Domestic Product) whereas in Chhattisgarh the service sector has a share of 43.7% of SDP.

85. The expansion of the industrial sector is quite tardy in the State. It is confined to few local areas, mainly in Durg, Raipur, Korba nad Raigarh districts. Most districts of the State hardly have any industrial units except rice milling and wood cutting. The agricultural productivity is very low (**Table 3.10**). Low agricultural productivity is the result of several factors, including mono-cropping practices, low use of fertilizer, lack of water resource management and irrigation facilities, and low levels of mechanization. There is significant scope for improving agricultural productivity by addressing these problems.

86. All parameters for the banking services namely, number of bank offices per 100 thousand population, percentage of households availing of the banking services, credit-deposit ratio indicate that banking activities are limited in Chhattisgarh in comparison with the all India scenario.

Table III.10 : Indicators of Economy of Chhattisgarh

Indicators		Year	Unit	Chhattisgarh	All India
SDP/GDP per capita		2001-02	Rs.	11952	17822.8
Composition of SDP / GDP	Primary	2002	Per cent	37.30	26.28
	Secondary	2002	Per cent	18.98	24.41
	Service	2002	Per cent	43.72	49.31
Average yield of principal crops	Rice	2008-09	Kg. per hect.	1485	2125
	Wheat	2008-09	Kg. per hect.	1086	2839
	Maize	2008-09	Kg. per hect.	1399	2024
Cropping Intensity		2003	Per cent	117	135
Consumption of fertilizers		2003-04	Kg. per hect.	46.5	89.8
Prop. of area under irrigation		2001	Per cent	20.66	44.2
Bank offices		2004	Per Lakh Pop.	2.80	4.54
HH availing banking services		2001	Per cent	24.10	35.50
Credit-Deposit Ratio		2003	Per cent	39.1	59.4

III.1.18. Agriculture

87. About 35% of the state's area is under agriculture and majority of the state's population (about 80%) is dependent on agriculture. The principal food crops of the state are rice, wheat and maize. Agriculture contributed about 34% to the Net State Domestic Product (NSDP) in 2002-2003.

88. Agriculture production and livestock farming is the main source of livelihood in sample project areas. The economy of the area is predominantly agriculture based. It has high potential for agriculture production such as crops, tropical fruits e.g. b mango, papaya, lemon, orange, etc., and green vegetables. Most of the common crops grown in the areas are as rice, wheat, maize, barley, as well as other important vegetables.

III.1.19. Mineral Resources

89. Chhattisgarh is well known for its abundant deposits of natural resources. The state's resources include minerals-mainly iron-ore, coal, bauxite, and dolomite, limestone, diamonds and other precious stones, gold and tin. The state accounts for 19% of the country's iron ore deposits. The iron ore of Bailadila mines in Dantewada district is exported to Japan because of its high ferrous content. 17% of the nation's coal reserves lie in the state. The state also accounts for 49% of the country's diamond deposits. The State is the largest producer of quartzite, and the second largest producer of iron ore, coal and dolomite in the country. Abundant deposits of limestone are found in the districts of Raipur, Bilaspur, Durg and Bastar regions.

90. The mining and quarrying sector contributed 12% to the state's Gross Domestic Product in 2001-02. Major companies operating in Chhattisgarh include Essar Steel, NMDC, Jindal Steel and Power, SAIL, BALCO, and South Eastern coalfields, De Beers, and Rio-Tinto. Several large Cement Companies such as ACC and the AV Birla Group also operate in the state.

III.1.20. Industries

91. The major industries of the state are electronics, telecommunications, petrochemicals, power, food processing and automobiles. The state has also taken a lead in the production of cement. The state is also famous for its traditional handicrafts and handlooms manufactured at Chanderi and Maheshwar. The major industrial unit in the state are: cement, pig iron, steel ingots, newsprints, and sugar mills.

III.1.21. Physical Infrastructure

92. **Road**: The road length and the railway route length per sq km of Chhattisgarh are less than the national average as shown in **Table 3.11**. An Infrastructure Development action plan is in place. Upgradation and expansion of the road network is being taken up.

Table III.11 : Physical Infrastructure

Indicators	Year	Unit	Chhattisgarh	All India
Road length	2008	Per '00 sq.km.	550.18	927.15
Railway route length	2001	Per'000 sq. km.	8.73	19.17
Village electrification	2004	Per cent	92.9	83.8
HH with electricity for lighting	2001	Per cent	53.10	55.8
No. of post offices	2011	Per Lakh Pop.	11.86	15.08 (2001)
Tele-density	2003	Per '00 Pop.	1.7	6.6

93. **Power**: The percentage of villages electrified is about 93% in the entire state. However, the percentage of households with electricity for lighting is only 53.1% the all India level. The state was until recently, power surplus state. It is also being linked to the Eastern grid. Korba in Chhattisgarh is the power capital of India. NTPC's Super Thermal Power Plant in Korba works at a very high Plant Load Factor (PLF). There are huge coal reserves in the vicinity, offering cheap power generation opportunities.

III.1.22. Religious and Cultural festivals:

94. The state of Chhattisgarh has great cultural value. Festivals and cultural activities are being celebrated throughout the year in the state. Specific events are being organized by tribal

communities i.e. Gonds and Banjaras, throughout the year. There are few temples located along the project roads. In some cases those need to be shifted.

E. Salient Environmental Features of Sample Roads

95. The salient environmental features of sample roads are summarized in **Error! Reference source not found.**12 below:

Table III.12 : Salient Environmental Features of Sample Roads

District	Block	Road Name (length)	Salient Environmental Features
Bilaspur	Marwahi	Katra - Kirhatola To Dhapnipani (6.72 Km)	• Topography is flat • Inhabited area Dhapnipani at Ch-6100m to Ch-6720m • Project road passes mainly through agricultural land • Forest area between Ch-2800 m to Ch-4800m both side along the proposed road alignment • Some water crossing points have found between Ch-2200m to Ch-2400m, Ch-3400m to Ch-3600m,Ch-3600m to Ch-3800m, Ch-3800m to Ch-4000m, Ch-4200m to Ch-4400m, Ch-4600m to Ch-4800m, Ch-5000m to Ch-5200m, Ch-5200m to Ch-5400m, Ch-6400m to Ch-6600m • 36 trees will be cut for the road project
	Pathriya	Chandkhuri To Ghuthiya (3.0 KM)	• Topography is flat • Inhabited areas namely village Chandkhuri and Ghuthiya starts between Ch-00m to Ch-900 and Ch-2300m to Ch-3000m respectively. • Project road passes mainly through barren land and patches of agricultural land • Pond located at Ch-1200m to Ch-1300m LHS and Ch-2500m to Ch-2800m LHS • 3 trees will be cut for the road project
Durg	Dhamdha	Bori to Parsadapar (6.4 Km)	• Topography is flat • Inhabited area starts between between Ch-2200m to Ch- 2400m, Ch-4000m to Ch-4700m and Ch-6200m to Ch-6400m. • Project road passes mainly through agricultural land • There are ponds located near the road alignment at Ch-200m to Ch-400m LHS and at Ch-1400m to Ch-1900m, Ch-2300m to Ch-2400m, Ch-2500m to Ch-3000m and Ch-5900m to Ch-6100m RHS • There is some water crossing points at the project road at Ch 400m to Ch-600m, Ch-1200m to Ch-1400m, Ch-2000m to Ch-2200m, 3800m to CH-4000m, Ch-4800m to Ch-5000m. • 3 trees will be cut for the road project

District	Block	Road Name (length)	Salient Environmental Features
Bemetera	Bemetara	Main Road to Jangalpur Road (2.13 Km)	• Topography is flat • Inhabited area starts between between Ch-1000m to Ch-1400m. • Project road passes mainly through agricultural land • There are ponds at Ch-600m to Ch-800m, Ch-1000m to Ch-1200m • There is no problem of water stagnation and other drainage issues on or near the road • 1 trees will be cut and 1 electric pole will be shifted due to the road project
Janjgir-Champa	Sakti	Main Road to Gharimuda (2.02 Km)	• Topography is flat • Inhabited area at Ch-00m to Ch-500m and Ch-1800m to Ch-202m. • Project road passes mainly through agricultural land • There is no flood prone area along the project road. • 2 trees will be cut and 6 electric poles will be shifted due to the road project.
Korba	Pali	T06 to Ramakachhar (3 Km)	• Topography is flat • Inhabited areas are concentrated at Ch. 2.400 To Ch 3.000 and at the target village on both sides of the road • Forest area located at Ch-0m to CH-2700m. • There is one pond at CH-2000m to CH-2200m LHS of the project road. • Project road passes mainly through barren land and patches of agricultural land
Mahasamund	Saraipali	NH-216 to Nawagarh (1.50 Km)	• Topography is flat • Inhabited area along the road is village Malidih situated between Ch-900m to Ch-1500m on both sides of the road • Pond located at Ch-800m to CH-900m LHS. • Water crossing structure along the alignment at Ch-300m to Ch-400m • 8 trees will be cut and 2 electric poles will be shifted due to the road project.
Raigarh	Baramkela	Bargarh Sohela-Kokbahal to Jirapali (3.75 km)	• Topography is flat • Inhabited area starts from Ch-2400m to CH-2800m and Ch-3300m to Ch-3750m • There is pond at Ch- 900m to CH-1000m RHS, Ch-2200m to Ch-2300m LHS, Ch-2400m to CH-2500m LHS of the proposed alignment. • 18 trees will be cut, 3 electric poles and 1 handpump will be shifted due to the road project.

District	Block	Road Name (length)	Salient Environmental Features
Raigarh	Dharamjaigarh	L050(Potiya) to Bhagdahi (7.55 Km)	• Topography is generally flat, • Project road passes mainly through agricultural land • Inhabited area between Ch-7200m to Ch-7500m. • Pond located between Ch-5200m to Ch-5400m • 12 trees will be cut due to the project
Raigarh	Dharamjaigarh	Amapali Bojiya road to Lamikhar (6.0 Km)	• Topography is flat • Forest area located between Ch-00m to Ch-4600m • The inhabited area start between Ch-5600m to Ch-6000m. • Project road passes mainly through agricultural land • 7 trees and 1 electric poles will be affected due to the project.
Raigarh	Lailunga	Kesla to Sarasmal (1.0 Km)	• Topography is flat • Forest area located between Ch-00m to Ch-100m • The inhabited area start between Ch-600m to Ch-1000m. • Project road passes mainly through agricultural land • 3 trees and 1 electric poles will be affected due to the project.
Raigarh	Lailunga	Tatkela to Kolardih (5.0 Km)	• Forest located at Ch-00m to 1000, Ch-1200m to Ch-1500m and Ch-2600m to Ch-3200 • The project road is passing through village namely Poteberni, Bardihl ,Kolardih between Ch-1000m to Ch-1200m,Ch-2200m to Ch-2300m, Ch-3200m to Ch- 4200m respectively. • Project road passes mainly through agricultural land • 18 trees and 6 electric pole will be affected due to the project.
Raipur	Arang	Kutela to Mohmela (1.66 Km)	• Topography is flat • Inhabited areas between Ch-00m to Ch-100m and Ch-600m to Ch-1300m with connecting village Kutela and Mohmela. • Project road passes mainly through agricultural land and patches of grazing land • There is pond at Ch-900m to Ch-1000m LHS • 3 electric pole will be affected due to the project
Raipur	Arang	Parsada to Semariya (2.01 Km)	• Topography is flat • The inhabited area start between Ch-0 to Ch-300m. • There is pond at Ch-600m to Ch-700m LHS • 2 trees and 2 electric poles will be affected due to the project.

District	Block	Road Name (length)	Salient Environmental Features
Raipur	Arang	Amethi to Gudguda (1.65 Km)	• Topography is flat • Inhabited areas are at Ch-00m to Ch-1300m RHS, Ch-00m to Ch-1400m at LHS • There is pond at Ch-1200m to Ch-1300m RHS. • 3 trees and 1 electric poles will be affected due to the project.
Baloda Bazar	Simga	Rohra to Machabhata (3.9 Km)	• Topography is flat • Inhabited areas are at Ch-1500m to Ch-2500m both sides • There are ponds located at Ch-1800m to Ch-2000m RHS,Ch-2800m to CH-3000m ,Ch5600m to Ch-5800m RHS and Ch-7600m to Ch-7800m. • 3 trees,1 electric pole and 1 handpump will be affected due to the project.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

96. 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.

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

98. 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

IV.1.1. Climate change

99. **Impact**: The proposed roads are analysed considering climate change vulnerability screening checklist defined under EARF to RCIP. The resource (like barrow 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 is located in natural hazard areas or passes through protected areas or flood prone areas. The habitations are 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.

100. **Mitigation Measures**: Compensatory tree plantations[6] (1:3) will be made to compensate the loss of trees cut for construction of subproject roads. Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of village Panchayat[7] . 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.

[6] 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.

[7] Village Panchayats are planting trees along rural roads with funding under Mahatma Gandhi National Rural Employment Act scheme. The PIUs may facilitate with them for planting trees along the road. Some of the PIUs in different states are already helping Village Panchayats for the same.

IV.1.2. Finalization of Alignment

101. **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.

102. **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 has also been modified to avoid tree cutting, shifting of utilities or community structure to the extent feasible. Some of the measures taken include widening of the road on one end to maintain the tree on the road edge to avoid its cutting, using retaining wall to minimize the road width to 5m wherever required. The road is aligned 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 criteria for alignment finalization:

- 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 forest land) and ADB's Safeguard Policy Statement 2009

IV.1.3. Land Acquisition

103. **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.

104. **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.

IV.1.4. Protected Areas (National parks, wildlife sanctuaries, Eco sensitive zones, protected /historical monuments) and Forest Areas.

105. **Impact**: Chhattisgarh state has many wildlife sanctuaries but none of the sample road is located within 10 km radius of the sample project roads. The nearest national parks and sanctuaries (Guru Ghasidas National Park in Koriya, Achanakmar in Bilaspur, Badalkhol in Jaspur,

Barnawapara and Udanti in Raipur, Gomarda in Raigarh and Bhoramdev in Kawardha district) are located at a distance of minimum 10km away from the project roads. Nine out of the 30 sample roads pass through forest area and the PIUs have already obtained clearance from the Forest department (Sample attached in **Appendix 3.1**) for the purpose of the road construction. As the roads/tracks are already existing in case of all these roads, the project will have very little impact on forest cover of the state/Country. Chhattisgarh is also known to have several archaeological monuments and historical monuments spread all over the state. However, none of them is located within 5 km of sample roads.

106. **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).

IV.1.5. Land Clearing Operations

107. **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.

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

- The land clearing operation should be undertaken as per the defined road alignment and community structure, utility and road furniture shifting plan.
- The road land width shall be clearly demarcated on the ground.
- The utility and community structure shifting shall be as per plan and with 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 permission of Forest department. The vegetable cover shall be removed and disposed in consultation with community.
- All public utilities shall be shifted with a concurrence of respective agencies/authority and to the adjacent location approved by them.
- 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.

IV.1.6. Cut and Fill and Embankment construction

109. 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 slop 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.

110. **Mitigation Measures:** 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 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. .

IV.1.7. Establishment of Construction Camp, Temporary office and Storage Area

111. **Impact**: The congregation of labour 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 labourers at the construction campsites, availability of safe drinking water, and sanitation.

112. 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.

113. **Mitigation Measures**: The following steps shall be taken to minimize/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 500m from forest land/areas to deter the construction labour in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 500m 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.

IV.1.8. Traffic Movement

114. **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.

115. **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, minimize 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.

IV.1.9. Associated Impacts due to Construction Activities

IV.1.9.1 Loss of productive soil, erosion and land-use

116. **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 6 roads in Raipur district, 2 roads in Durg district and 1 road in Bilaspur district where ponds are located close to the existing road. 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.

117. **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. The topography of all the sample roads through out the stretch is plain except in case of 2 roads where it is undulating for very small stretches. 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.

IV.1.9.2 Borrow Areas and Quarries

118. **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.

119. **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.

IV.1.9.3 Hydrology and Drainage

120. **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.

None of the sample roads is crossing any natural stream except Damdih road, which run close to Haf River. This road may be prone for flooding. Certain project roads are crossing local and seasonal drains. Village ponds are also located close to few roads.

121. **Mitigation Measures**: Adequate engineering measures like embankment height above high flood line, retaining wall, cros drainage structures are proposed for protection of sample roads from half river. Adequate provisions are also made for bank stabilisation (like toe wall, slop stabilisation), and prevention of silt runoff during construction and operational stages.

122. 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. 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.

123. 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.

IV.1.9.4 Compaction and Contamination of Soil

124. **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.

125. **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 minimize 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.

IV.1.9.5 Construction Debris and Wastes

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

127. **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 1000m away). It should also be located away from water bodies to prevent any contamination of these bodies.

IV.1.9.6 Air Quality

128. **Impact**: The potential sources of air emission during the construction phase of the project are given below which can cause localized 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.
- Localized 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.

129. **Mitigation Measures**: All these impacts will be temporary and hence, no significant impact is envisaged. The following measures will be taken to minimize 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,[8] 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.

IV.1.9.7 Noise Quality

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

131. **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. Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly.

IV.1.9.8 Groundwater and Surface Water Quality and Availability

132. **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.

133. **Mitigation Measures**: Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority[9] 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

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

[9] 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.

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.

IV.1.9.9 Biological Environment

134. **Impact:** Since the sample roads are not passing through any protected areas or forest area, there is no diversion of forest land**.** The major adverse impacts will be due to tree cutting, Siltation and contamination of water bodies may affect the aquatic life. Since there are only ponds and non-perennial water bodies (local nallas and few canals) the aquatic life is minimal and no significant impact is anticipated on aquatic life.

135. **Mitigation Measures:** All efforts shall be taken to avoid tree cutting wherever possible. Requisite permission from forest department shall 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.

IV.1.9.10 Impact on Common Property Resources

136. **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 and temples. One of the roads i.e NH6 - Malidih in Mahasamund district has a small temple located adjacent to the road that will be affected due to the project.

137. **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.

B. Common Impacts during Post Construction and Operation Phase

IV.1.10. Air Quality

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

139. **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. Also, 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.

IV.1.11. Noise

140. **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.

141. **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.

IV.1.12. Land, Soil, Tree Plantation

142. **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.

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

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

145. **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.

146. 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.

IV.1.13. Groundwater

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

IV.1.14. Hydrology and Drainage

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

149. **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.

IV.1.15. Socioeconomic Impact

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

151. **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.

152. **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 curves and bends where the curve design speed is less than 40 km per hour.
- 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

153. The assessment of sample roads indicates that environmental issue associated with all the roads are similar. Hence mitigation measures applicable to all the 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).

154. Two sample roads L-27 Loghama – Khutgaon in Jaspur district and T-04 Pali – Karmagarah in Tamnar block of Raigarh district) also have hilly/undulating topography at some locations. The appropriate design measures shall be taken for correcting the profile of the road with minimum cut and fill requirements.

155. Forest areas are located along nine out of the 30 sample roads at different chainages, Appropriate measures relating to location of campsites and working hours etc. should be maintained as provided in the environment management plan.

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

A. Environmental Management Plan

156. 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, timeframe and costs. The mitigation measures are proposed to eliminate or minimize the identified impact associated with design, construction and operation stages of the project, to acceptable level by adopting the most feasible options.

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

158. 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.

159. 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 for actions 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.

160. Since these are rural roads, 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

161. 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.

162. For rural roads, Environmental Monitoring plan will be more observation oriented and it provides observation areas with frequency of monitoring at pre construction aspects,[10] construction stage and operation stage. A monitoring plan with monitoring indicator and frequency of monitoring is given in **Appendix 5.2.**

C. Institutional Arrangements and Responsibilities

V.1.1. Institutional Arrangement

163. 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.

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

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

D. Institutional Environmental Responsibilities

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

167. **MORD**[11] 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 Agency). 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

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

[10] Aspects related to alignment selection for inclusion of new roads

[11] MoRD implements it through its nodal agency NRRDA which undertakes this with the help of Environmental Expert of Technical Support Consultant.

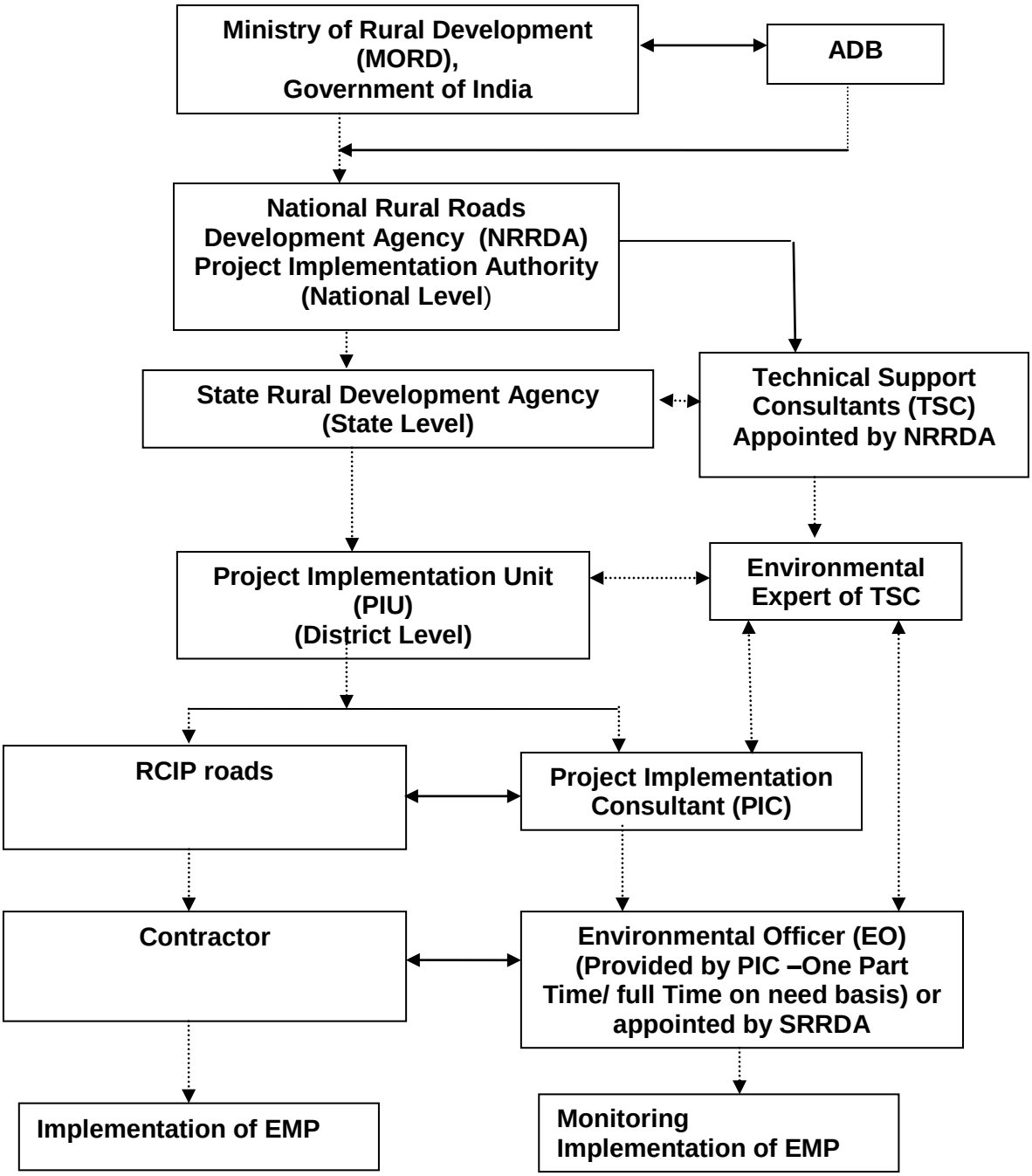


Figure V.1 : Institutional Arrangement for EMP Implementation

168. **SRRDA**[12] 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 IUs for EMP implementation and related safeguard compliances.

169. **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.

170. **The Technical Support Consultants (TSC)** appointed by NRRDA. The Environmental Expert of TSC:

a) Will 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.

171. **Project Implementation Consultant (PIC) is** appointed by SRRDA. PIC will provide one Environmental Officer (EO). The EO will be responsible to ensure adherence and

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

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:

a) Review of project design and specifications to ensure their adequacy and suitability with respect to the implementation of EMP;

b) Collection and dissemination of relevant environmental documents including amendments to environmental protection acts issued by the various agencies, namely, ADB, Government of India / State and local bodies;

c) Interact with the counterpart of the Contractor(s), review work progress/plans and ensure implementation of the EMP;

d) Coordination 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;

e) Monitoring sensitive environmental attributes during construction and operation stages[13] to ensure that the suggested mitigation measures in the EMP are implemented. This will also serve as the basis for the annual environmental monitoring reports;

f) Facilitate PIU for preparation of annual monitoring report as per ADB defined format;

g) 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

h) Conducting environmental training/awareness programs for the contractors, the project implementation personnel and the communities.

172. **Contractor** is appointed by SRRDA for construction of road and ensure implementation of EMP proposed. The broad duties of constrictor are as follows**:**

a) Make adequate costs provision for EMP requirements while biding

b) Ensure effective implementation of mitigative measures as per road specific EMP

c) 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 al permit conditions

d) Create awareness amongst workers for environment, occupational health and safety aspects. Participate in training and awareness programme along with its executives conducted by PIC

e) Provide PPE and adequate resources for Environment Occupational Health and Safety

f) Follow all the guidelines for borrowing earth and restoration of borrow areas, setting up construction camps

[13] 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.

g) Sourcing of quarry material from approved quarries only

h) Provide all required input to PIC for environmental monitoring as per EMP

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

173. 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:

V.1.2. Selection Criteria and Environmental Assessment Requirement

174. 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).

175. The following environmental Assessment requirement will be followed for all 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.

176. 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)?

V.1.3. Legal Framework

177. 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), 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[14] (IEE) report including the preparation of an Environmental Management Plan (EMP) and a Monitoring Plan.

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

F. Capacity Building

178. 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.

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

G. Consultation and Information Disclosure

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

180. 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.

H. Grievance Redress Mechanism

181. 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 concern 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.

182. At national level NRRDA has made provision of registering complain /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

183. Public consultation was undertaken consistent with the ADB requirements. All the five principles of information dissemination, information solicitation, integration, co-ordination 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.

184. 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, shifting of utilities, shifting of common cultural properties, effect on air and noise quality of the area due to traffic, water availability, accident and risk.

185. 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

186. In India, public consultation is mandatory in case of Category A and B1 category projects[15] 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

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

188. Some of the general issues raised during the different consultation sessions are summarised below:

- **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 where water logging takes place during monsoon season. The villagers requested for provision of adequate cross drainage structures at these locations.

[15] As per schedule I of EIA notification number S.O. 1533, dated 14 September 2006. This notification also defines when a public consultation is mandatory. However, the project roads doe not require environmental clearance under this notification.

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

- **Road Safety** - Safety issues were not of major 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 if required.

- **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 carried out. They recommended to plant only local tree species.

- **Impacts on Health** – Villagers do not perceived any impact due to this road project. However, issues pertaining to sexually transmitted diseases (STDs), HIV- AIDS may be an issue during construction stage however, this aspects are analysed by Social Impact Assessment team separately.

- **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. However, they do not want increased in pollution during construction phase.

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

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

- **Perceptions and Expectations -** The public and the affected persons appreciated need and supported the project fully. Community at large appreciated overall benefits to them resulting from project development.

D. Addressal of Issues

189. The efforts made to address all the issues raised during consultations through design changes/adjustments and environmental best practices. Some of the provisions made under the project to address the issues and concerns of the community are given in Error! Reference source not found..

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 is 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. Additional tree plantation shall be made wherever feasible
Increased pollution levels	Ambient air quality, water quality largely meets the prescribed standard. Al efforts shall be made to prevent pollution. No construction activity shall be taken at night in village area.
Utilities and basic infrastructure	All the effected utilities, electric poles, telephone lines, wells, tube wells etc. shall be relocated under the project cost. Primary water sources like hand pump and open well should be relocated first if affected.
Employment of locals during construction	Locals will be given preference for employment during the project implementation

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

190. 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.

191. 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.

192. 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.

193. None of the rural road crosses any river, only local nallas are crossed where adequate engineering measures are proposed for the protection of road from the flood.

194. 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.

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

196. 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.

197. The impacts identified are mostly related to alignment selection, land clearing, borrowing earth, 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.

198. 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.

199. NRRDA/SRRDA has defined institutional setup including with 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 appointed Environmental specialist. Trained and experienced in-house officials should carry out more raining in future periodically.

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

B. Key Recommendations

201. Any major changes or any major additional work other than the proposed project activities will require updation of ECOPs and IEE. The updated ECOPs and IEE will have to be submitted to NRRDA, and ADB for concurrence before civil works commence.

202. 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.

203. 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.

204. Executing agency shall ensure that updated road specific EMP forms part of DPR and is available to contractor at the time of bidding. 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 as per EMP requirements. The same shall be revised if there is any change in the project design. Any such change shall be reported to ADB as well.

Appendix 1.1: Details of Roads in Chhattisgarh

Chhattisgarh – District wise List of Roads Proposed under Batch 2

Sl. No.	Block	Name of Road	Length (Km)
		District : Bilaspur	
1	Takhatpur	SH-10 Domanpur to Khatola	4.71
2	Takhatpur	Pali To Gamju	3.00
3	Pathriya	Chandkhuri To Ghuthiya	2.77
4	Gourella	Kariaam To Umarkhohi	3.00
5	Gourella	Pathratola - Dhanouli To Chuilapani	2.61
6	Kota	T010 Shripara To Piparkhunti	5.30
7	Kota	T010 To Dawanpur	4.26
8	Kota	T011 To Pahad Bachhli	4.02
9	Kota	Kota Lormi Dhuma - Karpiha To Nagchuwa	4.50
10	Kota	T01 Majhwani Kenda Road To Kupabandha	2.22
11	Kota	T01 To Chureli	2.67
12	Kota	L021 Kendadand Road To Bargawan	2.49
13	Kota	Majhwani Kenda Road To Barpali	4.95
14	Kota	Dhanraas To Karkaa	2.46
15	Marwahi	Ghusaariya To Pateratola	2.86
16	Marwahi	Madwahi To Chachedi	2.91
17	Marwahi	T03 To Naka	2.84
18	Marwahi	Marwahi To Karhaniya	4.30
19	Marwahi	Katra - Kirhatola To Dhapnipani	6.72
20	Marwahi	Nimdha Siwani Road To Ainthi	2.10
21	Marwahi	Kotmi Marwahi Road To Kolbirra	2.88
22	Marwahi	Manjhgaon To Dumarkherwa	3.24
23	Marwahi	Danikundi To Deoridand	4.74
24	Marwahi	Marwahi To Litiyasarai	1.65
25	Marwahi	Silpahari To Majhitola	2.32
26	Pendra	Kotmikala To Tilora	3.87
27	Pendra	L 036 To Pachasipara	3.93
28	Pendra	Amarpur Lalathi To Majhetola	1.44
28	**Total**		**94.76**
	District: Durg/Bemetra		
1	Bemetara	Main Road to Jangalpur	2.13
2	Saja	Suwartala to Bhardalodi	6.00
2	**Total**		**8.13**
	District: Janjgir-Champa		
1	Nawagarh	T08 (Dhurkot) to Markadih	3.50
2	Akatara	Pakariya to Nawagaon	2.20
3	Malkharoda	Hardi to Basantpur	3.30
4	Sakti	Amapali to Baherapali	1.10
5	Sakti	Main Road to Sapanaipali	1.94
6	Sakti	Main Road to Ghuichua	1.80
7	Sakti	Main Road to Ghduimuda	2.02
8	Bamhidih	Main Road (Lakhurri) to Mauhadih	1.25
9	Bamhidih	Main Road Choriya to Parsapali	2.40
10	Pamgarh	To5 (Kamrid) to Devarghata	3.30
10	**Total**		**22.81**
	District: Korba		
1	Kartala	Champa chorbhatti to Kalgamar	3.10
2	Pali	T06 to Ramakachhar	3.00
3	Pondi Uproda	Lamna Basin to Matin mandir	2.80
4	Pondi Uproda	Katghora Andikachhar to Rampur	1.60

Sl. No.	Block	Name of Road	Length (Km)
5	Pondi Uproda	Pasan Pipariya to Sirri	1.85
6	Pondi Uproda	Pasan Pipariya to Kumharidarri	6.00
6	**Total**		**18.35**
	District:Mahasamund		
1	Mahasamund	Bhoring to Kukaradih	3.30
2	Pithora	T-09 to Sukhipali	4.15
3	Pithora	MDR Jhagrandih to Nayaktada	2.45
4	Pithora	TR-05(Baitari) to Jabalpur	4.15
5	Pithora	Katangtarai to Nawagaon	4.80
6	Pithora	Bijemal to Bhajpuri	3.60
7	Pithora	TR12 Sonasilli to Lamidih	2.20
8	Pithora	TR-06 Jogidadar to Rajpalpur	4.00
9	Basna	Chanat to Rangmatiya	6.90
10	Basna	Dongripali to Bhawar chuwa	5.15
11	Saraipali	NH-6 to Harratar	1.10
12	Saraipali	ODR Balsi to Pretandih	3.60
13	Saraipali	NH-6 to Parsada	1.05
14	Saraipali	TR-03 to Rafel	0.75
15	Saraipali	NH-216 to Nawagarh	1.50
15	**Total**		**48.70**
	District: Raigarh		
1	Sarangarh	Reda to Churela	3.30
2	Sarangarh	Sarangarh-Kosir(T09) to Machaladih	1.30
3	Sarangarh	Sarangarh- Saraipali to Kuwalijhar	3.05
4	Baramkela	Baramkela-Nawapara to Kamrid	5.07
5	Baramkela	Katanpali Saria- Nadigaon to Lipti	1.40
6	Baramkela	Kokbahal to Jirapali	3.75
7	Baramkela	Chandrapur road to Manikpur	1.00
8	Baramkela	Jhinkipali to Tarekela	3.71
9	Possore	Telipali to Kanwarih	1.10
10	Raigarh	Sambalpuri Chowk-Kolaibahal(T02) to Saraipali(E)	1.95
11	Kharsiya	Kurrubhatha - Tendumudi (T 02) to Jhitipali	1.35
12	Kharsiya	Domnara Deradih (T-012) to Tumidh	3.75
13	Kharsiya	Domanara-Darripali(T12) to Karuadih	1.55
14	Gharghoda	L039 to Danginara	1.10
15	Gharghoda	(L-055) Kudumkela-Nawadih to Fittingpara	1.20
16	Gharghoda	L027 to Jhanakdarha	3.40
17	Baramkela	Khichari-Karanpali (L044) to Bagindih	5.00
18	Dharamjaigarh	Amapali Bojiya road to Lamikhar	6.00
19	Dharamjaigarh	Dharamjaigarh Raigarh Road (T07) to Junapara	2.20
20	Dharamjaigarh	Bandhanpur-Sajapali (T-04) Kamrai Road to Bijapani (Kapia Bhound)	2.50
21	Dharamjaigarh	Kapu Road to Gosaipondi	1.10
22	Dharamjaigarh	Sisringa Road to Chulhakhol	7.00
23	Dharamjaigarh	Bandhapali - Dongabhouna road to Singijhap	3.05
24	Dharamjaigarh	D'gh - Raigarh T 07 to Pandripani	1.85
25	Dharamjaigarh	Kapu Road to Rawatpara	3.25
26	Dharamjaigarh	Tokrodand road L 092 to Raskudia	9.53
27	Lailunga	Turtura to Dhouradand	2.40
27	**Total**		**82.16**
	District : Raipur		
1	Arang	Amethi to Gudguda	1.65
2	Arang	Dhamani to Sonpairy	2.20
3	Arang	Kutela to Mohmela	1.66

Sl. No.	Block	Name of Road	Length (Km)
4	Arang	Parsada to Semariya	2.01
5	Tilda	Shirwe to SH37	1.25
6	Tilda	L043 to Mudpar	1.80
7	Deobhog	L036-Jhakarpara to Kodobhata	1.15
7	**Total**		**11.72**
	District : Baloda Bazar		
1	Bilaigarh	Bhatgaon(Salonikala) to Chikanidih	4.60
2	Bilaigarh	Saduras to Toulidih (kosamkunda)	3.60
3	Bilaigarh	05T08 to Gauradih (Dhangaon Junc.)	1.20
4	Bilaigarh	05T08 to (Khurdhara) to Gedapali-Darra	4.30
5	Bilaigarh	Bhatgaon(Shingichuwa) to Rikotar	1.55
6	Bilaigarh	05 T08 to Bisanpur	1.50
7	Bilaigarh	L043 To Khairjhiti	1.60
8	Baloda Bazar	Lawan to Turma(Pahanda)	8.50
9	Baloda Bazar	Baloda Bazar to Saloni	10.80
10	Simga	Rohra to Machabhata	3.90
10	**Total**		**41.55**
	District : Gariyaband		
1	Gariyaband	L039-SH2B Kamepur to Chindabhata	3.78
2	Chhura	L026-Matarbahara to Chitamada	5.10
2	**Total**		**8.88**
	District : Jashpur		
1	Duldula	Farsa - Sirimkela	3.20
2	Duldula	Barpani - TR-04	2.40
3	Duldula	Sapghara - Simda	4.30
4	Duldula	Godaamba - Haldimunda	3.05
5	Duldula	Dhuriamba - Kerdega	6.15
6	Duldula	Potkosemar - Kunkuri Lawakera	4.00
7	Duldula	Sarasbahar - Dandadih	2.70
8	Duldula	Bhushditoli - TR-06	5.25
9	Duldula	Mahakurtoli - Khatanga	1.70
10	Duldula	Basentuku - Khatanga	1.65
11	Duldula	Bakuna - L-27 Chatakpur	5.05
12	Duldula	Bamini - TR-01 NH-78 Patratoli	3.73
13	Duldula	Salamali - TR-04 Tangartoli	4.35
14	Duldula	Barojhariya - Hataklata	3.00
15	Duldula	L033 - Dhaidamba To Kardega	5.10
16	Duldula	Bangaon - L-25	5.80
17	Duldula	Haldimunda - Bhuaidand	6.85
18	Manora	Gwari - TR-07	3.50
19	Pathalgaon	TR 08 - Indiranager	1.20
20	Pathalgaon	T01 - Ghaghara	2.55
21	Pathalgaon	Korvapara - T-03	1.80
22	Pathalgaon	Kumhardhab - TR-02	1.50
23	Pathalgaon	TR 04 - Khamtarai	3.50
24	Pathalgaon	Pandribahla - T-03	2.48
25	Pathalgaon	L054 - Kukaricholi To L53	4.50
25	**Total**		**89.30**
132	**Grand Total**		**429.06**

Appendix 2.3: Rural Roads: Environmental Checklist

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Katra- Kirhatola to Dhapnipani**

Block Name: **Marwahi**

District Name: **Bilaspur**

Total Length of the Road: **6.72km**

A. Climatic Conditions

Temperature	High:45**°C (May)** Low: 10**°C (Dec)**
Humidity	High: **(Aug)** Low: **% (Dec)**
Rainfall Rainy Season	1320 mm/year **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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*	√		There was found forest area between Ch-2800 m to Ch-4800m both side along the proposed road alignment Type of Vegetation: Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)*
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		Inhabited areas namely village Dhapnipani starts between Ch-6100m to Ch-6720m
6.	Agricultural Land	√		The agriculture land lies has found between Ch-00m to Ch-2800m and Ch-4800m to Ch-6000m both side along the proposed alignment
7.	Grazing grounds		√	There is no Grazing ground along the project road
8.	Barren Land		√	There is no Barren land along the project road.

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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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*)**		√	No pond or other water body along the proposed alignment.
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***	√		Some water crossing points have found between Ch-2200m to Ch-2400m, Ch-3400m to Ch-3600m,Ch-3600m to Ch-3800m, Ch-3800m to Ch-4000m, Ch-4200m to Ch-4400m, Ch-4600m to Ch-4800m, Ch-5000m to Ch-5200m, Ch-5200m to Ch-5400m, Ch-6400m to Ch-6600m CDs have mentioned above alignment and Ch-2600m to Ch-2800m, Ch-5000m to Ch-5200m have Existing CDs
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**	√		There are some points of water stagnation and other drainage issues have found on or near the road which is discussed as above **S.NO. 3** ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	√		There is no prone to flooding along the project road. ( ) 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*)**	√		There are 48 trees of dbh of 30cm or more as attached in **Attachment I**
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 faunal habitat, breeding ground etc. was found within 100 m of the road shoulder.
			√	( ) 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			No rare, endangered or threatened species were found within 100 m of the road shoulder.

No.	Parameter/ Component	Yes	No	Explanation
	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[16] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures was noticed as listed in **Attachment II**
10.	Are there any religious, cultural or community structures/buildings[17] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are some utility structures was noticed as listed in **Attachment III**

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)***	√		Consultation with local community was conducted before finalizing the alignment.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

E. Please attach the following:

1) Sketch a map showing the bridge and the trees.
2) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
3) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
4) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
5) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
6) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph

[16] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[17] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (M)	Left	Right
600-800	-	10
800-1000	1	1
1000-1200	-	1
1200-1400	2	2
1400-1600	-	2
1600-1800	1	-
2000-2200	1	-
3400-3600	5	2
3600-3800	1	-
4000-4200	1	1
4600-4800	4	3
5400-5600	1	-
5600-5800	6	2
6600-6800	1	-
Total	**24**	**24**

Attachment II
List of Utilities

Chainage (M)	Left	Right
0-200	EP,ELC	-
200-400	EP,ELC	EP,ELC
400-600	-	HP
600-800	EP,HP	-
1000-1200	-	EP,ELC
1200-1400	EP,HP	-
1400-1600	EP,DP	EP,HP
1600-1800	EP,HP	2 EP
1800-2000	EP,ELC	-
2000-2200	-	EP,ELC,HP
2200-2400	EP	ELC
2400-2600	EP	-
2600-2800	EP	-
6200-6400	EP	EP
6600-6800	HP	-

Attachment III
List of Community Structures

Chainage	Left	Right
00-200	Panchyat Bhawan, Shop	Girl Hostel
1600-1800	School, Aganwadi,Temple	-
6600-6700	Aganwadi	School

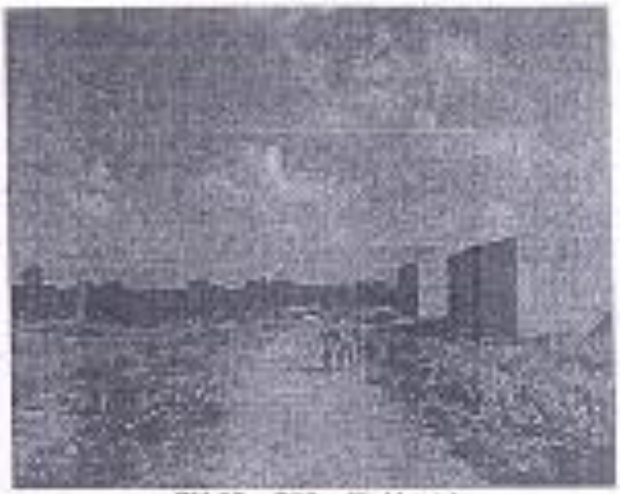
Attachment IV

Left					Chainage (M)	Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**		**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	Gram Panchyat, Shop	-	-	-	0-200	**-**	**-**	-	Girls Hostel	-
-	-	-	-	-	400-600	**-**	**-**	HP	-	-
-	-	HP	-	-	600-800	**-**	**10 trees**	-	-	-
	-	1 tree	-		800-1000	**1 tree**	**-**	-	-	-
-	-	-	-		1000-1200	**-**	**1 tree**	-	-	-
-	-	HP	1 tree	1 tree	1200-1400	**-**	2 trees	-	-	-
-	-	-	-		1400-1600	**-**	2 trees	HP	-	-
--	Temple	School, Aganwadi, HP	1 tree	-	1600-1800	**--**	-	-	--	--
--	-	-	-	-	1800-2000	**--**	-	HP	**--**	-
-	-	1 tree	-	-	2000-2200	**-**	-	-	**-**	-
-	-	4 trees	-	1 tree	3400-3600	**-**	2 trees	-	**-**	-
-	-	-	1 tree	-	3600-3800	**-**	-	-	**-**	-
-	-	-	1 tree	-	4000-4200	**--**	1 tree	-	**-**	-
-	-	-	4 trees	-	4600-4800	**-**	3 trees	-	**-**	-
-	-	-	1 tree	-	5400-5600	**-**	-	-	**-**	-
-	-	6 trees	-	-	5600-5800	**-**	2 trees	-	**-**	-
-	Aganwadi	-	HP	1 tree	6600-6800	**-**	-	-	**-**	School

E.P. – Electric Pole; H.P. – Hand Pump, TW; Tube Well, PHC- primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank

Attachment V
Photo Plates

CH-00m Start point of the road



CH-00m-200m Girl hostel

CH-200m-400m Curve RHS

CH-600m-800m Curve LHS

CH-800m-1000m Tree lies RHS

CH-1600m-1800m School and Anganwadi center LHS

CH-2201m-2400m Proposed CD

CH-2620m-2900m Painting CD

CH-2800m-3300m Forest land both side

CH-3400m-3600m Affected tree LHS

CH-3400m-3610m Proposed CD

CH-3803m-4003m Proposed CD

CH-4200m-4400m Proposed CD

CH-4600m-4800m Proposed CD

CH-5020m-5200m Existing CD

CH-5200m-5400m Proposed CD

CH-5800m-6000m Curve LHS

CH-6400m-6600m Curve LHS and proposed CD

CH:6600m-6700m Affected row LHS

CH: 6720m School End point of the road

Chainage wise Transect Walk Findings

Chainage (m)	Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestions
		LHS	RHS	LHS	RHS	LHS	RHS		
0-200	8	-	-	-	-	-	-	-	Panchyat Bhawan, Value shop, Girl hostel
200-400	8	-	-	-	-	-	-	-	EP-RHS,ELC, Curve-LHS
400-600	8	-	-	-	-	-	-	-	HP-RHS
600-800	8	-	-	-	-	-	-	-	EP-RHS,HP
800-1000	8	-	-	-	-	-	-	-	-
1000-1200	8	-	-	-	-	-	-	-	EP-RHS
1200-1400	8	-	-	-	-	-	-	-	HP-LHS,EP
1400-1600	8	-	-	-	-	-	-	-	EP-LHS,HP
1600-1800	8	-	-	-	-	-	-	-	School, Aganwadi, Temple-LHS
1800-2000	8	-	-	-	-	-	-	-	EP-LHS,HP, Curve-RHS
2000-2200	8	-	-	-	-	-	-	-	EP-LHS
2200-2400	8	-	-	-	-	-	-	-	Proposed CD
2400-2600	8	-	-	-	-	-	-	-	EP-LHS
2600-2800	8	-	-	-	-	-	-		Existing CD, EP-RHS
2800-3000	8	-	-	-	-	-	-	-	Forest land start
3000-3200	8	-	-	-	-	-	-	-	Both side forest, curve-LHS
3200-3400	8	-	-	-	-	-	-	-	Both side forest, curve-LHS
3400-3600	8	-	-	-	-	-	-	-	Forest land, 2 proposed CD
3600-3800	8	-	-	-	-	-	-	-	Both side forest proposed CD
3800-4000	8	-	-	-	-	-	-	-	Both side forest proposed CD
4000-4200	8	-	-	-	-	-	-	-	Both side forest land
4200-4400	8	-	-	-	-	-	-	-	Both side forest land
4400-4600	8	-	-	-	-	-	-	-	Both side forest land
4600-4800	8	-	-	-	-	-	-	-	Both side forest proposed CD
4800-5000	8	-	-	-	-	-	-	-	-
5000-5200	8	-	-	-	-	-	-	-	Proposed CD, Existing CD
5200-5400	8	-	-	-	-	-	-	-	Proposed CD
5400-5600	8	-	-	-	-	-	-	-	ELC
5600-5800	8	-	-	-	-	-	-	-	Curve-LHS
5800-6000	8	-	-	-	-	-	-	-	Curve-LHS
6000-6200	8	-	-	-	-	-	-	-	Habitation area
6200-6400	8	-	-	-	-	-	-	-	EP-LHS and RHS
6400-6600	8	-	-	-	-	-	-	-	Proposed CD, Curve-LHS
6600-6720	8	-	-	-	-	-	-	-	CC road proposed, aganwadi-LHS,HP, School

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Chandkhuri to Ghuthiya**

Block Name: **Pathariya**

District Name: **Bilaspur**

Total Length of the Road: **3.00 km**

F. Climatic Conditions

Temperature	High: **°C(May)** Low: **°C(Dec)**
Humidity	High: **(Aug)** Low: **% (Dec)**
Rainfall Rainy Season	mm/year **June** to **September**

G. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3.	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.)* No part of the project road passes through any forest area
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		Inhabited areas namely village Chandkhuri and Ghuthiya starts between Ch-00m to Ch-900 and Ch-2300m to Ch-3000m respectively.
6.	Agricultural Land	√		The agriculture land lies has found between Ch-200m to Ch-700m LHS and Ch-2500m to Ch-2800m both side along the proposed alignment
7.	Grazing grounds		√	There is no Grazing ground along the project road
8.	Barren Land		√	There is no Barren land along the project road.

H. 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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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***)	√		There was found pond between Ch-1200m to Ch-1300m LHS and Ch-2500m to Ch-2800m LHS along the proposed alignment.
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***	√		Some water crossing points have found between Ch-600m to Ch-700m, Ch-700m to Ch-800m CDs have proposed on above mentioned changes and Chj-200m to Ch-300m, Ch-1300m to Ch-1400m, Ch-1700m to Ch-1800m, Ch-2500m to Ch-2600m have Existing CDs
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***	√		There are some points of water stagnation and other drainage issues have found on or near the road which is discussed as above **S.NO. 3** ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	√		There is no prone to flooding along the project road. ( ) 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***)	√		There are 11 trees of dbh of 30cm or more as attached in **Attachment I**
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 faunal habitat, breeding ground etc. was found within 100 m of the road shoulder. ( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[18] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures was noticed as listed in **Attachment II**
10.	Are there any religious, cultural or community structures/buildings[19] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are some religious cultural or community structures/buildings was found as listed in **Attachment III**

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)***	√		Consultation with local community was conducted before finalizing the alignment.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

I. Please attach the following:

7) Sketch a map showing the bridge and the trees.
8) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
9) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
10) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
11) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
12) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

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

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

Attachment I
List of Trees

Chainage (M)	Left	Right
700-800	-	1
800-900	-	1
1200-1300	1	-
1400-1500	-	2
1700-1800	-	1
1800-1900	-	1
2400-2500	1	-
2500-2600	-	1
2600-2700	-	2
Total	**2**	**9**

Attachment II
List of Utilities

Chainage (M)	Left	Right
100-200	-	EP
300-400	EP	EP,ELC
700-800	-	HP
800-900	EP	EP,ELC
1000-1100	-	ELC
1400-1500	-	ELC
2200-2300	EP	DP
2400-2500	-	ELC
2500-2600	Pond, HP	2 EP
2900-3000	-	EP

Attachment III
List of Community Structures

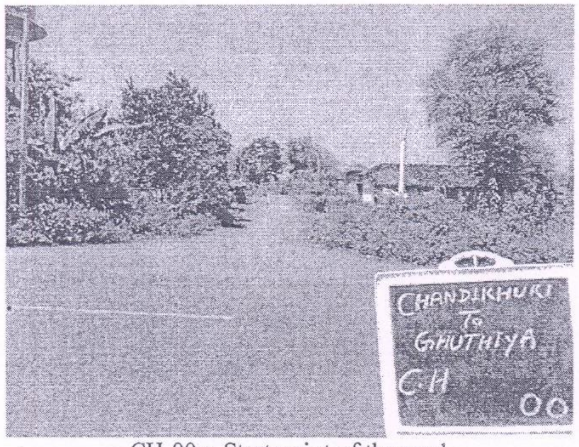
Chainage	Left	Right
0-100	School	Jai thumb
100-200	-	Community hall, primary hospital
200-300	Jai thumb	-
700-800	Aganwadi	Middle school
2100-2200	School	-
2300-2400	Panchyat Bhawan	-
2400-2500	Gram Office	School
2500-2600	Temple	-
2600-2700	Temple	-
2900-3000	-	Temple

Attachment IV

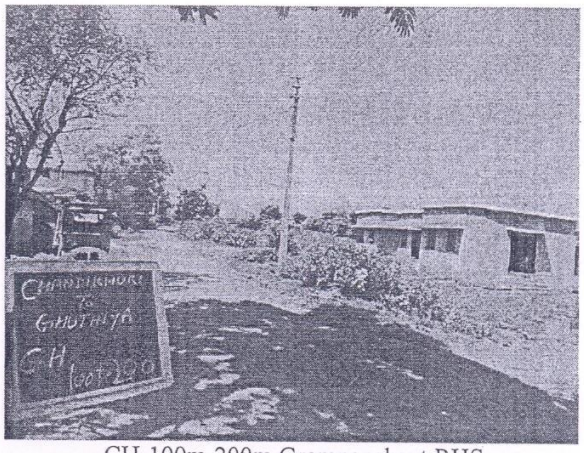
Left					Chainage (M)	Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**		**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
School	-	-	-	-	0-100	**-**	**-**	-	Jaithumb	-
-	-	-	-	-	100-200	**-**	**-**	-	Community hall, Primary hospital, Panchyat Bhawan	-
-	-	Jaithumb	-	-	200-300	**-**	**-**	-	-	-
	-	Aganwadi	-		700-800	**-**	1 tree	-	-	Middle School
-	-	-	-		800-900	**-**	**-**	1 tree	-	-
-	-	1 tree	-	-	1200-1300	**-**	-	-	-	-
-	-	-	-		1400-1500	**-**	-	2 tree	-	-
--	-	-	-	-	1700-1800	**--**	-	1 tree	--	-
--	-	-	-	-	1800-1900	**--**	-	-	**--**	1 tree
School (15-20m)	-	-	-	-	2100-2200	**-**	-	-	**-**	-
Panchyat Bhawan	-	-	-	-	2300-2400	**-**	-	-	**-**	-
Gram Office	-	1 tree	-	-	2400-2500	**-**	-	-	School	-
-	-	Temple	-	-	2500-2600	**-**	-	-	1 tree	-
-	-	Temple	-	-	2600-2700	**-**	2 tree	-	**-**	-
-	-	-	-	-	2900-3000	**-**	-	-	**-**	Temple

E.P. – Electric Pole; H.P. – Hand Pump, TW; Tube Well, PHC- primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank

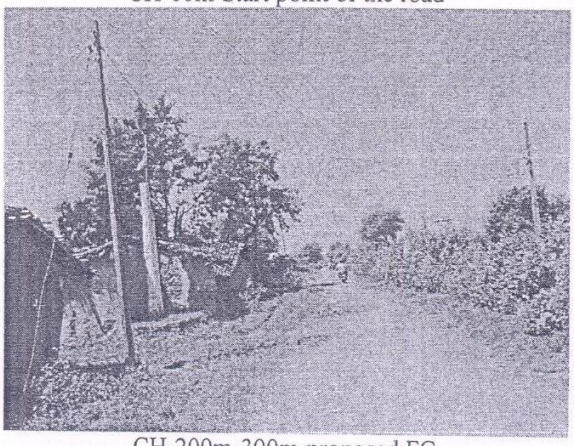
Attachment V
Photo Plates

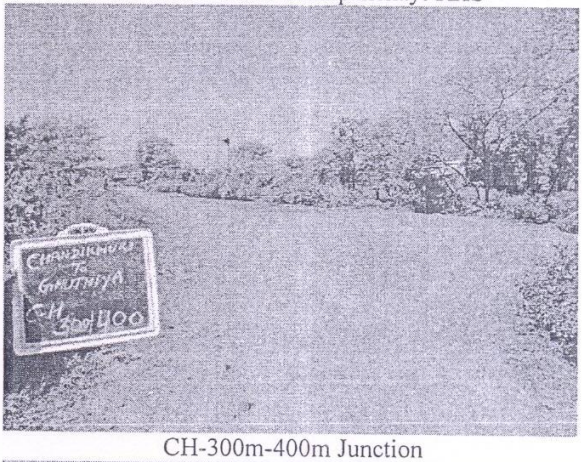


CH-00m Start point of the road

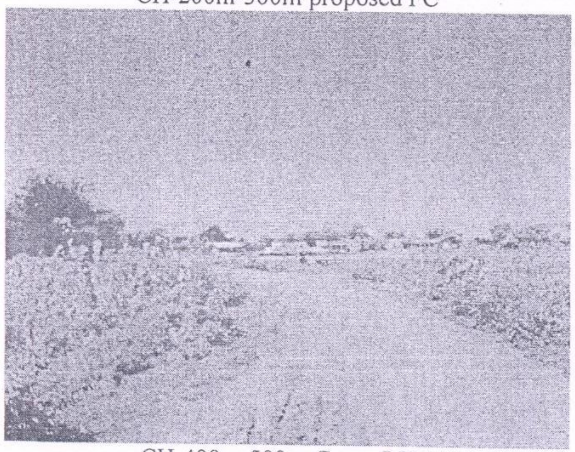


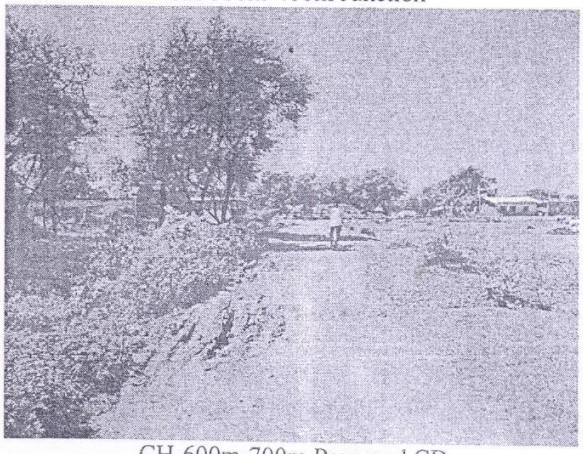
CH-100m-200m Grampanchayt RHS


CH-200m-300m proposed FC

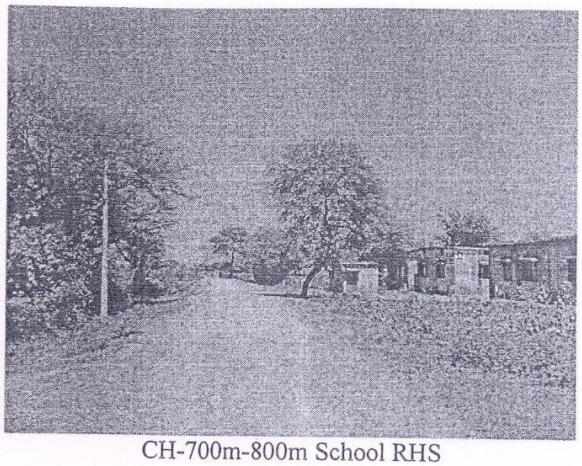


CH-300m-400m Junction

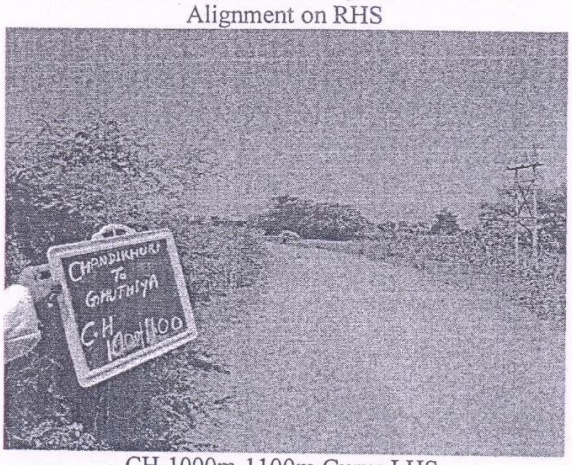

CH-400m-500m Curve LHS


CH-600m-700m Proposed CD

CH-700m-800m junction, Anganwadi LHS and Alignment on RHS

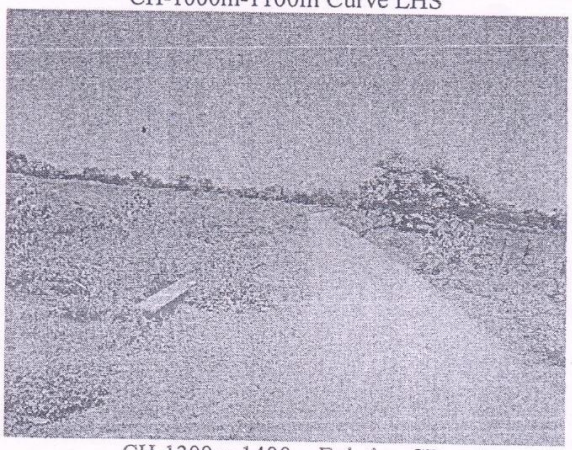


CH-700m-800m School RHS

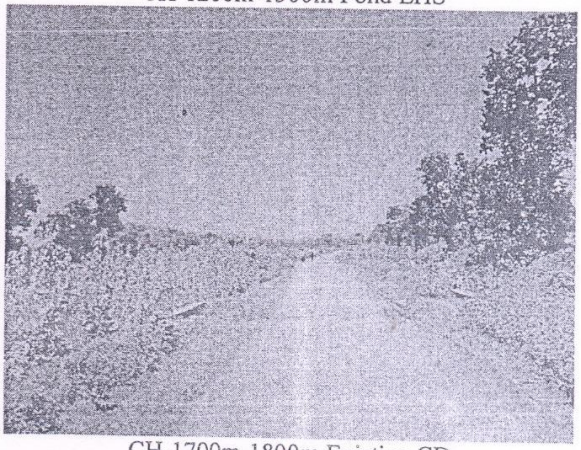


CH-1000m-1100m Curve LHS

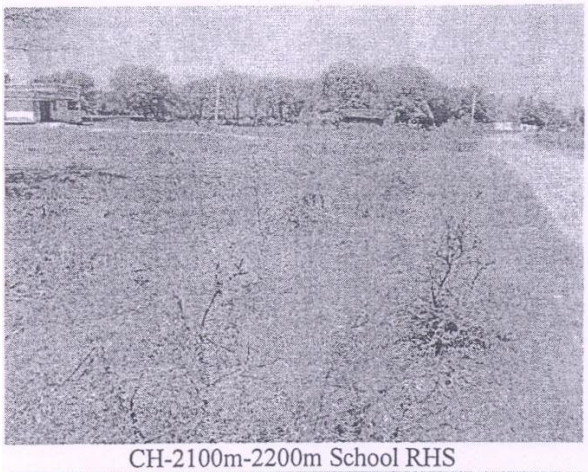
CH-1200m-1300m Pond LHS



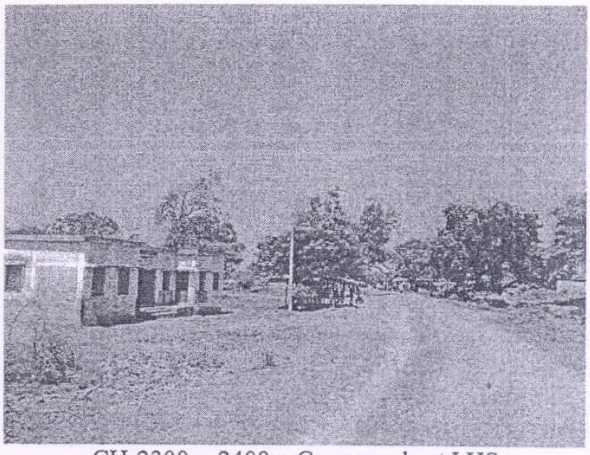
CH-1300m-1400m Existing CD



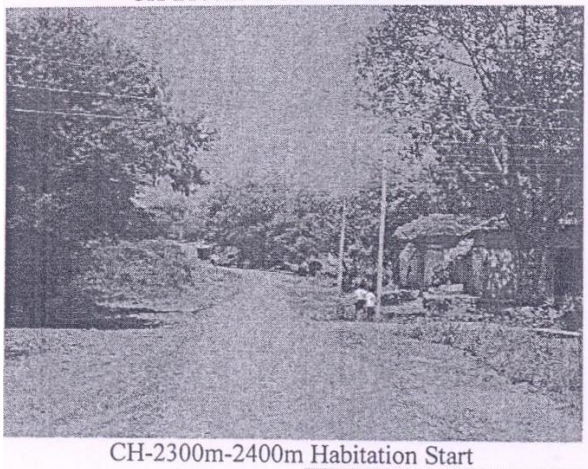
CH-1700m-1800m Existing CD



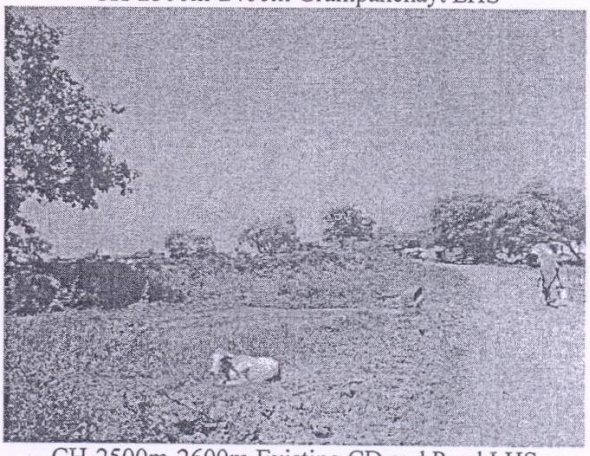
CH-2100m-2200m School RHS



CH-2300m-2400m Grampanchayt LHS



CH-2300m-2400m Habitation Start



CH-2500m-2600m Existing CD and Pond LHS

CH-3000m End point of the road

Chainage wise Transect Walk Findings

Chainage (m)	Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestions
		LHS	RHS	LHS	RHS	LHS	RHS		
0-100	8	-	-	-	-	-	-	-	School-LHS, Jai thumb-RHS
100-200	8	-	-	-	-	-	-	-	Panchyat Bhawan, Community hall, Primary hospital
200-300	8	-	-	-	-	-	-	-	Existing CD, Jai thumb
300-400	8	-	-	-	-	-	-	-	EP-LHS, Junction, Sign board proposed
400-500	8	-	-	-	-	-	-	-	Curve -LHS
500-600	8	-	-	-	-	-	-	-	School- RHS
600-700	8	-	-	-	-	-	-	-	Proposed CD
700-800	8	-	-	-	-	-	-	-	T-Junction, Agan wadi-LHS, Proposed CD
800-900	8	-	-	-	-	-	-	-	EP-LHS and RHS
900-1000	8	-	-	-	-	-	-	-	-
1000-1100	8	-	-	-	-	-	-	-	EP-RHS, Turn-LHS
1100-1200	8	-	-	-	-	-	-	-	-
1200-1300	8	-	-	-	-	-	-	-	Pond, Curve-RHS
1300-1400	8	-	-	-	-	-	-		Existing CD
1400-1500	8	-	-	-	-	-	-	-	ELC
1500-1600	8	-	-	-	-	-	-	-	-
1600-1700	8	-	-	-	-	-	-	-	-
1700-1800	0	4	4	4	4	Pvt. Land	Pvt. Land	-	Private Land
1800-1900	8	-	-	-	-	-	-	-	-
1900-2000	8	-	-	-	-	-	-	-	-
2000-2100	8	-	-	-	-	-	-	-	-
2100-2200	8	-	-	-	-	-	-	-	School-LHS
2200-2300	8	-	-	-	-	-	-	-	DP-RHS,EP-LHS
2300-2400	8	-	-	-	-	-	-	-	Panchyat bhawan-LHS, Junction
2400-2500	8	-	-	-	-	-	-	-	Gram office, ELC increase need in height, School
2500-2600	8	-	-	-	-	-	-	-	Existing CD, Pond, Temple, CC road proposed
2600-2700	8	-	-	-	-	-	-	-	Pond-LHS,CC road proposed
2700-2800	8	-	-	-	-	-	-	-	Pond-LHS,CC road proposed
2800-2900	8	-	-	-	-	-	-	-	CC road proposed
2900-3000	8	-	-	-	-	-	-	-	EP-LHS,CC road proposed

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Bori to Parsadapar Road**

Block Name: **Dhamada**

District Name: **Durg**

Total Length of the Road: **6.40 Km**

A. Climatic Conditions

Temperature	High: **42 °C (May)** Low: **15 °C (Dec)**
Humidity	High: 4**0% (Aug)** Low: 2**0% (Dec)**
Rainfall Rainy Season	**1200** mm/year **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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-2200m to Ch- 2400m, Ch-4000m to Ch-4700m and Ch-6200m to Ch-6400m with connecting village Funda, Nawagaon and Parsadapar respectively.
6.	Agricultural Land	√		The project road has agriculture land at Ch-00m to Ch-2000m, Ch-2800m to Ch-3600m and Ch-5500m to Ch-6200m.
7.	Grazing grounds		√	There is no Grazing ground at proposed alignment.
8.	Barren Land	√		There is Barren land found along the proposed road alignment at Ch-5000m to Ch-6200m.

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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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)***	√		There was pond at Ch-200m to Ch-400m LHS far away at 60m, Ch-1400m to Ch-1900m, Ch-2300m to Ch-2400m, Ch-2500m to Ch-3000m far away at 18-20m and Ch-5900m to Ch-6100m RHS.
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***	√		There is some water crossing points at 400m to Ch-600m, Ch-1200m to Ch-1400m, Ch-2000m to Ch-2200m, 3800m to CH-4000m, Ch-4800m to Ch-5000m has existing CD, Ch-2200m to Ch-2400m, has 2 CD proposed and 1CD existing, Ch-5200m to Ch-5400m 1CD proposed and 1 Existing CD and Ch-2400m to CH-2600m, Ch-2800m to CH-3000m, Ch- 5400m to Ch-5600m, Ch-5600m to Ch-5800m and Ch-6200m toCh-6400m has proposed CDs
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding. ( ) 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***)	√		There are 101 trees of dbh of 30 cm or more as attached in Attachment I
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder. ( ) 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		√	No rare, endangered or threatened species were found within 100 m of the road shoulder.

No.	Parameter/ Component	Yes	No	Explanation
	endangered species?			( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[20] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[21] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

E. Please attach the following:

1) Sketch a map showing the bridge and the trees.
2) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
3) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
4) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
5) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
6) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[20] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[21] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Right	Left
400	-	600	1	-
600	-	800	-	3
800	-	1000	-	3
1000	-	1200	-	2
1200	-	1400	2	-
1400	-	1600	-	21
1600	-	1800	-	40
1800	-	2000	2	2
2000	-	2200	1	-
2400	-	2600	2	1
2600	-	2800	1	2
2800	-	3000	-	2
5200	-	5400	1	1
5600	-	5800	-	5
5800	-	6000	8	1
TOTAL			**18**	**83**

Attachment II
List of Utilities

Chainage			Right	Left
200	-	400	Pond	-
400	-	600	HP,ELC	ELC
600	-	800	2EP	-
800	-	1000	EP	Pond, HP
1800	-	1900	-	HP
2200	-	2400	Pond,2EP	2HP,ELC
2500	-	3000	-	Pond, EP
3200	-	3400	ELC	-
3600	-	3800	ELC	-
3800	-	4000	2ELC	2ELC
4200	-	4400	-	ELC
4800	-	5000	ELC	EP,ELC
5000	-	5200	-	ELC
6000	-	6200	EP,DP	4ELC,1ELC height increase
6200	-	6400	ELC,6EP	DP

Attachment III
List of Community Structures

Chainage			Right	Left
0	-	200	Primary health center	-
400	-	600	temple	-
1800	-	2000	-	temple
2200	-	2400	temple	temple, atal chouk
4200	-	4400	atal chouk	primary school,aganwadi
4600	-	4800	New school	-
5000	-	5200	-	temple
6000	-	6200	-	temple

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
Health center (30-40m)	-	-	-	-	**0**	-	**200**	-	-	-	-	-
temple	Pond	-	-	-	200	-	400	-	-	-	-	-
1 tree	HP	-	-	-	400	-	600	-	-	-	-	-
-	2EP	-	-	-	600	-	800	-	-	3 tree	-	-
-	EP	-	-	-	800	-	1000	-	-	2 tree	1 tree	Pond
-	-	-	-	-	1000	-	1200	-	2 tree	-	-	-
-	-	2 tree	-	-	1200	-	1400	-	-	-	-	-
-	-	-	-	-	1400	-	1600	-	-	21 tree	-	-
-	-	-	-	-	1600	-	1800	-	-	40 tree	-	-
-	-	-	-	-	1800	-	1900	-	-	-	HP	-
-	-	-	2 tree	-	1800	-	2000	-	-	2 tree	-	temple
-	-	1 tree	-	-	2000	-	2200	-	-	-	-	-
school	Pond	2Ep, temple	-	-	2200	-	2400	-	-	temple, hP	-	2HP
-	-	2 tree	-	-	2400	-	2600	-	-	-	-	-
-	-	1 tree	-	-	2600	-	2800	-	-	2 tree	-	-
-	-	1Ep	-	-	2800	-	3000	-	1 tree	1 tree	-	Pond (18-20m)
-	-	2ELC	-	-	3800	-	4000	-	-	2ELC	-	-
-	Atal chouk	-	-	-	4200	-	4400	-	-	-	Primary school, aganwadi	-
New school	-	-	-	-	4600	-	4800	-	-	-	-	-
-	-	-	-	-	4800	-	5000	-	-	1EP	-	-
-	-	-	-	-	5000	-	5200	-	-	-	-	temple
-	1 tree	-	-	-	5200	-	5400	-	-	-	1 tree	-
-	-	-	-	-	5600	-	5800	-	-	-	-	5 tree
8 tree	-	-	-	-	5800	-	6000	-	-	-	1 tree	-
-	-	EP,DP	-	-	6000	-	6200	-	-	ELC height increase	temple	-
6EP	-	-	-	-	6200	-	6400	-	-	DP	-	-

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC, Electric Line crossing

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	200	8	-	-	-	-	-	-	-	Community health center at LHS
200	-	400	8	-	-	-	-	-	-	-	LHS pond
400	-	600	8	-	-	-	-	-	-	-	Existing CD, LHS temple, HP, ELC
600	-	800	8	-	-	-	-	-	-	-	2EP LHS
800	-	1000	8	-	-	-	-	-	-	-	LHS EP
1000	-	1200	8	-	-	-	-	-	-	-	Junction, sign board proposed
1200	-	1400	8	-	-	-	-	-	-	-	existing culvert
1400	-	1600	8	-	-	-	-	-	-	-	RHS pond
1600	-	1800	8	-	-	-	-	-	-	-	RHS pond and sign board proposed
1800	-	2000	8	-	-	-	-	-	-	Funda	RHS pond, RHS HP, Temple, sign board proposed
2000	-	2200	6	-	-	-	-	-	-	-	CC road proposed, Existing CD
2200	-	2400	8	-	-	-	-	-	-	-	2CD, signboard and speed breaker proposed, temple School
2400	-	2600	8	-	-	-	-	-	-	-	CD proposed, RHS EP and DP
2600	-	2800	8	-	-	-	-	-	-	-	-
2800	-	3000	8	-	-	-	-	-	-	-	CD proposed
3000	-	3200	8	-	-	-	-	-	-	-	-
3200	-	3400	8	-	-	-	-	-	-	-	ELC
3400	-	3600	8	-	-	-	-	-	-	-	-
3600	-	3800	8	-	-	-	-	-	-	-	ELC
3800	-	4000	8	-	-	-	-	-	-	Nawagaon	Canal crossing, LHS HP and ELC, sign board proposed
4000	-	4200	8	-	-	-	-	-	-	-	1EP RHS
4200	-	4400	5	-	-	-	-	-	-	-	CC road proposed, RHS school, atal chouk LHS, sign board proposed
4400	-	4600	6	-	-	-	-	-	-	-	CC road proposed
4600	-	4800	8	-	-	-	-	-	-	-	LHS new school
4800	-	5000	8	-	-	-	-	-	-	-	Existing CD, sign board proposed, Junction, speed breaker, EP
5000	-	5200	8	-	-	-	-	-	-	-	RHS temple

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
5200	-	5400	8	-	-	-	-	-	-	-	CD proposed and existing CD
5400	-	5600	8	-	-	-	-	-	-	-	CD proposed and sign board proposed
5600	-	5800	8	-	-	-	-	-	-	-	CD proposed and LHS EP
5800	-	6000	8	-	-	-	-	-	-	Parsadapar	RHS Pond and sign board proposed, Junction
6000	-	6200	8	-	-	-	-	-	-	-	RHS pond, temple LHS DP, ELC height should increase
6200	-	6400	8	-	-	-	-	-	-	-	2CD proposed RHS DP, LHS EP and sign board proposed

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Main road to Jangalpur**

Block Name: **Bemetara**

District Name: **Bemetara**

Total Length of the Road: **2.13 km**

A. Climatic Conditions

Temperature	High: 42**°C(May)** Low: 15 **°C(Dec)**
Humidity	High: 40 **(Aug)** Low: 20% **(Dec)**
Rainfall Rainy Season	1200 mm/year **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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3.	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.)* No part of the project roads passes through any forest area
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited areas is identified between Ch-1000m to Ch-1400m, Ch-3100m to Ch-3500m and Ch-5400m to Ch-6000m with connecting Muglatola, Bhardalodhi and Sonpuri respectively
6.	Agricultural Land	√		The project road has agriculture land at Ch-200m to Ch-1000m, Ch-100m to Ch-3100m and Ch-3500m to Ch-5400m.
7.	Grazing grounds	√		There is no Grazing ground ground at proposed alignment.
8.	Barren Land		√	There is no Barren land along the project road at C-00m to Ch-200m.

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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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*)**		√	There was pond at Ch-600m to Ch-800m, Ch-1000m to Ch-1200m.
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***	√		There is some water crossing points at Ch-00m to Ch-200m has 2CD, Ch-200m to Ch-400m, Ch-400m to Ch-600m Ch-600m to Ch-800m, Ch-100m to Ch-1200m, Ch-1200m to Ch-1400, Ch-3000m to Ch-3200m, Ch-4200m to Ch-4400m, Ch-4600m to Ch-4800m, Ch-4800m to Ch-5000m, has existing CD and Ch-4400m to Ch-4600 has existing canal
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**		√	There is no problem of water stagnation and other drainage issues on or near the road.is describe above serial No. 3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding.. ( ) 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*)**	√		There are 23 trees of dbh of 30 cm or more as attached in **Attachment I**
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 faunal habitat, breeding ground etc. was found within 100 m of the road shoulder. ( ) 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			No rare, endangered or threatened species were found within 100 m of the road shoulder.

No.	Parameter/ Component	Yes	No	Explanation
	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[22] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		Few utility structures were found as listed in attachment II.
10.	Are there any religious, cultural or community structures/buildings[23] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in **Attachment III**

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

D. Please attach the following:

13) Sketch a map showing the bridge and the trees.
14) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
15) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
16) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
17) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
18) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[22] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[23] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (M)	Left	Right
1000-1200	17	-
1600-1800	1	-
2800-3000	1	-
3200-3400	1	-
3400-3600	-	1
4600-4800	-	1
5800-6000	-	1
Total	**20**	**3**

Attachment II
List of Utilities

Chainage (M)			Left	Right
0	-	200	-	Power house (30m)
200	-	400	ELC	ELC
400	-	600	3ELC	ELC height increase
600	-	800	EP, Pond	ELC
800	-	1000	EP	-
1000	-	1200	Pond, HP	-
1200	-	1400	EP	-
1400	-	1600	2HP	-
1600	-	1800	-	EP
1800	-	2000	EP, 2ELC	ELC Height increase
2000	-	2200	ELC	-
2200	-	2400	1EP	-
2400	-	2600	ELC	2EP,DP
2600	-	2800	-	ELC
2800	-	3000	-	2EP, 2ELC
3000	-	3200	1EP, ELC	-
3200	-	3400	Well	-
3400	-	3600	ELC, EP, 2HP	HP
3600	-	3800	1EP	DP,2ELC
3800	-	4000	-	1EP
4400	-	4600	Canal, 4EP	-
4600	-	4800	2EP	-
4800	-	5000	ELC	-
5000	-	5200	DP,ELC	2EP
5200	-	5400	HP	-
5400	-	5600	-	EP,DP

Attachment III
List of Community Structures

Chainage (M)			Left	Right
2800	-	3000	Templ	-
3000	-	3200	School	-
5600	-	5800	-	School
5800	-	6000	-	Templ

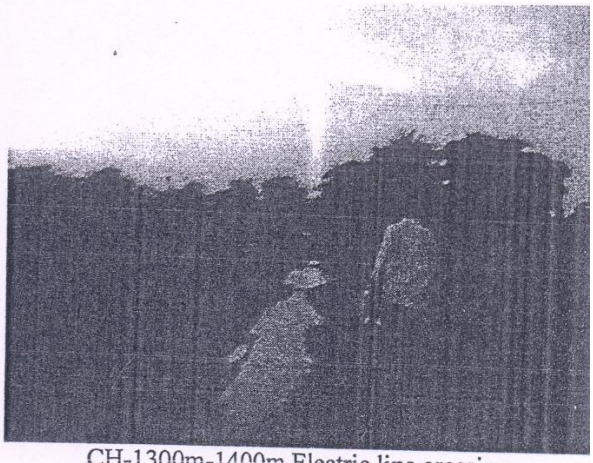
Attachment IV

Left					Chainage (M)	Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**		**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	-	-	0-200	-	-	-	-	-
-	-	-	-	-	200-400	-	-	-	-	-
-	-	-	-	-	400-600	-	-	-	-	-
-	-	EP, Pond	-	-	600-800	-	-	-	-	-
-	-	EP	-	-	800-1000	-	-	-	-	-
-	Pond, HP	17 trees	-	-	1000-1200	-	-	-	-	-
-	-	EP	-	-	1200-1400	-	-	-	-	-
-	-	2HP	-	-	1400-1600	-	-	-	-	-
-	-	-	1 Tree	-	1600-1800	-	-	EP	-	-
-	-	EP	-	-	1800-2000	-	-	ELC Height increased	-	-
-	-	-	-	-	2000-2200	-	-	-	-	-
-	-	EP	-	-	2200-2400	-	-	-	-	-
-	-	-	-	-	2400-2600	-	-	2EP, DP	-	-
-	-	-	-	-	2600-2800	-	-	-	-	-
-	-	1 Tree, Temple	-	-	2800-3000	-	-	2 EP, ELC	-	-
-	-	School, EP	-	-	3000-3200	-	-	-	-	-
-	-	1 TREE	Well	-	3200-3400	-	-	-	-	-
-	-	EP, 2HP	-	-	3400-3600	-	-	1 Tree, HP	-	-
-	-	-	1EP	-	3600-3800	-	-	DP, ELC	-	-
-	-	-	-	-	3800-4000	-	-	-	EP	-
-	-	Canal, 4EP	-	-	4400-4600	-	-	-	-	-
-	-	2EP	-	-	4600-4800	-	-	1 Tree	-	-
-	-	-	-	-	4800-5000	-	-	-	-	-
-	-	DP, ELC	-	-	5000-5200	-	-	-	2EP	-
-	-	HP	-	-	5200-5400	-	-	-	-	-
-	-	-	-	-	5400-5600	-	-	EP, DP	-	-
-	-	-	-	-	5600-5800	-	School	-	-	-
-	-	-	-	-	5800-6000	-	-	1 tree	Temple	-

E.P. – Electric Pole; H.P. – Hand Pump, TW; Tube Well, PHC- primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank

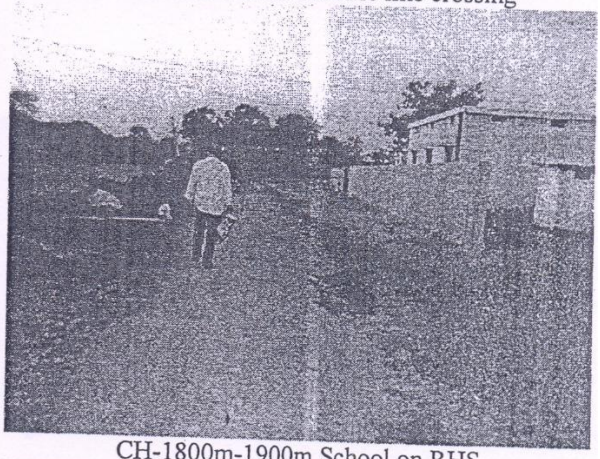
PHOTO PLATE

CH-1100m-1200m Proposed CD

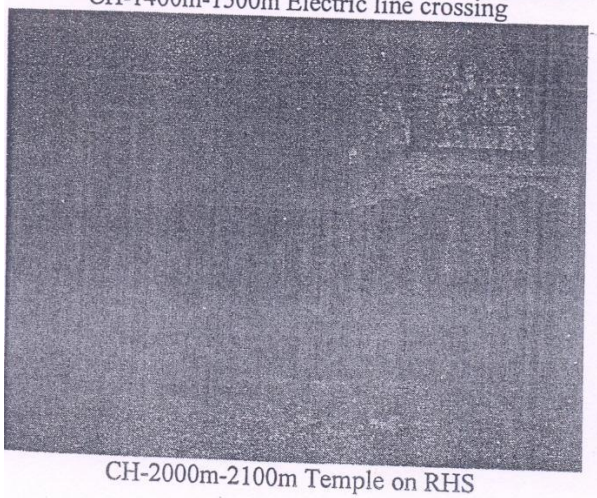


CH-1300m-1400m Electric line crossing

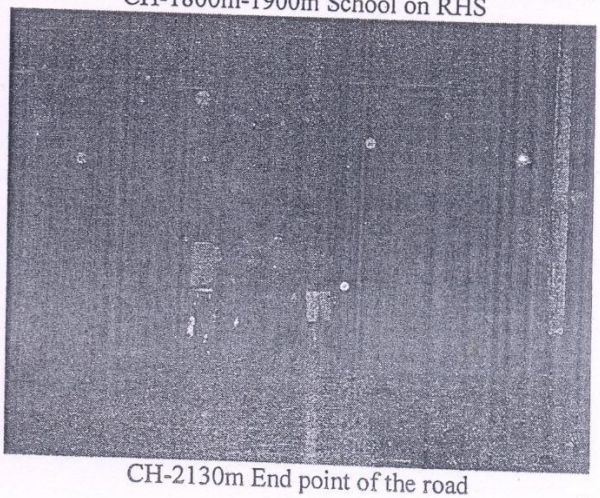
CH-1400m-1500m Electric line crossing



CH-1800m-1900m School on RHS



CH-2000m-2100m Temple on RHS



CH-2130m End point of the road

Chainage wise Transect Walk Findings

Chainage (m)	Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestions
		LHS	RHS	LHS	RHS	LHS	RHS		
0-100	8	-	-	-	-	-	-	-	CD proposed
100-200	8	-	-	-	-	-	-	-	RHS EP
200-300	8	-	-	-	-	-	-	-	CD proposed, EP RHS
300-400	8	-	-	-	-	-	-	-	LHS curve, sign board proposed
400-500	8	-	-	-	-	-	-	-	CD proposed
500-600	8	-	-	-	-	-	-	-	-
600-700	8	-	-	-	-	-	-	-	CD Proposed
700-800	8	-	-	-	-	-	-	-	-
800-900	6	-	-	-	-	-	-	-	2 CD proposed
900-1000	6	-	-	-	-	-	-	-	LHS curve, sign board proposed
1000-1100	6	-	-	-	-	-	-		-
1100-1200	6	-	-	-	-	-	-	-	CD proposed, RHS EP
1200-1300	8	-	-	-	-	-	-	-	-
1300-1400	8	-	-	-	-	-	-	-	CD proposed , ELC
1400-1500	8	-	-	-	-	-	-	-	
1500-1600	8	-	-	-	-	-	-	-	
1600-1700	8	-	-	-	-	-	-	-	
1700-1800	8	-	-	-	-	-	-	Jangalpur	Habitation area starts, sign board proposed, RHS school
1800-1900	2	3m	3m	3m	3m	AL	AL	-	CC road proposed
1900-2000	8	-	-	-	-	-	-	-	CC road pproposed, CD and sign board proposeod
2000-2130	8	-	-	-	-	-	-	-	CD proposed RHS temple, LHS gram Panchayat

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Main Road to Ghduimuda**

Block Name: **Sakti**

District Name: **Janjgir-Champa**

Total Length of the Road: **2.02 km**

E. Climatic Conditions

Temperature	High: 48.2**°C(May)** Low: 10**°C(Dec)**
Humidity	High: 88% **(Aug)** Low: 52 **% (Dec)**
Rainfall Rainy Season	1145 mm/year **June** to **September**

F. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3.	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.)* Ch-00m to Ch-1100m both sides
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		Inhabited areas starts at Ch-00m to Ch-500m and Ch-1800m to Ch-202m with connecting village Kharripara and Ghduimuda.
6.	Agricultural Land	√		The agriculture land lies between Ch-500m to Ch-1800 m at both sides.
7.	Grazing grounds		√	There is no Grazing ground along the project road
8.	Barren Land		√	There is no Barren land along the project road.

G. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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***)		√	There was not found pond along the proposed alignment.
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***	√		There was found at Ch-200m to Ch-300m, Ch-400m to Ch-500m, Ch-500m to Ch-600m, Ch-700m to Ch-800m, has existing CD and Ch-1700m to Ch-1800m proposed CD
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***	√		There are some points of water stagnation and other drainage issues have found on or near the road which is discussed as above **S.NO. 3** ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are not found any flood prone area along the project road. ( ) 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***)	√		There are 17 trees of dbh of 30cm or more as attached in **<u>Attachment I</u>**
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 faunal habitat, breeding ground etc. was found within 100 m of the road shoulder. ( ) 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		√	No rare, endangered or threatened species were found within 100 m of the road shoulder.

No.	Parameter/ Component	Yes	No	Explanation
	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[24] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures was noticed as listed in **Attachment II**
10.	Are there any religious, cultural or community structures/buildings[25] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***		√	Few religious cultural or community structures/buildings were found as listed in **Attachment III**

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)***	√		Consultation with local community was conducted before finalizing the alignment.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

H. Please attach the following:

19) Sketch a map showing the bridge and the trees.
20) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
21) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
22) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
23) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
24) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[24] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[25] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (M)	Left	Right
0-100	1	1
300-400	1	-
400-500	1	-
600-700	2	-
700-800	-	1
1000-1100	2	-
1100-1200	1	1
1200-1300	1	1
1500-1600	1	-
1600-1700	-	2
1700-1800	-	1
Total	**10**	**7**

Attachment II
List of Utilities

Chainage (M)	Left	Right
0-100	2EP,DP	HP,EP,ELC
200-300	-	EP,ELC
300-400	-	HP
400-500	EP	EP,ELC
1000-1100	EP,ELC	-
1600-1700	Bore	-
1700-1800	EP	-
1800-1900	-	EP
1900-2000	EP,ELC	-

Attachment III
List of Community Structures

Chainage	Left	Right
100-200	Samudaik Bhavan	-
200-300	Sub hospital	-
1900-2000	-	Manch

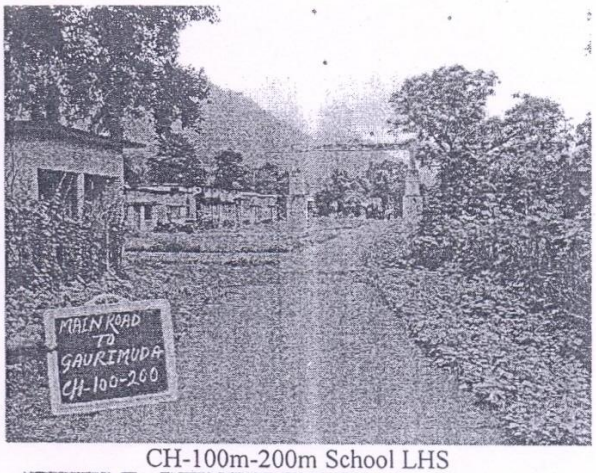
Attachment IV

Left					Chainage (M)	Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**		**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	DP,EP	-	0-100	**-**	EP,ELC,HP,1 tree	-	-	-
Samudaik Bhavan (15m), Sub hospital	-	1 tree	-	-	100-200	**-**	-	-	-	-
-	-	-	1 tree	-	200-300	**-**	EP,ELC	-	-	-
	-	1 tree	EP	-	300-400	**-**	EP,ELC	-	-	-
-	-	-	-	-	400-500	**-**	EP,ELC	-	-	-
-	-	EP,ELC, 2 tree	-	-	700-800	**-**	-	1 tree	-	-
-	EP	1 tree	-	-	1000-1100	**-**	-	-	-	-
-	-	1 tree	-	-	1100-1200	**--**	-	-	1 tree	--
--	-	1 tree	-	-	1200-1300	**--**	-	-	1 tree	-
-	-	Bore	-	-	1300-1400	**-**	-	-	-	-
-	-	EP	-	-	1600-1700	**-**	-	2 tree	-	-
-	-	-	-	-	1700-1800	**-**	-	-	1 tree	-
-	-	-	-	-	1800-1900	**-**	EP	-	**-**	-
-	-	-	Tangmanch	-	1900-2000	**-**	-	-	**-**	-

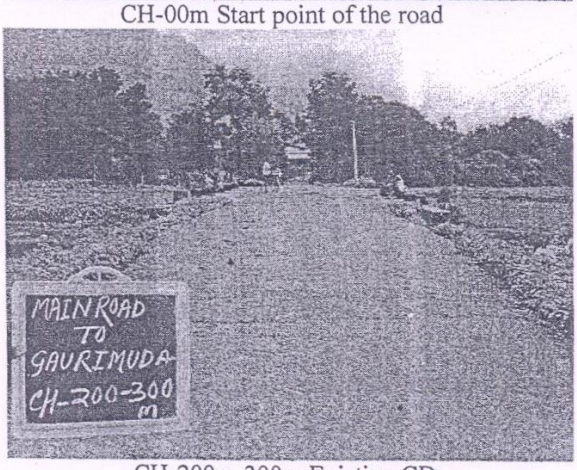
E.P. – Electric Pole; H.P. – Hand Pump, TW; Tube Well, PHC- primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank

Attachment V
Photo Plates

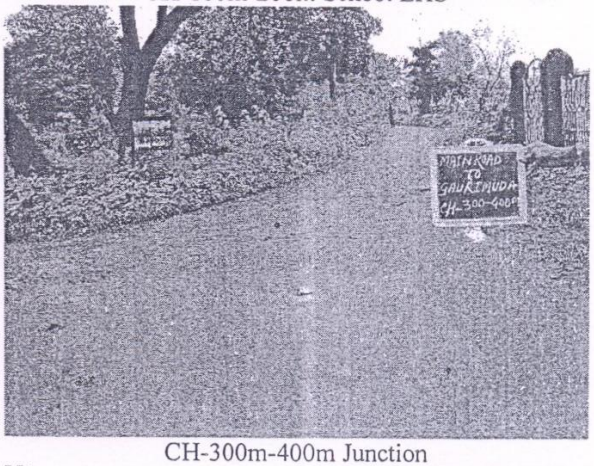
CH-00m Start point of the road



CH-100m-200m School LHS

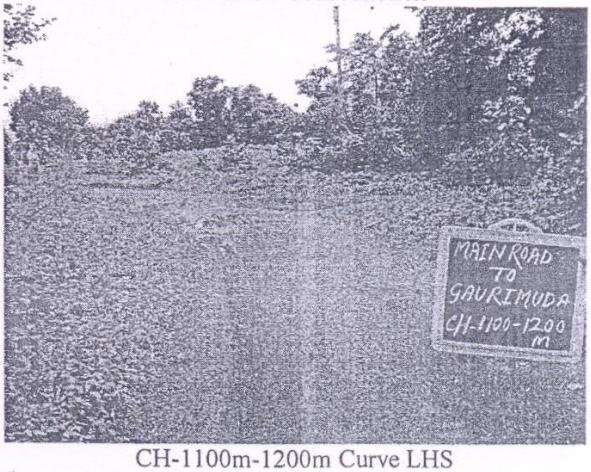


CH-200m-300m Existing CD



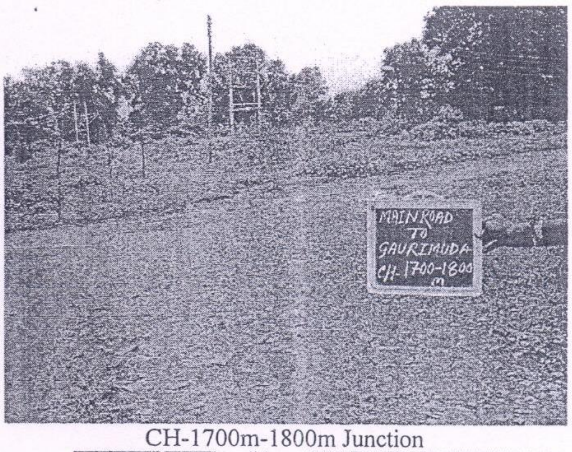
CH-300m-400m Junction

CH-500m-600m Existing CD

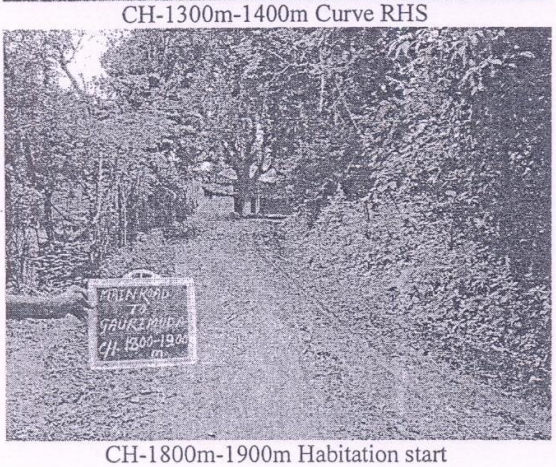


CH-1100m-1200m Curve LHS

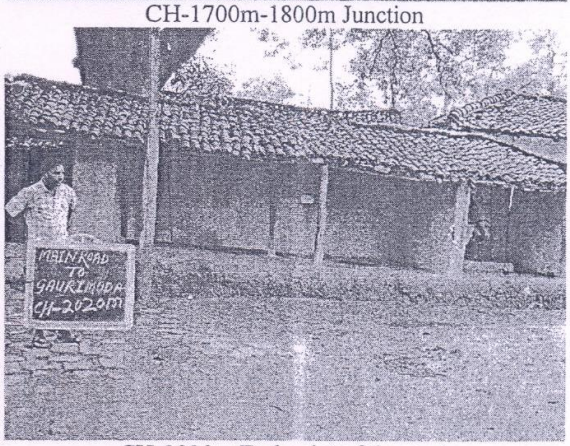
CH-1300m-1400m Curve RHS



CH-1700m-1800m Junction



CH-1800m-1900m Habitation start



CH-2020m End point of the road

Chainage wise Transect Walk Findings

Chainage (m)	Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestions
		LHS	RHS	LHS	RHS	LHS	RHS		
0-100	8	-	-	-	-	-	-	Kharripara	Ch-100m to Ch-500m CC road proposed, DP,ELC, 2EP(LHS),HP,EP,ELC(RHS)
100-200	8	-	-	-	-	-	-	Kharripara	Samudaik Bhavan(LHS), near cutting shoap
200-300	8	-	-	-	-	-	-	Kharripara	Existing CD,EP(RHS), Sub hospital
300-400	8	-	-	-	-	-	-	Kharripara	EP,ELC(RHS),Junction
400-500	8	-	-	-	-	-	-	Kharripara	Existing CD,EP(LHS), EP,ELC(RHS)
500-600	8	-	-	-	-	-	-	Kharripara	Existing 2 CD
600-700	8	-	-	-	-	-	-	Kharripara	AL
700-800	8	-	-	-	-	-	-	Kharripara	Existing CD,AL
800-900	8	-	-	-	-	-	-	Kharripara	AL
900-1000	8	-	-	-	-	-	-	Kharripara	Curve (lhs) & AL
1000-1100	8	-	-	-	-	-	-	Kharripara	2 EP,ELC(LHS), Curve(RHS)
1100-1200	8	-	-	-	-	-	-	Kharripara	AL
1200-1300	8	-	-	-	-	-	-	Kharripara	Curve(LHS & RHS)
1300-1400	8	-	-	-	-	-	-	Kharripara	Curve(LHS) & AL
1400-1500	8	-	-	-	-	-	-	Kharripara	AL
1500-1600	8	-	-	-	-	-	-	Kharripara	Curve(LHS) & AL
1600-1700	8	-	-	-	-	-	-	Kharripara	Curve(LHS) & AL
1700-1800	8	-	-	-	-	-	-	Kharripara	Proposed CD & Junction(LHS) Gram Panchayat, EP(LHS)
1800-1900	8	-	-	-	-	-	-	Ghduimuda	Pro. CC Road Ch-180m to Ch-2020m, EP, ELC(RHS)
1900-2000	8	-	-	-	-	-	-	Ghduimuda	EP,ELC(LHS), Rangmanch
2000-2020	8	-	-	-	-	-	-	Ghduimuda	Habitation area

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: NH 216 to Nawagarh

Block Name: Saraipali

District Name: Mahasamund

Total Length of the Road: 1.50 Km

D. Climatic Conditions

Temperature	High: **(May)** Low: **(Dec)**
Humidity	High: **(Aug)** Low: **(Dec)**
Rainfall Rainy Season	mm/year **June** to **September**

E. 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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-900m to Ch-1500m with connecting village Nawagarh.
6.	Agricultural Land	√		The project road has agriculture land at Ch-400m to CH-800m LHS, Ch-700m to CH-900m RHS.
7.	Grazing grounds	√		Grazing land starts at Ch-00m to Ch-200m of the proposed alignment.
8.	Barren Land		√	There is Barren no land found along the proposed road alignment.

F. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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***)	√		There was found pond at Ch-800m to CH-900m LHS
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***	√		There was found some water crossing structure along the alignment at Ch-300m to Ch-400m has proposed CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding. ( ) 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***)	√		There are 13 trees of dbh of 30 cm or more as attached in Attachment I
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder.
			√	( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[26] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[27] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment		√	
3.	If suggestions received, were they incorporated into the design?		√	

E. Please attach the following:

7) Sketch a map showing the bridge and the trees.
8) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
9) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
10) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
11) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
12) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[26] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[27] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Left	Right
300	-	400	-	1
700	-	800	-	1
800	-	900	3	4
900	-	1000	-	1
1000	-	1100	-	2
1100	-	1200	1	-
TOTAL			**4**	**9**

Attachment II
List of Utilities

Chainage			Left	Right
300	-	400	EP	-
600	-	700	EP	-
800	-	900	-	POND
900	-	1000	-	EP
1000	-	1100	EP	-
1200	-	1300	-	HP
1300	-	1400	-	EP

Attachment III
List of Community Structures

Chainage			Left	Right
100	-	200	-	Society
200	-	300	School	-
600	-	700	School, temple	-
1100	-	1200	temple	-
1300	-	1400	-	Temple, well

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	**-**	**-**	**-**	**-**	100	-	200	**-**	**-**	**-**	**-**	Society
School (25m)	**-**	**-**	**-**	**-**	200	-	300	**-**	**-**	**-**	**-**	-
-	**-**	EP	**-**	**-**	300	-	400	**-**	**-**	1 tree	**-**	**-**
2School (25m)	**-**	EP	**-**	**-**	600	**-**	700	**-**	**-**	-	**-**	**-**
-	-	-	-	**-**	700	-	800	**-**	-	1 tree	-	-
-	-	-	3 tree	**-**	800	-	900	**-**	2 tree	1 tree, POND	-	-
-	-	-	-	**-**	900	-	1000	**-**	1 tree, EP	-	-	-
-	-	EP	-	**-**	1000	-	1100	**-**	1 tree	1 tree	-	-
-	-	temple	1 tree	**-**	1100	-	1200	**-**	-	-	-	-
-	-	-	-	**-**	1200	-	1300	**-**	-	HP	-	-
-	-	-	EP	**-**	1300	-	1400	**-**	temple, well	-	-	-

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC, Electric Line crossing

Attachment V
Photo Plates

CH-00m Start point of the road

Ch-100m-200m Both side Grazing Land

CH-200m-300m School Navagarah on LHS

CH-300m-400m Proposed CD

CH-600m-700m Primary School Navagarah on LHS

CH-700m-800m Prerak Shala on LHS

CH-800m-900m Pond on RHS

CH-900m-1000m Start of Habitation

CH-1100m-1200m Temple on LHS

CH-1300m-1400m Well and Temple on RHS

CH-1400m Both side Habitation Village Navagarah

Ch-1500m End point of road

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	Nawagarh	-
100	-	200	8	-	-	-	-	-	-	-	-
200	-	300	8	-	-	-	-	-	-	-	School, Speed breaker and sign board proposed
300	-	400	8	-	-	-	-	-	-	-	CD proposed
400	-	500	8	-	-	-	-	-	-	-	-
500	-	600	8	-	-	-	-	-	-	-	-
600	-	700	8	-	-	-	-	-	-	-	School, Speed breaker and sign board proposed
700	-	800	8	-	-	-	-	-	-	-	-
800	-	900	5	-	-	-	-	-	-	-	Pond both side, protection work, speed breaker proposed
900	-	1000	5	-	-	-	-	-	-	-	Habitation area, CC road proposed
1000	-	1100	5	-	-	-	-	-	-	-	Habitation area, CC road proposed
1100	-	1200	5	-	-	-	-	-	-	-	CC road proposed
1200	-	1300	5	-	-	-	-	-	-	-	CC road proposed
1300	-	1400	5	-	-	-	-	-	-	-	CC road proposed
1400	-	1500	5	-	-	-	-	-	-	-	CC road proposed

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Kokbahal to Jirapali**

Block Name: **Baramkela**

District Name: **Raigarh**

Total Length of the Road: **3.75 Km**

G. Climatic Conditions

Temperature	High: **42 °C (May)** Low: **15 °C (Dec)**
Humidity	High: 4**0% (Aug)** Low: 2**0% (Dec)**
Rainfall Rainy Season	**1200** mm/year **June** to **September**

H. 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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-2400m to CH-2800m and Ch-3300m to Ch-3750m with connecting village Jamdalakha and Jirapali.
6.	Agricultural Land	√		The project road has agriculture land at Ch-00m to CH-2400m and Ch-2600m to CH-3300m at both side of the proposed alignment.
7.	Grazing grounds		√	There is no Grazing ground at proposed alignment.
8.	Barren Land		√	There is Barren no land found along the proposed road alignment.

I. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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***)	√		There is pond at Ch- 900m to CH-1000m RHS, Ch-2200m to Ch-2300m LHS, Ch-2400m to CH-2500m LHS of the proposed alignment.
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***	√		There are some water crossing structure between Ch- 200m to Ch-300m, CH-400m to CH-500m has proposed CD and Ch-1300m to CH-1400m, CH-2400m to CH-2500m and Ch-3100m to Ch-3200m has existing CDs.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage***)	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding. ( ) 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***)	√		There are 58 trees of dbh of 30 cm or more as attached in Attachment I
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder. ( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[28] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[29] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment	√		Not received suggestion related to the alignment, besides good quality of construction work and CC road.
3.	If suggestions received, were they incorporated into the design?	√		PIU will incorporate their suggestion and fulfill in their maximum ends.

E. Please attach the following:

13) Sketch a map showing the bridge and the trees.
14) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
15) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
16) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
17) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
18) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[28] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[29] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (m)			Left	Right
0	-	100	-	2
100	-	200	2	2
200	-	300	-	1
300	-	400	1	-
400	-	500	2	-
500	-	600	2	2
600	-	700	2	1
700	-	800	3	1
800	-	900	-	1
1000	-	1100	2	-
1100	-	1200	1	-
1300	-	1400	1	-
1400	-	1500	2	1
1500	-	1600	2	-
1600	-	1700	1	1
1700	-	1800	1	1
1800	-	1900	2	-
1900	-	2000	1	1
2000	-	2100	1	-
2100	-	2200	1	-
2400	-	2500	2	-
2600	-	2700	1	-
2700	-	2800	1	-
2900	-	3000	-	1
3100	-	3200	3	2
3200	-	3300	2	-
3300	-	3400	2	1
3600	-	3700	-	1
TOTAL			**38**	**19**

Attachment II
List of Utilities

Chainage (m)			Left	Right
900	-	1000	-	
2000	-	2100	-	
2200	-	2300	-	
2400	-	2500	-	
2500	-	2600	HP,EP	
3100	-	3200	-	
3200	-	3300	ELC	
3300	-	3400	-	
3400	-	3500	HP,EP	
3500	-	3600	-	
3600	-	3700	EP,ELC	
3700	-	3750	EP	

Attachment III
List of Community Structures

Chainage (m)			Left	Right
2300	-	2400	Temple	-
2400	-	2500	-	School
2800	-	2900	-	Atal chouk, temple
3000	-	3100	-	School, GP
3300	-	3400	Temple	Aganwadi, School
3500	-	3600	-	Temple

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	-	-	0	-	100	**-**	1 tree	-	**-**	1 tree
-	**-**	-	2 trees	-	100	-	200	**-**	-	2 trees	**-**	-
-	**-**	-	-	**-**	200	-	300	**-**	1 tree	-	**-**	-
-	**-**	-	1 tree	**-**	300	-	400	**-**	-	-	**-**	-
-	**-**	2 trees	-	**-**	400	-	500	**-**	-	-	**-**	-
-	2 trees	-	-	**-**	500	-	600	**-**	-	2 trees	**-**	**-**
-	**-**	2 trees	-	-	700	-	800	-	1 tree	-	**-**	**-**
-	**-**	3 trees	-	**-**	800	-	900	-	-	-	1 tree	**-**
-	**-**	-	-	**-**	900	-	1000	-	-	-	**-**	Pond
-	**-**	2 trees	-	**-**	1000	-	1100	**-**	-	1 tree	**-**	**-**
1 tree	-	-	-	**-**	1100	-	1200	**-**	-	-	-	-
1 tree	-	-	-	**-**	1300	-	1400	**-**	-	-	-	-
-	2 trees	-	-	**-**	1400	-	1500	**-**	-	-	-	-
-	2 trees	-	-	**-**	1500	-	1600	**-**	-	-	-	-
-	-	1 tree	-	-	1600	-	1700	**-**	1 tree	-	-	-
-	1 trees	-	-	**-**	1700	-	1800	**-**	-	-	-	-
2 trees	-	-	-	**-**	1800	-	1900	**-**	-	-	-	-
1 tree	-	-	-	**-**	1900	-	2000	**-**	-	1 trees	-	-
2 trees	-	-	-	**-**	2000	-	2100	**-**	-	-	-	HP
-	1 tree	-	-	**-**	2100	-	2200	**-**	-	-	-	-
-	-	-	Pond	**-**	2200	-	2300	EP shifts	-	-	-	-
-	-	-	Temple, pond ,EP	**-**	2300	-	2400	-	-	-	-	-
-	2 trees	-	-	**-**	2400	-	2500	**-**	School	EP,DP	-	-
-	1 tree	HP, EP	-	-	2600	-	2700	**-**	-	-	-	-
-	-	-	1 tree	-	2700	-	2800	**-**	-	-	-	-
-	-	-	-	-	2800	-	2900	**-**	-	Atal chouck	-	Temple
-	-	-	-	-	2900	-	3000	**-**	-	-	-	-
-	-	-	-	-	3000	-	3100	**-**	-	-	-	-
-	1 tree	-	2 trees	-	3100	-	3200	**-**	2 trees	-	-	-
-	-	-	2 trees	-	3200	-	3300	**-**	-	DP	-	-
-	-	-	2 trees, temple	-	3300	-	3400	**-**	1 tree, 2 EP, Aganwadi, School	-	-	School (20m)

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	HP,EP	-	3400	-	3500	**-**	-	-	-	-
-	-	-	-	-	3400	-	3600	**-**	2EP,HP, temple	-	-	-
-	**-**	-	EP	**-**	3600	-	3700	**-**	1 tree,EP	-	-	-
-	-	-	EP	**-**	3700	-	3750	**-**	-	-	-	-

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC, Electric Line crossing

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	-	Agriculture land
100	-	200	8	-	-	-	-	-	-	-	Agriculture land
200	-	300	8	-	-	-	-	-	-	-	Proposed CD LHS curve
300	-	400	8	-	-	-	-	-	-	-	Agriculture land
400	-	500	8	-	-	-	-	-	-	-	Proposed CD RHS curve
500	-	600	8	-	-	-	-	-	-	-	Agriculture land
600	-	700	8	-	-	-	-	-	-	-	LHS curve
700	-	800	8	-	-	-	-	-	-	-	Agriculture land
800	-	900	8	-	-	-	-	-	-	-	Agriculture land
900	-	1000	8	-	-	-	-	-	-	-	RHS pond
1000	-	1100	8	-	-	-	-	-	-	-	Agriculture land
1100	-	1200	8	-	-	-	-	-	-	-	Agriculture land
1200	-	1300	8	-	-	-	-	-	-	-	Agriculture land
1300	-	1400	8	-	-	-	-	-	-	-	Existing CD and LHS curve
1400	-	1500	8	-	-	-	-	-	-	-	Agriculture land
1500	-	1600	8	-	-	-	-	-	-	-	Agriculture land
1600	-	1700	8	-	-	-	-	-	-	-	LHS curve
1700	-	1800	8	-	-	-	-	-	-	-	Agriculture land
1800	-	1900	8	-	-	-	-	-	-	-	Agriculture land
1900	-	2000	8	-	-	-	-	-	-	-	LHS house
2000	-	2100	8	-	-	-	-	-	-	-	RHS HP
2100	-	2200	8	-	-	-	-	-	-	-	Agriculture land
2200	-	2300	8	-	-	-	-	-	-	-	Pond LHS and EP,ELC RHS
2300	-	2400	8	-	-	-	-	-	-	-	LHS temple
2400	-	2500	8	-	-	-	-	-	-	Jamdalkha	Pond, EP, ELC LHS, Existing CD, DP, 2EP, School, Junction RHS
2500	-	2600	8	-	-	-	-	-	-	-	Proposed CC road ch-2400m to Ch-2600m, HP,LHS EP
2600	-	2700	8	-	-	-	-	-	-	-	Agriculture land
2700	-	2800	8	-	-	-	-	-	-	-	Agriculture land
2800	-	2900	8	-	-	-	-	-	-	-	Junction, Atal chouck, Temple RHS
2900	-	3000	8	-	-	-	-	-	-	-	Agriculture land
3000	-	3100	8	-	-	-	-	-	-	-	Grampanchyat, School RHS
3100	-	3200	8	-	-	-	-	-	-	-	Existing CD
3200	-	3300	8	-	-	-	-	-	-	-	DP,ELC RHS
3300	-	3400	5	-	-	-	-	-	-	Jirapali	Proposed CC road, School, aganwadi, temple LHS
3400	-	3500	5	-	-	-	-	-	-	-	HP,EP LHS, EP RHS
3500	-	3600	5	-	-	-	-	-	-	-	2EP, HP,Temple RHS
3600	-	3700	5	-	-	-	-	-	-	-	EP,ELC
3700	-	3750	5	-	-	-	-	-	-	-	EP LHS

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: L050(Potiya) to Bhagdahi

Block Name: Dharamjaigarh

District Name: Raigarh

Total Length of the Road: 7.75 km

J. Climatic Conditions

Temperature	
Humidity	
Rainfall Rainy Season	

K. Location of the Road and Generic description of Environment

S. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*	√		There was found forest area between Ch-600m to Ch-6800m on the proposed alignment. Type of Vegetation: Legal Status of the Forest Area: (Reserved, National Park, Sanctuaries, Unclassified, etc.)
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		The project road is passing through village namely Bhagdahi between Ch-7200m to Ch-77500m.
6	Agricultural Land	√		Agriculture land lies on both side of agriculture between Ch-200m toCH-600m, Ch-6000m to CH-7200m
7.	Grazing grounds		√	The project road is not passing through grazing land.
8.	Barren Land		√	The project road is not passing through the barren land.

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)

S. 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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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***).	√		The pond has been found between Ch-5200m to Ch-5400m far away 10m along the proposed alignment
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)***	√		A few water crossing has been observed between Ch-600m to Ch-800m, Ch-2400m to Ch-2600m, Ch-2800m to Ch-3000m, Ch-3400m to Ch-3600m, Ch-3800m to Ch-4000m, Ch-4600 m to Ch-4800m, Ch-4800m to Ch-5000m, Ch-5400mto Ch-5600m CDs have been proposed on above mentioned locations.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There are some points of water stagnation and other drainage issues on or near the road which is discussed as above in S.No.3. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	Apart from above mentioned location no other area is flood prone along the alignment. (√) 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 of the center line of the road alignment? (***If yes attach list of trees indicating the location (right or left side)and the chainage***)	√		A total of 97 trees are falling within 10m of the center line of proposed alignment. The list of trees on giving in as Attachment I.
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 rare, endangered or threatened species have been found within 100 m of the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter.

9.	Are there any utility structures[30] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures found as listed in **Attachment II.**
10.	Are there any religious, cultural or community structures/buildings[31] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious cultural or community structures/buildings were found as listed in **Attachment III.**

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)***	√		Yes, consulting held with the community.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design.		√	NA

E. Please attach the following:

19) Sketch a map showing the bridge and the trees
20) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
21) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
22) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
23) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
24) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[30] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[31] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Left	Right
200	-	400	2	2
400	-	600	3	2
600	-	800	3	1
1000	-	1200	2	-
1200	-	1400	2	2
1400	-	1600	-	4
1600	-	1800	2	2
1800	-	2000	1	1
2000	-	2200	2	4
2200	-	2400	3	4
2400	-	2600	4	3
2600	-	2800	3	2
2800	-	3000	2	2
3000	-	3200	2	4
3200	-	3400	2	2
3400	-	3600	2	1
3600	-	3800	1	1
3800	-	4000	1	-
4000	-	4200	1	1
4200	-	4400	2	2
4800	-	5000	1	1
5000	-	5200	-	3
5200	-	5400	1	-
5800	-	6000	2	2
6000	-	6200	-	2
6200	-	6400	1	1
6800	-	7000	1	-
7000	-	7200	-	1
7400	-	7600	1	-
Total			**47**	**50**

Attachment II
List of Utilities

Chainage			Left	Right
0	-	200	2 EP, Water tank	-
800	-	1000	-	EP, ELC
1000	-	1200	EP, ELC	2 EP
1200	-	1400	EP, ELC	EP, ELC
1400	-	1600	EP, ELC	-
1600	-	1800	-	2 EP
4000	-	4200	EP	-
4200	-	4400	2 EP	-
4400	-	4600	EP, ELC	EP
4600	-	4800	EP, ELC	-
4800	-	5000	-	EP
5000	-	5200	EP, ELC	-
5200	-	5400	-	EP, Pond
7200	-	7400	-	EP, HP

Attachment III
List of Community Structures

Chainage			Left	Right
7200	-	7400	-	School

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	2 EP, Water tank	-	0	-	200	-	-	-	-	-
2 trees	-	-	-	-	200	-	400	-	-	2 trees	-	-
-	-	3 trees	-	-	400	-	600	-	-	-	2 trees	-
-	-	3 trees	-	-	600	-	800	-	-	1 tree	-	-
-	-	-	-	-	800	-	1000	-	-	-	EP	-
2 trees	-	EP	-	-	1000	-	1200	-	-	-	2 EP	-
-	-	EP, 2 trees	-	-	1200	-	1400	-	-	EP, 2 trees	-	-
-	-	EP	-	-	1400	-	1600	-	-	4 trees	-	-
-	-	2 trees	-	-	1600	-	1800	-	-	2 EP, 2 trees	-	-
-	-	1 tree	-	-	1800	-	2000	-	-	1 tree	-	-
-	-	-	2 tree	-	2000	-	2200	-	-	4 trees	-	-
-	-	3 trees	-	-	2200	-	2400	-	-	4 trees	-	-
-	-	4 trees	-	-	2400	-	2600	-	-	3 trees	-	-
-	-	3 trees	-	-	2600	-	2800	-	-	2 trees	-	-
-	-	2 trees	-	-	2800	-	3000	-	-	2 trees	-	-
-	-	2 trees	-	-	3000	-	3200	-	-	4 trees	-	-
-	-	2 trees	-	-	3200	-	3400	-	-	2 trees	-	-
-	-	2 trees	-	-	3400	-	3600	-	-	1 tree	-	-
-	-	1 tree	-	-	3600	-	3800	-	-	1 tree	-	-
-	-	1 tree	-	-	3800	-	4000	-	-	-	-	-
-	-	EP	1 tree	-	4000	-	4200	-	1 tree	-	-	-
-	-	2 EP, 2 trees	-	-	4200	-	4400	-	-	2 trees	-	-
-	-	EP	-	-	4400	-	4600	-	-	EP	-	-
-	-	-	EP	-	4600	-	4800	-	-	-	-	-
-	-	1 tree	-	-	4800	-	5000	-	-	EP, 1 tree	-	-
-	-	2 EP	-	-	5000	-	5200	-	-	3 tree	-	-
-	-	-	1 tree	-	5200	-	5400	-	EP	-	-	Pond
-	-	2 trees	-	-	5800	-	6000	-	-	2 tree	-	-
-	-	-	-	-	6000	-	6200	2 trees	-	-	-	-
-	-	-	1 tree	-	6200	-	6400	-	1 tree	-	-	-
-	-	-	1 tree	-	6800	-	7000	-	-	-	-	-
-	-	-	-	-	7000	-	7200	-	1 tree	-	-	-
-	-	-	-	-	7200	-	7400	-	HP, School	EP	-	-
-	-	-	1 tree	-	7400	-	7600	-	-	-	-	-

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	200	8	-	-	-	-	-	-	-	2 EP, Atal Chouck, water tank
200	-	400	8	-	-	-	-	-	-	-	-
400	-	600	8	-	-	-	-	-	-	-	Curve-LHS
600	-	800	8	-	-	-	-	-	-	-	CD proposed, Curve-RHS
800	-	1000	8	-	-	-	-	-	-	-	EP-RHS
1000	-	1200	8	-	-	-	-	-	-	-	EP-LHS, 2 EP, Curve-S type
1200	-	1400	8	-	-	-	-	-	-	-	EP-LHS and RHS
1400	-	1600	8	-	-	-	-	-	-	-	EP, Curve
1600	-	1800	8	-	-	-	-	-	-	-	2 EP
1800	-	2000	8	-	-	-	-	-	-	-	Junction-LHS
2000	-	2200	8	-	-	-	-	-	-	-	Curve-LHS
2200	-	2400	8	-	-	-	-	-	-	-	Forest
2400	-	2600	8	-	-	-	-	-	-	-	CC road proposed, CD proposed
2600	-	2800	8	-	-	-	-	-	-	-	Forest
2800	-	3000	8	-	-	-	-	-	-	-	CD proposed
3000	-	3200	8	-	-	-	-	-	-	-	Forest
3200	-	3400	8	-	-	-	-	-	-	-	Forest
3400	-	3600	8	-	-	-	-	-	-	-	CD Proposed
3600	-	3800	8	-	-	-	-	-	-	-	Forest
3800	-	4000	8	-	-	-	-	-	-	-	CD proposed
4000	-	4200	8	-	-	-	-	-	-	-	EP-LHS
4200	-	4400	8	-	-	-	-	-	-	-	2 EP-LHS, Curve-RHS
4400	-	4600	8	-	-	-	-	-	-	-	EP LHS and RHS
4600	-	4800	8	-	-	-	-	-	-	-	CD proposed, EP
4800	-	5000	8	-	-	-	-	-	-	-	CD proposed, EP
5000	-	5200	8	-	-	-	-	-	-	-	2 EP
5200	-	5400	8	-	-	-	-	-	-	-	EP, Pond, Curve-RHS
5400	-	5600	8	-	-	-	-	-	-	-	CD proposed, Curve-LHS
5600	-	5800	8	-	-	-	-	-	-	-	Curve-LHS
5800	-	6000	8	-	-	-	-	-	-	-	Forest
6000	-	6200	8	-	-	-	-	-	-	-	-
6200	-	6400	8	-	-	-	-	-	-	-	Forest
6400	-	6600	8	-	-	-	-	-	-	-	Forest
6600	-	6800	8	-	-	-	-	-	-	-	Forest
6800	-	7000	8	-	-	-	-	-	-	-	-
7000	-	7200	8	-	-	-	-	-	-	-	-
7200	-	7400	5	-	-	-	-	-	-	-	CC road proposed, 3 EP, HP School
7400	-	7600	5	-	-	-	-	-	-	-	Habitation area
7600	-	7750	5	-	-	-	-	-	-	-	Habitation area

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Amapali Bojiya road to Lamikhar

Block Name: Dharamjaigarh

District Name: Raigarh

Total Length of the Road: 6.00 km

L. Climatic Conditions

Temperature	
Humidity	
Rainfall Rainy Season	

M. Location of the Road and Generic description of Environment

S. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*	√		There was found forest area between Ch-00m to Ch-4600m on the proposed alignment. Type of Vegetation: Legal Status of the Forest Area: (Reserved, National Park, Sanctuaries, Unclassified, etc.)
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		The project road is passing through village namely lamikhar between Ch-5600m to Ch-6000m.
6	Agricultural Land	√		Agriculture land lies on both side of agriculture between Ch-4600m to CH-5600m.
7.	Grazing grounds		√	The project road is not passing through grazing land.
8.	Barren Land		√	The project road is not passing through the barren land.

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)

S. 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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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***).		√	The pond has been not found on the proposed alignment
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)***	√		A few water crossing has been observed between Ch-00m to Ch-200m, Ch-200m to Ch-400m, Ch-4200m to Ch-4400m, Ch-5400m to Ch-5600m CDs have been proposed on above mentioned locations and between Ch-5600m to Ch-5800m has existing CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There are some points of water stagnation and other drainage issues on or near the road which is discussed as above in S.No.3. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	Apart from above mentioned location no other area is flood prone along the alignment. (√) 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 of the center line of the road alignment? (***If yes attach list of trees indicating the location (right or left side)and the chainage***)	√		A total of 75 trees are falling within 10m of the center line of proposed alignment. The list of trees on giving in as Attachment I.
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 rare, endangered or threatened species have been found within 100 m of the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter.

9.	Are there any utility structures[32] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures found as listed in **Attachment II.**
10.	Are there any religious, cultural or community structures/buildings[33] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious cultural or community structures/buildings were found as listed in **Attachment III.**

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)***	√		Yes, consulting held with the community.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design.		√	NA

E. Please attach the following:

25) Sketch a map showing the bridge and the trees
26) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
27) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
28) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
29) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
30) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[32] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[33] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Left	Right
0	-	200	-	3
200	-	400	1	1
400	-	600	-	1
600	-	800	-	3
800	-	1000	1	5
1000	-	1200	1	2
1200	-	1400	2	2
1400	-	1600	3	1
1600	-	1800	-	1
1800	-	2000	2	-
2000	-	2200	1	-
2200	-	2400	1	2
2600	-	2800	-	2
2800	-	3000	-	1
3000	-	3200	1	2
3200	-	3400	1	1
3400	-	3600	1	2
3600	-	3800	1	2
3800	-	4000	2	2
4000	-	4200	2	-
4400	-	4600	-	1
4600	-	4800	-	1
4800	-	5000	-	1
5000	-	5200	1	2
5200	-	5400	2	4
5400	-	5600	4	1
5600	-	5800	-	5
Total			**27**	**48**

Attachment II
List of Utilities

Chainage			Left	Right
4800	-	5000	-	ELC-Height increase
5800	-	6000	EP, ELC	2 EP, HP

Attachment III
List of Community Structures

Chainage			Left	Right
5800	-	6000	-	Temple

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	-	-	0	-	200	**-**	-	-	**-**	3 trees
-	1 tree	-	-	-	200	-	400	**-**	-	-	**-**	1 tree
-	**-**	-	-	**-**	400	-	600	**-**	-	1 tree	**-**	-
-	**-**	-	-	**-**	600	-	800	**-**	-	2 tree	**-**	1 tree
1 tree	**-**	-	-	**-**	800	-	1000	**-**	-	2 trees	**-**	3 trees
1 tree	**-**	-	-	**-**	1000	-	1200	**-**	-	-	**2 trees**	**-**
2 trees	**-**	-	-	**-**	1200	-	1400	**-**	-	-	-	**2 trees**
-	**-**	3 trees	-	-	1400	-	1600	-	-	1 tree	**-**	**-**
-	**-**	-	-	**-**	1600	-	1800	-	-	1 tree	**-**	**-**
-	**-**	2 trees	-	**-**	1800	-	2000	**-**	-	-	**-**	**-**
-	-	1 tree	-	**-**	2000	-	2200	**-**	-	-	-	-
-	-	1 tree	-	**-**	2200	-	2400	**-**	-	-	-	2 tree
-	-	-	-	**-**	2600	-	2800	**-**	-	2 trees	-	-
-	-	-	-	**-**	2800	-	3000	**-**	-	1 tree	-	-
1 tree	-	-	-	-	3000	-	3200	**-**	-	1 tree	-	1 tree
-	-	1 tree	-	**-**	3200	-	3400	**-**	-	-	-	1 tree
-	1 tree	-	-	**-**	3400	-	3600	**-**	-	2 tree	-	-
-	1 tree	-	-	**-**	3600	-	3800	**-**	-	2 tree	-	-
-	-	2 trees	-	**-**	3800	-	4000	**-**	-	2 tree	-	-
-	-	2 trees	-	**-**	4000	-	4200	**-**	-	-	-	-
-	-	-	-	**-**	4400	-	4600	**-**	-	1 tree	-	-
-	-	-	-	-	4600	-	4800	**-**	-	1 tree	-	-
-	-	-	-	-	4800	-	5000	**-**	-	1 tree	-	-
-	-	1 tree	-	-	5000	-	5200	2 tree	-	-	-	-
-	-	2 tree	-	-	5200	-	5400	**-**	-	4 tree	-	-
1 tree	-	-	3 tree	-	5400	-	5600	1 tree	-	-	-	-
-	-	-	-	-	5600	-	5800	1 tree	4 tree	-	-	-
-	-	-	EP	-	5800	-	6000	**-**	Temple	-	-	-

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	200	8	-	-	-	-	-	-	-	CD proposed, Forest start
200	-	400	8	-	-	-	-	-	-	-	CD proposed, Curve-LHS
400	-	600	8	-	-	-	-	-	-	-	-
600	-	800	8	-	-	-	-	-	-	-	Y-Junction
800	-	1000	8	-	-	-	-	-	-	-	Forest
1000	-	1200	8	-	-	-	-	-	-	-	Forest
1200	-	1400	8	-	-	-	-	-	-	-	Forest
1400	-	1600	8	-	-	-	-	-	-	-	Curve-LHS
1600	-	1800	8	-	-	-	-	-	-	-	Junction-RHS
1800	-	2000	8	-	-	-	-	-	-	-	Forest
2000	-	2200	8	-	-	-	-	-	-	-	Forest
2200	-	2400	8	-	-	-	-	-	-	-	Forest
2400	-	2600	8	-	-	-	-	-	-	-	Curve-RHS
2600	-	2800	8	-	-	-	-	-	-	-	Forest
2800	-	3000	8	-	-	-	-	-	-	-	Forest
3000	-	3200	8	-	-	-	-	-	-	-	Forest
3200	-	3400	8	-	-	-	-	-	-	-	Forest
3400	-	3600	8	-	-	-	-	-	-	-	Forest
3600	-	3800	8	-	-	-	-	-	-	-	Forest
3800	-	4000	8	-	-	-	-	-	-	-	Forest
4000	-	4200	8	-	-	-	-	-	-	-	Forest
4200	-	4400	8	-	-	-	-	-	-	-	Existing CD, junction-RHS
4400	-	4600	8	-	-	-	-	-	-	-	Forest
4600	-	4800	8	-	-	-	-	-	-	-	-
4800	-	5000	8	-	-	-	-	-	-	-	ELC
5000	-	5200	8	-	-	-	-	-	-	-	Junction-RHS, 02 tree loss
5200	-	5400	8	-	-	-	-	-	-	-	-

5400	-	5600	8	-	-	-	-	-	-	-	2 Existing CDs
5600	-	5800	8	-	-	-	-	-	-	-	Existing CD
5800	-	6000	8	-	-	-	-	-	-	-	Curve, EP, Temple, HP

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Kesla to Sarasmal

Block Name: Lailunga

District Name: Raigarh

Total Length of the Road: 1.00 km

N. Climatic Conditions

Temperature	
Humidity	
Rainfall Rainy Season	

O. Location of the Road and Generic description of Environment

S. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*	√		There was found forest area between Ch-00m to Ch-100m on the proposed alignment. Type of Vegetation: Legal Status of the Forest Area: (Reserved, National Park, Sanctuaries, Unclassified, etc.)
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		The project road is passing through village namely Sarasmal between Ch-600m to Ch-1000m.
6	Agricultural Land	√		Agriculture land lies on both side of agriculture between Ch-100m to Ch-600m.
7.	Grazing grounds		√	The project road is not passing through grazing land.
8.	Barren Land		√	The project road is not passing through the barren land.

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)

S. 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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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***).		√	The pond has been not found the proposed alignment
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)***	√		A few water crossing has been observed between Ch-200m to Ch-300m proposed CD on above mentioned locations and Ch-100m to Ch-200m have been existing CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There are some points of water stagnation and other drainage issues on or near the road which is discussed as above in S.No.3. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	Apart from above mentioned location no other area is flood prone along the alignment. (√) 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 of the center line of the road alignment? (***If yes attach list of trees indicating the location (right or left side)and the chainage***)	√		A total of 09 trees are falling within 10m of the center line of proposed alignment. The list of trees on giving in as Attachment I.
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 rare, endangered or threatened species have been found within 100 m of the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter.

9.	Are there any utility structures[34] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures found as listed in **Attachment II.**
10.	Are there any religious, cultural or community structures/buildings[35] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious cultural or community structures/buildings were found as listed in **Attachment III.**

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)***	√		Yes, consulting held with the community.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design.		√	NA

E. Please attach the following:

31) Sketch a map showing the bridge and the trees
32) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
33) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
34) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
35) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
36) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[34] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[35] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (m)			Left	Right
0	-	100	4	2
100	-	200	-	1
200	-	300	-	1
600	-	700	1	-
Total			**5**	**4**

Attachment II
List of Utilities

Chainage (m)			Left	Right
300	-	400	EP, HP	-
400	-	500	3 EP	-
600	-	700	EP	EP
700	-	800	HP	2 EP
800	-	900	HP	2 EP
900	-	1000	-	2 EP

Attachment III
List of Community Structures

Chainage (m)			Left	Right
500	-	600	Agan wadi	-
600	-	700	-	Manch
700	-	800	School	-
900	-	1000	School	-
-	-	-	-	-

Attachment IV

Left					Chainage (m)			Right				
8 to 10m	6 to 8m	4 to 6m	2 to 4m	0 to 2m				0 to 2m	2 to 4m	4 to 6m	6 to 8m	8 to 10m
-	-	4 trees	-	-	0	-	100	-	1 tree	-	-	1 tree
-	-	-	-	-	100	-	200	-	1 tree	-	-	-
-	-	-	-	-	200	-	300	-	1 tree	-	-	-
-	-	EP, HP	-	-	300	-	400	-	-	-	-	-
-	-	-	3 EP	-	400	-	500	-	-	-	-	-
-	-	1 tree	3 EP	-	600	-	700	-	EP	-	-	-
-	-	-	HP	-	700	-	800	-	2 EP	-	-	-
-	-	-	HP	-	800	-	900	-	2 EP	-	-	-
-	-	-	-	-	900	-	1000	-	2 EP	-	-	-

Chainage wise Transect Walk Findings

Chainage (M)			Existing Land Width (m)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestion
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	-	-
100	-	200	8	-	-	-	-	-	-	-	Existing CD
200	-	300	8	-	-	-	-	-	-	-	CD proposed, Curve-LHS
300	-	400	8	-	-	-	-	-	-	-	EP, HP
400	-	500	8	-	-	-	-	-	-	-	3 EP
500	-	600	8	-	-	-	-	-	-	-	Agan wadi
600	-	700	5	-	-	-	-	-	-	-	CC road proposed, EP, Curve, Junction, Manch
700	-	800	5	-	-	-	-	-	-	-	School, HP, 2EP
800	-	900	5	-	-	-	-	-	-	-	HP-LHS, 2EP
900	-	1000	5	-	-	-	-	-	-	-	School-LHS, 2 EP

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Tatkela to Kolardih

Block Name: Lailunga

District Name: Raigarh

Total Length of the Road: 5.00km

P. Climatic Conditions

Temperature	
Humidity	
Rainfall Rainy Season	

Q. Location of the Road and Generic description of Environment

S. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*	√		There was located forest area between Ch-00m to 1000, Ch-1200m to Ch-1500m, Ch-2600m to Ch-3200 on the proposed alignment. Type of Vegetation: Legal Status of the Forest Area: (Reserved, National Park, Sanctuaries, Unclassified, etc.)
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: NA Endangered species (if any): None
5.	Inhabited Area	√		The project road is passing through village namely poteberni, bardihl ,kolardih between Ch-1000m to Ch-1200m,Ch-2200m to Ch-2300m, Ch-3200m to Ch- 4200m respectively.
6	Agricultural Land	√		Agriculture land lies on both side of agriculture between Ch-1500m to Ch-22000m, Ch-2300m to Ch-2600m, Ch-4200 to Ch- 5000m
7.	Grazing grounds		√	The project road is not passing through grazing land.
8.	Barren Land		√	The project road is not passing through the barren land.

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)

S. 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 part of the project road lies in hilly terrain prone to landslide or erosion. ( ) 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***).		√	The pond has been not found on the proposed alignment
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)***	√		A few water crossing has been observed between Ch-1900m to Ch-2000m CDs has been proposed on above mentioned locations and Ch-1300m to Ch-1400m, Ch-1500m to Ch-1600m, Ch-1600m to Ch-1700m have been existing CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There are some points of water stagnation and other drainage issues on or near the road which is discussed as above in S.No.3. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	Apart from above mentioned location no other area is flood prone along the alignment. (√) 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 of the center line of the road alignment? (***If yes attach list of trees indicating the location (right or left side)and the chainage***)	√		A total of 90 trees are falling within 10m of the center line of proposed alignment. The list of trees on giving in as Attachment I.
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 rare, endangered or threatened species have been found within 100 m of the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter.

9.	Are there any utility structures[36] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are few utility structures found as listed in **Attachment II.**
10.	Are there any religious, cultural or community structures/buildings[37] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious cultural or community structures/buildings were found as listed in **Attachment III.**

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)***	√		Yes, consulting held with the community.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design.		√	NA

E. Please attach the following:

37) Sketch a map showing the bridge and the trees
38) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
39) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
40) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
41) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
42) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

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

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

Attachment I
List of Trees

Chainage			Left	Right
0	-	100	2	-
100	-	200	1	1
200	-	300	2	1
300	-	400	1	2
400	-	500	1	2
500	-	600	1	4
600	-	700	2	2
700	-	800	2	3
800	-	900	1	-
900	-	1000	-	1
1000	-	1100	3	-
1200	-	1300	6	-
1300	-	1400	1	-
1400	-	1500	2	1
1500	-	1600	3	-
1600	-	1700	-	1
1700	-	1800	1	2
1800	-	1900	2	-
2000	-	2100	1	-
2100	-	2200	-	1
2200	-	2300	6	-
2400	-	2500	-	4
2500	-	2600	-	1
2600	-	2700	3	3
2700	-	2800	-	1
2800	-	2900	-	1
2900	-	3000	1	-
3000	-	3100	-	1
3100	-	3200	-	3
3500	-	3600	1	-
3600	-	3700	1	-
3800	-	3900	1	-
4200	-	4300	-	1
4300	-	4400	1	1
4400	-	4500	-	1
4500	-	4600	1	-
4600	-	4700	-	1
4700	-	4800	-	1
4800	-	4900	1	-
4900	-	5000	1	1
Total			49	41

Attachment II
List of Utilities

Chainage			Left	Right
1000	-	1100	-	3EP,HP
1100	-	1200	HP,EP	2EP
1200	-	1300	EP	-
2200	-	2300	EP	EP
3200	-	3300	2EP	HP
3400	-	3500	EP,HP	-
3500	-	3600	EP,	2EP
3600	-	3700	-	EP,DP
3700	-	3800	HP,EP	EP
3800	-	3900	EP,HP	EP
3900	-	4000	-	EP
4000	-	4100	EP	-

Attachment III

List of Community Structures

Chainage			Left	Right
0	-	100	Waiting room	-
1000	-	1100	-	Munch
3300	-	3400	Govt. Shop	-

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	6 to 8m	4 to 6m	2 to 4m	0 to 2m				0 to 2m	2 to 4m	4 to 6m	6 to 8m	8 to 10m
-	-	-	2 Tree, Waiting room	-	0	-	100	-	-	-	-	-
-	-	-	1 Tree	-	100	-	200	-	1 Tree	-	-	-
-	-	-	2 Tree	-	200	-	300	-	1 Tree	-	-	-
-	-	-	1 Tree	-	300	-	400	-	2 Tree	-	-	-
-	-	-	1 Tree	-	400	-	500	-	-	2 Tree	-	-
-	-	-	1 Tree	-	500	-	600	-	-	4Tree	-	-
-	-	-	2 Tree	-	600	-	700	-	-	2 Tree	-	-
-	-	-	2 Tree	-	700	-	800	-	3 Trees	-	-	-
-	-	-	1 Tree	-	800	-	900	-	-	-	-	-
-	-	-	-	-	900	-	1000	-	1 Tree	-	-	-
-	-	3 Trees	-	-	1000	-	1100	-	3EP, Manch, HP	-	-	-
3Tree	-	3 Trees	HP,EP	-	1100	-	1200	-	2 EP	-	-	-
-	-	-	EP	-	1200	-	1300	-	-	-	-	-
-	-	-	1 Tree	-	1300	-	1400	-	-	-	-	-
-	-	-	2 Tree	-	1400	-	1500	-	1 Tree	-	-	-
-	-	3 Trees	-	-	1500	-	1600	-	-	-	-	-
-	-	-	-	-	1600	-	1700	-	1 Tree	-	-	-
-	-	-	1 Tree	-	1700	-	1800	-	2 Tree	-	-	-
-	-	-	2 Tree	-	1800	-	1900	-	-	-	-	-
-	-	-	1 Tree	-	2000	-	2100	-	-	-	-	-
-	-	-	-	1 Tree	2100	-	2200	-	-	-	-	-
-	-	-	6 Trees, EP	-	2200	-	2300	-	EP	-	-	-
-	-	-	-	-	2400	-	2500	-	4Tree	-	-	-
-	-	-	-	-	2500	-	2600	-	1 Tree	-	-	-
-	-	3 Trees	-	-	2600	-	2700	-	3 Trees	-	-	-
-	-	-	-	-	2700	-	2800	-	1 Tree	-	-	-
-	-	-	-	-	2800	-	2900	-	1 Tree	-	-	-
-	-	-	1 Tree	-	2900	-	3000	-	-	-	-	-
-	-	-		-	3000	-	3100	-	1 Tree	-	-	-
-	-	-	-	-	3100	-	3200	-	3 Trees	-	-	-
-	-	-	2 EP	-	3200	-	3300	-	HP	-	-	-
-	-	-	-	-	3300	-	3400	-	Shop	-	-	-
-	-	HP	EP	-	3400	-	3500	-	-	-	-	-

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	1 Tree	-	3500	-	3600	**-**	2 EP	-	-	-
-	-	-	1 Tree	-	3600	-	3700	**-**	EP, DP	-	-	-
Hp	-	-	EP	-	3700	-	3800	**-**	EP	-	-	-
-	-	-	1 Tree, EP, DP	-	3800	-	3900	-	EP	-	-	-
-	-	-	-	-	3900	-	4000	-	EP	-	-	-
-	-	-	EP	-	4000	-	4100	-	-	-	-	-
-	-	-	-	-	4200	-	4300	**-**	-	1 Tree	-	-
-	-	1 Tree	-	-	4300	-	4400	**-**	1 Tree	-	-	-
-	-	-	-	-	4400	-	4500	**-**	1 Tree	-	-	-
-	-	-	1 Tree	-	4500	-	4600	**-**	-	-	-	-
-	-	-	-	-	4600	-	4700	**-**	1 Tree	-	-	-
-	**-**	-	-	**-**	4700	-	4800	**-**	-	1 Tree	-	-
-	-	1 Tree	-	**-**	4800	-	4900	**-**	-	-	-	-
-	**-**	1 Tree	-	**-**	4900	-	5000	**-**	-	1 Tree	**-**	**-**

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	-	Waiting room
100	-	200	8	-	-	-	-	-	-	-	-
200	-	300	8	-	-	-	-	-	-	-	Curve-LHS
300	-	400	8	-	-	-	-	-	-	-	-
400	-	500	8	-	-	-	-	-	-	-	-
500	-	600	8	-	-	-	-	-	-	-	-
600	-	700	8	-	-	-	-	-	-	-	-
700	-	800	8	-	-	-	-	-	-	-	-
800	-	900	8	-	-	-	-	-	-	-	-
900	-	1000	8	-	-	-	-	-	-	-	-
1000	-	1100	5	-	-	-	-	-	-	Potebarni	CC road proposed, EP, HP, Munch
1100	-	1200	5	-	-	-	-	-	-	-	HP, 2 EP
1200	-	1300	8	-	-	-	-	-	-	-	School, Agan wadi, EP
1300	-	1400	8	-	-	-	-	-	-	-	Existing CD , Junction RHS
1400	-	1500	8	-	-	-	-	-	-	-	-
1500	-	1600	8	-	-	-	-	-	-	-	Existing CD, Junction LHS
1600	-	1700	8	-	-	-	-	-	-	-	Existing CD
1700	-	1800	8	-	-	-	-	-	-	-	-
1800	-	1900	8	-	-	-	-	-	-	-	-
1900	-	2000	8	-	-	-	-	-	-	-	CD Proposed
2000	-	2100	8	-	-	-	-	-	-	-	Curve-LHS
2100	-	2200	8	-	-	-	-	-	-	-	-
2200	-	2300	5	-	-	-	-	-	-	Bardih	CC road proposed, EP both side
2300	-	2400	8	-	-	-	-	-	-	-	Curve-RHS
2400	-	2500	8	-	-	-	-	-	-	-	-
2500	-	2600	8	-	-	-	-	-	-	-	Curve-RHS
2600	-	2700	8	-	-	-	-	-	-	-	T Point junction LHS
2700	-	2800	8	-	-	-	-	-	-	-	-
2800	-	2900	8	-	-	-	-	-	-	-	-
2900	-	3000	8	-	-	-	-	-	-	-	Curve-RHS
3000	-	3100	8	-	-	-	-	-	-	-	-
3100	-	3200	8	-	-	-	-	-	-	-	-
3200	-	3300	5	-	-	-	-	-	-	-	CC road proposed, EP, HP
3300	-	3400	5	-	-	-	-	-	-	Koilardih	Shop
3400	-	3500	5	-	-	-	-	-	-	-	Junction, EP, HP
3500	-	3600	5	-	-	-	-	-	-	-	EP
3600	-	3700	5	-	-	-	-	-	-	-	EP,DP
3700	-	3800	5	-	-	-	-	-	-	-	School. Aganwadi, EP, HP
3800	-	3900	5	-	-	-	-	-	-	-	HP, EP
3900	-	4000	5	-	-	-	-	-	-	-	EP
4000	-	4100	5	-	-	-	-	-	-	-	EP
4100	-	4200	5	-	-	-	-	-	-	-	-
4200	-	4300	8	-	-	-	-	-	-	-	-
4300	-	4400	8	-	-	-	-	-	-	-	-
4400	-	4500	8	-	-	-	-	-	-	-	-
4500	-	4600	8	-	-	-	-	-	-	-	-
4600	-	4700	8	-	-	-	-	-	-	-	-
4700	-	4800	8	-	-	-	-	-	-	-	-
4800	-	4900	8	-	-	-	-	-	-	-	-
4900	-	5000	8	-	-	-	-	-	-	-	-

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Kutela to Mohmela**

Block Name: **Arang**

District Name: **Raipur**

Total Length of the Road: **1.66 Km**

R. Climatic Conditions

Temperature	High: **42 °C (May)** Low: **15 °C (Dec)**
Humidity	High: 4**0% (Aug)** Low: 2**0% (Dec)**
Rainfall Rainy Season	**1200** mm/year **June** to **September**

S. 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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-00m to Ch-100m and Ch-600m to Ch-1300m with connecting village Kutela and Mohmela.
6.	Agricultural Land	√		The project road has agriculture land at Ch-100m to CH-600m and Ch-1300m to Ch-1660m.
7.	Grazing grounds		√	There is no Grazing ground at proposed alignment.
8.	Barren Land		√	There is Barren no land found along the proposed road alignment.

T. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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)***	√		There is pond at Ch-900m to Ch-1000m LHS which is far away 10m from the proposed alignment.
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***	√		There is water crossing points at Ch-300m to Ch-400m has FC Proposed and Ch-500m to CH-600m, Ch-1300m to Ch-1400m has existing CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding. ( ) 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***)	√		There are 12 trees of dbh of 30 cm or more as attached in Attachment I
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder. ( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[38] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[39] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment	√		Community has suggested that speed breaker near the school and sign board and CC road in the habitation area which comes at Ch-400m to CH-1000m.
3.	If suggestions received, were they incorporated into the design?	√		

E. Please attach the following:

43) Sketch a map showing the bridge and the trees.
44) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
45) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
46) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
47) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
48) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[38] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[39] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Left	Right
0	-	100	1	-
300	-	400	1	-
400	-	500	1	-
500	-	600	-	3
600	-	700	2	1
900	-	1000	1	-
1000	-	1100	-	1
1100	-	1200	1	-
Total			**7**	**5**

Attachment II
List of Utilities

Chainage			Left	Right
0	-	100	EP	2EP
100	-	200	-	-
200	-	300	DP	-
300	-	400	EP	-
400	-	500	EP	-
500	-	600	2EP	2EP
600	-	700	-	-
700	-	800	-	3EP
800	-	900	-	EP
900	-	1000	Pond	2EP
1000	-	1100	-	EP,HP
1100	-	1200	EP	-
1200	-	1300	EP	EP
1300	-	1400	-	-
1400	-	1500	2EP	EP
1500	-	1600	EP	-

Attachment III
List of Community Structures

Chainage			Left	Right
0	-	100	Temple	-
500	-	600	School	-
600	-	700	Temple	-
700	-	800	-	Temple
1400	-	1500	Temple	-

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
EP	-	1Tree,Temple	-	-	0	-	100	**-**	-	2EP	**-**	-
-	**-**	-	-	-	100	-	200	**-**	-	-	**-**	-
-	**-**	DP	-	**-**	200	-	300	**-**	-	-	**-**	-
DP	**-**	1 Tree	-	**-**	300	-	400	**-**	-	-	**-**	-
1 Tree	**-**	EP	-	**-**	400	-	500	**-**	-	-	**-**	-
School	**-**	2EP	-	**-**	500	-	600	**-**	-	3Tree,2EP	**-**	**-**
1Tree,Temple	**-**	1 Tree	-	**-**	600	-	700	**-**	-	-	1 Tree	**-**
-	**-**	-	-	-	700	-	800	-	3EP	Temple	**-**	**-**
-	**-**	-	-	**-**	800	-	900	-	EP	-	**-**	**-**
1 Tree, Pond	**-**	-	-	**-**	900	-	1000	**-**	-	2EP	**-**	**-**
-	-	-	-	**-**	1000	-	1100	**-**	EP	1 Tree, HP	-	-
-	-	1 Tree	EP	**-**	1100	-	1200	**-**	-	-	-	-
-	-	EP	-	**-**	1200	-	1300	**-**	EP	-	-	-
-	-	-	-	**-**	1300	-	1400	**-**	-	-	-	-
-	-	2EP,Temple	-	-	1400	-	1500	**-**	EP	-	-	-
-	-	EP	-	**-**	1500	-	1600	**-**	-	-	-	-
-	-	-	-	**-**	1600	-	1660	**-**	-	-	-	-

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC, Electric Line crossing

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	-	Temple, EP LHS and 2EP RHS
100	-	200	8	-	-	-	-	-	-	-	Curve LHS
200	-	300	8	-	-	-	-	-	-	-	DP LHS
300	-	400	8	-	-	-	-	-	-	-	Proposed FC and EP LHS
400	-	500	8	-	-	-	-	-	-	-	EP LHS
500	-	600	8	-	-	-	-	-	-	-	Existing CD, 2EP LHS and 2EP RHS
600	-	700	5	-	-	-	-	-	-	Mohmela	Proposed CC road at Ch-600m to1300m Temple LHS
700	-	800	5	-	-	-	-	-	-	-	3Ep, Temple RHS
800	-	900	5	-	-	-	-	-	-	-	EP RHS
900	-	1000	5	-	-	-	-	-	-	-	Pond LHS and 3EP RHS
1000	-	1100	5	-	-	-	-	-	-	-	EP RHS and Curve LHS
1100	-	1200	5								EP LHS
1200	-	1300	5	-	-	-	-	-	-	-	EP both side
1300	-	1400	8	-	-	-	-	-	-	-	Existing CD
1400	-	1500	8	-	-	-	-	-	-	-	Junction, 2EP, Temple LHS and EP sifting RHS
1500	-	1600	8								EP LHS
1600	-	1660	8	-	-	-	-	-	-	-	-

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Parsada to Semariya

Block Name: **Arang**

District Name: **Raipur**

Total Length of the Road: **2.01 Km**

U. Climatic Conditions

Temperature	High: **42 °C (May)** Low: **15 °C (Dec)**
Humidity	High: 4**0% (Aug)** Low: 2**0% (Dec)**
Rainfall Rainy Season	**1200** mm/year **June** to **September**

V. 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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-00m to Ch-300m with connecting village Parsada.
6.	Agricultural Land	√		The project road has agriculture land at Ch-300m to CH-1100m and Ch-1800m to Ch-2000m.
7.	Grazing grounds	√		There is Grazing ground at Ch-1100m toCh-1800m both side of the proposed alignment.
8.	Barren Land		√	There is Barren no land found along the proposed road alignment.

W. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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)***	√		There is pond at Ch-600m to Ch-700m LHS along the proposed alignment.
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***	√		There is water crossing points at Ch-1000m to Ch-1100m and Ch-1800m to CH-1900m has FC and Ch-1800m to Ch-1900m has existing CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is no prone to flooding. ( ) 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***)	√		There are 21 trees of dbh of 30 cm or more as attached in Attachment I
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder. ( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[40] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[41] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment	√		Community has suggested that speed breaker near the school and sign board and CC road in the habitation area which comes at Ch-400m to CH-1000m.
3.	If suggestions received, were they incorporated into the design?	√		

E. Please attach the following:

49) Sketch a map showing the bridge and the trees.
50) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
51) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
52) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
53) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
54) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

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

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

Attachment I
List of Trees

Chainage			Left	Right
0	-	100	1	-
300	-	400	1	-
400	-	500	3	2
700	-	800	1	1
800	-	900	4	1
900	-	1000	2	1
1000	-	1100	1	-
1100	-	1200	-	1
1400	-	1500	1	-
1900	-	2000	-	1
Total			14	7

Attachment II
List of Utilities

Chainage			Left	Right
0	-	100	EP, HP	-
100	-	200	2EP	-
200	-	300	HP	EP
300	-	400	-	EP
600	-	700	POND	-
1300	-	1400	-	EP
1500	-	1600	-	EP
1800	-	1900	EP	-
1900	-	2000	EP	-

Attachment III
List of Community Structures

Chainage			Left	Right
0	-	100	GP	School
800	-	900	-	Temple
1700	-	1800	Anganwadi center	-

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	1 Tree, GP	EP,HP	-	0	-	100	**-**	School	-	**-**	-
-	**-**	-	2 EP	-	100	-	200	**-**	-	-	**-**	-
-	**-**	-	HP	**-**	200	-	300	**-**	EP	-	**-**	-
-	**-**	-	1 Tree	**-**	300	-	400	**-**	EP	-	**-**	-
-	**-**	3 Tree	-	**-**	400	-	500	**-**	-	2 Tree	**-**	-
-	**-**	-	-	**-**	500	-	600	**-**	-	-	**-**	**-**
-	**-**	Pond	-	**-**	600	-	700	**-**	-	-	**-**	**-**
-	**-**	1 Tree	-	-	700	-	800	-	-	1 Tree	**-**	**-**
-	**-**	4 Tree	-	**-**	800	-	900	-	1 Tree, temple	-	**-**	**-**
-	**-**	2 Tree	-	**-**	900	-	1000	**-**	-	1 Tree	**-**	**-**
-	-	1 Tree	-	**-**	1000	-	1100	**-**	-	-	-	-
-	-	-	-	**-**	1100	-	1200	**-**	-	1 Tree	-	-
-	-	-	-	**-**	1200	-	1300	**-**	-	-	-	-
-	-	-	-	**-**	1300	-	1400	**-**	-	EP	-	-
-	-	1 Tree	-	-	1400	-	1500	**-**	-	-	-	-
-	-	-	-	**-**	1500	-	1600	**-**	-	EP	-	-
-	-	-	-	**-**	1600	-	1700	**-**	-	-	-	-
Anganwadi center	-	-	-	**-**	1700	-	1800	**-**	-	-	-	-
-	-	EP	-	**-**	1800	-	1900	**-**	-	-	-	-
-	-	EP	-	**-**	1900	-	2000	**-**	-	1 Tree	-	-
-	-	-	-	**-**	2000	-	2100	**-**	-	-	-	-

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC – Electric Line crossing

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	5	-	-	-	-	-	-	Parsada	Proposed CC road at Ch-00m to 300m, GP, HP,EP LHS and School RHS
100	-	200	5	-	-	-	-	-	-	Parsada	2EP LHS and Curve RHS,LHS
200	-	300	5	-	-	-	-	-	-	Parsada	Junction Hp LHS and EP RHS
300	-	400	8	-	-	-	-	-	-	-	EP, Y Junction
400	-	500	8	-	-	-	-	-	-	-	
500	-	600	8	-	-	-	-	-	-	-	Curve RHs
600	-	700	8	-	-	-	-	-	-	-	Curve , Pond LHS
700	-	800	8	-	-	-	-	-	-	-	Curve LHS
800	-	900	8	-	-	-	-	-	-	-	Temple and 01 tree affected RHS
900	-	1000	8	-	-	-	-	-	-	-	
1000	-	1100	8	-	-	-	-	-	-	-	Proposed FC
1100	-	1200	8							-	Curve LHs
1200	-	1300	8	-	-	-	-	-	-	-	
1300	-	1400	8							-	EP RHS
1400	-	1500	8	-	-	-	-	-	-	-	
1500	-	1600	8							-	EP RHS
1600	-	1700	8	-	-	-	-	-	-	-	Junction
1700	-	1800	8							-	School and Anganwadi center
1800	-	1900	8	-	-	-	-	-	-	-	Proposed FC and Existing CD, EP LHS
1900	-	2000	8							-	EP LHS
2000	-	2100	8	-	-	-	-	-	-	-	-

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Amethi to Gudguda**

Block Name: **Arang**

District Name: **Raipur**

Total Length of the Road: **1.65 km**

I. Climatic Conditions

Temperature	High: 42**°C(May)** Low: 15 **°C(Dec)**
Humidity	High: 40 **(Aug)** Low: 20%**(Dec)**
Rainfall Rainy Season	1200 mm/year **June** to **September**

J. 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)*		√	Altitude: The topography of the project road is flat at almost all locations.
3.	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.)* No part of the project roads passess through any forest area
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-1400m to Ch-1650m with connecting village Gudguda
6.	Agricultural Land	√		The project road has agriculture land at Ch-00m to Ch-1300m RHS, Ch-00m to Ch-1400m at LHS along the road.
7.	Grazing grounds		√	There is no Grazing ground at proposed alignment.
8.	Barren Land		√	There is no Barren land along the project road.

K. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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***)	√		There is pond at Ch-1200m to Ch-1300m RHS along the proposed alignment.
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***	√		There is water crossing points at Ch-200m to Ch-00m to Ch-100m. Proposed FC, Ch-1000m to Ch-1100m and Ch-1400m to Ch-1500m has proposed CD.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial no -3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There is no prone to flooding along the project road. ( ) 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***)	√		There are 15 trees of dbh of 30cm or more as attached in **Attachment I**
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 faunal habitat, breeding ground etc. was found within 100 m of the road shoulder. ( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[42] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are some utility structures was noticed as listed in **Attachment II**
10.	Are there any religious, cultural or community structures/buildings[43] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in **Attachment III**

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)***	√		Consultation with local community was conducted before finalizing the alignment.
2.	Any suggestion received in finalizing the alignment		√	NA
3.	If suggestions received, were they incorporated into the design?		√	NA

L. Please attach the following:

25) Sketch a map showing the bridge and the trees.
26) List of trees indicating location (left or right side of the road) and chainage (as required under C. 6)
27) List of utility structures indicating location (left or right side of the road) and chainage (as required under C. 9)
28) List of community structures indicating location (left or right side of the road) and chainage (as required under C. 10)
29) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
30) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[42] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[43] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage (M)	Left	Right
100-200	1	-
300-400	2	-
400-500	3	-
700-800	2	-
800-900	1	-
900-1000	2	1
1000-1100	-	2
1600-1650	1	-
Total	**12**	**3**

Attachment II
List of Utilities

Chainage (M)	Left	Right
200-300	-	EP,ELC
1200-1300	-	Pond
1500-1600	-	HP
1600-1650	-	EP

Attachment III
List of Community Structures

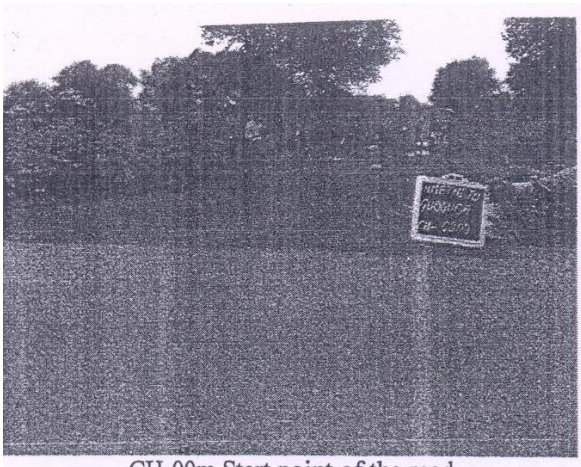
Chainage	Left	Right
1100-1200	Aganwadi	-
1400-1500	-	Mangal Bhawan
1500-1600	-	Plate form
1600-1650	-	School

Attachment IV

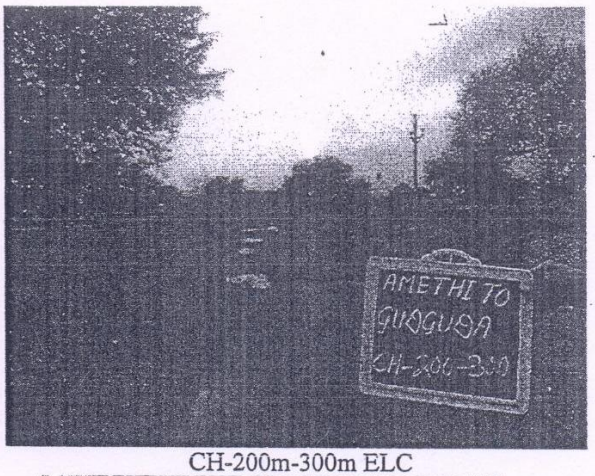
Left					Chainage (M)	Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**		**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
-	-	-	1 tree	-	100-200	**-**	**-**	-	-	-
-	-	-	-	-	200-300	**-**	**-**	EP,ELC	-	-
	-	1 tree	1 tree	-	300-400	**-**	**-**	-	-	-
-	-	2 tree	1 tree	-	400-500	-	**-**	-	-	-
-	-	-	2 tree	-	700-800	**-**	-	-	-	-
1 tree	-	-	-	-	800-900	**-**	-	-	-	-
-	2 tree	-	-	-	900-1000	**--**	-	1 tree	-	-
-	-	-	-	-	1000-1100	**--**	2 tree	-	-	-
Aganwadi	-	-	-	-	1100-1200	**-**	-	-	-	-
-	-	-	-	-	1200-1300	**-**	-	-	-	Pond
-	-	-	-	-	1400-1500	**-**	Mangal Bhawan	-	-	-
-	-	-	-	-	1500-1600	**-**	Plate form	-	**-**	-
-	-	-	1 tree	-	1600-1650	**-**	EP	-	**School**	-

E.P. – Electric Pole; H.P. – Hand Pump, TW; Tube Well, PHC- primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank

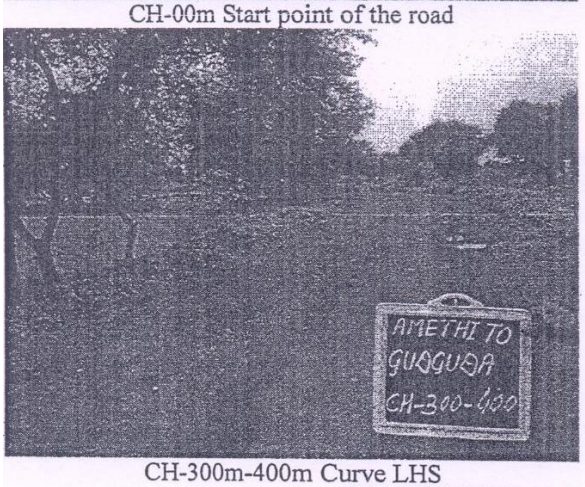
Attachment V
Photo Plates



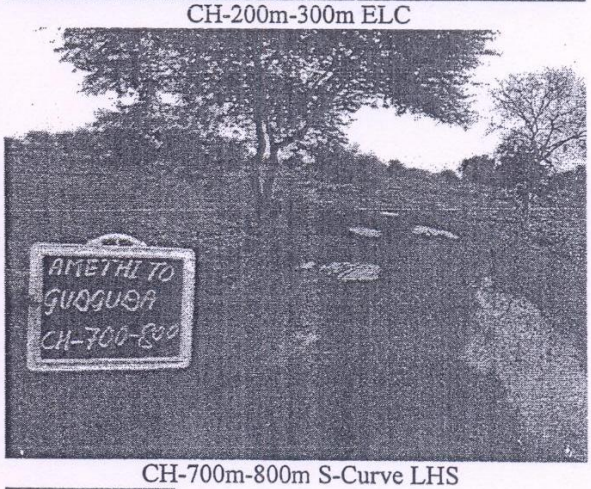
CH-00m Start point of the road



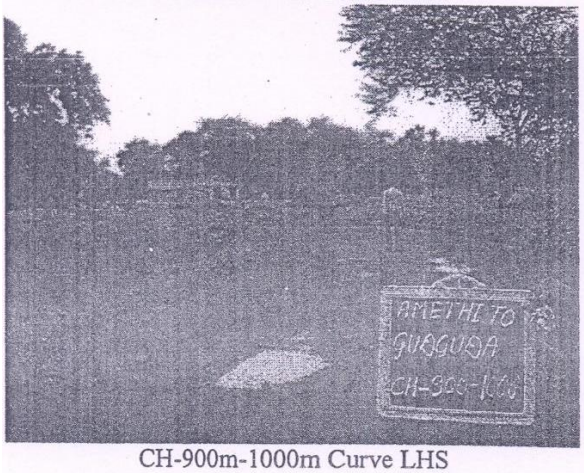
CH-200m-300m ELC



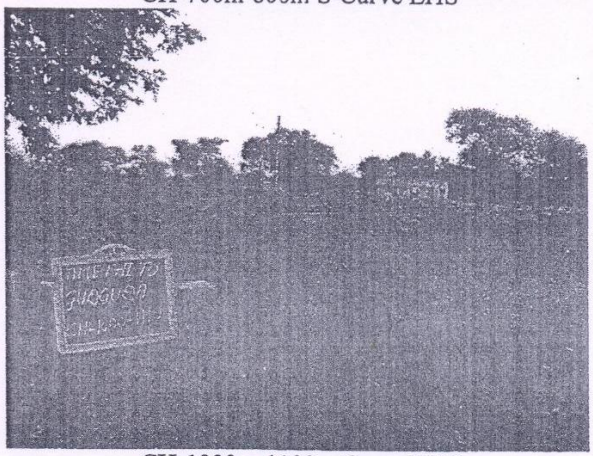
CH-300m-400m Curve LHS



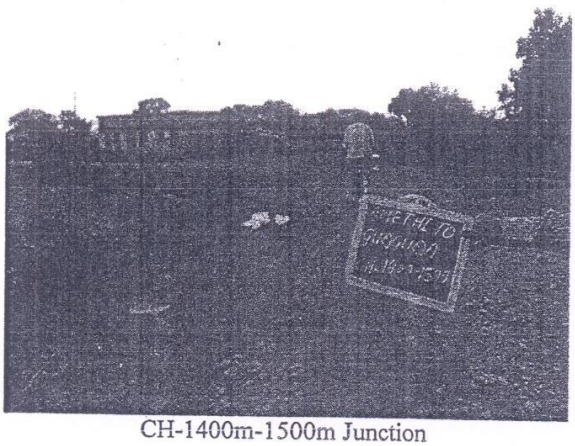
CH-700m-800m S-Curve LHS



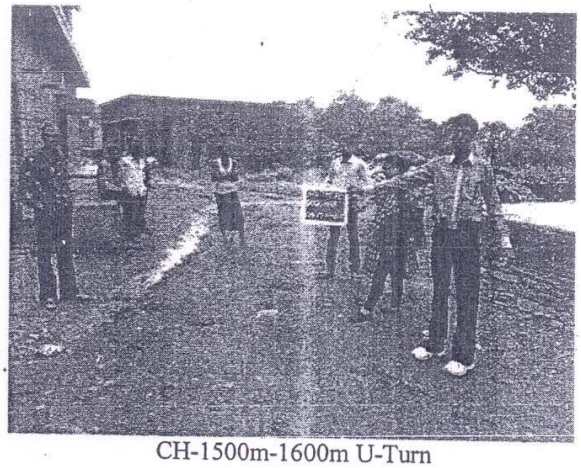
CH-900m-1000m Curve LHS



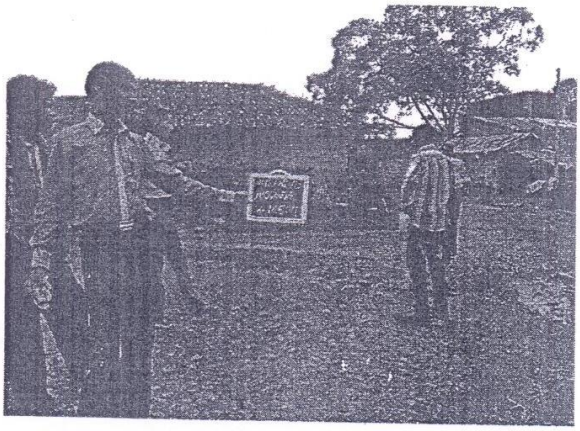
CH-1000m-1100m Curve RHS



CH-1400m-1500m Junction



CH-1500m-1600m U-Turn



CH-1650m End point of the road

Chainage wise Transect Walk Findings

Chainage (m)	Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks /Suggestions
		LHS	RHS	LHS	RHS	LHS	RHS		
0-100	8	-	-	-	-	-	-	-	FC proposed
100-200	8	-	-	-	-	-	-	-	Agri land
200-300	8	-	-	-	-	-	-	-	EP,ELC, RHS
300-400	8	-	-	-	-	-	-	-	-
400-500	8	-	-	-	-	-	-	-	-
500-600	8	-	-	-	-	-	-	Ramakachar	-
600-700	8	-	-	-	-	-	-	-	-
700-800	8	-	-	-	-	-	-	-	-
800-900	8	-	-	-	-	-	-	Sararpara	-
900-1000	8	-	-	-	-	-	-	-	-
1000-1100	8	-	-	-	-	-	-		CD Proposed
1100-1200	8	-	-	-	-	-	-	-	Aganwadi LHS
1200-1300	8	-	-	-	-	-	-	-	Pond, RHS
1300-1400	8	-	-	-	-	-	-	-	Agri. land
1400-1500	5	-	-	-	-	-	-	Gudguda	Proposed CD and Mangal bhawan RHS,LHS curve
1500-1600	5	1	1	1	1	Plate form	Plate form	-	HP, Platform RHS
1600-1650	5	-	-	-	-	-	-	-	EP

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Rohra to Machabhata

Block Name: Simga

District Name: Balodabazar

Total Length of the Road: 4.00 Km

X. Climatic Conditions

Temperature	High: 40**°C(May)** Low: 5**°C(Dec)**
Humidity	High: **(Aug)** Low: **% (Dec)**
Rainfall Rainy Season	**1300** mm/year **June** to **September**

Y. 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)*		√	Altitude: The topography of the project road is almost plain in all locations
3.	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.)* No part of the project road passes through any forest area.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **NA** Endangered species (if any): **None**
5.	Inhabited Area	√		The Inhabited area is identified between Ch-1500m to Ch-2500m with connecting village Machabhata.
6.	Agricultural Land	√		The project road has agriculture land at Ch-400m to Ch-1500m, Ch-2500m to Ch-4000m both side of the alignement.
7.	Grazing grounds	√		There is Grazing ground at Ch- 00m to Ch-400m along the project road.
8.	Barren Land		√	There is no Barren land at the proposed road alignment.

Z. 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 part of the project road lies in hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion. ( ) 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)***	√		There is a pond located at Ch-1800m to Ch-2000m RHS,Ch-2800m to CH-3000m ,Ch5600m to Ch-5800m RHS and Ch-7600m to Ch-7800m.
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***	√		There was found some water crossing points at Ch-100m to Ch-200m, Ch-500m to CH-600m, Ch-600m to Ch-700m, Ch-900m to Ch-1000m-2, Ch-1400m to Ch-1500m, Ch-2200m to Ch-2300m, Ch-2600m to Ch-2700, Ch-2800m to Ch-2900m, Ch-3300m to 3400m and Ch-3600m to Ch-3700m has existing CDs.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention Chainage)***	√		The problem of water stagnation and other drainage issues on or near the road is describe above serial No.-3 ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is not prone for 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***)	√		There are 10 trees of dbh of 30 cm or more as attached in <u>Attachment I</u>
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 faunal habitat, breeding ground etc. is found within 100 m of the road shoulder.
			√	( ) 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 rare, endangered or threatened species were found within 100 m of the road shoulder. ( ) 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[44] within 10 m on either side from the center line of the road alignment? ***(If yes, attaCh list with Chainage)***	√		Few utility structures were found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[45] within 10 m on either side from the center line of the road alignment? ***(If yes attaCh list with Chainage)***	√		Few religious structures were found on either side of the proposed alignment as listed in Attachment III.

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)***	√		Yes, consulting with the community
2.	Any suggestion received in finalizing the alignment	√		Community has suggested that at Ch-200m to Ch-300m near the school has proposed speed breaker along with the sign board and at Ch-800m to Ch-1500m has proposed CC road.
3.	If suggestions received, were they incorporated into the design?	√		PIU has incorporate their suggestion in the DPR.

E. Please attach the following:

55) Sketch a map showing the bridge and the trees.
56) List of trees indicating location (left or right side of the road) and Chainage (as required under C. 6)
57) List of utility structures indicating location (left or right side of the road) and Chainage (as required under C. 9)
58) List of community structures indicating location (left or right side of the road) and Chainage (as required under C. 10)
59) Sketch of strip map of the road covering details of at least 10 m on either side from the center line of the road
60) Photographs of the project area showing at least 10 m on either side from center line of road alignment. Every 2 km or less of road must have at least 1 photograph.

[44] Water tap, hand pump, electric pole, telephone pole, water pipe and other similar structures.
[45] Mandir, Masjid, Church, religious/cultural/historical monuments, school, health center, public toilet and other similar structures.

Attachment I
List of Trees

Chainage			Left	Right
0	-	100	1	-
500	-	600	4	1
1600	-	1700	-	2
1900	-	2000	1	-
3000	-	3100	-	1
Total			6	4

Attachment II
List of Utilities

Chainage			Left	Right
300	-	400	-	EP
1600	-	1700	2 EP	-
1900	-	2000	HP	EP
2000	-	2100	EP, HP	EP
2100	-	2200	-	EP, DP
2300	-	2400	-	EP

Attachment III
List of Community Structures

Chainage			Left	Right
500	-	600	Temple	-
1500	-	1600	Temple	-
1600	-	1700	-	Temple
2000	-	2100	School	-

Attachment IV

Left					Chainage (M)			Right				
8 to 10m	**6 to 8m**	**4 to 6m**	**2 to 4m**	**0 to 2m**				**0 to 2m**	**2 to 4m**	**4 to 6m**	**6 to 8m**	**8 to 10m**
1 tree	-	-	-	-	0	-	100	**-**	-	-	**-**	-
-	**-**	-	-	-	100	-	200	**-**	-	-	**-**	-
-	**-**	-	-	**-**	200	-	300	**-**	-	-	**-**	-
-	**-**	-	-	**-**	300	-	400	**-**	-	-	**-**	EP
-	**-**	-	-	**-**	400	-	500	**-**	-	-	**-**	-
-	**-**	4tree, Temple	-	**-**	500	-	600	**-**	-	1 tree	**-**	**-**
-	**-**	-	-	**-**	600	-	700	**-**	-	-	**-**	**-**
-	**-**	-	-	-	700	-	800	-	-	-	**-**	**-**
-	**-**	-	-	**-**	800	-	900	-	-	-	**-**	**-**
-	**-**	-	-	**-**	900	-	1000	**-**	-	-	**-**	**-**
-	-	-	-	**-**	1000	-	1100	**-**	-	-	-	-
-	-	-	-	**-**	1100	-	1200	**-**	-	-	-	-
-	-	-	-	**-**	1200	-	1300	**-**	-	-	-	-
-	-	-	-	**-**	1300	-	1400	**-**	-	-	-	-
-	-	-	-	-	1400	-	1500	**-**	-	-	-	-
-	-	Temple	-	**-**	1500	-	1600	**-**	-	-	-	-
-	-	2 EP	-	**-**	1600	-	1700	**-**	2tree Temple	-	-	-
-	-	-	-	**-**	1700	-	1800	**-**	-	-	-	-
-	-	-	-	**-**	1800	-	1900	**-**	-	-	-	-
-	-	-	1tree,HP	**-**	1900	-	2000	**-**	EP	-	-	-
-	-	EP, HP	-	**-**	2000	-	2100	**-**	-	School, EP	-	-
-	-	-	-	-	2100	-	2200	**-**	-	EP,DP	-	-
-	-	-	-	-	2200	-	2300	**-**	-	-	-	-
-	-	-	-	-	2300	-	2400	**-**	-	-	-	-
-	-	-	-	-	2400	-	2500	**-**	-	-	-	-
-	-	-	-	-	2500	-	2600	**-**	-	-	-	-
-	-	-	-	-	2600	-	2700	**-**	-	-	-	-
-	-	-	-	-	2700	-	2800	**-**	-	-	-	-
-	**-**	-	-	**-**	2800	-	2900	**-**	-	-	-	-
-	-	-	-	**-**	2900	-	3000	**-**	-	-	-	-
-	**-**	-	-	**-**	3000	-	3100	**-**	-	1tree	**-**	**-**

E.P. – Electric Pole; H.P. – Hand Pump, A.L. – Agricultural Land; C.D. – Cross Drainage structure, ELC, Electric Line crossing

Chainage wise Transect Walk Findings

Chainage (m)			Existing Land Width (M)	Additional Land Required		Losses		Type of loss		Village	Remarks/Suggestions
				LHS	RHS	LHS	RHS	LHS	RHS		
0	-	100	8	-	-	-	-	-	-	-	"Y" Point junction
100	-	200	8	-	-	-	-	-	-	-	Existing CD
200	-	300	8	-	-	-	-	-	-	-	-
300	-	400	8	-	-	-	-	-	-	-	EP RHS
400	-	500	8	-	-	-	-	-	-	-	-
500	-	600	8	-	-	-	-	-	-	-	Temple, Curve LHS and Existing CD
600	-	700	8	-	-	-	-	-	-	-	Existing CD
700	-	800	8	-	-	-	-	-	-	-	AL
800	-	900	8	-	-	-	-	-	-	-	Curve LHS and RHS
900	-	1000	8	-	-	-	-	-	-	-	Existing 2 CD
1000	-	1100	8	-	-	-	-	-	-	-	AL
1100	-	1200	8	-	-	-	-	-	-	-	Curve LHS
1200	-	1300	8	-	-	-	-	-	-	-	ELC height incheasing
1300	-	1400	8	-	-	-	-	-	-	-	-
1400	-	1500	8	-	-	-	-	-	-	-	TempleLHS and Existing CD
1500	-	1600	5	-	-	-	-	-	-	Machabhat	Temple LHS
1600	-	1700	5	-	-	-	-	-	-	Machabhat	Proposed CC road CH-1500-1600m 2 EPLHS and Temple RHs
1700	-	1800	5	-	-	-	-	-	-	Machabhat	-
1800	-	1900	5	-	-	-	-	-	-	Machabhat	-
1900	-	2000	5	-	-	-	-	-	-	Machabhat	HP LHS, curve and Ep RHS
2000	-	2100	8	-	-	-	-	-	-	-	Junction, EP RHS, and EP,HP, School LHS
2100	-	2200	8	-	-	-	-	-	-	-	EP, DP,RHS
2200	-	2300	8	-	-	-	-	-	-	-	Existing CD
2300	-	2400	8	-	-	-	-	-	-	-	EP RHS
2400	-	2500	8	-	-	-	-	-	-	-	-
2500	-	2600	8	-	-	-	-	-	-	-	AL
2600	-	2700	8	-	-	-	-	-	-	-	Existing CD and ELC height incheasing
2700	-	2800	8	-	-	-	-	-	-	-	AL
2800	-	2900	8	-	-	-	-	-	-	-	Existing CD
2900	-	3000	8	-	-	-	-	-	-	-	-
3000	-	3100	8	-	-	-	-	-	-	-	Curve LHS
3100	-	3200	8	-	-	-	-	-	-	-	-
3200	-	3300	8	-	-	-	-	-	-	-	-
3300	-	3400	8	-	-	-	-	-	-	-	Existing CD and Curve RHS
3400	-	3500	8	-	-	-	-	-	-	-	-
3500	-	3600	8	-	-	-	-	-	-	-	Curve LHS and RHS
3600	-	3700	8	-	-	-	-	-	-	-	Existing CD
3700	-	3800	8	-	-	-	-	-	-	-	-
3800	-	3900	8	-	-	-	-	-	-	-	Curve LHS
3900	-	4000	8	-	-	-	-	-	-	-	-

Appendix 3.1: Clearance from Forest Department

कार्यालय वनमण्डलाधिकारी, कोरबा वनमण्डल कोरबा (छ ग)

क्रमांक/मा.वि./ 1260 कोरबा, दिनांक 9/12/07

प्रति,

कार्यपालन अभियंता
प्रधान मंत्री ग्राम सड़क योजना
कोरबा

विषय :– वर्ष 1980 के पूर्व मौजूद वन क्षेत्र से गुजरने वाले मार्ग अजगरबहार कछार से कोसगाई मंदिर 0.75 कि.मी. को पक्का करने की अनुमति।

संदर्भ :– 01. छत्तीसगढ़ शासन वन विभाग का आदेश क्र./एफ/19/12/व/ 10–2/ 2005/1949 रायपुर दिनांक 21.06.07
02. आपका पत्र क्र./ 1350/प्र.मं.ग्रा.सं.यो/वन/ कोरबा दिनांक 04.10.07

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विषयान्तर्गत लेख है कि वर्ष 1980 के पूर्व मौजूद मार्ग अजगरबहार कछार रोड से कोसगाई मंदिर 0.75 कि.मी. 0.75 कि.मी. लंबाई में कोरबा वनमण्डल के बालको परिक्षेत्र के वनक्षेत्र से गुजरता है, को पक्का करने की अनुमति निम्न शर्तो के अधीन दी जाती है।

01. मार्ग की ब्लेक टापिंग करने हेतु आवश्यक कोलतार मिक्स उरगा में स्थापित प्लांट से लाया जावेगा। वनक्षेत्र के अंदर कोलतार पिघलाने एवं मिलाने का कार्य नहीं किया जावेगा।

02. वनक्षेत्रों के अंदर पत्थर तोड़ने की अनुमति नहीं होगी। मार्ग निर्माण हेतु आवश्यक सामाग्री यथा मिट्टी, मुरूम रेत,गिट्टी, बोल्डर आदि वनक्षेत्र से नहीं निकाला जावेगा। वनक्षेत्र से अवैध उत्खनन आदि की स्थिति में अधिरोपित अर्थदण्ड आदि अदा करने की जिम्मेदारी कार्य पालन अभियंता प्रधान मंत्री ग्राम सड़क योजना की होगी। अवैध उत्खनन संबंधी गंभीर वन अपराध उक्त मार्ग के निर्माण के संबंध में घटित होने की स्थिति में क्रियान्वयन विभाग को जिम्मेदार माना जावेगा।

03. उन्नयित सड़क के किनारे ईट/पत्थर से सुदृढ़ किये जावेंगे तथा भू–क्षरण को रोकने हेतु इस कार्यालय द्वारा जारी किये गये निर्देशों के पालन किया जावेगा।

04. मार्ग निर्माण में किसी वृक्ष को नहीं काटा जावेगा।

05. सड़क का चौड़ीकरण नहीं किया जावेगा। पूर्व में वन विभाग व प्रधान मंत्री सड़क योजना के अधिकारियों द्वारा किये गये संयुक्त निरीक्षण में उक्त मार्ग में वनक्षेत्र की लंबाई 0.75 कि.मी. में चौड़ाई की स्थिति निम्नानुसार पाई गई है।

अ.क.	मार्ग का नाम	कुल लंबाई	वनक्षेत्र में	
			लंबाई	चौड़ाई
01.	अजगरबहार कछार रोड से कोसगाई मंदिर	0.75 कि.मी.	0.75 कि.मी.	10 मी.

उक्त चौड़ाई निर्माण के दौरान न बढ़ाई जावें।

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वनक्षेत्र को कहीं भी तोड़ा नहीं जावें।

07. आवश्यकतानुसार उक्त मार्ग के दोनों ओर वृक्षारोपण हेतु प्रोजेक्ट तैयार किये जाकर आपको प्रस्तुत किया जावेगा, कार्य हेतु परियोजना लागत से आवश्यक धनराशि आपके द्वारा उपलब्ध कराया जावेगा।

08. वनभूमि पर श्रमिक कैम्प नहीं लगाया जायेगा।

09. सूर्यास्त के पश्चात् कोई कार्य नहीं किया जायेगा।

10. सड़क का उन्नयन कार्य के कारण यदि वनक्षेत्र में कोई नुकसान होता है तो कार्यान्वित करने वाली एजेंसी परियोजना लागत पर ऐसे नुकसान की भरपाई करेगी। ऐसी स्थिति पाये जाने पर नुकसान की गणना इस कार्यालय द्वारा कर आपको सूचित किया जावेगा, जिसे जमा करने हेतु आप बाध्य होगें।

11. इस उन्नयित की गई सड़क पर अथवा उन्नयन के अधीन सड़क पर स्थायी चेकपोस्ट उपयुक्त स्थानों पर शासन की पूर्व अनुमति प्राप्त कर लगाये जायेंगे।

12. भारत शासन पर्यावरण एवं वन मंत्रालय नई दिल्ली की अधिसूचना 50–1537 दिनांक 19.09.2006 के अनुसार इस मार्ग हेतु पर्यावरण स्वीकृति की आवश्यकता नहीं है। पर्यावरण स्वीकृति के संबंध में यदि कोई नई अधिसूचना/नियम आदि सक्षम स्तर से जारी होते है तो उसका पालन अनिवार्य होगा।

13. मार्ग निर्माण के दौरान वन अधिकारियों द्वारा क्षेत्र निरीक्षण करने पर यदि कोई अन्य शर्तें नियमानुसार अधिरोपित करने की स्थिति बनती है तो इससे आपको लिखित में अवगत कराया जावेगा। साथ ही क्षेत्र की Flora and fauna को सुरक्षित रखने के समस्त प्रयास निर्माण कार्य में लगे विभागीय व अन्य व्यक्तियों द्वारा किये जावें, इस बाबत् समस्त को निर्देशित करें।

वनमण्डलाधिकारी
कोरबा वनमण्डल कोरबा

पृ.क्रमांक/मा.चि./ कोरबा दिनांक

प्रतिलिपि :–

01. मुख्य वन संरक्षक, भू– सर्वे, छ.ग. रायपुर को सूचनार्थ सम्प्रेषित।

02. वन संरक्षक बिलासपुर वृत्त बिलासपुर को सूचनार्थ सम्प्रेषित।

03. उपवनमण्डलाधिकारी उत्तर कोरबा/ परिक्षेत्राधिकारी बालको को सूचनार्थ अग्रेषित। समय–समय पर उक्त निर्माण कार्यों का निरीक्षण कर उक्त अधिरोपित शर्तों का पालन सुनिश्चित करावें। मार्ग के दोनों ओर यदि वृक्षारोपण की आवश्यकता हो तो कार्य का प्रोजेक्ट बनाकर प्रस्तुत करें।

वनमण्डलाधिकारी
कोरबा वनमण्डल कोरबा

Appendix 4.1: Guidelines for Borrow Areas Management

I. SELECTION OF BORROW AREAS

1. 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.

2. 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.

II. CONTRACTOR'S RESPONSIBILITY

3. 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.

III. 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 2m 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; 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 1.5m.

(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 10m.

IV. REHABILITATION OF BORROW AREAS

4. 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.

5. 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.

6. 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/ CGRRDA
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 forestland and ADB's Safeguard Policy Statement 2009. ○ Alignment finalization considering availability of right of way and in consultation with local people. ○ ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. ○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. ○ The road shall follow natural topography to avoid excessive cut and fill.	All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ CGRRDA
3.	Land acquisition	○ Avoid or minimize land acquisition. ○ Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation	All through the alignment of each rural road	Pre Construction Phase	Land to be made available by	PIU, Govt. of Madhya Pradesh , and other	Environmental officer under the PIC will also coordinate and

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.			the state Government		ensure implementation
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 to the adjacent location approved by them	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 vegetative cover and timely replacement of perished plantations. implementation Unit (PIU) of CGRRDA,	Environmental officer under the PIC will coordinate and ensure Officials of Forest Department, Contractor and local NGOs and coordinated by Environmental officer of 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***	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

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
			structures to be shifted along with chainages for the location of such structures)				interact with the local people who are likely to be affected to ensure that their interests are protected and no social resentment sets in.
6.	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 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 (HFL) wherever, area is prone to flood.	All through the alignment of each rural road ***(Highlight the high flood level, chainage for action and linkages to DPR section)***	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ CGRRDA
7.	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. ○ 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.	Near all drainage crossing , nalas and river crossings etc. ***(indicate HFL Level and Highlight the chainage for action and linkages to DPR section)***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ 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 .					
8.	Establishment of Construction Camp, temporary office and storage area	○ Construction campsites 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 labour 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 provision of 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 provision of 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 provision of health care facilities for adults, pregnant women and children.	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). ***(Contractor to specify the cost provision made for PPE and other environmental sanitation measures required per construction camp / temporary office / storage area)***	Pre-construction and construction stage	To be included in contractor's cost	All facilities are to be planned and implemented by contractor under approval by PIU / PIC	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ 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. ○ 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. ○ Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.					
9.	Traffic Movement	○ The contractor will identify the areas were temporary traffic diversion may be required. He 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. ○ 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. ○ The diversion plan should ensure smooth flow of traffic, minimize 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 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/ ***(Highlight the chainages which may require traffic diversions)***	Pre-construction and construction stage	To be included in contractor's cost	All facilities are to be planned and implemented by contractor under approval by PIU / PIC	PIU
10.	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	Throughout the project section at the location determined by contractor and				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation. 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 o At a main road, intersection or crossing "STOP" sign and 'T-intersection' warning sign shall be installed on the village road. o 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	approved by PIU ***(Highlight the location with chainage for such requirements)***				
	Construction Stage						
11.	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	As Borrow sites and quarries (if required) location. ***(List the probable locations for borrow areas. (Highlight the identified quarries, if***	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
		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. 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 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**	***already identified. Contractors should also indicate the 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
		○ 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.					
12.	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 ***(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 / CGRRDA
13.	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.	Throughout the project section of the road s ***(The contractor shall include the***	• Design and constructio n stage	• Project preparatio n cost and constructio n cost •	• Design consultant and Contractor,	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ 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 minimize 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.	***cost for the measures as part of the construction cost)***				
14.	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 away from the	• Throughout the project section of the road	• Design and constructio n stage	• Project preparatio n cost and constructio n cost	• Design consultant and Contractor,	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.					
15.	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. ***(The contractor shall include the cost for the measures as part of the construction cost)***	• During Construction stage	• Included in engineering cost	Contractor	PIU/ CGRRDA
16.	Biological environment - Tree planting	○ Compensatory Afforestation shall be made on 1:3.ratio basis as per the plannings. ○ Additional trees shall be planted wherever feasible.	Throughout the project section of the road ***(Highlight Tree***	during the design and Construction stage	Part of engineering work cost included	CGRRDA	PIU and CGRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
			cutting locations & proposed likely plantation location)				
17.	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 ***(The contractor shall include the cost for the measures as part of the construction cost)***	construction stage	construction cost	Contractor,	PIC/PIU
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 restrictions may be enforced near sensitive locations.	Throughout the project section at the location determined by contractor and approved by PIU	Operation stage stage	construction cost	Contractor,	PIC/PIU
	Site restoration	○ All construction camp/temporary office/material	***(The contractor***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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	***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 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	Operation stage stage	construction cost	Contractor,	PIC/PIU

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 forestland and ADB's Safeguard Policy Statement 2009. ○ Alignment finalization considering availability of right of way and in consultation with local people. ○ ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. ○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. ○ The road shall follow natural topography to avoid excessive cut and fill.	All through the alignment of each rural road	Compliance to Conditions of Forest Clearance if applicable		

3.	Land acquisition	○ Avoid or minimize land acquisition. ○ 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	○ 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			
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 to the adjacent location approved by them	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 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. ○ 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 .	Near all drainage crossing , nalas and river crossings etc.			
9.	Establishment of Construction Camp, temporary office and storage area	○ Construction campsites 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 labour 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 provision of 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 provision of 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 provision of health care facilities for adults, pregnant women and children. ○ Personal Protective Equipments (PPEs) like helmet, boots, earplugs for workers, first aid and fire fighting equipments shall be available at	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.		

		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	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 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. 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 o At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road. o 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	o 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. 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 wastes and	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		

		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 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.				
2.	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 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	Thought out the road section			
3	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.	• Throughout the project section of the road s			

		○ 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 minimize 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 away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.	• Throughout the project section of the road			
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	• Near all drainage crossing , nalas and river crossings etc.			

		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. o The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall 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.				
6.	Biological environment - Tree planting	o Compensatory Afforestation shall be made on 1:3.ratio basis as per the plannings. o Additional trees shall be planted wherever feasible.	Throughout the project section of the road			
7.	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. o Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible o Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. o 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	o Verification of implementation of provision made at planning stage. o Each worker is provided with requisite PPE o Directional sight board shall be installed on all sharp curves and bends o 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	o 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

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		
3	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			
4.	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			
5.	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

District	Name	Designation	Contact Number
Raipur	Mr. P C Pandey	Chief Executive Office	9926153204
	Mr. S K Gupta	Chief Engineer	
	Mr. S K Srivastav	Superintending Engineer	
	Mr. Ram Sagar	Superintending Engineer	9424141450
	Mr. S K Tandon	AE	7712424275
	Mr. M Despande	AE	9406214070
	Mr. S K Jadhav	Executive Engineer	9425535158
Jaspur	G R Sahu	AE	
	Smt. Ambika Badek	Sarpanch, Korgamal	
Bilaspur	Mr. Y K Giri	Superintending Engineer	
	Mr. C L Bhardwaj	AE	7752250359
	Mr. Tirath Ram Patel	Sarpanch, Marakone	
	Sondas Satnami	Villager	
Durg	R K Srivastav	AE	9165018000
	D K Dubey	AE	
	Smt. Mina Bai	Sarpanch, Dhangaon	
	Smt. Ashwini Bai Patel	Sarpanch, Tedhi	
	Shri Mohan Verma	Secretary, Tedhi	
	Gulab Chand	Villager	
	Shyam Prasad Tiwari	Affected Person	
	Bodhi Ram	Affected Person	
Janjgir-Champa	Mr. R Yadav	AE	9406213094
	Mr. H R Teli	AE	
	K S Rathore	Sarpanch, Aphrid	
	Puni Ram Sahu	Villager	
	Main Bai Sidar	Affected Person	
	Mukesh Kumar	Villager	
Korba	Mr. M R Singh	Superintending Engineer	9826528601
	Shri Man Kuwar	Sarpanch, Ratija	
	Mr. Ram Dayal Rathia	Villager	
	Ajmer Singh	Affected Person	
Koria	Mr. V Sharma	SAE	9406089309
	Mr. Sumiya Bai	Sarpanch, Mainpur	
	Smt. Kalabati	Sarpanch, Nogai	
	Mr. Jawai Lal	Affected Person	
	Mr. Manraj	Affected Person	
	Mr. Hira Lal	Affected Person	
Raigarh	Mr.A K Sai	Executive Engineer	9425290994
	Mr. R R Chauhan	AE	
	Mr. B K Bahidar	AE	
	Sushil Rathiya	Sarpanch, Kudekela	
	Om Prakash Khuswaha	Secretary, Kudekela	
	Sh. Pratap Mishra,	Sarpanch, Jobro	
	Mahesh Ram	Affected Person	
	Madan Mohan	Affected Person	
Mahasamund	Mr. S K Gupta	Executive Engineer	9826877140
	Mr. Rajesh Ramniwas	AE	9424237261
Mahasamund (Contd.)	Khed Ram Patel	Sarpanch, Kashibahar	
	Ramesh Dhub	Sarpanch, Malidih	

District	Name	Designation	Contact Number
	Mr. Ram Singh	Villager	
	Mr. Santosh Kumar	Villager	
	Mr. Nakul Subudhhi	Villager	
Kawardha	Mr. R K Sahu	AE	
	Mr. N R Ranbir	AE	9755679860
	Mr. S K Rathia	AE	9753468896
	Mr. C L Bhardwaj	AE	
	Paras Ram Loji	Sarpanch, Bandha	