Initial Environmental Examination (Draft)

August 2013

IND: Rural Connectivity Investment Program – Project II

Odisha

Prepared by Odisha State Rural Roads 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
NGO	–	Non-governmental Organisation
NOx	–	Nitrogen Oxide
NC	–	Not Connected
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
OSRRA	–	Odisha State Rural Road Agency
ZP	–	Zilla Parisad

WEIGHTS AND MEASURES

km	–	kilometer
m	–	meter

NOTE

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

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I. INTRODUCTION

A. Project Background

1. As one of the key features of the Government's poverty reduction agenda for the rural sector, the Government of India (GOI) is implementing a 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, Odisha, 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 1,208.81 km of rural roads in the state of Odisha. OSRRA 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 the ADB loan assistance.

B. Project Roads Identification and Location

4. PMGSY has prepared specific guidelines for the selection of roads under this programme. The key requirements is that any road will be eligible for construction or upgradation only if it is part of the Core 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

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

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

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

5. The OSRRA has selected 1,184.06 km of rural roads to be taken up under RCIP Tranche II 2 in the state. The 1,184.06 km of roads comprises 269 different stretches spread over in 14 districts of the State. Within each district, the roads are further scattered in several blocks and sub divisions. In this batch of subprojects, the longest road is 20.01 km (Budhidar to Upperdunda in Junagarh block of Kalahandi district), while NH6 to Bhoitikra road (0.67 km) in Dhankauda block of Sambalpur district is the shortest. The average length of roads works out to 3.45 km. The list of 1,184.06 km roads with location and length is given in **Appendix 1.1**.

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

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

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

and unpaved movement paths. As such, land acquisition is nil or very minimal which is also acquired through donations from villagers. Hence, the project will fall under category B as per ADB SPS 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 Environnemental 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's for each and every road will be difficult and time consuming. ADB had finalized Environmental Code of Practices (ECOP) checklist under RRS II, which is modified for RCIP. Subprojects specific Initial Environmental Assessment (IEE) is carried out as per this ECOP checklist. These completed ECOP checklist with annexures on tree, utility and community structures, strip maps and photographs for each selected sample road are enclosed as **Appendix 1.2.**

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

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 EMPs, 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 were analyses and impact was identified using experts' assessment and following established practices. Mitigative measures are proposed common to larger roads and specific to the roads. EMP is prepared considering mitigative measures and institutional framework of SRRDA.

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 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. Since above environmental assessment requirement is not applicable, the mainstream environmental concerns specific procedures that were formulated under Rural Roads Sector I (RRS I) and Rural Roads Sector II Investment Program (RRS II) will in any case be implemented.

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

Sl. No.	Legislation	Applicability
1.	Environment (Protection) Act 1986-EIA Notification 2006 (Amended 2009)	Not applicable to these rural roads. It is applicable only to 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

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

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 sample road selection and regulatory compliance which is also to be complied with.

H. Acknowledgement

23. The consultants gratefully acknowledge the support received from NRRDA and OSRRA officials throughout the environmental assessment process. We also acknowledge the assistance received from respective PIUs 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 tranche IIin Odisha, about 1184.06 km of roads have been identified for implementation under RCIP. The broad specification for road alignment selection, payment design, construction methodology, geometric design etc. are same and is as per the "Specification for Rural Roads" published by IRC on behalf of the Ministry of Rural Development, Government 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 Odisha state is largely flat, the design details applicable to flat terrain are presented in following section.

B. Sample Roads Selected in Odisha State

26. The Odisha state has selected 269 roads with a total length of 1184.06 km spread over 14 districts as summarized at **Table II.1** below and detailed at **Appendix 1.1.**

Table II.1 : Summary of District Wise Proposed Rural Roads- Batch 2

Sl. No.	Name of District	No. of Pkgs.	No. of Roads	Length of Roads (Km)			
				Total	Max	Min	Average
1	Angul	3	7	30.38	7.97	1.10	4.34
2	Balasore	31	39	117.89	7.67	1.00	3.02
3	Bargarh	20	30	99.63	8.43	0.80	3.21
4	Bolangir	27	51	136.63	8.60	0.68	2.68
5	Boud	17	20	67.96	10.30	0.90	3.39
6	Bhadrak	14	18	60.50	6.00	1.75	3.36
7	Cuttack	10	10	41.96	7.43	1.97	4.51
8	Jagatsinghpur	11	11	55.72	8.60	2.30	5.07
9	Jharsuguda	7	9	18.21	3.55	0.83	2.02
10	Kalahandi	34	34	189.62	20.01	1.50	5.58
11	Kendrapara	14	14	53.19	13.66	1.81	4.46
12	Khurda	7	11	33.02	4.56	1.80	3.00
13	Puri	47	54	167.03	11.80	0.75	3.09
14	Sambalpur	27	35	112.33	14.88	0.67	3.21
Total		**269**	**343**	**1184.06**	**20.01**	**0.67**	**3.45**

C. Project Description

1. 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

[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.

pavement design considers a base layer of variable thickness as per the design with granular sub-base, 150 mm thick water bound macadam (WBM grade I & II) and finally topped with 20 mm thick bituminous pavement. Adequate cross drainage structures like pipe or slab culverts/bridge structures are considered for drainage channels across the roads. Few minor bridges are also proposed for construction. **Figure 2.1** shows the typical cross section of the rural roads.

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.

2. Present Condition

29. The project roads mainly pass through plain or riverine terrain and agricultural area. The project roads have several cross drainage structure, electric post 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 widening of roads. There are some utilities besides the roads. Some of these may need to be shifted.

3. Alignment and Profile

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

4. Design Considerations

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 II.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 (60 m 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 1 m (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 rainwater 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 motorized 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 5 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

5. 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 and 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. Compaction of all items shall be done by ordinary smooth wheeled roller if the thickness of the compacted layer does not exceed 100 mm. It is also considered that, hot mix plant of medium type & capacity with separate dryer arrangement for aggregate shall be used for bituminous surfacing work that can be easily shifted. A self-propelled or towed bitumen pressure sprayer shall be used for spraying the materials in narrow strips with a pressure hand

sprayer. For structural works, concrete shall be mixed in a mechanical mixer fitted with water measuring device. The excavation shall be done manually or mechanically using suitable medium size excavators.

6. Available Right of Way

40. As per the information available with Odisha Rural Road Agency (OSRRA), 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.

7. Traffic

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

8. Economic Assessment

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

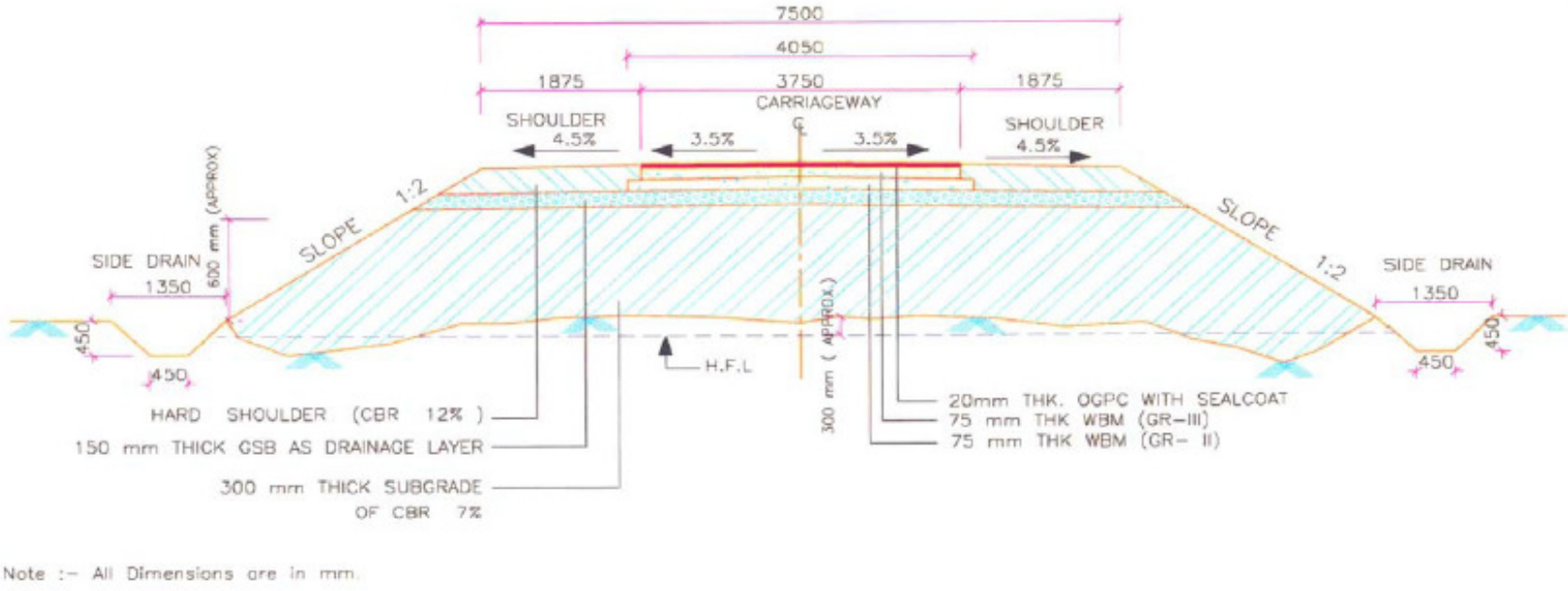


Figure II.3 : Typical Cross-section of Rural Roads

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 summarized in this chapter.

45. Odisha state is located between latitude 17°49' and 22°34' North and longitude 81°27' and 87°29' East. The geographical area of the state is 1,55,707 sq km. The state is bounded by the bay in the east, West Bengal in the north-east, Bihar in the north, Chhattisgarh in the west and Andhra Pradesh in the south. The batch 2 roads of the state fall in 14 out of the 30 districts of the state and the sample roads have been selected from each of these 14 districts. In total 35 sample roads have been selected that comprise 10.16% of the roads proposed. List of the sample roads is as under;

46. Summary key environmental features of the project districts are given in **Table III.1**.

B. Physical Environment

1. Meteorology and Climate

47. Standing on the coastal belt, the weather in Odisha is greatly influenced by the sea. The climate of the region is tropical resulting in very high temperature in the months of April and May. On the contrary, the Eastern Ghats of the state experience an extremely cold climate.

48. There are three major seasons - summer (March-June), rainy season (July-September) and the winter (October-February). It is warm almost throughout the year in the Western districts of Sundergarh, Sambalpur, Baragarh, Bolangir, Kalahandi and Mayurbhanj (maximum temperature between 40-46°C). In the coastal districts, the climate is equable but highly humid and sticky. The summer maximum temperature ranges between 35-40°C and the low temperatures are usually between 12-14°C. Winter is not very severe except in some areas in Koraput and Phulbani where minimum temperature may drop to 3-4°C. The annual maximum temperature in different years for the state is shown in **Figure III**.1. The figure reveals that the high temperatures are observed mostly in areas such as Balangir, Angul, Sundergarh and Titlagarh.

Table III.1 Summary Key Environmental Features of the Project Districts

Districts	Location	Climate	Ecologically Sensitive Area (Wildlife Sanctuaries/National Park etc)	Geomorphology (Major Physiographic Units and land use)	Major Drainage	Major Soil Type	Principal Crops	Key Environmental Issues
Angul	▪ The district covers a geographical area of 6232 square kilometers and supports a population of about 12.70 lakhs. ▪ Angul lies between, 20° 31' N & 21° 40' N latitude, 84° 15¢ E & 85° 23¢ E longitude. ▪ Angul shares its borders with Sundargarh in the north, Deogarh, Sambalpur & Sonepur in the west, Boudh & Nayagarh districts in the south, Dhenkanal & Cuttack in the south-east & Keonjhar in the east.	▪ The climatic condition of Angul is much varied. It has mainly 4 seasons. The summer season is from March to Mid June, the period from Mid June to September is the Rainy season, October and November constitute the post monsoon season and winter is from December to February. ▪ The average annual rainfall of the district is 1421 mm. However there is a great variation of rainfall from year to year. May is the hottest month with a mean daily maximum temperature at 44 degree Celsius. ▪ The district is affected by hailstorm and depressions in the monsoon season and in October, when winds increase in force and widespread heavy rain occurs.	▪ Total forest area constitutes 37% of the geographical area. ▪ Angul district boasts of several wildlife habitats viz. Satakosia gorge Sanctuary, Malyagiri, Bulajhar, Panchadhara and Mahanadi river system.	▪ The physiography of the district is marked by three major regions. The South and Western part comprises ranges of the Easternghat Super group & the Older Metamorphic Group. The Central portion is represented by sediments deposited in the Satpura- Mahanadi graven defined by pronounced NW-SE trending lineaments on a Precambrian plat form, almost separating the Easternghat Mobile Belt and Odisha craton. The northern boundaries of Talcher Basin are faulted.	▪ The river Mahanandi marks the southern boundary of this district. River Brahmani enters the district through Rengali reservoir & passes through Talcher sub-division.	▪ The soil is very fertile and is of medium black alluvial type	▪ Different crops taken during Rabi season are paddy, wheat, Maize, Gram, Fieldpea, Mung, Biri, Mustard, Sunflower, Safflower, Niger, Potato, Onion, Garlic, Coriander, different vegetables, Tobacco & Sugarcane	
Balasore	▪ Balasore is situated between 20.48 degree and21.59 degree north latitude, and between 86.16 degree and 87.29 degree east longitude ▪ Balasore has a geographical area of 3706 sq kms ▪ It has a population of 23, 17,419 as per 2011 census.	▪ The climate is generally hot with high humidity and precipitation. May is the hottest and December is the coolest month. The highest maximum temperature recorded was 44 degree Celsius on June 8th 1998 ▪ The average annual rainfall is between 1550 to 1600 mm.		▪ Balasore can be divided into three geographical regions, namely the coastal belt, the inner alluvial plain and the North-Western Hills that are part of the Eastern Ghats ▪ The district has an average altitude of 19.08 metres, with the hills of Nilagiri having the highest peak at 1783 feet.	▪ The major rivers are Subarnarekha, Budhabalanga, Jalaka, Kansabansa and Sono	▪ The major soils are Clay loam, Sandy clay loam and Sandy loam ▪ A small strip of saline soil is also witnessed in the coastal part of the district		

Districts	Location	Climate	Ecologically Sensitive Area (Wildlife Sanctuaries/National Park etc)	Geomorphology (Major Physiographic Units and land use)	Major Drainage	Major Soil Type	Principal Crops	Key Environmental Issues
Boudh	▪ The District is bounded by River Mahanadi & Angul District to the north, Kandhamal District to the south, Nayagarh District to the east and River Tel & Subarnapur District to the west. Covering a geographical area of 3444.8 sq km, the District lies 20 degree 22' to 20 degree 50' North Latitude and 83 degree 34' to 84 degree 49' East Longitude.	▪ The climatic condition of the District is subtropical, being hot and dry in summer and cold and dry in winter. The rainy season is hot and humid. In summer temperature reaches 45 degree C and in winter temperature may come down to as low as 10 degree C.	Boudh has reserved Forest Areas of 924.774 sq kms, Demarcated Protected Forests of 31.5527 sq kms, Un-Demarcated Protected Forests of 227.006 sq kms, unclassified forests of 1.6995 sq kms and village forests of 11.925 sq kms				The principal crops are Wheat, Rice, Jowar, Maize, Gram, Sugar cane	The district has no key environmental issue except that its surface water sources in major town are not safe for drinking due to increasing urbanisation. Ground water is suitable for drinking as per Central Ground Water Board. The district has substantial agriculture activities. District area lies in tropical climate zone and has medium range of flora and fauna.
Cuttack	▪ Cuttack is situated between 84.58 degree and 86.20 east longitude; and 20.03 degree to 20.40 degree north latitude ▪ Cuttack has an area of 3932 sq kms ▪ The total population of Cuttack as per 2001 census is 2341094 ▪ Cuttack has three sub-divisions ▪ Cuttack is surrounded by Jajpur, Dhenkanal and Angul districts in the north, Puri, Nayagarh, Khurda and Jagatsinghpur districts in the south, Kendrapara district in the east and Boudh distrist in the west	▪ The climate is sub-humid and average annual rainfall is in the range of 1500 to 1550 mm ▪ The climate condition of the district is generally hot with high humidity during May and June and cold during December and January. The monsoon generally breaks during the month of June. Average annual rainfall of the district was 1842.2 m.m in 2007, which is higher than the normal rainfall (1501.3 m.m).	Cuttack has got Reserve Forests of 522.39 sq kms, Demarcated Protected Forests of 102.60 sq km, unclassified forests of 0.45 sq km and other category of forests of 163.65 sq kms		The district has many rivers. Principal rivers are Mahanadi and its big distirbutaries like Kathajodi and Brahmani. Kuakhai, Devi, Kushabhadra and many small offshoots of Mahanadi	The soil is very fertile and is of medium black alluvial type	Cuttack district has princip0al Kharif season with secondary Rabi seaon. The principal crop is Paddy. During the year 2006-07, the net area sown was 149 thousand hectares against 4823 thousand hectares of the state. Other crops grown are some amount of wheat, maize, ragi, mung, biri, kulthi, and till, groundnuts, mustard, Jute, potatoes & sugarcane	

Districts	Location	Climate	Ecologically Sensitive Area (Wildlife Sanctuaries/National Park etc)	Geomorphology (Major Physiographic Units and land use)	Major Drainage	Major Soil Type	Principal Crops	Key Environmental Issues
Dhenkanal	▪ Dhenkanal lies between 85.58 degree east to 86.2 degree east longitude, and from 20.29 degree north to 21.11 degree north latitude ▪ Its total area is 4452 sq kms and population 11,92,948 as per 2011 census ▪ The district touches Keonjhar district in the north, Jajpur district in the east, Cuttack in the south and Angul in the west ▪ Average annual rainfall is between 1400mm to 1450 mm ▪ Dhenkanal has three sub-divisions	▪ The climate condition of the district is generally hot with high humidity during April and May and cold during December and January. The monsoon generally breaks during the month of June.	▪ It has a forest area of 1737.62 sq kms ▪ Most part of the district is filled with dense forests and long range of hills. This district is called as the home of Elephants and Tigers. ▪ The principal forest products are Timber, bamboo, Firewood and Kendu leaf	▪ The district can be divided in to three natural divisions , 1. Southern hilly region. 2. The river Valley with tributains and 3. The northern hilly region.	▪ Major rivers of the district are Brahmani, Ramiala and Sapu	▪ The district has 5 major types of soils namely Alluvial soil available in river valleys, Red leam soil available in high land, Sandy loam soil found in patches, Gravelly soil found in hill slopes and Cleaving loam soil that is found through out the district.	Both Kharif and Rabi crop are grown here. Paddy, wheat maize, ragi,Oilseeds, pulses, vegetables and other crops are main crops	
Khurda	▪ Khurda is situated between 35.85 degree and 37.30 degree east longitude, and between 19.40 degree to 20.25 degree north latitude ▪ Total population is 1,87,7395 as per 2001 census ▪ Khurda's total area is 2887.50 sq kms ▪ Khurda has two sub-divisions-Khurda and Bhubaneswar	▪ Khurda's climate is hot and sub-humid. ▪ Average rainfall is between 1450 to 1500 mm			▪ Principal rivers are Kuakhai, Bhargabi, Budunai, Daya, Kushabhadra, Malaguni, rana and Kusumi	▪ Khurda has deltaic alluvium soil structure with laterite sub-regions	▪ Both Kharif and Rabi crop are grown here	
Puri	▪ Puri lies between 19.28 degree north to 26.35 degree north latitude, and from 84.29 degree east to 86.25 degree east longitude ▪ Puri has an area of 3051 sq kms ▪ Puri has only one sub-division	▪ Climate is humid with temperatures ranging between 14 degree to 37 degree Celsius throughout the year		▪ The whole district is divided into two dissimilar topographical terrains, viz: the Littoral Tract, and the Level Alluvial Tract, along with sea coast bays and islands	The principal rivers are Kushabhadra, Daya, Bhargabi, Kadua and Prachi.		Both Kharif and Rabi crop are grown here	

Districts	Location	Climate	Ecologically Sensitive Area (Wildlife Sanctuaries/National Park etc)	Geomorphology (Major Physiographic Units and land use)	Major Drainage	Major Soil Type	Principal Crops	Key Environmental Issues
Bhadrak	▪ Bhadrak lies between 21.4 degree and 21.067 degree north latitude, and between 86.30 degree & 86.50 degree north longitude ▪ The total area of Bhadrak is 1,721 sq kms ▪ The population is 1,33,2000 as prer 2001 census ▪ The district is bound by Balasore diostrict in the north, Baitrani river in the south, Keonjhar district in the west and Bay of Bengal in the east ▪ There is one sub-division i.e. Bhadrak. However there are seven tehsils, which are also blocks, viz; Basudebpur, Banta, Bhadrak, Chandbali, Dham Nagar, Tihidi and Bhandaripokhari	▪ Bhadrak has hot and humid climate with high precipitation ranging between 1400 to 1600 mm per year. ▪ The range of temperature throughout the year is between as high as 48 degree Celsius to 17 degree celsius	▪ The total forest area in 60.12 sq kms, i.e. 3.96 sq kms of demarcated protected forests, 32.98 sq kms of un-demarcated forests besides other forests. However, there are no reserved forests area	▪ The average altitude of the district is 13 metres	▪ A number of deltaic rivers, viz: Salandi, Baitarani, Kansabansa, Gamol, Mantei, Genguti, Kochila, Reba and Kapali pass through and around the district	▪ Bhadrak ha saline, alluvial and sandy soil, with salt tracks found along the coast and arable tracts in the inner precincts of the district	▪ Both Kharif and Rabi crop are grown here. However, Paddy is the principal crop, followed by pulses, vegetables and oilseeds	▪
Bargarh	▪ The district is located between 20°43' and 21°41' N Latitude and 82°39' and 83°58' E Longitude covering an area of 5837 Sq.Km with total population of 14,78,883 as per 2001 Census ▪ .The District is surrounded by Jharsuguda, Sambalpur, Sonapur, Balangir in north, east, and south respectively. It shares the boundary with Chhattisgarh State on the west side. ▪ It has an average elevation of 171 metres.	▪ The district is located between 20°43' and 21°41' N Latitude and 82°39' and 83°58' E Longitude covering an area of 5837 Sq.Km with total population of 14,78,883 as per 2001 Census ▪ .The District is surrounded by Jharsuguda, Sambalpur, Sonapur, Balangir in north, east, and south respectively. It shares the boundary with Chhattisgarh State on the west side.	▪ Debrigarh wildlife Sanctuary is located in the district but none of the subproject roads passes through or close to this sanctuary.	▪ The Bargarh plain is not a flat alluvial tract but an expanse of undulating country sloping down from the Barapahar hills in the north, to the Mahanadi valley in the east. The greater portion is an open plain of considerable fertility and being cultivated. ▪ In Hydro-geological aspects, it falls in the consolidated formations, which include hard crystalline and compact sedimentary rock. ▪ It has an average elevation of 171 metres.	▪ District is drained by Jira and Jhaun the two tributaries of Mahanadi.	▪ Red & Black; ▪ Laterite and Alluvial	▪ The major crops are Rice, Pulses like Arhar, Mung and Biri, Oil-seeds like Groundnuts, Til and Mustard.	▪ The district has no key environmental issue. Ground water is suitable for drinking as per Central Ground Water Board. The district has substantial agriculture activities. District has wildlife sanctuary and rich flora and fauna. Though the sample project road areas has medium range of flora & fauna
Bolangir	▪ The District is surrounded by Subarnapur district in east, Nuapada District in the west, Kalahandi District in the south and Bargarh District in the north. The District lies between 20^{o} 11'40 to 21^{o} 05'08 N latitude and 82^{o}41'15 to 83^{o}40'22 E longitude. The District covers an area of 6575 sq.km. ▪ Total population of the District is 1,337,194. comprising 673,985 male population and	▪ Minimum temperature measured in the District is 16.6 C and maximum is 48.7 C. 1215.6 mm average rainfall is experienced in Balangir District.				▪ Predominant soil groups found in the district are red, mixed red, black and alluvial soils.	▪ Paddy is the principal crop, accounting for 61 % of gross cropped area. ▪ Other important crops grown in the district are pulses,followed by oil seeds, fibre and other food crops like	

Districts	Location	Climate	Ecologically Sensitive Area (Wildlife Sanctuaries/National Park etc)	Geomorphology (Major Physiographic Units and land use)	Major Drainage	Major Soil Type	Principal Crops	Key Environmental Issues
	663,209 female population. The total SC population of the District is 226,300 and ST population is 275,822.						spices and condiments etc	
Jagatsinghpur	▪ Jagatsinghpur district is surrounded by Bay of Bengal in the East, Cuttack district in the West, Kendrapada district in the North and Puri district in the South. ▪ It is the smallest district of Odisha with ageographical area of 759 sq km, ▪ The district has got a total population of 11,36,604 including 577,699 male and 558,905 female as per 2011 census	▪ The district enjoys a temperate climate. Winters are cold, while summers are hot and humid. ▪ The District is prone to cyclonic rainfalls during the monsoons. ▪ The maximum temperature is 38^{o} C and minimum temperature is 12^{o} C. The average rainfall measured in the District is 1765.1mm.				▪ .The District enjoys rich fertile soil of the Mahanadi.	▪ The Major food crop grown in Jagatsinghpur District is paddy. ▪ Sugarcane, turmeric and cotton are the major commercial crops	
Jharsuguda	▪ District is located between 21034' and 220 02' N Latitude and 830 25' and 840 23' E Longitudes covering an area of 2081 sq. km. with total population of 5,14,853 As per 2001 Census. ▪ The district is surrounded by Sundargarh, Sambalpur and Bargarh, North, East, South and west respectively. It shares the boundary with Chhattisgarh State on the west side.	▪ The district is characterized by extreme climates with hot summer and well distributed rains. The summer temperature reaches a maximum of 46°C and drops to a lowest of 11°C in winter. ▪ The average annual rainfall is 1527 mm.	▪ There are no Wildlife Sanctuaries and National parks in the Project area.	▪ Varied topographic setup comprising rugged terrain with isolated hills and undulating plains. ▪ Major land use is agriculture. However, certain coal mines are also located in the district. ▪ It has an average elevation of 272 metres	▪ District is drained by River Ib a tributaries of Mahanadi, which flows along western side of Jharsuguda .	▪ Red & Yellow ▪ Laterite	▪ Paddy is the principle crop. The other crops grown in the district are oil seeds, pulses, vegetables and condiments.	▪ It falls in the semi-consolidated formations which include hard crystalline and compact sedimentary rock. ▪ The district has no key environmental issue. Ground water is suitable for drinking as per Central Ground Water Board. The district has substantial agriculture activities. District has medium range of flora and fauna
Sambalpur	▪ Sambalpur district lies between 20° 40' N and 22° 11' N latitude, 82° 39' E and 85° 15' E longitude with a toal area of 6,702 Sq. Kms. The district is surrounded by Deogarh district in the east, Bargarh and Jharsuguda districts in the west, Sundergarh district in the north and Subarnpur and Angul districts in the South.	▪ Sambalpur district experiences extreme type of climate with 153 centimeters rainfall on an average per annum. Most of the rainfall is confined to the months from June to October ▪ Mercury rises upto 47° celcius during May with intolerable heat wave and falls as low as 11.8° celcius during December with extreme cold.	▪ The district has a total forest area of 3986.27 Sq. Kms. which is 59.46% of the total area of the district.	▪ The district has three distinctive physiographic units such as, Hilly Terrain of Bamra and Kuchinda in the north, plateau and ridges of Rairakhol in the south-east and valley and plains of Sambalpur Sub-division in the south east. ▪ Sambalpur district forms a part of North-West upland of Odisha, which is rolling and multiplying the ground slopes from a height of 776 ft. to a height of 460 ft.	The district forms a part of the Mahanadi River basin. Other important rivers of the district are the Maltijor, the Harrad, the Kulsara, the Bheden, and the Phuljharan.	The thick blanket of black cotton soil all over the district has been made somewhat sticky by the yellow earth developing in the undulating topography of the district.	Total land under cultivation in the district is 173540 hectares. Paddy is the principle crop.	

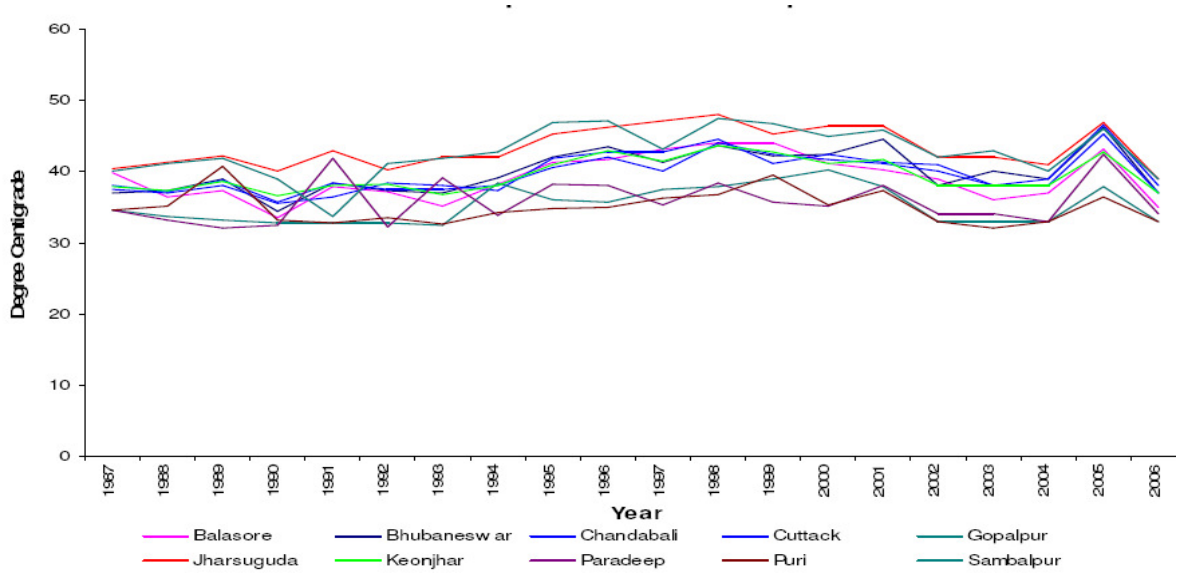


Figure III.1 : Annual Maximum Temperature in Odisha

49. The state receives most of its rainfall from the southwest monsoon between mid-June to early October. A few pre-monsoon showers during April to mid-June and few during the winter months from the retreating northeast monsoon are not infrequent in the state. But most of the precipitation is confined to the four months from July to October. Consequently many parts of Odisha are hit by severe drought. The maximum and minimum rainfall is in the neighbourhood of 1,800 mm and 1,000 mm respectively; the average is about 1,500 mm. Cyclonic storms (due to depression in Bay of Bengal), sometimes of devastating magnitude followed by heavy rains occur in the months of September, October and November frequently. On the average there are about 60 to 70 rainy days in a year.

50. **Rainfall:** The rainfall in the project districts range between 1,082 mm to 1,527 mm, out of which more than 80% is received between June to September.

51. **Relative Humidity:** Normally, May to October months are humid and January to April are dry. The relative humidity in project districts range between 15 to 92%.

2. Air Quality

52. 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 to fulfill this requirement:

Table III.2 Ambient Air Quality during 2008

	SO_2 (µg/m^3)	NO_2 (µg/m^3)	RSPM (µg/m^3)
Industrial	14	24	34
Residential	8	23	61
NAAQS	80	80	100

Source: National Ambient Air Quality Status, 2008, CPCB and Table III.3.

53. The above reveals that the concentration of all the pollutants well within the limits (NAAQS). A comparison of the pollutant concentration levels in different years is given in **Table III.3.** The table gives higher suspended particulate matter levels, which 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.

3. Noise

54. 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 limited to daytime. The existing roads do not appear to have vehicular traffic in the night time. Therefore, the ambient noise levels are expected to be within the National Ambient Noise Standards.

4. Topography and Geomorphology

55. Odisha is located between the parallels of 17.49'N and 22.34'N latitudes and meridians of 81.27'E and 87.29'E longitudes. It is bounded by the Bay of Bengal on the east, Chhattisgarh on the west and Andhra Pradesh on the south. It has a coastline of about 450 kms. It extends over an area of 155,707 sq km. according to the 1991 census. This region is the combination of several deltas of varied sizes and shapes formed by the major rivers of Odisha, such as the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi, and the Rushikulya. Therefore, the coastal plain of Odisha is called the"Hexadeltaic region" or the "Gift of Six Rivers". It stretches along the coast of the Bay of Bengal having the maximum width in the Middle Coastal Plain (the Mahanadi Delta), narrow in the Northern Coastal Plain (Balasore Plain) and narrowest in the Southern Coastal Plain (Ganjam Plain). The North Coastal Plain comprises the deltas of the Subarnarekha and the Budhabalanga rivers and bears evidences of marine transgressions. The Middle Coastal Plain comprises the compound deltas of the Baitarani, Brahmani and Mahanadi rivers and bears evidences of past 'back bays' and present lakes. The South Coastal Plain comprises the laccustrine Plain of Chilika Lakeand the smaller delta of the Rushikulya River. The plateaus are mostly eroded plateaus forming the western slopes of the Eastern Ghats with elevation varying from 305-610metres. There are two broad plateaus in Odisha: (i) the Panposh - Keonjhar –Pallahara plateau comprises the Upper Baitarani catchment basin, and (ii) the Nabrangpur -Jeypore plateau comprises the Sabari basin.

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

CITY	LOCATION	Type of Area	SO_2			NO_2			RSPM (PM10)			SPM		
			2004	2007	2008	2004	2007	2008	2004	2007	2008	2004	2007	2008
NAAQS			**80**			**80**			**100**			**-**		
Sambalpur	Roof of Filter Plant PHD Off.	R	-	BDL	3	-	11	14	-	74	0	-	163	130
Behrampur	Regional Office	R	-	BDL	BDL	-	15	13	-	89	6	-	201	154
Talcher	T.T.P.S. Colony	I	5	8	14	20	18	24	79	71	16	163	142	234
	Coal Field	I	5	10	10	8	15	19	95	95	4	203	192	189
Angul	Industrial Estate	I	BDL	6	6	17	17	22	61	107	34	113	186	282
	NALCO Nagar Township	R	4	5	8	8	19	18	101	54	24	188	102	172
Rourkela	IDL Police Outpost	R	5	6	6	9	10	10	82	57	61	165	105	215
	Regional Office	R	BDL	5	5	9	10	11	73	68	50	132	130	188
Rayagada	Jaykaypur	I	BDL	BDL	BDL	7	10	19	56	65	0	100	117	112
	Regional Office	R	BDL	BDL	BDL	11	13	20	59	81	1	107	156	121
Bhubaneshwar	SPCB Building	R	5	BDL	BDL	20	14	18	79	75	14	163	169	158
	IRC Village	R	5	BDL	BDL	8	13	21	95	88	40	203	324	166
	Capital Police Station	R	BDL	BDL	BDL	17	16	18	61	49	22	113	125	157
Cuttack	R.O. Cuttack Office	R	-	BDL	BDL	-	16	23	-	62	32	-	157	281
	Roof of Traffic Tower	R	-	BDL	BDL	-	43	16	-	62	28	-	138	167

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)

5. Topography and Geomorphology

56. Odisha is located between the parallels of 17.49'N and 22.34'N latitudes and meridians of 81.27'E and 87.29'E longitudes. It is bounded by the Bay of Bengal on the east, Chhattisgarh on the west and Andhra Pradesh on the south. It has a coastline of about 450 kms. It extends over an area of 155,707 sq km. according to the 1991 census. This region is the combination of several deltas of varied sizes and shapes formed by the major rivers of Odisha, such as the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi, and the Rushikulya. Therefore, the coastal plain of Odisha is called the "Hexadeltaic region" or the "Gift of Six Rivers". It stretches along the coast of the Bay of Bengal having the maximum width in the Middle Coastal Plain (the Mahanadi Delta), narrow in the Northern Coastal Plain (Balasore Plain) and narrowest in the Southern Coastal Plain (Ganjam Plain). The North Coastal Plain comprises the deltas of the Subarnarekha and the Budhabalanga rivers and bears evidences of marine transgressions. The Middle Coastal Plain comprises the compound deltas of the Baitarani, Brahmani and Mahanadi rivers and bears evidences of past 'back bays' and present lakes. The South Coastal Plain comprises the laccustrine Plain of Chilika Lake and the smaller delta of the Rushikulya River. The plateaus are mostly eroded plateaus forming the western slopes of the Eastern Ghats with elevation varying from 305-610metres. There are two broad plateaus in Odisha: (i) the Panposh - Keonjhar –Pallahara plateau comprises the Upper Baitarani catchment basin, and (ii) the Nabrangpur -Jeypore plateau comprises the Sabari basin.

57. The project districts fall under the rolling upland category and include a number of erosional plains and river basin of Mahanadi presenting an upland plain as shown in **Figure 3.2**. The tract covers major parts of districts of Sambalpur, Deogarh, Jharsaguda, Bargarh, Bolangir, Sonepur, Dhenkanal, Angul, Boudh, Nayagarh, Khurda and northern parts of Phulbani (Kandhamal) and western part of Puri districts.

58. Ground elevation of the project districts vary from 150 to 300 m above mean sea level, but the topography of the project region is mostly flat.

6. Geology/Soil

59. Three distinct geological formations namely Consolidated, Semi-consolidated and Unconsolidated are found in Odisha as detailed at **Table III.4**. The project districts comprise of semi-consolidated formation of the Gondwana group and is covered with the rocks of Eastern Ghat mobile belt.

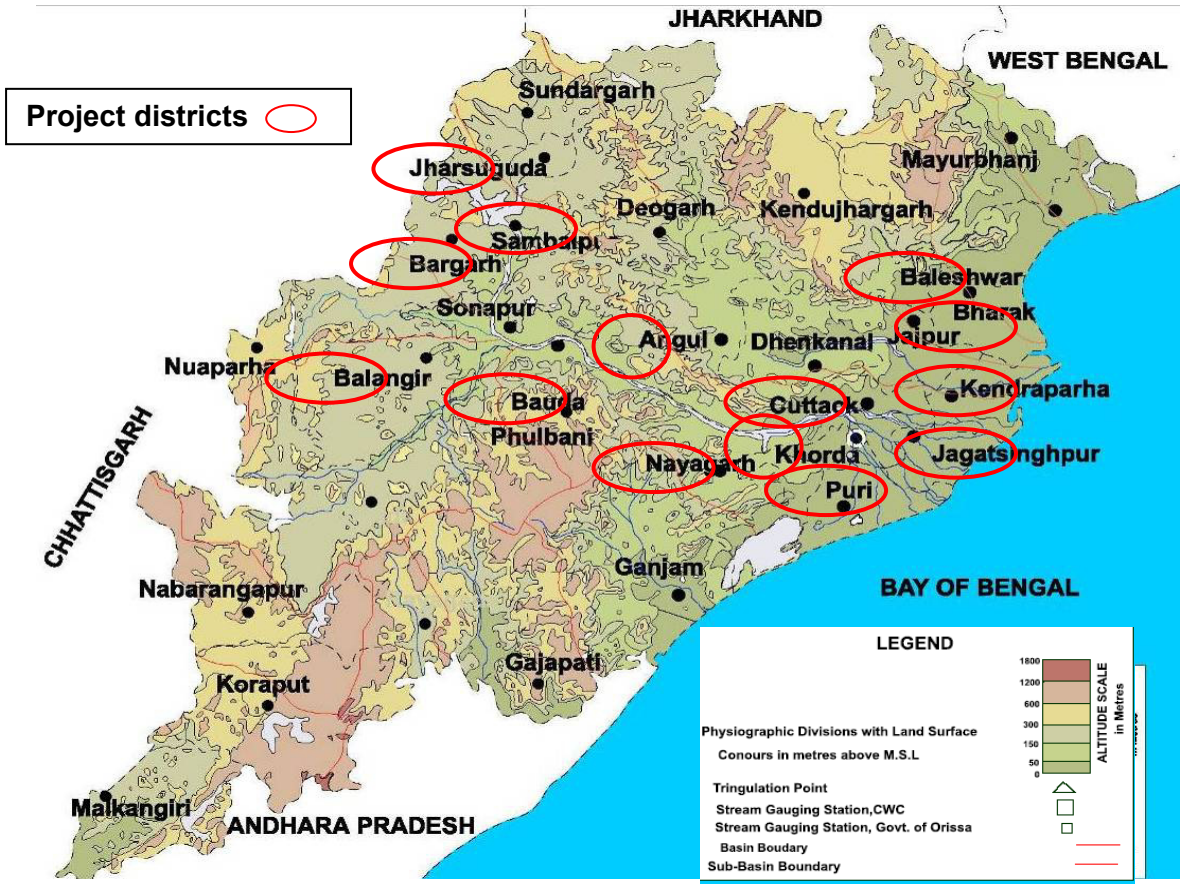


Figure III.2 : Physiography of Odisha

Table III.4 : Distribution of Major Geological Units in Odisha

Geological Age	Rock formation		Districts
CONSOLIDATED FORMATION			
Pre-Cambrian	Archaean complex	Granite gneisses Charnockites, Khondalites, Schist, Phyllite, slates, Granulite,Banded Haematite-Quartzite etc.	Occur in all districts except Kendrapara, Jagatsinghpur, Bhadrak
	Cuddapah Vindhyan	Shale, Sand Stone, Quartzite, Limestone etc.	Koraput, Nowrangpur, Bargarh, Nawapara
SEMI – CONSOLIDATED FORMATION			
Palaeozoic – Mesozoic	Gondwana Group	Boulder bed, Sandstone, Shale and coalseams	Angul, Sambalpur, Jharsuguda, Cuttack, Khurda, Bolangir, Phulbani, Sundergarh,
Tertiary	Baripada beds	Loosely cemented calcareous sandstone	Mayurbhanj
UNCONSOLIDATED FORMATION			
Pleistocene to Recent		Alluvium (clay, silt, gravel and sand in varying proportion)	Ganjam, Gajapati, Mayurbhanj, Khurda, Puri, Cuttack, Kendrapara, Jajpur, Bhadrak, Balasore, Keonjhar, Rayagada, Koraput, Nawarangapur.

Source: Central Ground Water Board, South Eastern Region, Bhubaneshwar.

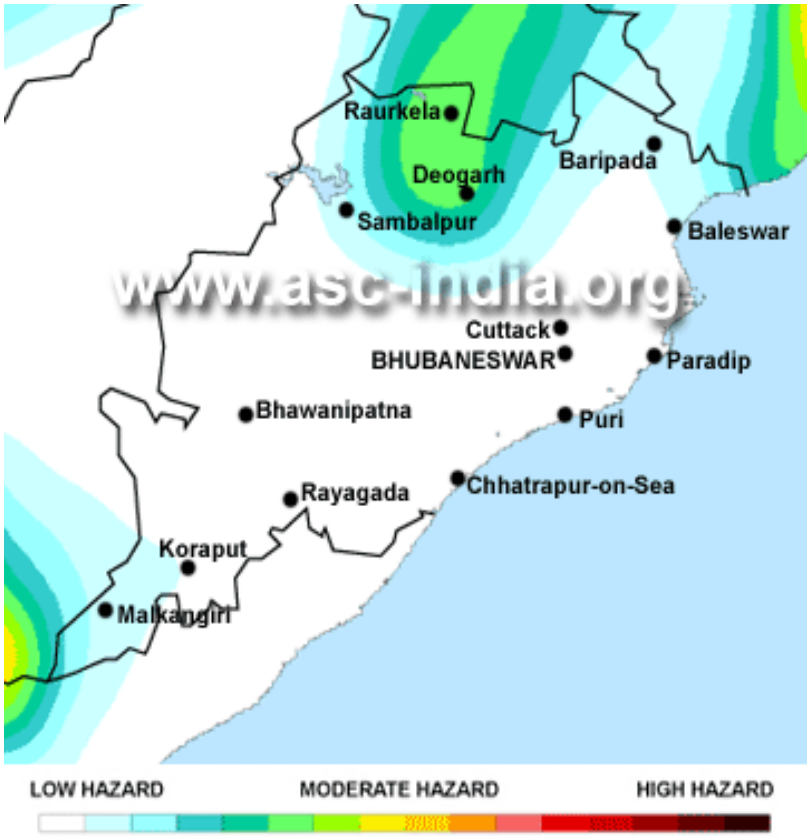
7. Soils

60. The state has different soil types ranging from fertile alluvial deltaic soils in coastal plains, mixed red and black soils in central table land, red and yellow soils with low fertility in northern plateau and red, black& brown forest soils in Eastern Ghat region. The soil types differ widely from high acidic with the degree of acidity varying widely. The majority of soils in Odisha are light textured red soils, which have low water holding capacity, low fertility and are highly erodible.

61. The major soil types within the project districts can be classified into five groups namely: inceptisols, ultisols, entisols, aridisols and alfisols. These soil types can be further classified into brown, red, yellow and lateritc soils. The entisols is sub-classified into younger alluvial, and laterite soils. The aridisols is sub-classified into saline and salinealkali soils. The alfisols is sub-classified into deltaic alluvial soils, older alluvial soils, redgravel soils, red sandy soils, red sandy soils, red loamy and mixed red black soils.

8. Earthquake & Seismicity

62. A large portion of Odisha comes under earthquake risk zone-II (low damage risk zone). The Mahanadi and Brahmani graven, Mahanadi delta and parts of Balasore and Mayurbhanj district come under earthquake risk zone –III (moderate damage risk zone). The seismic hazard map of India was updated in 2000[3] by the Bureau of Indian Standards (BIS) as shown in **Figure 3.3**. It reveals that the project region falls in Zones II & III i.e., low to moderate risk zone. According to Global Seismic Hazard Assessment Program (GSHAP) data, the state of Odisha falls in a region of low to moderate seismic hazard. As per the 2002 Bureau of Indian Standards (BIS) map, Odisha also falls in Zones II & III. Historically, parts of this state have experienced seismic activity in the M4.0 range. The hazard zoning map is shown in **Figure 3.4**.



Source: Amateur Seismic Centre, Pune

Figure III.3 : Hazard Zone Map

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

Source: Odisha State Disaster Management Authority

Figure III.4 : Seismic Zone Map

9. Land use

63. The state has broadly divided into 4 physiographic zones namely coastal plains, central tableland, northern plateau and Eastern Ghats. The area under various land uses in the state is presented in **Figure 3.5**. It shows that the state records a forest area of 37.3% of the total State area. The cultivated area accounts for about 40% indicating the dominance of agriculture. As per the report of Odisha Remote Sensing Application Centre of 2002, water body covers an area of 230104.36 ha. The Wasteland Atlas of India -2000 reports shifting cultivation area in the state to be 10014.07 ha and mining industrial wasteland of 35.45 ha. This area is gradually increasing as per the other published reports. The land use pattern within the project districts can be broadly classified into arable irrigated, arable un-irrigated, forest areas, waste land/scrub, and rural / urban settlements areas.

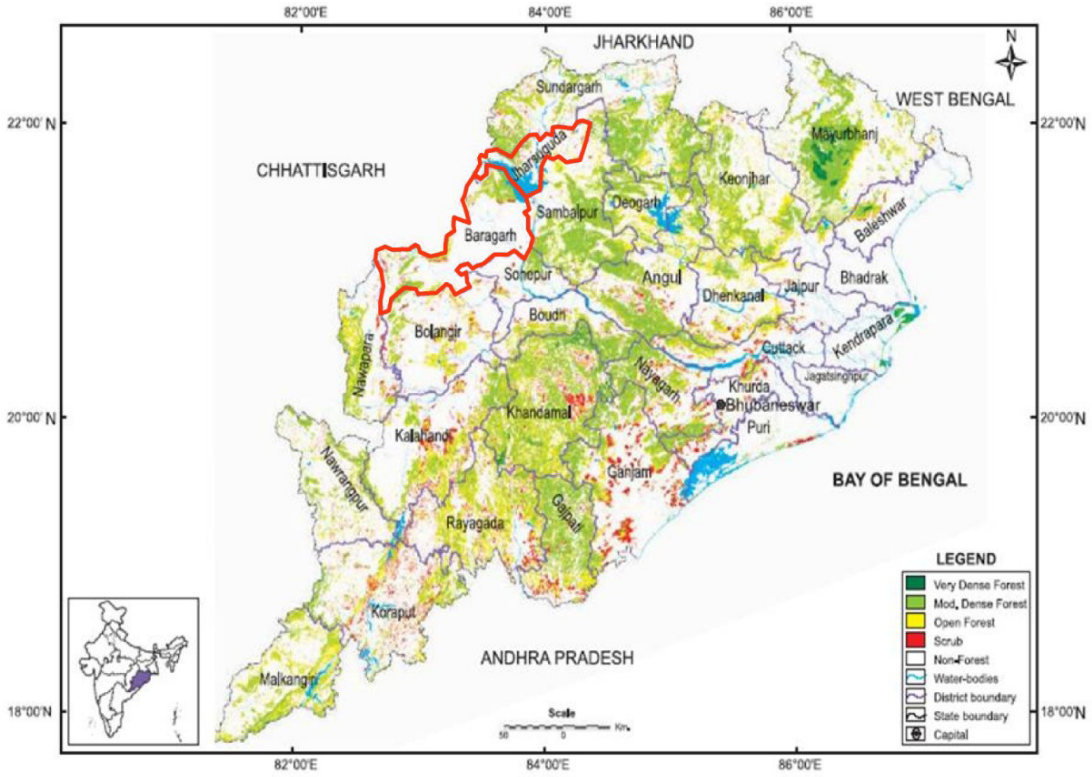


Figure III.5 : Land Use Pattern in the Project Districts

10. Hydrology and Water Quality

64. Odisha is drained by the Mahanadi, Brahmani, Baitarani, Nagaballi, Subarnarekha, Rusikulya and the Budhabalanga rivers along with their tributaries and distributaries. The tributaries of Mahanadi are Ib, Jhaun, Jira. The Sankh and the Tirka are important tributaries of Brahmani. Those of Baitarni are the Salandi and the Matai.

65. Hydro geologically, the area is underlain by diverse rock types ranging in age from Achaean to Recent. The State can be hydro-geologically sub divided into consolidated, semi-consolidated & unconsolidated formations as shown in **Figure III**.66.

66. **Surface Water Quality**: The rural road construction proposals normally cross small drainage channels (Mostly agricultural field 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. Therefore, surface water quality is expected to remain as such.

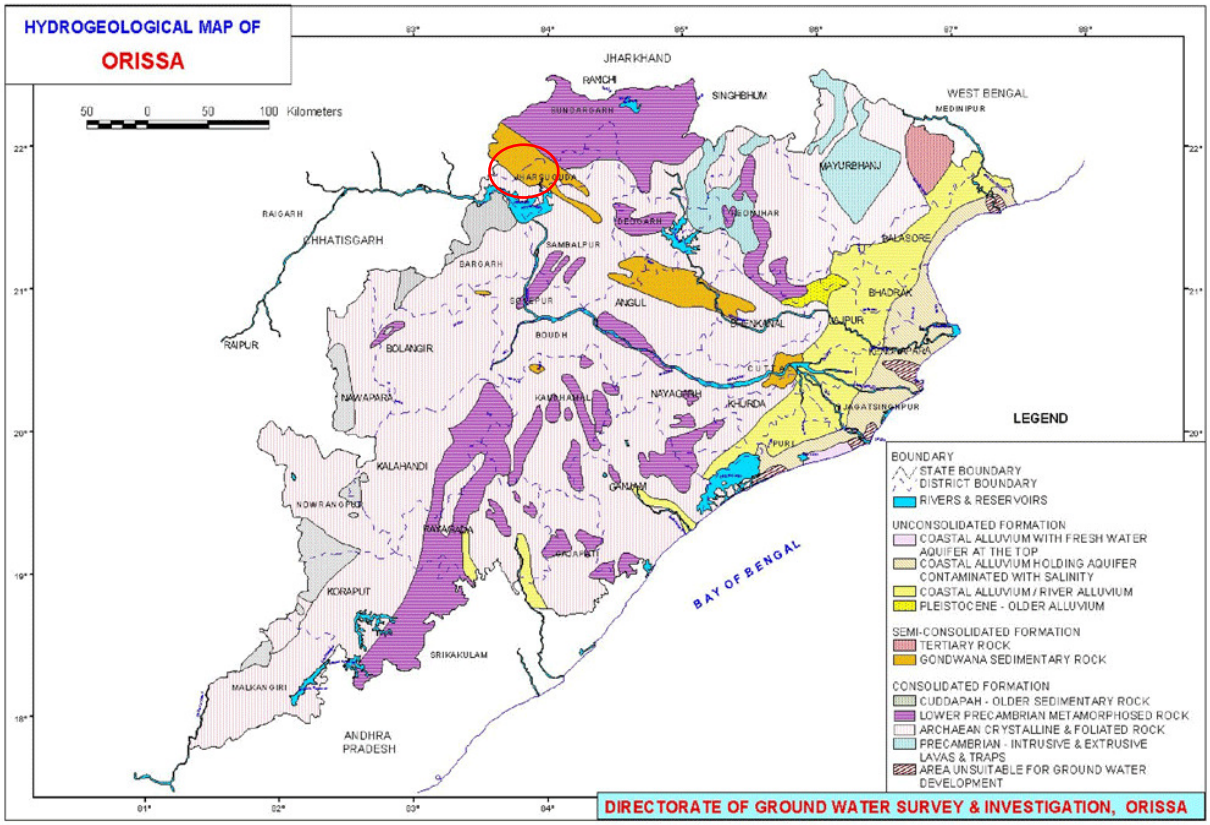


Figure III.6 : Hydrogeology of Odisha

67. **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.

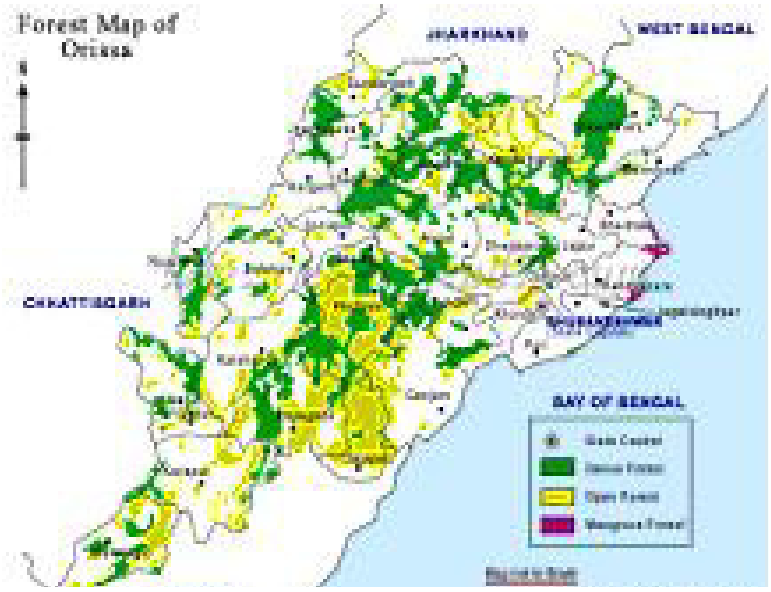
68. The groundwater potential in the project districts vary from than 1 liter/sec to 40 liter/sec. the hydro-geological formations in the coastal districts range between porous confined aquifers having primary intra-granular porosity (with yields up to 40 liter/sec). to upland regions with generally limited ground water potential having less intra-granular porosity and fractures (with yield less than 1 liter/sec) the occurrence of ground water table range from 1m above mean sea level to 500 m above mean sea level across the state.

69. An investigation was carried out by Mahananda et al. in 2010[4] to study the ground as well as surface water quality, nutrient status and physico-chemical characteristic of Bargarh district. The analysis was conducted for two types of ground water (dug and bore well) and three types of surface water (temple and community ponds). A comparative study of both type of ground water as well as pond water was carried out by taking certain important parameters like

[4] Mahananda, M.R., Mohanty, B.P. and Behera, N.R., 2010. "Physico-Chemical Analysis of Surface and Groundwater of Bargarh District, Odisha, India", International Journal of Research and Reviews in Applied Sciences, 2010, pp.284-295.

temperature, pH, total suspended solid, total dissolved solid, alkalinity, dissolved oxygen, chemical oxygen demand, nitrate, chloride, sodium, potassium, phosphate, fluoride and total coliform and faecal coliform (pond water). It was found that the maximum parameters were not at the level of pollution except few parameters like nitrate for ground water. So, both type of ground water satisfy the requirement for the use in various purposes. But the study of pond water indicated that the community ponds are highly polluted and unsafe for human use. Temple pond was comparatively less polluted than small and large community ponds, the study concluded.

C. Ecological Resources



70. The state of Odisha is known for abundance of natural beauty and wildlife. The major types of forests present in the state are tropical moist deciduous type and tropical dry deciduous type. The hills, plateaus and isolated areas of the northeastern part of the state are covered by the tropical moist deciduous forests whereas the second types of the forests are located in the southwest region of the state. Some of the trees which grow in abundance in Odisha are bamboo (*Dendrocalamus sp.*), Teak (*Tectona grandis*), Mahula (*Madhuca indica*), sal (*Shorea robusta*), Jamun (*Syzygium cumini*), Dhoben (*Dalbergia paniculata*) Mundi (*Mitragyna parvifolia*) etc. There are 479 species of birds, 86 species of mammals, 19 species of amphibians and 110 species of reptiles present in Odisha. The state is also an important habitat for the endangered Olive Ridley turtles and Irrawaddy dolphins (found in coastal district of Odisha).

1. Terrestrial flora:

71. Important floral species observed in the project area are Amba (*Mangifera indica*), Aaola (*Emblica officinalis*), Arjun (*Terminalia arjuna*), Ashok (*Saraca asoca*), Bahada (*Terminalia belerica*), Bandhan (*Ougenia oojeinensis*), Bija (*Pterocarpus* marsupium), Bheru (*Chloroxylon swietiana*), Char (*Buchanania lanzan*), Dhaman (*Grewia tiliofolia*), Dhaura(*Anogeissus latifolia*), Dhoben (*Dalbergia paniculata*), Genduli (*Sterculia urens*), Harida (*Terminalia chebula*), Jamun (*Syzygium cumini*), Kanchan (*Bauhinia spp.*), Karanj (*Pongamia glabra*), Kendu (*Diospyros melanoxylon*), Khair (*Acacia* catechu), Kochila (*Strychnos nuxvomica*), Kongra (*Xylia xylocarpa*), Kurum (*Adina cordifolia*), Kusum (*Schleichera olesa*), Mahalimba (*Ailanthus excelsa*), Mahula (*Madhuca indica*), Tentra (*Albizia procera*), Mundi (*Mitragyna* parvifolia), Phasi (*Anogeissus acuminata*), Pitamai (*Garuga pinnata*), Rai (*Dillenia pentagyna*), Rajmohi (*Lannea coromandelica*), Rimili (*Bursera serrata*), Saguan (Tectona *grandis*), Sal (*Shorea robusta*), Salai (*Boswellia serrata*), Semal (*Bombax ceiba*), Sidha (*Lagerstromia parviflora*), Silveroak (*Grevillea robusta*), Siris (*Albizzia lebbeck*), Sisso (Bali) (*Dalbergia sisoo*), Sissoo (Pahari) (*Dalbergia latifolia*),Sunari (*Cassia fistula*), Tentuli (*Tamarindus indica*) etc.

72. The project area lies in tropical moist deciduous type and tropical dry deciduous type zone, it has a medium range of flora and fauna. However, none of the roads consists of any rare, endangered or threatened floral species**.**

2. Terrestrial/Avian fauna:

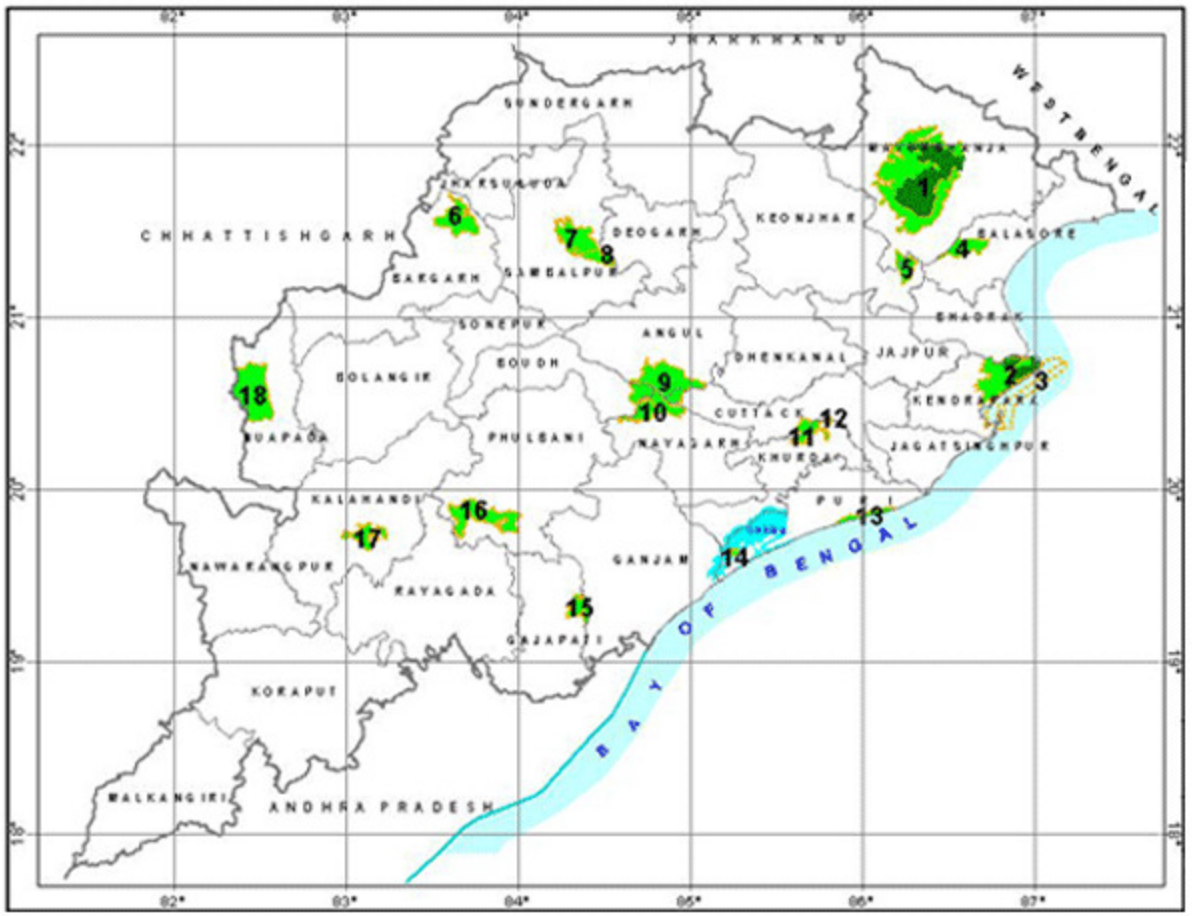
73. The protected area (PA) network in the state comprises of 18 sanctuaries as given in **Table III.5** and **Figure 3.7**. It constitutes 4.2% of the geographical area of the state and 11.4% of the forest area.

Table III.5 : List of Protect*ed Areas in Odisha*

Sanctuaries			
S. No.	***Name***	***Distric*t Located**	**Area (sq. km)**
1.	Badrama	Sambalpur	304.03
2.	Baisipali	Nayagarh	168.35
3.	Balukhand-Konark	Puri	71.71
4.	Bhitarkanika	Kendrapara	672.00
5.	Debrigarh	Baragarh	346.91
6.	Gahirmatha	Kendrapara	1435.00
7.	Hadgad	Keonjhar	191.06
8.	Karlapat	Kalahandi	147.66
9.	Khalasuni	Sambalpur	116.0
10.	Kotgad	Phulbani	399.05
11.	Kuldhia Wildlife	Balasore	272.75
12.	Lakhari Valley	Gajapati	185.87
13.	Nalaban(Chilika)	Khurda, Puri & Ganjam	15.53
14.	Satkosia Gorge	Angul, Nayagarh, Phulbani	745.52
15.	Sunabeda	Nuapada	591.75
National Parks			
1.	Nandankanan	Khurda	14.16
2.	Similipal Tiger Reserve	Mayurbhanj	2200.00
3.	Chandaka Elephant Reserve	Khurda & Cuttack	175.79

74. Debrigarh Wildlife Sanctuary is about 5 km away from the proposed roads in Ambabhona and Bhatli blocks in Bargarh District.

75. Important faunal species found in the forest areas of Odisha are Sambar (*Cervus unicolar*), Chital (*Axis axis*), Barking deer (*Muntiacus muntjak*), Indian wild boar (*Sus scrofa*), Rhesus macaque (*Macaca mulatta*), Common langur (*Presbytis entellus*), Indian porcupine (*Hytrix indica*), and Indian pangolin (*Manis crassicaudata*). However, none other than Langur was observed near the subproject rods areas. The occurrence of wildlife species and or threatened or endangered species has not been reported within subproject road areas.



Index map of
Wildlife Sanctuaries &
National Parks

30 0 30 60Km.

1. Similipal Sanctuary & National Park
2. Bhitarkanika Sanctuary & National Park
3. Ghahirmatha Marine Sanctuary
4. Kuldhia Sanctuary
5. Hadgarh Sanctuary
6. Debrigarh Sanctuary
7. Badrama Sanctuary
8. Khalasuni Sanctuary
9. Satkosia Gorge
10. Baisipalli Sanctuary
11. Chandaka-Dampara Sanctuary
12. Nandankanan Sanctuary
13. Balukhand-Konark Sanctuary
14. Nalaban Sanctuary
15. Lakhari Valley Sanctuary
16. Kotgarh Sanctuary
17. Karlapat Sanctuary
18. Sunabeda Sanctuary

Figure III.7 : Protected Area Map of Odisha

3. Aquatic Biology:

76. No wetland or big water bodies are located in and around the selected subproject road areas. Therefore construction works are not envisaged to affect aquatic biology of the area. The aquatic life in few ponds located along the certain roads limited to fishing only.

D. Socioeconomic Environment

1. Demography

77. The state has an overall population of 41.95 million people. As per 2001 census 5.496 million lived in towns. The corresponding rate of urbanization is 15%, compared to almost 30% to India as a whole. In 2001, the state's average population density was 236 persons per km^2. In 2011 the gender ratio of the state is 978, which is more than the country as a whole (940). The literacy rate overall is 73.45 % which is slightly lower than the country average (74.04%). The male literacy rate is 82.4% whereas female literacy rate is 64.36%. The demographic profile of the state in comparison with the national average is shown in **Table III.6.**

Table III.6 : Demographic Profile

S. No.	Item	Odisha	India
1	Total population (Census 2011) (in million)	41.95	1210.19
2	Decadal Growth (Census 2011) (%)	13.97	17.64
3	Crude Birth Rate (SRS 2008)	21.4	22.8
4	Crude Death Rate (SRS 2008)	9.0	7.4
5	Total Fertility Rate (SRS 2008)	2.4	2.6
6	Infant Mortality Rate (SRS 2008)	69	53
7	Maternal Mortality Ratio (SRS 2004 - 2006)	303	254
8	Sex Ratio (Census 2011)	978	940
9	Population below Poverty line (%)	47.15	26.10
10	Schedule Caste population (in million)	6.08	166.64
11	Schedule Tribe population (in million)	8.15	84.33
12	Literacy Rate (Census 2011) (%)	73.45	74.04
13	Male Literacy Rate (Census 2011) (%)	82.4	82.14
14	Female Literacy Rate (Census 2011) (%)	64.36	65.46

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

2. Healthcare

78. As of 2001, there are 180 hospitals, 183 PHCs, 1,166 new PHC (new) and 14 mobile health units in the entire state. There are 13,786 hospital beds with 7,560 people per doctor and 2,663 people per hospital bed (India average 1361) in the state which is far from satisfactory. The state is well behind the aims of National Health Policy of providing universal health care and access to medical services. Life expectancy in the State has crawled to 57 years against national average of 61. The fact worrying the Government is the infant mortality rate (IMR)

which is the highest (96 per thousand) in India. Contaminated water contributes substantially to the ill heath of the society. Lack of sanitation is another factor which affects the rural people mostly. The habit of people to defecate in the open is one sure reason for spreading of water borne diseases. It is important to provide flush latrines in villages and motivate people to use them.

3. Literacy and Education

79. The literacy rate in the state is 73.45% which is slightly lower than the country average (74.04%). The male literacy rate is 82.4% whereas female literacy rate is 64.36%. Compared to more advanced states of the country the literacy rates needs improvement. Poor literacy areas are again the less developed south and west districts. Only a third (11 out of 30) districts have a literacy rate more than 70% most of which belong to the coastal area. Improvement in literacy rate changes the outlook of the people and makes them more useful assets of the community. The spread of literacy and education among women are more fruitful for the society. There are 35 engineering colleges, 3 medical colleges, 26 engineering schools and 24 ITIs to provide technical education.

4. Economy

80. The economy of Odisha has been lagging behind the national economy by several decades. Its per capita net state domestic product, a measure of average income, stood at Rs. 20,200 for 2006-07, which falls behind the national average by about 35%. Moreover, the gross domestic product of the state grew by a considerable lower rate than many other states for a long time despite its high growth potential.

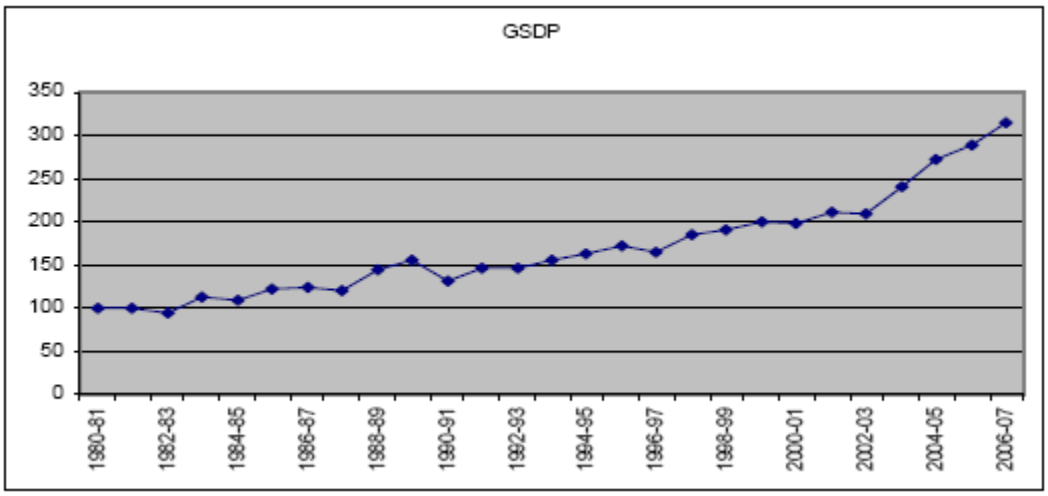


Figure III.8 : Index of Real GSDP in Odisha

81. Odisha's real GSDP has grown by an average annual rate of 4.8% on a long term basis during 1980-81 to 2006-07 compared to 6% for the same period for the nation as a whole. The index number of GSDP (with 1980-81 = 100.0) shown in Figure 3.9 nearly doubled over the 20-year period 1980-2000 and has further increased by another 60% since then. In particular, the figure shows a sharp rise in the index after 2002-03. The average GSDP growth rate of 8.6% per annum during the period 2002-03 to 2006-07 compares very well with the national level. The per capita income of Odisha was about Rs. 7,700 at 1999-2000 prices in the year 1980-81. It nearly doubled to Rs.15100 in 2006-07 (**Figure 3.10**). Per capita income at the national level

has grown by 160% from about Rs.8,600 to Rs.22,700 during the same period. Odisha thus continues to remain behind the national average considerably.

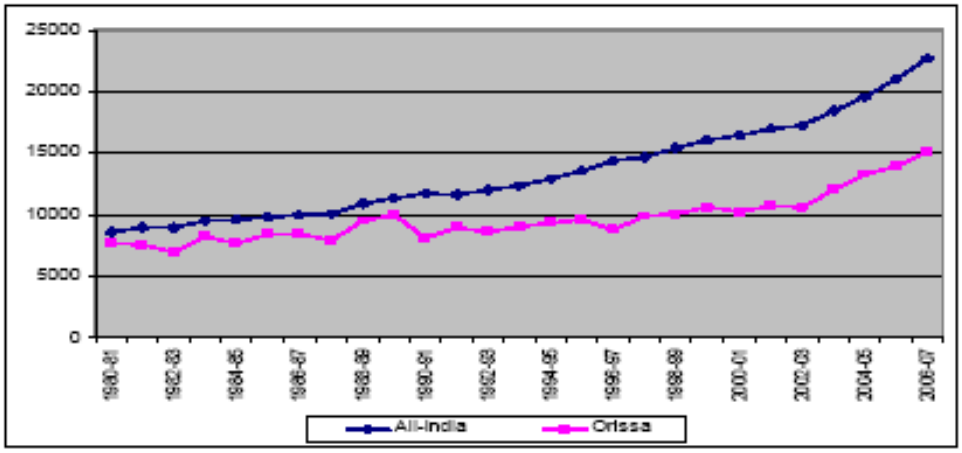


Figure III.9 : Per Capita Income (NDP) at 1999-2000 prices: Odisha and All India

5. Agriculture

82. The majority of the population in project districts is dependent on agriculture and subsistence forest. Podu cultivation (slash and burn) is practiced extensively by the tribals in the"dongar" (Upland). In the high hill slopes pulses, millets, mandya (ragi) and oilseeds like niger and mustard are grown. In the "Bilo" (low land) paddy is cultivated. Horticulture is also practiced particularly among the tribals. Vegetables are also cultivated crops being sweet potato, beans, chilly and yam. The agriculture is rain-fed. The agricultural implements used are still wooden plough, wooden plod-breaker (coporpotta) and phouda sickle and hand axe especially in the backward districts of Koraput, Malkangir etc.

6. Industry and Mines

83. Although Jharsuguda and Sundergarh have major industrial areas, none of them fall with in the core or the buffer zone of the proposed road corridors. In general, none of the proposed road falls in mineral mining area whereas coal mining is the major mining activities of Jharsuguda districts. Sundargarh is known for the iron ore mining areas and Rourkela steel plant. None of these mining areas fall within subproject areas.

7. Flood Control facilities:

84. Odisha is generally prone to various disasters like flood, cyclone, drought and fire. The last super cyclone in 1999 is an unforgettable event in the history of Odisha so also the high flood in 2001 and the drought in 2002. Bargarh roads are prone to flood during monsoon season. Various organizations working in Odisha in the field of disaster management as given below might be consulted for any further precaution in construction work apart from proper drainage provisions.

- Odisha State Disaster Mitigation Authority
- National Informatics Centre
- UNDP

8. Archaeological/Historical monuments:

85. Although, Odisha is known to have several archaeological and historical/protected monuments spread all over the state, none of them are situated within 5 km on each side from the sample project roads.

9. Temples/Shrines/Idols/Statues:

86. No historical religious structure falls close to proposed sample roads. Small tombs and roadside small temples do falls. Some of these which might be impacted or require relocation due to the construction works.

10. Power

87. During 2002-03, State's share in installed capacity in the State sector was 2,798.88 MW (hydro 1,918.88 MW and thermal 880.00 MW) against which power was available to the extent of about 869 MW. In addition to this, 440 MW of power was received from Central sector projects towards State share and 62 MW of power was purchased from captive power plants installed in the State by different industries. Thus, from all sources about 1371 MW of power was available against the estimated demand of 1367 MW. Out of 46,989 inhabitated villages in the State, 37,790 villages have been electrified by the end of 2002-03 with coverage of 84%. (*Source: Economic survey, 2003-04*)

E. Salient Environmental Features of Sample Roads

88. The salient environmental features of sample roads are summarized in **Table III.7** below.

Table III.7 : Salient Environmental Features of Sample Roads

Sl No.	District	Block	Road Name	Salient Environmental Features
1	Angul	Chendipada	Golagadia Salakhaman road (3.50km)	• The topography is mostly plain • The road passes through patches of agriculture land • Habitation areas are at Ch. ch 2/440 to 2/744 and 3/100 to 3/500 • A Pond located at Ch. 2/100 to 2/240. • Few tree cutting and utility/community structure shifting will be required • 2 schools and 1 temple are within the 10m COI but none is affected by the road.
2	Balasore	Oupada	Bankipada to Bidubazar Road (4.5 km)	• Topography is plain. • Road passes through agricultural & barren land • Habitation areas are located at Ch. 0/100 to 0/600, 1/400 to 2/100 & 3/400 to 3/900. • Nallahs are at CH 0+650, 3/520 & 4/045 and part of the road gets submerged due to flood during rains • Few tree cutting and utility/community structure shifting will be required.
3	Balasore	Simulia	NH-5 Anantapur (2.7 km)	• Topography is plain. • Habitation areas are at Ch. Ch. 1/800 to 2/250. • Protection works required at Ch- 1/140 to 1/290 and 1/850 to 1/900 • Few tree cutting and utility/community structure

Sl No.	District	Block	Road Name	Salient Environmental Features
				shifting will be required
4	Balasore	Soro	Nuahat Sujanpur (5.52 Km)	• The topography is mostly plain • Habitation areas are located at Ch. 0/360 to 0/480, 0/920 to 1/500, 4/500 to 4/900. • The road passes mostly through agriculture and grazing areas. • Few tree cutting and Elec. Pole shifting will be required.
5	Balasore	Simulia	Achyatipur Nijorash (2.7 Km)	• The topography is plain • The road passes through agricultural fields • Habitation areas are located at Ch. 0/600 to 0/800, 1/000 to 1/200 and 1/700 to 2/100. • There are 2 nos of pond along the project road at ch. 0/850km (RHS) & 1/300km (RHS). • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required
6	Baragarh	Attabira	Kathadera to Ludupali (1.74 Km)	• The topography is plain • Habitation areas are at Ch. Ch- 0/700 to 0/850, 1/200 to 1/500. • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required • 1 school is within the 10m COI but none is affected by the road.
7	Bargarh	Bargarh	R D Road to Dhamnamunda (1.3 Km)	• The topography is plain • The road passes through agricultural fields • Habitation areas are at Ch. 0/600 to 1/100. • Few tree cutting and utility/community structure shifting will be require
8	Bargarh	Padampur	Dahigaon to Bubuda (4.73 Km)	• The topography is plain • Habitation areas are at Ch. 0/000 to 0/400, 2/500 to 3/000 and 4/300 to 4/800. • The road passes through agricultural fields • Slope protection works required at Ch- 1/800 to 2/040 • Few tree cutting and utility/community structure shifting will be required
9	Bolangir	Bolangir	Bhundimuhan to Kankara road (2.5 Km)	• The topography is mostly plain • The road passes through patches of agriculture and grazing land. • Inhabited areas are located at Ch.2/130 to 2/400. • Slope protection works required at Ch. Ch- 1/290 to 1/430
10	Bolangir	Deogaon	RD road to Barlapali road (2.75 Km)	• The topography is plain • Habitation Areas are at Ch. -0/575 to 0/750 • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required

Sl No.	District	Block	Road Name	Salient Environmental Features
11	Bolangir	Titilagarh	Belpada to Ganjiabahal road (1.9 Km)	• The topography is plain • Habitation areas are located at Ch 1/200 to 1/500 • A nallah crosses the road at Ch. 0/350 • Few tree cutting and utility/community structure shifting will be required
12	Bolangir	Patnagarh	PS road to Barbahal (6.11 Km)	• The topography is plain and the road passes through agricultural fields • Habitation areas are at Ch. 3/640 to 4/080 • Protection work required at Ch. 3/100 to 3/640, 3/100 to 3/730, 4/880 to 4/930, 4/880 to 4/960, 5/040 to 5/120, 5/320 to 5/655, 5/380 to 5/600. • Few tree cutting and utility/community structure shifting will be required
13	Boud	Kantamal	PWD SH-41 to PWD SH-41 Dapala Road (10.3 Km)	• The topography is plain. • Inhabited areas are at ch 0/120 to 0/520, 2/850 to 3/450 & 9/280 to 9/780 • There is a pond at CH 3200m to Ch 3300m RHS. • There is no flood prone zone or problem of water stagnation • Few tree cutting and utility/community structure shifting will be required.
14	Boudh	Boudh	NH-224 to Chandigada (3.50 Km)	• The topography is plain • The road passes through agricultural fields • Habitation areas are at ch 0/341 to 0/687, 1928 to 2180 and 2/970 to 3/100 • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required
15	Bhadrak	Dhamnagar	PWD Road to Solagaon (4.0 Km)	• The topography of the project road is flat at almost all locations. • Inhabited areas are concentrated at Ch. 3/050 to 4/000 • A pond is located at Ch. 1.8 km (LHS) • Few tree cutting and utility/community structure shifting will be required.
16	Bhadrak	Bhadrak	L63 to Kantapada (2.0 Km)	• The topography of the project road is flat at almost all locations • Inhabited areas are concentrated at Ch. 0/500 to 0/900. • Protection works will be required at Ch.0/210-0/291, 1/400-1440. • Few tree cutting and utility/community structure shifting will be required
17	Cuttack	Niali	Diha Barisan to Baragudi Kuda (5.12 Km)	• The topography is plain • The road passes through agricultural fields • Inhabited areas are located at Ch. 0/100-0/492, 1/188-1/742, 2/751-3/132 on main road and from ch.0/229-0/668 on link road • The road passes through low lying area and slope protection works will be required both on the main and the link road. • Few tree cutting and utility/community structure shifting will be required

Sl No.	District	Block	Road Name	Salient Environmental Features
18	Jagatsinghpur	Jagatsinghpur	Mandasahi to Naranpur (8.6 Km)	• The topography of the project road is plain • Inhabited areas are at Ch.0/600 to 2/700, 3/650 to 3/900, 4/150 to 4/900 and 6/900 to 7/300 • No part of the road is prone to flooding as there are no rivers near the alignment • Few tree cutting and utility/community structure shifting will be required
19	Jharsuguda	Jharsuguda	MCL Road to Baliput (1.1 Km)	• The topography of the project road is plain • Inhabited areas are from Ch. 0/390 to 0/450 and 0/990 to 1/020 • No part of the road is prone to flooding as there are no rivers near the alignment • Few tree cutting and utility/community structure shifting will be required
20	Jharsuguda	Lakhanpur	NH200 to Kutrapali (5.02 Km)	• The topography of the project road is plain • Inhabited areas are concentrated at Ch. 1/450 to 1/730 • Protection works are required at Ch. Ch.0/500-0/530 (LHS), 1/670-1/690(RHS), 4/250-4/270(LHS) • Few tree cutting and utility/community structure shifting will be required
21	Kalahandi	Bhawanipatna	RD Road to Dhanarbhata (2.9 Km)	• The topography of the project road is plain • Inhabited areas are concentrated at Ch. 1/000 to 1/100 & 2/400 to 2800. • The project road passes through mostly agriculture land • No part of the road is prone to flooding as there are no rivers near the alignment • Few tree cutting and utility/community structure shifting will be required
22	Kalahandi	Kesinga	Kanabira to Khamari (3.42 Km)	• The topography is plain • The road passes through agricultural fields • Habitation areas are at Ch. 1/700 & 1/900 • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required
23	Kalahandi	Bhawanipatna	Attanguda to Gachhkhola (13.5 Km)	• Topography is plain • Inhabited areas are at Ch. 0/1000-0/500, 1/600-2-000, 8/300-8/600 & 12/900 -13/500 • Slope protection works required from ch-0/120 to 0/240, ch-1/710 to 1/830, ch-2/220 to 2/370, ch .3/570 to 3/630, ch. 4/680 to 4/720, ch 4/710 to 4/750, ch 5/370 to 5/390, ch 6/480 to 6/600, ch. 11/360 to 11/560 and ch. 13/500 to 13/550 • Few tree cutting and utility/community structure shifting will be required.
24	Kalahandi	M. Rampur	RD Road to Chitalpata (2.01 Km)	• The topography is plain • Habitation areas are at Ch.1/100-1/300 & 1/800-2/000. • Protection work will be required at ch-0/250 to 0/350 • Few tree cutting and utility/community structure shifting will be required

Sl No.	District	Block	Road Name	Salient Environmental Features
25	Kendrapara	Patakura	CC Road to Sridharpur road (2.4 Km)	• Topography is plain • Habitation areas are at CH 0/000 to 1/350, 1/850 to 2/400. • The project road passes through agriculture land • Slope protection works required at Ch –0/486 to 0/570(RHS), 0/550 to 0/639(LHS), 1/930 to 1/960(RHS), 1/980 to 2/000(LHS), 2/250 to 2/280(LHS). • Few tree cutting and utility/community structure shifting will be required.
26	Kendrapara	Rajnagar	Baghamari to Sailendrasarai (7.7 Km)	• Topography is plain • Habited areas located at Ch. 0/000 to 1/110km, 5/200 to 5/600km, 7/480 to 7/700 on both sides of the road • A pond is located at Ch Ch.5/500 to 5/540 (RHS). • Few tree cutting and utility/community structure shifting will be required.
27	Khurda	Begunia	RD road to Gaudapatna (3.0 Km)	• Topography plain • Inhabited areas at Ch. 0/000-0/180, 0/800- 1/130 & 2/420-3/000. The stretch through the village is narrow and encroached posing problems to road safety. • The project road passes through agriculture land between Ch- 00m to Ch-1500m • Few tree cutting and utility/community structure shifting will be required..
28	Puri	Puri	RD Road to Satipur (4.45 Km)	• Topography plain • Inhabited areas are at Ch. 3/480 to 4/000. • The project road passes through agriculture land • There is a pond (RHS) at Ch-1600 to Ch- 1750 where protection measures have been provided. • Few tree cutting and utility/community structure shifting will be required..
29	Puri	Pipli	T-7 to BS Deuli (1.9 Km)	• The topography is plain • The road passes through agricultural fields • Habitation areas are at Ch. 0/000 to 0/215 and 0/865 to 1/100 • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required
30	Puri	Nimapada	Bhapur to Sainsasan (5.2 Km)	• Topography is plain. • Road passes through agricultural land • Habitation areas are at Ch 0/0 to 0/500, 3/500 to 3/840 & 5/000 to 5/200. • Water bodies are located at Ch. 0/970 to 2/270 (LHS) and Ch, 4/770 to 4/830 (LHS). A nallah crosses the road at Ch. 3+120. • Few tree cutting and utility/community structure shifting will be required
31	Puri	Gop	RD road to Ogalpur (2.0 Km)	• Topography is plain. • Road passes through agricultural land • Habitation areas are at ch-0/720 to 1/245 • 1 nos, nallah cross the road at Ch1/200. • 11 nos of EPs and oneTW may require shifting due to the project.

Sl No.	District	Block	Road Name	Salient Environmental Features
32	Puri	Satyabadi	PWD road to Uttarpada (2.14 Km)	• The topography is plain • Habitation areas are at Ch. 0/000 to 0/350 and 1/425 to 2/140. • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required • Two temples and a community hall located within the COI will not be affected
33	Sambalpur	Jujumura	RD road to Khasapali (1.4 Km)	• The topography is plain • Habitation areas are at Ch. 1/150 to 1/450km. • There is no water logging issue at any location on the road • Few tree cutting and utility/community structure shifting will be required
34	Sambalpur	Rengali	SH-10 to Pudapada (1.4 Km)	• The topography is plain. • Inhabited areas are at ch-1/300 to 1/400. • The proposed alignment passes through agricultural land • There is a pond at CH 500m RHS. • Few tree cutting and utility/community structure shifting will be required.
35	Sambalpur	Kuchinda	Gochhara Katupali (8.1 Km)	• The topography is flat • Inhabited areas are concentrated at Ch-3/432 to 3/890 and 5/520 to 5/920 • An irrigation canal runs along the road from CH 2200m to 2300 m (LHS). There is no flood prone zone or problem of water stagnation • Few tree cutting and utility/community structure shifting will be required..
36	Sambalpur	Rairakhol	RD road to Mahaling (6.3 Km)	• The topography is mostly plain • The road passes mostly through mostly agriculture land. • Habitation areas are at Ch. 5/425 to 5/625. • Few tree cutting and utility/community structure shifting will be required.

89. The overall summary of the key environmental features within 10m corridor of impacts of the tranche 2 roads in Odisha is presented in ***Appendix – 3.1***

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

90. 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.

91. 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.

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

A. Common Impacts during Design and Construction Phase

1. Climate change

93. **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 habitation is less along these rural roads and as such, no exponential population growth is expected considering the generic trend of population migration from rural to urban areas. Most of the sample roads pass through agricultural fields and along the existing road alignments with low embankment height of 1m (average) from ground to crust except at the approaches to cross drainage structures. As such, the subproject roads are unlikely to be vulnerable or increase the vulnerability of surrounding areas (with respect to population growth, settlement patterns, increasing runoff or landslides).

94. **Mitigation Measures**: Compensatory tree plantations[5] (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.[6] 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 minimization of identified vulnerability if any.

2. Finalization of Alignment

[5] 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.

[6] Village Panchayats are planting trees at 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.

95. **Impact**: The proposed rural roads 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 roads 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.

96. **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:

a. The road will be part of district core network and will comply with PMGSY guidelines.
b. Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.
c. Subproject will not pass through any designated wildlife sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area.
   Subproject to comply with local and National legislative requirements (such as forest clearance for diversion of forest land) and ADB's Safeguard Policy Statement 2009.

3. Land Acquisition

97. **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.

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

4. Protected Areas (National parks, Wildlife Sanctuaries, Eco-sensitive zones, protected /historical monuments) and Forest Areas

99. **Impact**: Debrigah sanctuary is located in district Bargarh but none of the sample road is located within 10 km radius of the sample project roads. None of the sample road passes through any forest land (except Talamaninaga to Uppar Maninaga road in Ranapur block of Nayagarh district) and as such, project has no impact on forest cover of the state/Country.

Odisha 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.

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

5. Land Clearing Operations

101. **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.

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

a. The land clearing operation should be undertaken as per the defined road alignment and community structure, utility and road furniture shifting plan.
b. The road land width shall be clearly demarcated on the ground.
c. The utility and community structure shifting shall be as per plan and with consultations and concurrence of the community.
d. Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a permission of Forest department. The vegetable cover shall be removed and disposed in consultation with community.
e. All public utilities shall be shifted with a concurrence of respective agencies/authority and to the adjacent location approved by them.
f. The top soils shall be collected and preserved for reuse as a base for turfing of embankment slopes or development of barren areas along roadside. The top soil shall be preserved at identified location with the provision of watering /grass development on the heap surface to prevent air pollution.

6. Cut and Fill and Embankment construction

103. **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.

104. **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.

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

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

106. 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

107. **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 5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 1 km from forest land/areas.

- The construction camps, office and storage areas shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.

- All construction camps shall have rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.

- The construction camps, office and storage areas shall have health care facilities for adults, pregnant women and children.

- All construction personnel shall be subjected to routine vaccinations and other preventive/healthcare measures.

- Contractor shall arrange all personal protective equipment (PPEs) like helmet, boots, and earplugs for workers, first-aid and fire fighting equipment at construction sites. An emergency plan shall be prepared to fight with any emergency like fire.

- Garbage bins must be provided in the camp and regularly emptied and disposed off in a hygienic manner. Domestic solid waste shall be disposed of in a control manner. The recyclable waste shall be sold off and non saleable and biodegradable waste shall be disposed through secured land filling.

- All fuel oil/lubricant unloading and storage shall be made on the paved areas away from storm water drainage.

- After completion of construction work, the camp /temporary office/storage areas sites shall be restored to its original condition.

8. Traffic Movement

108. **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.

109. **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.

9. Associated Impacts due to Construction Activities

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

110. **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. 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.

111. **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.

b. Borrow Areas and Quarries

112. **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.

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

c. Hydrology and Drainage

114. **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.

115. None of the sample roads is crossing any natural stream except NH-55 to Siridihi (A) road in Dhenkanal district, which crosses Sarapa Nallah. No flooding is reported from this river except stagnation of water along the road. Certain subproject roads are cross local and seasonal drains. Village ponds are also located close to few roads. As such impact on Hydrology and Drainage Pattern is expected to be minimal.

116. **Mitigation Measures**: The provision of adequate cross drainage structures shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. 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.

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

d. Compaction and Contamination of Soil

118. **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.

119. **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.

e. Construction Debris and Wastes

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

121. **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 1,000 m away). It should also be located away from water bodies to prevent any contamination of these bodies.

f. Air Quality

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

- Dust from earth works (during site preparation).
- Emissions from the operation of construction equipment and machines.
- Fugitive emissions from vehicles plying on the road, during the transport of construction materials.
- Emissions other than dust particularly from the hot mix plants and laying of bitumen. Hot mix plant will generate carbon monoxide (CO), un-burnt hydrocarbon (HC), sulphur dioxide (SO_2), particulate matters (PM), and nitrogen oxides (NOx) emissions.
- 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.

123. **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,[7] earthworks, stockpiles and asphalt mixing plant areas.

- Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements.

- Material storage areas shall also be located downwind of the habitation area.

- Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by state pollution control board (SPCB) to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions.

- Diesel Generating (DG) sets shall also be fitted with stack of adequate height. Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained.

- The requisite PPE (helmet, mask, boot, hand gloves) shall be provided to the construction workers.

g. Noise Quality

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

125. **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.

h. Groundwater and Surface Water Quality and Availability

126. **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.

127. **Mitigation Measures**: Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority[8] if applicable. The

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

contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. Water intensive activities shall not be undertaken during summer period to the extent feasible. Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting. Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. Measures are already purposed in earlier section for prevention of siltation in water bodies.

i. Biological Environment

128. **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 the aquatic life is minimal and no significant impact is anticipated on aquatic life.

129. **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.

j. Impact on Common Property Resources

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

131. **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 Operation Phase

1. Air Quality

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

133. **Mitigation Measures**: The bad road condition is the main cause of poor air pollution at present. The improved road conditions will re**s**ult 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.

2. Noise

[8] 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.

134. **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.

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

3. Land, Soil, Tree Plantation

136. **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.

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

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

139. **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.

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

4. Groundwater

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

5. Hydrology and Drainage

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

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

6. Socioeconomic Impact

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

145. **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.

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

- Speed breakers (rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain in rolling terrain.

- Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation.

- The speed breakers are provided and directional sight boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required.

- Hazard markers to be installed at each end of all box culverts, river crossing causeways and similar CD structures

- Shoulder side slopes shall not be steeper than 2h: 1v unless stone pitching of the slopes is provided.

- Cement concrete pavement and V-shaped drain is constructed to the full width of the available roadway within densely populated habitation.

- Directional sight board are installed on all sharp curves and bends

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

C. Road Specific Impacts

147. 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).

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

A. Environmental Management Plan

148. 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.

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

150. 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.

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

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

B. Environmental Monitoring Plan

153. 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.

154. For rural roads, Environmental Monitoring plan will be more observation oriented and it provides observation areas with frequency of monitoring at pre construction aspects,[9] construction stage and operation stage. A monitoring plan with monitoring indicator and frequency of monitoring is given at **Appendix 5.2.**

C. Institutional Arrangements and Responsibilities

1. Institutional Arrangement

155. 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.

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

157. 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

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

159. **MORD**[10] 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

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

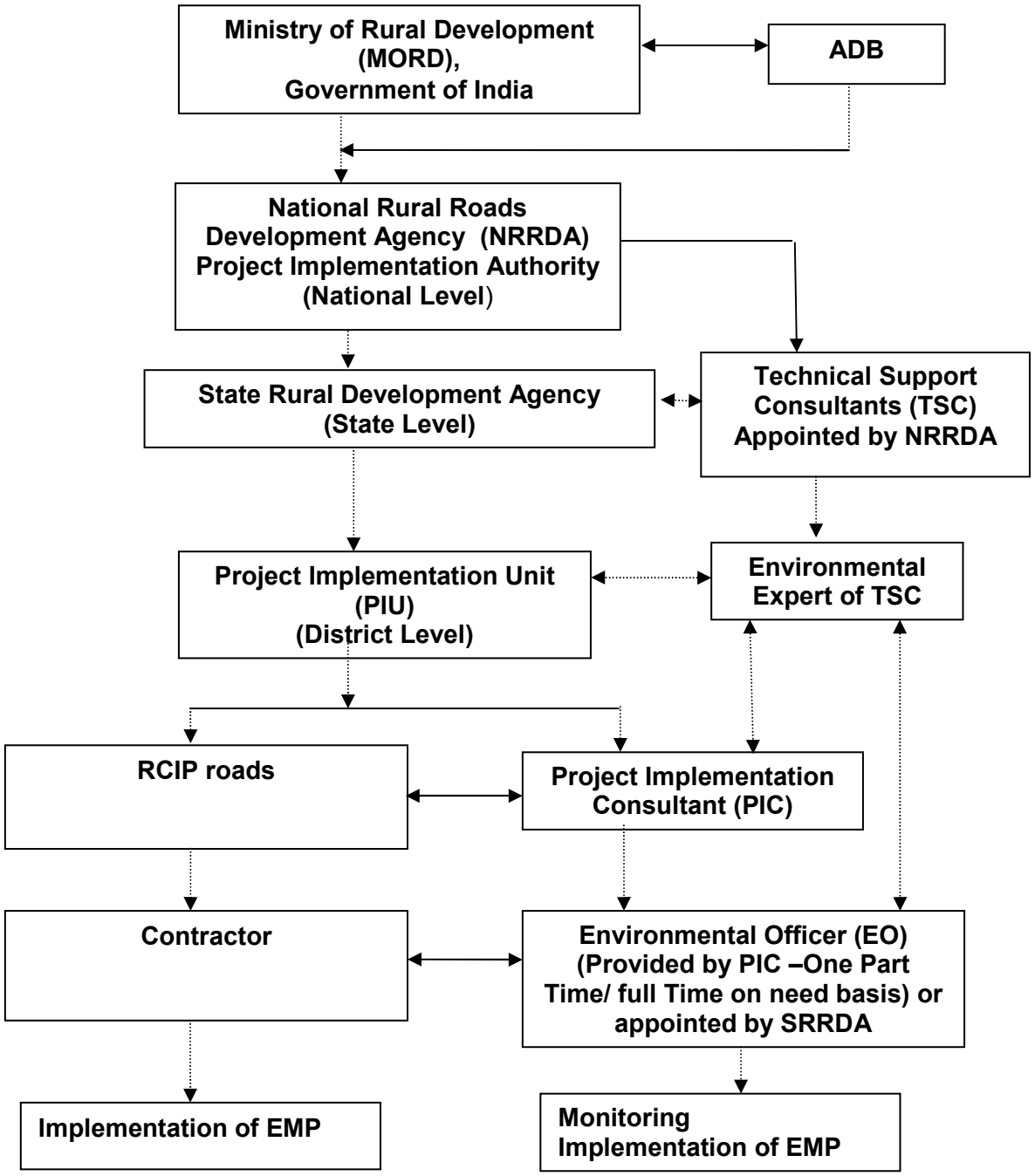


Figure V.3 : Institutional Arrangement for EMP Implementation

160. SRRDA[11] will ensure that:

a. ECOP checklist is prepared for each road;
b. The completed ECOP checklist is included in the DPR with the help of PIC;
c. Ensure that all required statutory environmental clearances are obtained and comply with clearance conditions;
d. Ensure that the subproject specific EMPs and respective budget are included in the bidding documents;
e. Ensure that the ECOP checklists and EMP (including general and site specific issues) are made available to the contractors;
f. Undertake routine monitoring of the implementation of the EMP including spot checks on site and prepare monitoring reports at least once a year;
g. With the support of technical support consultants prepare satisfactory environmental due diligence reports of the earlier tranche/periodic financing request before implementing the next tranche; and
h. Appoint Project Implementation Consultant (PIC) for construction supervision and assist PIUs for EMP implementation and related safeguard compliances.

161. **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.

162. **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;
e. Prepare state Level IEE reports and EMPs for non-sample roads based on the ECOP checklist completed by the PIC;

163. **Project Implementation Consultant (PIC) is** appointed by SRRDA. PIC will provide one Environmental Officer (EO). The EO will be responsible to ensure adherence and implementation of EMP at all stages of works by the contractor. The EO, if found warranting may also conduct field tests, independent of the contractor to determine the effectiveness of

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

EMP under approval of PIC/PIU. The broad duties / responsibilities of the Environmental Officer will include:

- Review of project design and specifications to ensure their adequacy and suitability with respect to the implementation of EMP;
- 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;
- Interact with the counterpart of the Contractor(s), review work progress/plans and ensure implementation of the EMP;
- 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;
- Monitoring sensitive environmental attributes during construction and operation stages[12] 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;
- Facilitate PIU for preparation of annual monitoring report as per ADB defined format;
- Documentation of the environmental management/monitoring activities for the regular project implementation progress report; which will serve as the basis for the annual environmental monitoring reports; and
- Conducting environmental training/awareness programs for the contractors, the project implementation personnel and the communities.

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

- Make adequate costs provision for EMP requirements while biding
- Ensure effective implementation of mitigative measures as per road specific EMP
- Comply with all applicable legislative requirements and obtain necessary consents for to Establish/Operate before start of hot mix plant and batching plants. Comply with al permit conditions
- Create awareness amongst workers for environment, occupational health and safety aspects. Participate in training and awareness programme along with its executives conducted by PIC.
- Provide PPE and adequate resources for Environment Occupational Health and Safety
- Follow all the guidelines for borrowing earth and restoration of borrow areas, setting up construction camps
- Sourcing of quarry material from approved quarries only
- Provide all required input to PIC for environmental monitoring as per EMP.

[12] 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 seond year of operation stage.

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

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

1. Selection Criteria and Environmental Assessment Requirement

166. 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)

167. The following environmental assessment requirement will be followed roads included under RCIP:

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

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

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

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

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

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

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

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

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

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

2. Legal Framework

169. 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 SPS 2009, the subprojects will be subject to the following requirements:

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

(ii) An Initial Environmental Examination[13] (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

170. 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-

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

construction monitoring checklists; and (iv) preparation of monitoring reports. These few workshops have already been conducted at participating states though ADB officials and TSC experts. Additional training will be carried out periodically, by in-house trained and experienced officials.

G. Consultation and Information Disclosure

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

172. 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

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

174. 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

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

176. Stakeholders' 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.

177. The discussions were designed to receive maximum inputs from the participants regarding their acceptability and environmental concerns arising out of the subproject. 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

178. In India, public consultation is mandatory in case of Category A and B1 category projects[14] 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

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

180. Some of the general issues raised during the different consultation sessions are summarized 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.

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

- **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.

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

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

- **Losses of Idols/Shrines -** Participants supported the project and were willing to shift the idols, burial grounds and other religious structures observed at certain locations 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 PAPs appreciated need and supported the project fully. Community at large appreciated overall benefits to them resulting from project development;

D. Addressal of Issues

181. 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**Table VI.1.**

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

Issue/Concern	Addressal under the project
Water Logging and Drainage	Adequate cross drainage structures have been planned
Road Safety	Adequate safely signage 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

182. 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.

183. 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

184. 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.

185. None of the rural road crosses any natural stream except one road namely NH-55 to Siridihi (A) that crosses Sarpa Nallah which is a small river. Reportedly, no flooding occurs due to this river. However, water logging problem along the road exist. Adequate engineering measures are proposed slop stabilisation, erosion control and drainage of water.

186. 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.

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

188. No categorization 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.

189. 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.

190. 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.

191. 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 officials and TSC experts. Trained and experienced in-house officials should carry out more training in future periodically.

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

B. Key Recommendations

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

194. 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.

195. 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.

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

APPENDICES

Appendix 1.1: Details of Roads in Odisha Proposed under RCIP Batch 2

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
			District: Angul Division Angul		
1	Chhendipada	OR-01-ADB-32(A)/TII	Brambhanbil to Balinali Road	3.20	168.10
2	Chhendipada	OR-01-ADB-32(B)/TII	Kosala to Sandhapal Road	4.20	212.25
3	Chhendipada	OR-01-ADB-32(C)/TII	Golagadia to Salakhaman Road	3.50	176.46
4	Banarapal	OR-01-ADB-33/TII	Balaramprasad to Kendupali Road(A)	4.85	251.34
5	Angul	OR-01-ADB-33/TII	Sankhapur to Manapur road (B)	5.56	287.51
6	Kishorenagar	OR-01-ADB-35/TII	Rajamunda (Himitira Chhak) to Batimunda	7.97	423.33
7	Athamallik	OR-01-ADB-35/TII	R.D Road to Nuagaon	1.10	53.91
7	**Total**			**30.38**	**1572.89**
	District : Balasore Division Balasore I				
1	Balasore	OR-02-ADB-48/TII	R D Road to Khadikapada Road	3.70	176.03
0	Balasore	OR-02-ADB-48/TII	LSB	0.00	43.10
2	Balasore	OR-02-ADB-49/TII	Purusottampur - Basantapur	5.48	266.79
3	Remuna	OR-02-ADB-50/TII	NH60 -Madhupura	5.50	239.03
4	Remuna	OR-02-ADB-51/TII	Junada to Dharamanandapur	1.50	89.22
5	Remuna	OR-02-ADB-51/TII	NH5-Hiratikiri	1.70	90.76
6	Basta	OR-02-ADB-52/TII	N H 60 to Belgaon Road	2.30	137.84
	Basta	OR-02-ADB-52/TII	LSB	0.00	277.00
7	Basta	OR-02-ADB-52/TII	R D Road at Begunia to Sonpur Road	2.55	134.69
8	Basta	OR-02-ADB-53/TII	P W D Road to Jamalapur Road	3.02	222.13
9	Basta	OR-02-ADB-53/TII	R D Road at pariharipur Chhak to Gholei Rd	1.85	92.39
10	Basta	OR-02-ADB-54/TII	Vellora - Chandipur	2.65	144.56
11	Basta	OR-02-ADB-54/TII	N H 60 to Baigandiha Road	1.90	104.02
12	Oupada	OR-02-ADB-55/TII	PWD Road to Juriapatna Road	2.50	141.71
13	Oupada	OR-02-ADB-56/TII	Bankipada to Bidubazar Road	4.50	245.82
14	Oupada	OR-02-ADB-57/TII	Oupada to Surispal Road	3.85	178.29
15	Oupada	OR-02-ADB-58/TII	PWD road to Balimunduli Road	3.50	202.71
16	Oupada	OR-02-ADB-58/TII	Oupada to Dhimpur Road	1.00	64.11
17	Oupada	OR-02-ADB-59/TII	Oupada Ramachandrapur Road	1.70	110.49
18	Nilagiri	OR-02-ADB-61/TII	PWD Road to Jokananda	2.50	115.74
19	Nilagiri	OR-02-ADB-61/TII	PWD -Kharadiha	2.30	108.98
20	Nilagiri	OR-02-ADB-62/TII	Bhugabandhu - Saruchampa	2.30	119.01
21	Nilagiri	OR-02-ADB-62/TII	Kalakad to Nuapal Road	1.80	92.89
22	Nilagiri	OR-02-ADB-63/TII	kansa to Kakudipal Road	1.50	76.04
23	Nilagiri	OR-02-ADB-63/TII	PWD Road to Mardarajpur	2.50	109.91
24	Oupada	OR-02-ADB-64/TII	Kasapa -Bikrampur	2.00	105.79
24	**Total**			**64.10**	**3689.05**
	District : Balasore Division Balasore II				
1	Bahanaga	OR-02-ADB-65/TII	R.D Road -Kochiakoili to Patna	1.10	54.87
2	Soro	OR-02-ADB-66/TII	Bartana to Thala	3.63	201.73
	Soro	OR-02-ADB-66/TII	LSB	0.00	122.24

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
3	Bahanaga	OR-02-ADB-67/TII	PWD Road to Balarampur	2.30	119.17
4	Bahanaga	OR-02-ADB-68/TII	PWD Road to Nilakanthapur	6.00	296.43
5	Bahanaga	OR-02-ADB-69/TII	N.H-5 -Bidu to Mugunipur	1.85	92.04
6	Soro	OR-02-ADB-70/TII	Nuahat to Sujanpur	5.52	285.03
7	Soro	OR-02-ADB-71/TII	Tudigadia-Naharapada	6.50	334.87
0	Soro	OR-02-ADB-71/TII	LSB	0.00	56.23
8	Khaira	OR-02-ADB-75/TII	Ranital-Kupari PWD road to Muhanchuan	3.00	152.37
9	Khaira	OR-02-ADB-76/TII	Ranital-Kupari PWD road to Kalyani	2.50	126.52
10	Simulia	OR-02-ADB-77/TII	N.H-5 to Anantapur	2.70	139.09
11	Khaira	OR-02-ADB-78/TII	Bateswar to Trilochanpur	7.67	393.61
12	Khaira	OR-02-ADB-79/TII	Achyutpur to Nijorash	2.70	119.40
13	Khaira	OR-02-ADB-80/TII	Trishalpur to Mundahata	2.80	144.98
14	Khaira	OR-02-ADB-81/TII	Sardang to Bhogpur	3.40	176.76
14	**Total**			**51.67**	**2815.34**
	District : Balasore Division Jaleswar				
1	Baliapal	OR-02-ADB-47/TII	Darada Sartha PWD road at Kunduli to Shipura	2.13	105.46
1	**Total**			**2.13**	**105.46**
1	Sohela	OR-03-ADB-82/TII	Jhar to Khapanpali	3.10	126.77
2	Sohela	OR-03-ADB-83/TII	Mangalpali to Rengali	2.89	116.60
3	Bhatli	OR-03-ADB-84/TII	R D Road to Nilji	5.50	193.77
4	Bhatli	OR-03-ADB-85/TII	Gopalpur to Rusipali	6.04	248.56
5	Bhatli	OR-03-ADB-86/TII	R D Road to Bhojpuri	5.80	192.96
6	Ambabhona	OR-03-ADB-87(A)/TII	Kumbho to Pikirijharan	3.47	137.47
7	Ambabhona	OR-03-ADB-87(B)/TII	R D Road to Ghughurapali	3.62	156.68
8	Bargarh	OR-03-ADB-88/TII	NH-06 to Sauntpur	1.03	39.24
9	Bargarh	OR-03-ADB-88A/ TII	R D Road to Dhamnamunda	1.30	53.37
10	Attabira	OR-03-ADB-89/TII	NH-6 at Godbhaga to Dhemsa	8.43	330.36
11	Attabira	OR-03-ADB-90/TII	Kathdera to Lurupalli	1.74	70.23
12	Attabira	OR-03-ADB-90(A)/TII	Silet to Nuabhatimunda	3.77	137.00
13	Attabira	OR-03-ADB-91/TII	Tangerpalli to Rujhenmal	3.47	129.28
14	Attabira	OR-03-ADB-91(A)/TII	Bargarh Main Canal to Kantal	1.46	60.31
15	Ambabhona	OR-03-ADB-101/TII	Kandpala to Ichhapur	7.68	304.57
15	**Total**			**59.29**	**2297.15**
	District : Bargarh Division Padampur				
1	Padampur	OR-03-ADB-92/TII	Dahigoan to Bubuda	4.73	219.34
2	Paikmal	OR-03-ADB-92/TII	RD Road at 11 KM to Gandapali	0.80	43.45
3	Bijepur	OR-03-ADB-93/TII	RD Road to Kandhara	0.80	46.17
4	Jharbandh	OR-03-ADB-94/TII	RD Road to Saramsil	4.70	216.26
	Jharbandh	OR-03-ADB-94/TII	LSB	0.00	1225.79
5	Jharbandh	OR-03ADB-95/TII	P.R road to Temper	3.50	166.52
6	Paikmal	OR-03-ADB-96/TII	SH3 at 71 km to Kuapali	5.00	240.21
7	Paikmal	OR-03-ADB-96/TII	SH3 at 64 km to Goibahali	0.86	28.35
8	Padampur	OR-03-ADB-97/TII	SH3 at 31 km to Kurlubahal	2.41	93.04

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
9	Padampur	OR-03-ADB-97/TII	R.D Road to Siletpali	2.30	182.28
10	Paikmal	OR-03-ADB-98/TII	SH-3 at Dunguripali to Katangapali	3.80	173.82
11	Bijepur	OR-03-ADB-99/TII	R.D. Road to Bhalupali	2.75	97.54
12	Bijepur	OR-03-ADB-99/TII	R.D. Road to Mundomahul	1.85	74.09
13	Bijepur	OR-03-ADB-99/TII	R.D. Road to Manikchoura	2.74	96.50
14	Bijepur	OR-03-ADB-100/TII	Laumunda to Tangurupadar	2.60	101.99
15	Gaisilet	OR-03-ADB-100/TII	P.R. Road to Dunguripali	1.50	59.60
15	**Total**			**40.33**	**3064.95**
	District : Bhadrak Division Bhadrak I				
1	Bonth	OR-04-ADB-21/TII	PWD Road to Aranji	1.75	81.84
2	Bonth	OR-04-ADB-21/TII	RD Road to Pangira	2.50	109.72
3	Bonth	OR-04-ADB-22/TII	RD Road to Gharpada	3.70	174.30
4	Bonth	OR-04-ADB-22/TII	RD Road to Trikona	1.75	97.73
5	Bhadrak	OR-04-ADB-23/TII	Gopalbindha to panibhandar	3.50	178.81
6	Bhadrak	OR-04-ADB-24/TII	L86 to Jiragambhira	3.90	198.86
7	Bhadrak	OR-04-ADB-25/TII	L63 to Kantapada	2.00	103.97
7	**Total**			**19.10**	**945.23**
	District : Bhadrak Division Bhadrak II				
1	Basudevpur	OR-04-ADB-26/TII	(A) Brahmanigaon to Manmathpur	6.00	292.19
2	Basudevpur	OR-04-ADB-26/TII	(B) PWD Road to Kapagadia	1.80	93.64
3	Basudevpur	OR-04-ADB-27/TII	(A) RD Road to Naichhanpur	3.50	166.07
4	Chandabali	OR-04-ADB-28/TII	(A) Bidyutprava to Rabindra Nagar	3.50	193.64
5	Basudevpur	OR-04-ADB-29/TII	PWD Road to Mohanpur	4.50	230.84
6	Dhamnagar	OR-04-ADB-30/TII	PWD Road to Solagaon	4.00	230.56
7	Basudevpur	OR-04-ADB-31/TII	RD road to Sribastapur	4.90	238.82
8	B.Pokhari	OR-04-ADB-32/TII	T3 to Khadisingha	5.00	232.08
9	B.Pokhari	OR-04-ADB-33/TII	(A) T2 to Tulasipur	2.50	117.47
10	Bhadrak	OR-04-ADB-33/TII	(B) Jalahari to Joragadia	2.50	117.28
11	B.Pokhari	OR-04-ADB-34/TII	T1 to Mituani	3.20	151.72
11	**Total**			**41.40**	**2064.31**
	District : Bolangir Division Bolangir				
1	Agalpur	OR-05-ADB-58/TII	RD Road to Bangabahal	3.05	123.89
2	Agalpur	OR-05-ADB-58/TII	Roth Chhak to Chhalkhai	2.35	106.53
3	Bolangir	OR-05-ADB-59/TII	Mayabarha to Pipalkani (Road-A)	3.70	137.96
4	Bolangir	OR-05-ADB-59/TII	Bhundimuhan to Kankara (Road-B)	2.50	103.27
5	Bolangir	OR-05-ADB-60/TII	Kutumdola to Duanpali(Road-A)	6.50	273.60
6	Loisingha	OR-05-ADB-60/TII	Bhoipali to Raghupadar(Road-B)	1.50	59.48
7	Bolangir	OR-05-ADB-61/TII	Ranipali to Kirabahal (Road-A)	1.50	66.77
8	Bolangir	OR-05-ADB-61/TII	SH-42 to Saraspita (Road-B)	3.60	131.43
9	Deogaon	OR-05-ADB-62/TII	RD Road to Barlapali	2.75	131.22
10	Deogaon	OR-05-ADB-62/TII	Dhandamal to Dangarpada	0.85	36.02
11	Deogaon	OR-05-ADB-62/TII	RD Road to Lakhanpur	2.74	105.39
12	Deogaon	OR-05-ADB-63/TII	Ramchandrapur to Matupali	5.00	174.76

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
13	Deogaon	OR-05-ADB-64/TII	PWD Road to Goilpita	4.28	159.80
14	Deogaon	OR-05-ADB-64/TII	PWD Road to Ailapali via Madapur	2.50	96.61
15	Gudvela	OR-05-ADB-65/TII	Tusura to Kharda	2.58	113.17
16	Gudvela	OR-05-ADB-65/TII	PS Road to Ghuna	0.79	41.17
17	Puintala	OR-05-ADB-66/TII	L-24 to Bandhanbahal	0.90	42.76
18	Puintala	OR-05-ADB-66/TII	T-01 to Ainlasar	1.10	47.09
19	Puintala	OR-05-ADB-66/TII	SH-14 to Bainsapali	1.50	64.53
20	Puintala	OR-05-ADB-66/TII	Budhisindhol PS Road to Dumerpali	0.68	33.19
21	Saintala	OR-05-ADB-67/TII	Tikrapada Deysand RD Road to Nuamunda	1.40	63.89
22	Saintala	OR-05-ADB-67/TII	Deng Tikrapada PWD Road to Rengalbahal	3.55	137.57
23	Saintala	OR-05-ADB-67/TII	NH-201 to Jampadar	1.55	62.46
24	Belpada	OR-05-ADB-68/TII	PWD Road to Bharuamunda	1.00	47.23
25	Belpada	OR-05-ADB-68/TII	PWD Road to Nagaphena	4.64	174.56
26	Belpada	OR-05-ADB-68/TII	RD Road to Chandrapur	2.15	104.46
27	Belpada	OR-05-ADB-68/TII	PWD Road to Dungriguda	1.72	72.05
28	Belpada	OR-05-ADB-69/TII	PWD Road to Ghagara	1.48	52.21
29	Belpada	OR-05-ADB-69/TII	RD Road to Tora	2.47	107.44
30	Belpada	OR-05-ADB-69/TII	PS Road to Jhankirpali	2.00	77.25
31	Belpada	OR-05-ADB-69/TII	Kapani to Patrapalli	3.22	128.15
32	Patnagarh	OR-05-ADB-70/TII	Salepali to Karlamal	2.95	110.92
33	Patnagarh	OR-05-ADB-70/TII	PWD Road to Salepali	1.78	77.45
34	Patnagarh	OR-05-ADB-70/TII	PWD Road to Nahenabandha	1.15	50.67
35	Patnagarh	OR-05-ADB-71/TII	PWD Road to Chauliudar	0.75	36.14
36	Patnagarh	OR-05-ADB-71/TII	PS Road to Barbahal	6.11	233.01
36	**Total**			**88.27**	**3584.09**
	District : Bolangir Division Titilagarh				
1	Muribahal	OR-05-ADB-42/TII	Phatamunda to Bhairguda	3.00	151.14
2	Muribahal	OR-05-ADB-43/TII	Kharli to Chiknibahal	5.50	273.24
3	Muribahal	OR-05-ADB-44/TII	Ichhapada to Sargul via Sandhibahal	3.00	134.92
4	Muribahal	OR-05-ADB-45/TII	Andaldar to Jharbahali	2.60	112.23
5	Muribahal	OR-05-ADB-46/TII	Andaldar to Chitramunda (Mundapala)	3.00	128.09
6	Muribahal	OR-05-ADB-47/TII	Ichhapara to Bhagubahal	8.60	390.87
7	Turekela	OR-05-ADB-48/TII	Salemurunga to Sanabanki	3.51	160.20
8	Titilagarh	OR-05-ADB-49/TII	Sireikela Goudtola RD Road to Kanarla (Road-A)	1.50	62.16
9	Titilagarh	OR-05-ADB-49/TII	L-81 to Brahmanipada (Road-B)	1.50	66.77
10	Titilagarh	OR-05-ADB-50/TII	Desil Luthorbandha RD Road to Bagdel	2.55	81.33
11	Bangomunda	OR-05-ADB-51/TII	Gandharla to Jhinkapara	5.50	250.35
12	Bangomunda	OR-05-ADB-52/TII	RD Road to Beherabhata	2.50	116.31
13	Bangomunda	OR-05-ADB-54/TII	Road-A Dhundimahul to Dumermunda	2.20	90.78
14	Bangomunda	OR-05-ADB-54/TII	Road-B Belpada to Ganjiabahal	1.90	84.40
15	Bangomunda	OR-05-ADB-55/TII	Kuturabeda to Tetelpara	1.50	66.04
15	**Total**			**48.36**	**2168.83**
	District : Boud Division Boud				

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
1	Kantamal	OR-06-ADB-11/TII	PWD Road (SH-41) to PWD Road (SH-41) Dapala	10.30	452.33
2	Boudh	OR-06-ADB-12/TII	NH-224 to Chandigada	3.50	172.27
3	Boudh	OR-06-ADB-13/TII	Telibandha-Barapuduga RD to Kasalpur	3.10	140.72
4	Boudh	OR-06-ADB-14/TII	NH-224 at Khuntabandha to Charda	4.40	210.63
5	Boudh	OR-06-ADB-15/TII	PWD Road NH-224 to Lundabereni	2.80	120.25
6	Boudh	OR-06-ADB-16/TII	PWD Road ODR to Khuntiapada	2.60	128.65
7	Kantamal	OR-06-ADB-17/TII	SH-41 Narayanaprasad to Gochhangi	1.45	63.37
8	Kantamal	OR-06-ADB-17/TII	PWD Road (SH-41) - Kumarkeli to Brahmani	1.15	55.81
9	Boudh	OR-06-ADB-18/TII	Telibandha-Barapuduga RD road to Budhipadar	3.00	136.75
10	Harabhanga	OR-06-ADB-19/TII	Tileswar on Boudh-Dhalpur Road to Fakirpur	4.00	200.13
11	Harabhanga	OR-06-ADB-20/TII	Udayapur-Balanda to Saradhapur	2.50	115.89
12	Boudh	OR-06-ADB-20/TII	NH-224 to Tainjan	1.30	55.51
13	Kantamal	OR-06-ADB-21/TII	SH-41-Gabjore Road to Kirla	3.05	139.13
14	Kantamal	OR-06-ADB-22/TII	Manmunda-Baragochha to Narasinghapur	2.70	130.04
15	Kantamal	OR-06-ADB-22/TII	SH-41-Dapala Road to Rabedi	1.30	59.53
16	Kantamal	OR-06-ADB-23/TII	PWD (SH-41) to Ambagahana	7.66	324.96
0	Kantamal	OR-06-ADB-23/TII	LSB	0.00	69.39
17	Harabhanga	OR-06-ADB-24/TII	Dhalpur-Atalsar RD Road to Kharasankulei	1.25	68.45
18	Boudh	OR-06-ADB-25/TII	Khaliapalli PMGSY road to Talapadar	6.70	313.27
19	Kantamal	OR-06-ADB-26/TII	Manamunda-Baragochha Road to Uchabahali	0.90	41.94
20	Boudh	OR-06-ADB-27/TII	NH-224 to Kanapada	4.30	182.86
20	**Total**			**67.96**	**3181.89**
	District : Cuttack Division Cuttack I				
1	Salipur	OR-07-ADB-19/TII	Pattamundai canal Embk.to Nanpur	3.00	182.79
2	Mahanga	OR-07-ADB-20/TII	Barahimpur to Keutakhandi	6.00	358.80
3	Mahanga	OR-07-ADB-21/TII	Rahania to Champatipur	4.00	241.88
4	Mahanga	OR-07-ADB-22/TII	Alijoda to Jahal	3.00	178.34
5	Salipur	OR-07-ADB-24/TII	Malabodamundai RD Road to Gothada	4.00	217.82
6	Salipur	OR-07-ADB-25/TII	Pattamundai canal Embk.to Tunupur	2.22	150.92
7	Nischintakoili	OR-07-ADB-26/TII	Nageshpur to Charirakaba Road	5.21	275.76
8	Cuttack	OR-07-ADB-27/TII	Praharajpur to Fullara	7.43	419.43
9	Cuttack	OR-07-ADB-28/TII	S.H. 12 to Tanarapa.	1.97	137.57
10	Niali	OR-07-ADB-29/TII	Diha Barisana to Baragudikuda.	5.13	456.83
10	**Total**			**41.96**	**2620.14**
	District : Cuttack Division Jagatsinghpur				
1	Balikuda	OR-12-ADB-17/TII	Alikanan - Ranapur	2.50	181.45
2	Raghunathpur	OR-12-ADB-18/TII	T 06 Sadeipur to Banikunda	3.50	181.57
3	Erasama	OR-12-ADB-19/TII	Erasama chatua RD Road (Baleipur) to Badabuda	6.00	325.45
4	Biridi	OR-12-ADB-20/TII	Hazipur - Salijanga	7.85	388.64
5	Jagatsinghpur	OR-12-ADB-21/TII	Mandasahi - Naranapur	8.60	572.79
6	Erasama	OR-12-ADB-22/TII	Janakideipur to Basudevpur	2.30	134.60
7	Tirtol	OR-12-ADB-23/TII	Bisanpur to Matagajpur	3.60	196.23
8	Balikuda	OR-12-ADB-24/TII	Nalara to Podaruan	8.50	538.00

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
9	Balikuda	OR-12-ADB-25/TII	Borikina - Barilo	6.00	340.97
10	Raghunathpur	OR-12-ADB-26/TII	Manijanga (Irrigation Embkt.) to Gandakula	3.37	217.24
11	Balikuda	OR-12-ADB-27/TII	SH43 - Badaghara	3.50	240.81
11	**Total**			**55.72**	**3317.74**
	District : Jharsuguda Division Jharsuguda				
1	Jharsuguda	OR-14-ADB-15/TII	MCL to Baliput	1.11	50.18
2	Lamhanpur	OR-14-ADB-17/TII	Muralipali to Sardha	2.78	117.01
3	Laikera	OR-14-ADB-18/TII	ODR to Kankmal	3.06	117.13
4	Lakhanpur	OR-14-ADB-19/TII	RD Road to Barihapali	2.03	80.44
5	Kolabira	OR-14-ADB-20/TII	Road(A)-N.H-200 to Sanyasipali	0.83	40.12
6	Kolabira	OR-14-ADB-20/TII	Road(B)-Tareikela to Patapada	1.35	60.78
7	Lakhanpur	OR-14-ADB-23/TII	Road(A)-RD Road to Jamuna	2.01	80.51
8	Lakhanpur	OR-14-ADB-23/TII	Road(B)-RD Road to Tangarpali	1.49	64.68
9	Lakhanpur	OR-14-ADB-25/TII	NH-200 to Kudabaga	3.55	155.41
9	**Total**			**18.21**	**766.26**
	District : Kalahandi Division Bhawanipatna				
1	Narla	OR-15-ADB-64/TII	P.W.D. Road TO Goipita	4.20	144.70
2	Narla	OR-15-ADB-65/TII	Saria TO Denguguda	1.50	54.05
3	Narla	OR-15-ADB-66/TII	P.W.D. Road To Taprang	5.50	205.65
4	Narla	OR-15-ADB-67/TII	P.W.D. Road To Bilat	2.65	110.54
5	Narla	OR-15-ADB-68/TII	P.W.D. Road To Baddharpur	5.04	195.60
6	Narla	OR-15-ADB-69/TT	P.W.D. Road To Dampadar	2.55	93.42
7	Bhawanipatna	OR-15-ADB-70/TII	R.D. Road To Dhanarbhata	2.90	104.55
8	Bhawanipatna	OR-15-ADB-71/TII	R.D. Road To Kerandihapar	13.98	546.21
0	Bhawanipatna	OR-15-ADB-71/TII	LSB	0.00	47.52
9	Bhawanipatna	OR-15-ADB-72/TII	Bargaon To Kendupati	3.21	112.94
10	Bhawanipatna	OR-15-ADB-73/TII	Kukuti To Lahardebri	4.50	147.42
11	Bhawanipatna	OR-15-ADB-74/TII	R.D. Road TO Durduri	3.71	120.41
0	Bhawanipatna	OR-15-ADB-74/TII	LSB	0.00	76.97
12	Bhawanipatna	OR-15-ADB-75/TII	Borda To Jeypadar	2.40	80.50
13	Bhawanipatna	OR-15-ADB-76/TII	P.W.D. Road To Sirliguda	2.00	62.95
14	Bhawanipatna	OR-15-ADB-77/TII	Attanguda To Gachhakhola	13.50	474.74
15	Bhawanipatna	OR-15-ADB-78/TII	P.W.D. Road To Dakibundel	7.02	228.61
16	Junagarh	OR-15-ADB-79/TII	R.D. Road To Panigaon	2.58	119.81
17	Junagarh	OR-15-ADB-80/TII	Gopinathpur To BudeL	4.80	202.14
18	Junagarh	OR-15-ADB-81/TII	N.H. - 201 To Ghantabahali	3.10	107.17
19	Junagarh	OR-15-ADB-82/TII	R.D. Road To Munguda	2.00	69.02
20	Junagarh	OR-15-ADB-83/TII	R.D. Road To Khudupada	2.60	112.05
21	Kesinga	OR-15-ADB-84/TII	Dendeguda To Gaidhar	3.60	149.69
22	Kesinga	OR-15-ADB-85/TII	Kandel To Sindhabali	1.50	53.29
23	Kesinga	OR-15-ADB-86/TII	Kanabira To Khamari	3.42	118.41
24	Karlamunda	OR-15-ADB-87/TII	Kandrei To Karnikhunti	5.68	201.07
0	Karlamunda	OR-15-ADB-87/TII	LSB	0.00	80.70

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
25	Karlamunda	OR-15-ADB-88/TII	Porkela To Siralbahal	3.03	113.57
26	Th. Rampur	OR-15-ADB-89/TII	Simaska To Sindhipadar	7.95	299.76
0	Th. Rampur	OR-15-ADB-89/TII	LSB	0.00	42.51
27	Th. Rampur	OR-15-ADB-90/TII	R.D. Road To Dabriguda	3.63	181.39
28	Th. Rampur	OR-15-ADB-91/TII	P.W.D. Road To Kukurbhuri	3.81	173.29
29	Th. Rampur	OR-15-ADB-92/TII	Kumudabahal Chhak To Nichemaska	8.16	333.96
0	Th. Rampur	OR-15-ADB-92/TII	LSB	0.00	224.09
30	Th. Rampur	OR-15-ADB-93/TII	R.D. Road To Tangri	3.51	121.88
0	Th. Rampur	OR-15-ADB-93/TII	LSB	0.00	50.17
31	M. Rampur	OR-15-ADB-94/TII	R.D. Road To Chitalpata	2.01	71.32
32	Th. Rampur	OR-15-ADB-95/TII	Maligaon To Kansukuli	17.01	632.45
0	Th. Rampur	OR-15-ADB-95/TII	LSB	0.00	83.37
33	Th. Rampur	OR-15-ADB-96/TII	Thukguda To Uperjhapl	16.56	650.62
0	Th. Rampur	OR-15-ADB-96/TII	LSB	0.00	198.57
34	Junagarh	OR-15-ADB-97/TII	Budhidar To Upperdunda	20.01	813.86
0	Junagarh	OR-15-ADB-97/TII	LSB	0.00	99.64
34	**Total**			**189.62**	**8110.59**
	District : Kendrapada Division Kendrapada I				
1	Garadpur	OR-16-ADB-23/TII	Padhanpatikira To Dhanmandal (Bhagabanpur To Dhanmandal)	5.50	357.88
2	Garadpur	OR-16-ADB-25/TII	Hurasahi-Indalo road to Sisua	2.40	198.47
3	Derabis	OR-16-ADB-26/TII	C.C. Road To Sridharpur	2.40	184.50
4	Derabis	OR-16-ADB-27/TII	Kosida To Karimul	3.36	195.07
4	**Total**			**13.66**	**935.92**
	District : Kendrapada Division Kendrapada II				
1	Rajnagar	OR-16-ADB-12/TII	R&B Road To Katakana	3.52	214.94
2	Rajnagar	OR-16-ADB-13/TII	Bhaghamari To Sailendrasarai	7.70	468.13
3	Rajnagar	OR-16-ADB-14/TII	R&B Road To Kanahapur	4.90	307.79
4	Rajkanika	OR-16-ADB-15/TII	S.B. Gopalpur To Kusailo	5.25	320.64
5	Rajkanika	OR-16-ADB-17/TII	Katana Chhak To Diangiri	2.90	234.41
6	Rajkanika	OR-16-ADB-18/TII	Ayatan To GajarajpuR	2.20	135.20
7	Pattamundai	OR-16-ADB-19/TII	P.W.D Road To Berhampur	1.81	116.26
8	Pattamundai	OR-16-ADB-20/TII	Indupur Road To Kadalibana	4.50	253.95
9	Pattamundai	OR-16-ADB-21/TII	Taradipal To Kulasahl	3.95	263.75
0	Pattamundai	OR-16-ADB-21/TII	LSB	0.00	51.03
10	Pattamundai	OR-16-ADB-22/TII	Aradapalli To Pejipur	2.80	184.68
10	**Total**			**39.53**	**2550.78**
	District : Khurda Division Bhubaneswar				
1	Begunia	OR-18-ADB-21/TII	MDR 68 at Govindpur to Narasinghapur	4.56	252.53
2	Begunia	OR-18-ADB-21/TII	RD road at Kathakhuntia to Swapneswar	1.80	104.66
3	Begunia	OR-18-ADB-22/TII	Kenduapali to Godipokhari	3.65	212.55
4	Begunia	OR-18-ADB-22/TII	RD road to Gaudapatna	3.00	139.86
5	Balianta	OR-18-ADB-23/TII	Balianta to Kurunti	4.40	276.03

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
6	Balianta	OR-18-ADB-23/TII	Jitikar sunalo to Kantagada	2.60	138.18
7	Balipatna	OR-18-ADB-24/TII	RD Road at Banamalipur to Baghabareipatna	3.26	180.82
8	Balipatna	OR-18-ADB-24/TII	Banamalipur Balanga to Koilipada	2.55	144.49
9	Balipatna	OR-18-ADB-25/TII	Madhuban Darada Road to Baradisahi	3.00	152.82
0	Balipatna	OR-18-ADB-25/TII	LSB	0.00	91.70
10	Khurda	OR-18-ADB-26/TII	Nuapada to Tarakai	2.20	136.25
11	BBSR	OR-18-ADB-27/TII	PWD road to Dalua	2.00	122.46
11	**Total**			**33.02**	**1952.35**
	District : Puri Division Puri				
1	Pipilli	OR-26-ADB-43/TII	L-24 to Kakudikosanga	3.52	185.56
2	Pipilli	OR-26-ADB-43/TII	L-37 to Srikanthapur	1.60	92.01
3	Pipilli	OR-26-ADB-44/TII	NH-203 to Ekchalia	1.75	93.07
4	Pipilli	OR-26-ADB-44/TII	NH-203 to Orakal	3.30	200.03
5	Pipilli	OR-26-ADB-45/TII	NH-203 to A.Singhpur	2.70	156.42
6	Pipilli	OR-26-ADB-46/TII	T-7 to BS Deuli	1.90	119.26
7	Delanga	OR-26-ADB-47/TII	T-3 to Nuagarh	2.00	98.71
8	Delanga	OR-26-ADB-47/TII	T-4 to Nuagaon	1.45	73.40
9	Delanga	OR-26-ADB-48/TII	Maunimatha to Deypursasan	4.51	260.10
10	Satyabadi	OR-26-ADB-49/TII	Bagulipari to Bhutapada	3.20	202.63
11	Satyabadi	OR-26-ADB-50/TII	Banapur to Berhampur	0.80	44.36
12	Satyabadi	OR-26-ADB-50/TII	RD road to Solahala	2.50	143.32
13	Satyabadi	OR-26-ADB-51/TII	RD road to Bhimdaspur	3.05	219.67
14	Satyabadi	OR-26-ADB-52/TII	Narendrapur to Benakera	3.12	194.96
15	Puri	OR-26-ADB-53/TII	RD Road to Satipur	4.46	326.84
16	Puri	OR-26-ADB-54/TII	NH-203 to Rebatiraman	2.00	140.61
17	K.Prasad	OR-26-ADB-55/TII	RD road to Khirisahi	3.20	248.55
18	K.Prasad	OR-26-ADB-56/TII	T-1 to Padanpur	2.60	173.66
19	Brahmagiri	OR-26-ADB-57/TII	L-74 to Madhapada	2.00	124.29
20	Brahmagiri	OR-26-ADB-57/TII	PWD road to Manapada	1.00	68.91
21	Brahmagiri	OR-26-ADB-58/TII	Kadajit to Tinikudi	3.04	219.10
22	Kanas	OR-26-ADB-59/TII	PWD road to Bagipada	4.50	276.50
23	Kanas	OR-26-ADB-60/TII	NJ Sadak to Kalighadi	3.10	200.09
24	Pipilli	OR-26-ADB-68/TII	T-9 to Manitri	3.59	229.43
25	Pipilli	OR-26-ADB-69/TII	NH-203 to Birapurusottampur Rly.station	3.41	190.29
26	Pipilli	OR-26-ADB-70/TII	SBC T1 to Balarampur Paikasahi	2.31	136.56
27	Puri	OR-26-ADB-71/TII	NJ sadak to Malasahi	2.15	141.15
28	Satyabadi	OR-26-ADB-72/TII	NH-203 to Antharpatna	2.04	127.69
29	Satyabadi	OR-26-ADB-73/TII	Algum PWD road to Padansahi	1.48	92.91
30	Satyabadi	OR-26-ADB-73/TII	PWD road to Puruna Someswarpur	1.20	79.41
31	Satyabadi	OR-26-ADB-74/TII	PWD road to Uttarpada	2.14	142.30
32	Satyabadi	OR-26-ADB-75/TII	NH-203 toTentulia	4.50	285.54
33	Satyabadi	OR-26-ADB-76/TII	Algum PWD road to Charibhayapada	4.50	322.47
34	Brahmagiri	OR-26-ADB-77/TII	NH-203A to Raihat	3.43	237.23

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
35	Brahmagiri	OR-26-ADB-77/TII	PWD road to Raisimuli	0.75	54.31
36	K.Prasad	OR-26-ADB-78/TII	Gobar dhuli to Gaurisahi	2.00	140.17
37	K.Prasad	OR-26-ADB-79/TII	RD road to Nalitakuda	2.90	182.38
38	K.Prasad	OR-26-ADB-80/TII	RD road to Anua	2.50	177.69
39	Kanas	OR-26-ADB-81/TII	NJ sadak to Radhamohanpur via-Kotakana	3.30	209.02
39	**Total**			**103.48**	**6610.59**
	District : Puri Division Nimapada				
1	Gop	OR-26-ADB-36/TII	R.D.Road to Aingala	6.67	450.74
2	Gop	OR-26-ADB-37/TII	R.D Road to Ogalapur	2.00	139.46
3	Satyabadi	OR-26-ADB-38/TII	Mahura to sameipur	3.30	205.38
4	Gop	OR-26-ADB-39/TII	R.D Road to ortanda	3.55	213.15
5	Nimapara	OR-26-ADB-40/TII	Bhanapur to Sainsasasan	5.20	347.67
6	Satyabadi	OR-26-ADB-41/TII	Ketakipatna to Dubapatna	3.70	249.85
7	Gop	OR-26-ADB-42/TII	R.D Road to Banilo	2.80	186.98
8	Gop	OR-26-ADB-61/TII	M.B.Road to Gadajanga	5.78	355.21
0	Gop	OR-26-ADB-61/TII	LSB	0.00	94.48
9	Kakatpur	OR-26-ADB-62/TII	Othaka to Gopikantapur	1.40	87.50
10	Nimapara	OR-26-ADB-63/TII	Patapur to Bamanal	2.95	188.34
11	Gop	OR-26-ADB-64/TII	M.D.Road to Tikana	1.10	68.41
12	Astaranga	OR-26-ADB-65/TII	Gudabani to Solapatia	2.70	169.16
13	Gop	OR-26-ADB-66/TII	RD Road to Paitabori	7.30	432.13
14	Satyabadi	OR-26-ADB-82/TII	Mahura (Dangura Chhak) to Allikira	3.30	205.92
15	Gop	OR-26-ADB-83/TII	P.K. Road to Khargaon	11.80	695.05
15	**Total**			**63.55**	**4089.43**
	District : Sambalpur Division Sambalpur				
1	Rengali	OR-28-ADB-29(A)/TII	RD Road to Banjiberna	1.35	81.08
2	Rengali	OR-28-ADB-29(B)/TII	SH-10 to Pudapada	1.40	51.23
3	Rengali	OR-28-ADB-30(A)/TII	Ghichamura to Kendmal	2.22	92.91
4	Rengali	OR-28-ADB-30(B)/TII	RD Road to Bisadihi	2.28	98.46
5	Naktideul	OR-28-ADB-31/TII	Keutiberni Bypass to Sandhubali	7.40	319.80
6	Rengali	OR-28-ADB-32/TII	PWD Road to Thapapali	1.38	56.63
7	Dhankauda	OR-28-ADB-33(A)/TII	NH-6 to Jharmunda	1.32	67.45
8	Dhankauda	OR-28-ADB-33(B)/TII	Mundoghat to Potapali	1.63	82.61
9	Dhankuda	OR-28-ADB-34/TII	Left Dyke road to Tihura	0.96	48.04
10	Dhankauda	OR-28-ADB-35(A)/TII	PWD Road to Dungipali road	2.65	100.40
11	Dhankauda	OR-28-ADB-35(B)/TII	PWDRoad SH10 to Patrapali Road	2.10	85.28
12	Dhankauda	OR-28-ADB-36(A)/TII	NH-6 to Maulibhag	2.48	106.07
13	Dhankauda	OR-28-ADB-36(B)/TII	NH-6 to Bhoitikira	0.67	31.76
14	Jujumura	OR-28-ADB-37(A)/TII	RD Road to Khasupali	1.40	61.49
15	Jujumura	OR-28-ADB-37(B)/TII	RD Road to Gudiapali via Rengalkani	2.53	118.72
16	Jujumura	OR-28-ADB-37(C)/TII	RD Road to Bhatasinghpada	2.50	105.65
17	Maneswar	OR-28-ADB-38/TII	RD Road to Kanbar	0.75	35.02
18	Naktideul	OR-28-ADB-39/TII	RD Road to Musakani	1.40	54.16

Sl. No.	Name of the Block	Package No.	Name of the Road	Length (Km)	Cost
1	2	3	4	5	6
19	Jamankira	OR-28-ADB-40(A)/TII	Kulundi to Banmal	3.50	174.82
20	Jamankira	OR-28-ADB-40(B)/TII	NH-6 to Badakundisora	2.90	133.93
21	Jamankira	OR-28-ADB-41/TII	PMGSY Road to Bhejikudar	1.50	82.59
22	Redhakhol	OR-28-ADB-42/TII	RD road to Mahaling	6.30	220.03
0	Redhakhol	OR-28-ADB-42/TII	LSB	0.00	54.97
23	Jamankira	OR-28-ADB-43/TII	RD Road to Ganghusa	3.60	155.04
0	Jamankira	OR-28-ADB-43/TII	LSB	0.00	39.17
24	Jujumara	OR-28-ADB-44/TII	NH-42 to Tetulipada	3.75	165.07
25	Kuchinda	OR-28-ADB-45/TII	Gochhara to Katupali	8.10	318.20
0	Kuchinda	OR-28-ADB-45/TII	LSB	0.00	36.81
26	Kuchinda	OR-28-ADB-46/TII	Baxma to Barghat	7.98	383.64
27	Maneswar	OR-28-ADB-47/TII	RD Road to Bolbanga	1.20	57.65
28	Jamankira	OR-28-ADB-48/TII	Goilomundi to Pandibahal	3.70	196.98
29	Rengali	OR-28-ADB-49/TII	SH-10 to Bansimal	3.00	114.57
30	Dhankauda	OR-28-ADB-50/TII	NH6 to Khariapada road	1.60	68.66
31	Jamankira	OR-28-ADB-51/TII	Mahada to Kardakhaman	3.35	180.73
32	Naktideul	OR-28-ADB-52/TII	Keutiberni to Chemerda	6.10	260.09
33	Bamra	OR-28-ADB-53/TII	Talasara to Jhagadatiria	2.05	80.79
34	Naktideul	OR-28-ADB-54/TII	Laiza to Kholgarh	14.88	646.03
35	Rengali	OR-28-ADB-55/TII	Khinda to Dantamura	2.42	109.61
35	**Total**			**112.33**	**5076.12**
343	**Grand Total**			**1184.06**	**61519.13**

Appendix 1.2: Rural Roads: Environmental Checklist

RURAL ROADS: ENVIRONMENTAL CHECKLIST

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: PWD Road to Nachhipur

Block Name: Bhadrak

District Name: Bhadrak

Total Length of the Road: 3.10 km

A. Climatic Conditions

Temperature	High: 9~0 (May) Low: 46 ~0(Dec)
Humidity	High: 82% Low : 34%
Rainfall Rainy Season	1478 mm/year 15th June to 31st 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: 70 km ( ) more than 50% ( ) less than 30%
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: Not Applicable Endangered species (if any): None
5.	Inhabited Area	√		Inhabited areas are concentrated at Between 2.0 km to 2.2 km both side of the road.
6.	Agricultural Land	√		The project road passes through agriculture land.
7.	Grazing grounds		√	As per the discussions with the villagers no part of the study area consisted of grazing land.
8.	Barren Land	√		Patches of barren land was found between Ch. 0.4 to 0.650 on both side of the road,0.930 to 1.060 both side of the 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. 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)	√		The project road passes by a pond at left hand side namely at Ch. 1.8 km.
3.	Are there any nalas/streams/rivers etc. along/crossing the road? (If yes, list them indicating the location (right, left or crossing) and the chainage		√	There are no Nalas/Streams/rivers along the road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (If yes, mention chainage)		√	The project road does not have any water logging problem informed by the villagers. [ ] 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)		√	No part of the road is prone to flooding as there are no rivers near 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 from the centre line of the road alignment? (If yes attach list of trees indicating the location (right or left side)and the chainage)	√		There are 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

9.	Are there any utility structures[6] within 10 m on either side from the centre line of the road alignment? (If yes, attach list with chainage)	√		Few utility structures were found as listed in Attachment I).
10.	Are there any religious, cultural or community structures/buildings[7] within 10 m on either side from the centre line of the road alignment? (If yes attach list with chainage)		√	There are no Community structures found with in the 10 m of the road. 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)	√		The proposed alignment has been finalized after taking suggestions from the local community. This was confirmed by the villagers during the transect walk.
2.	Any suggestion received in finalizing the alignment		√	No written suggestion was received. However, during transect walk few requests were made by the villagers
3.	If suggestions received, were they incorporated into the design?	√		All the relevant suggestions has been incorporated in the alignment.

E. Please attach the following:

1) List of trees indicating location (left or right side of the road) and chainage (as required under C. 8)

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

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

4) Sketch of strip map of the road covering details of atleast 10 m on either side from the centre line of the road

5) Photographs of the project area showing atleast 10 m on either side from centre line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

Attachment I

List of Trees

Chainage	Left	Right
0.5	-	1

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

0.5	1	-
1.6	2	-
1.7	1	-
1.8	1	-
2.0	4	2
2.2	9	-
2.4	3	-
Total	21	3

Attachment II

List of Utilities

Chainage	Left	Right
0.4	Electric Pole	-
0.5	Electric Pole	-
1.6	-	Electric Pole
1.8	2 Electric Pole	Electric Pole
2	-	Electric Pole

Attachment III

List of Community Structures

Chainage	Left	Right
1.2	-	Pond
2.8	School	-

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: BC Road To Bagunia

Block Name: Chandabali

District Name: Bhadrak

Total Length of the Road: 7.00 km

A. Climatic Conditions

Temperature	High: 45°C (May) Low: 9°C(Dec)
Humidity	High: 80% Low : 35%
Rainfall Rainy Season	1478 mm/year 15th June to 31st 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: 20 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, Declassified, 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: Not Applicable Endangered species (if any): None
5.	Inhabited Area	√		Inhabited areas are concentrated at Between 6.0 km to 6.8 km both side of the road.
6.	Agricultural Land	√		The project road passes through agriculture land.
7.	Grazing grounds		√	As per the discussions with the villagers no part of the study area consisted of grazing land.

No.	Type of Ecosystem	Yes	No	Explanation
8.	Barren Land		√	No barren land along the Project.

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 are two protected pond identified between 1.020 to 1.130 and 3.445 to 3.580km of the proposed road.
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 no nallas/streams/rivers along the road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (If yes, mention chainage)		√	The project road does not have any water logging problem informed by the villagers. ( ) 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)		√	No part of the road is prone to flooding as there are no rivers near 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 from the centre line of the road alignment? (If yes attach list of trees indicating the location (right or left side)and the chainage)	√		There are 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
9.	Are there any utility structures[1] within 10 m on either side from the centre 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[2] within 10 m on either side from the centre line of the road alignment? (If yes attach list with chainage)		√	No Community structures found with in the 10 m of the road.

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)	√		The proposed alignment has been finalized after taking suggestions from the local community. This was confirmed by the villagers during the transect walk.
2.	Any suggestion received in finalizing the alignment		√	No written suggestion was received
3.	If suggestions received, were they incorporated into the design?		√	Not applicable

E. Please attach the following:

1) List of trees indicating location (left or right side of the road) and chainage (as required under C. 8)

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

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

4) Sketch of strip map of the road covering details of atleast 10 m on either side from the centre line of the road

5) Photographs of the project area showing atleast 10 m on either side from centre line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

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

Attachment I

List of Trees

Chainage	Left	Right
0.0	1	-
0.8	2	-
0.760	1	-
1.1	1	-
1.180	1	2
3.4	2	1
Total	8	3

Attachment II

List of Utilities

Chainage	Left	Right
4.3		Electric Pole
4.5		Electric Pole

Attachment III

List of Community Structures

Chainage	Left	Right
	Nil	

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **R.D Road DTS to Bagadia**

Block Name: **Boudh**

District Name: **Boudh**

Total Length of the Road: **4.25 km**

A. Climatic Conditions

Temperature	High: **40 °C (May)** Low: 18 °C (Dec)
Humidity	High: 35% (Aug) Low: 10% (Dec)
Rainfall	1589 mm/year
Rainy Season	June to September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		√	Distance from Coastline: km ( ) more than 50% ( ) less than 20%
2.	Type of Terrain-(Plain/Hilly/ Mountainous etc.) *(Explain the topography of the area and how many km of the road are located in the hilly area)*		√	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 area starts between Ch-400m to Ch-1400m with connecting hamlet villages of Bagadia.
6.	Agricultural Land	√		The project road passes through agriculture land between Ch- 400m to Ch-1000m. &Ch -2050m to Ch-2550m.
7.	Grazing grounds		√	There is no Grazing ground along the project road.
8.	Barren Land	√		There is Barren land along the project road from C.H-2500m to C.H-2900m and C.H-4100m (RHS)

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 is a pond at right side of the proposed road at CH-3200m to CH-3300m.
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 Irr.Canal situated along the left side of the project road at CH-2200m to CH-2300m.
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 mention 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 flood prone zone 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)	√		18 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 breading 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			No rare, endangered or threatened species were found within 100 m of the road shoulder.

No.	Parameter/ Component	Yes	No	Explanation
	faunal species that are classified as endangered species?		√	|| No Secondary Information Available and Local Community is not aware of the matter
9.	Are there any utility structures[1] within 10 m on either side from the center line of the road alignment? (If yes, attach list with chainage)	√		There are few utility structures Found as listed in Attachment II.
10.	Are there any religious, cultural or community structures/buildings[2] within 10 m on either side from the center line of the road alignment? (If yes attach list with chainage)	√		Few religious cultural or community structures/buildings were found as listed in Attachment II.

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)	√		The community is satisfied with the road proposed alignment and they don't want to change the alignment.
2.	Any suggestion received in finalizing the alignment		√	Not received any suggestion.
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.

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

Attachment I

List of Trees

Chainage (M)	Left	Right
300-350	-	1
1000-1050	1	-
1400-1450	-	1
1600-1650	5	2
1700-1750	-	1
2000-2050	-	1
2100-2200	5	-
2250-2300	1	-
Total	12	6

Attachment II

List of Utilities

Chainage (M)	Left	Right
0-100	Electric Pole	Electric Pole
300	-	Tube-well
1500-1550	-	Electric Pole
2000-2100	-	Electric Pole

Attachment III

List of Community Structures

Chainage	Left	Right
250-300	Building	-
1000-1100	Thached-Building	-
1500-1550	Building	-
2550-2600	Building	Building

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	-	-	00-100	-	-	EP	-	-
-	S.B	-	-	-	200-300	-	-	T.W	-	-
-	-	-	-	-	300-400	-	-	-	1 tree	-
-	T.Building	1 tree	-	-	1000-1100	-	-	-	-	-
-	T.Building	5 tree	-	-	1400-1500	-	-	1 tree	-	-
-	-	-	-	-	1500-1600	-	-	2 tree	-	E.P
-	-	-	-	-	1700-1800	-	-	-	1 tree	-
-	-	-	-	-	1900-2000	-	-	-	-	-
-	-	5 tree	-	-	2000-2100	-	-	-	1 tree	E.P
-	-	1 tree	-	-	2100-2200	-	-	-	-	-
-	T.Building	-	-	-	2200-2300	-	-	-	-	-
					2500-2600	-	-	-	T.Building	-

E.P. Electric Pole; H.P. – Hand Pump, T.W. : Tube Well, P.H.C ; Primary Health Center
A.L. – Agricultural Land; C.D. – Cross Drainage structure, W.T.—Water Tank,S.B-School Building

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: NH-55 to Sridihi

Block Name: Odapada

District Name: Dhenkanal

Total Length of the Road: 2.780 Km

A. Climatic Conditions

Temperature	High: 44° Low: 18°
Humidity	High: 98% Low: 30%
Rainfall	1300/ 1500 mm/year
Rainy Season	June to September

B. Location of the Road and Generic description of Environment

I No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		No	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)	Yes (Plain)		Altitude: Plain The topography is flat 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)?		No	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)		No	Name of animals: Endangered species (if any):
5.	Inhabited Area	Yes		In habited areas are situated at starting point and end point of the proposed road.

No.	Type of Ecosystem	Yes	No	Explanation
6.	Agricultural Land	Yes		Agricultural lands are situated in some patches on both side of the project road.
7.	Grazing grounds	Yes		There is grazing ground located between chainage 0/300km to 0/750km of the project road.
8.	Barren Land	Yes		Barren lands are situated in some patches on both side of 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	No part of the project road lies in hilly terrain prone to land side 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)	Yes		There are 3 nos of pond along the project road at ch. 1/650km (RHS), 1/900km (RHS) & 1/920km (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)	Yes		There is nallah crossing at Ch. 2/562km. Hence Cross Drainage works have been provided at the same chainage as per the discussion with the community.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (If yes, mention chainage)		No	There is no problems of water stagnation and other drainage issues on or near the road. ( ) 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)		No	There is no area along the project road 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 10m 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)		No	There is no any trees with a dbh of 30 cm or more within 10m on either side from the center line of the road alignment.
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	No faunal habitat breeding ground breeding etc. is found with 100mtr of the roads shoulders.
				( ) No Secondary Information is available and Local Community is not aware of the 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	No rare, endangered or threatened species where found within 100mtr of the road shoulders.
				( ) No Secondary Information Available and Local Community is not aware of the matter
9.	Are there any utility structures[1] within 10m on either side from the center line of the road alignment? (If yes attach list with chainage)	Yes		Some of the utilities structure are found along the project road as attached in attachment III.
10.	Are there any religious, cultural or community structures/buildings[2] within 10m on either side from the center line of the road alignment? (If yes attach list with chainage)		No	Some of the utilities structure are found along the project road as attached in attachment III.

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

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. (Attach list of people contacted also)	Yes		Consultation was held with local community before finalizing the alignment. Community was satisfied with the proposed alignment.
2.	Any suggestion received in finalizing the alignment	Yes		Community members has suggested to take up the alignment along the existing earthen track.
3.	If suggestions received, were they incorporated into the design?	Yes		No retain suggestion was received, however during transect walk few suggestions were made by the villagers which have been considered.

E. Please attach the following:

1) List of trees indicating location (left or right side of the road) and chainage (as required under C. 8)

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

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

4) Sketch of strip map of the road covering details of atleast 10m on either side from the center line of the road

5) Photographs of the project area showing atleast 10m on either side from center line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

Assistant Engineer
Rural Work Sub-Division
Bhenkana

Attachment –I

LIST OF TREES

Chainage (In KM)	Left	Right
0	1	
0.100		1
0.200	1	
0.300	1	
0.400	3	4
0.700	1	
1.150	1	
1.200	1	
1.250	1	
1.400	1	1
1.500 to 1.600	8	
1.750	3	
1.800	1	
1.900	1	
2.200	1	
2.300		1
2.400		1
TOTAL	25	9

Attachment - II

LIST OF UTILITIES

Chainage (In KM)	Left	Right
0.200	EP	
0.300		EP
1.900	EP	
2.000		EP
2.100		EP
TOTAL	3 nos	2 nos

Attachment - I"

LIST OF COMMUNITY STRUCTURES

Chainage (In KM)	Left	Right
0.100		School
2.100	Hand Pump	
2.300	Hand Pump	
2.400	School	
TOTAL	3 nos	1 no.

Assistant Engineer
Rural Works Sub-Division

STRIP PLAN

LIS of the Propose road					Project Road chainage (In km)	RIS of the Propose road				
8 to 10 mtr	6 to 8 mtr	4 to 6 mtr	2 to 4 mtr	0 to 2 mtr		0 to 2 mtr	2 to 4 mtr	4 to 6 mtr	6 to 8 mtr	8 to 10 mtr
R.	R.	R.	OL	OL	0	OL	OL	VA	VA	VA
R.	R.	R.	OL	OL	0.1	OL	OL	VA	VA (School)	VA
R.	R.	R.	OL (EP)	OL	0.2	OL	OL	VA	VA	VA
R.	R.	R.	OL	OL	0.3	OL	OL (EP)	VA	VA	VA
OL	OL	OL	OL	OL	0.4	OL	OL	BL	BL	BL
OL	OL	OL	OL	OL	0.5	OL	OL	BL	BL	BL
OL	OL	OL	OL	OL	0.6	OL	OL	BL	BL	BL
OL	OL	OL	OL	OL	0.7	OL	OL	BL	BL	BL
OL	OL	OL	OL	OL	0.8	OL	OL	BL	BL	BL
OL	OL	OL	OL	OL	0.9	OL	OL	BL	BL	BL
R.	R.	R.	OL	OL	1	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.1	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.2	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.3	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.4	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.5	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.6	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.7	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	1.8	OL	OL	R.	R.	R.
R.	R.	R.	OL (EP)	OL	1.9	OL	OL	R.	R.	R.
R.	R.	R.	OL	OL	2	OL	OL (EP)	R.	R.	R.
VA	VA	VA (EP)	OL	OL	2.1	OL	OL (EP)	VA	VA	VA
VA	VA	VA	OL	OL	2.2	OL	OL	VA	VA	VA
VA	VA	VA (EP)	OL	OL	2.3	OL	OL	VA	VA	VA
R.	R.	R.	OL	OL	2.4	OL	OL	R.	R. (School)	R.
R.	R.	R.	OL	OL	2.5	OL	OL	R.	R.	R.
VA	VA	VA	OL	OL	2.6	OL	OL	BL	BL	BL
VA	VA	VA	OL	OL	2.7	OL	OL	BL	BL	BL
VA	VA	VA	OL	OL	2.8	OL	OL	BL	BL	BL

O.L - Open land
A.L - Agriculture land
H.P- Hand Pump
E.P -Electric Pole

BL- Barren Land
VA- Village Area
PL- Private Land

Assistant Engineer
Rural
Dhenkanal

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Badbil to Nati**
Block Name: Niali & Kantapada

District Name: Cuttack

Total Length of the Road: 27.150km

A. Climatic Conditions

Temperature	High: 40 Low: 18
Humidity	High: 78 Low: 62
Rainfall Rainy Season	1760 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: 45 km Costal area is very far from the project road ( ) 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: Plain
4.	Forest Area (Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?		√	Type of Vegetation: Open area Legal Status of the Forest Area: Away from the road area (Reserved, National Park, Sanctuaries, Doubtful, etc.)
5.	Wildlife (Explain whether there are any wildlife species in the project area)		√	Name of animals: Endangered species (if any):

No.	Type of Ecosystem	Yes	No	Explanation
6.	Inhabited Area	√		The road passes on river embankment through Open & Builtup area.
7.	Agricultural Land		√	There is no agriculture land to be affected for the road project.
8.	Grazing grounds		√	
9.	Barren Land	√		

C. Specific description of the Road Environment

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

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

				( ) 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)		√	
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?		√	
	(If yes, specify details of habitat with chainage)			( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		√	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[9] within 10 m on either side from the center line of the road alignment? (If yes, attach list with chainage)	√		Provision of made for shifting of Electric poles
10.	Are there any religious, cultural or community structures/buildings[10] within 10 m on either side from the center line of the road alignment? (If yes attach list with chainage)		√	

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 is conducted.
2.	Any suggestion received in finalizing the alignment	√		

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

3.	If suggestions received, were they incorporated into the design?	√		

E. Please attach the following:

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

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

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

4) Sketch of strip map of the road covering details of atleast 10 m on either side from the center line of the road

Photographs of the project area showing atleast 10 m on either side from center line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

List of Trees Attachment - I

Chainage (M)	Left	Right
21580		1 tree
23820		1 tree

List of Utilities Attachment - II

Chainage (M)	Left	Right
10 -2350	Canal	
3960 - 14350		Canal
15050-16000		Canal
0 - 17800	River Kandal (0 -2500)- River Devi (2500 – 17800)	
17800-27150		River Devi
17750	Road Crossing	
17830	Sithalo Bridge	

List of Community Structures Attachment - III

Chainage (M)	Left	Right
530	Temple	
3420		Temple
6700	Temple	
13500	Temple	Temple
13750	Temple	
19850	Temple	
24800		School
25000	Temple	
25800	Temple	
27050		Temple

Attachment - IV

Left					Chainage	Right				
8 to 10m	6 to 8m	4 to 6m	2 to 4m	0 to 2m	(M)	0 to 2m	2 to 4m	4 to 6m	6 to 8m	8 to 10m
					30		1 E.P			
			1 E.P		50					
			1 E.P		80					
					120					1 E.P
					150			1 E.P		
					260			1 E.P		
					300			1 E.P		
					360			1 E.P		
		1 E.P			430					
		1 E.P			480					
					500		1 E.P			
		1 H.P			530					
					550			1 E.P		
		1 E.P			1730					
			1 E.P		2450					
			1 E.P		2500					
			2 E.P		2550					

			1 E.P		2600					
			1 E.P		2620					
					3300					1 E.P
	1 E.P				3380					
		1 E.P			3600					
		1 E.P			3700					
		1 E.P			3750					
		1 E.P			3800			1 E.P		
					3900					
					3930				1 E.P	
			1 E.P		5920					
			1 E.P		6170					
					6230					
		1 E.P			6280					
		1 E.P			6300					
		1 E.P			6350					
		1 E.P			6400					
		1 E.P			6450					
			1 E.P		6500					
				1 E.P	6900					
			1 E.P		7080					
		1 E.P			7180					
			1 E.P		7450					
			1 E.P		7750					
			1 E.P		7900					
					8020			1 E.P		
			1 E.P		8030					
		1 E.P			8070					
		1 E.P			10300					
			1 E.P		10640					
			1 E.P		10840					
					11230				1 E.P	
					11300				1 E.P	
			1 E.P		11800					
				1 E.P	15910					
				1 E.P	15950					

	1 E.P				20250					
			1 E.P		20290					
					20310		H.P			
			1 E.P		24360					
			1 E.P		24510					
		1 E.P			24600					
			1 E.P		24630					
			1 E.P		25950					
			1 E.P		25970					

E.P. – Electric pole, H.P – Hand Pump
A.L Agricultural Land, C.D Cross Drainage Structure

RURAL ROADS , ENVIRONMENTAL CHECKLIST

ROAD NAME :- NH-5 to Brahmanakusadiha
BLOCK NAME :- Chilika
DISTRICT NAME :- Khurda
TOTAL LENGTH OF THE ROAD :- 1.250 KM

A. Climatic Condition :-

Temperature	High :- 46 ° C	Low :- 10 ° C
Humidity	High :- 74 %	Low :- 30 %
Rainfall	1539.03 mm /year	
Rainy season	June to October	

B. Location of The Road And Generic Description of Environment :-

Sl. No	Type of Ecosystem	Yes	No	Explanation
1	Coastal area Mangrove *(Along Road side)*	√		Distance from Coast Line 20 Km 1.00 .km more than 50 % 5.00 km less than 20 %
2	Type of Terrain (Plain, Hilly, Mounteneous) *(Explain the Topography of the Area and how many kilometers of the road are located in the hilly area)*		√	Altitude 5.00m above MSL The Topography of the project road is flat at almost all location.
3	Forest Area *(Explain whether the road passes through forest ares or located along the forest ares , Length of the road passes through or located along the forest areas & distance from the road shoulder to the forest area .)*		√	Type of Vegetation Forest is away from 15 to 20 k.m. Legal Status of the Forest Area *(Reserved Forest , National Park , Sanctuary , unclassified etc)* *No Part of the project road passes through any forest area.*

4	Wild life *(Explain whether there are any wildlife species in the project area)*		√	Name of animals: NA
5	Inhabited Atrea	√		Habitation village Brahmanikushadiha is located between CH 1/000 to 1/250.
6	Agricultural Land	√		The project road passes through the Govt. Land & crop field.
7	Grazing Grounds	√		The Govt. Barren Lands are used as Grazing Grounds.
8	Barren Land	√		Most of the Flat area are seen on the right side of the road.

C. Description of the Road Environment :-

Sl. no	Parameter / Component	Yes	No	Explanation
1	Are there any areas with landslide or erosion problems along the road ?		√	Project area is not prone to landslide and erosion problems.
2	Are there any lakes/swamps beside the road ?		√	There is no lake/Swamps along the project road.
3	Are there any nallas/streams/rivers etc. along/crossing the road?		√	No Nallh & Stream
4	Are there problems of water stagnation and other drainage issues on or near the road?	√		Inadequate Ventage at 0/100,0/325,0/41so extra Hp Culverts are Provided.
5	Is the area along the project road prone to flooding?		√	No River is adjacent to Nallah
6	Are there any trees with a dia of 30cm or more with in 10m on either side from the centre line of the road alignment	√		There are 20 nos of trees are within 10mt on either side from the centre line of the road alignment but located beyond the road way width.

7	Along the road and within 100mt of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas.		√	No faunal habitat, breeding ground etc. is found within 100mt of the road shoulder.
8	Along the road and within 100mt of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		√	No, endangered species were found within 100mt
9	Are there any utility structures within 10m on either side from the center line of the road alignment?	√		6 nos of E.P. are to be shifted.
10	Are there any religious, cultural or community structures/buildings within 10m either side from the centre line of the road alignment?		√	There is no a temple along the project road

D . Public consultation :-

Sl. No	Consultation Activities	Yes	No	Remarks
1	Consultation with local community was conducted before finalizing the alignment? *(Provide the Issue raised by the community)*	√		Consultation was held with local community before finalizing the alignment. Community was satisfied the alignment.
2	Any suggestions received in finalizing the alignment ?	√		Community members have suggested to construct the road along the existing alignment
3	If suggestions received do they get incorporated into design ?	√		Community members have suggested to construct additional C.D. Works for discharge of excess rain water, which has been incorporated along the existing alignment

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

Attachment I

List of Trees

Chainage (M)	Left	Right
0-400	1	2
400-800	3	3
800-1000	1	3
1000-1100	3	2
1100 - 1250	2	2
Total	**10**	**12**

Attachment II

List of Utilities

Chainage (M)	Left	Right
0-200	-	-
200-400		Electric Pole
400-600	Electric Pole	-
600-800	-	Electric Pole
800-1000	Electric Pole	-
1000-1250	Electric Pole	Electric Pole

Attachment III

List of Community Structures

Chainage	Left	Right
-	-	-

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	-	-	-	-	00-100	-	-	-	-	-
-	-	-	-	-	100-200	-	-	-	Temple	-
-		-	-	-	200-300	-	-	-	-	-
-	1 tree	-	-	-	300-400	-		EP	2 tree	-
2 tree	-	-	-	-	400-500	-	-	-	-	-
-	-	-	EP	-	500-600	-	-	-	2 tree	-
-	1 tree	-	-	-	600-700	-	-	-	-	-
2 tree	-	-	-	-	700-800	-	-	EP	1 tree	-
-	-	-	EP	-	800-900	-	-	-	-	-
-	1 tree	-	-	-	900-1000	-	-	-	-	2 tree
-	-	-	-	-	1000-1100	-	-	-	-	-
-	2 tree	-	EP	-	1100-1250	-	-	EP	-	1 tree

7) E.P. Electric Pole; H.P. – Hand Pump, T.W. ; Tube Well, P.H.C ; Primary Health Center

Road Name: Rajas to Garia

Block Name: Balipatana

District Name: Khurda

Total Length of the Road: 2.0 km

A. Climatic Conditions

Temperature	High: 46 °C (May) Low: 11 °C (Dec)
Humidity	High: 35% (Aug) Low: 10% (Dec)
Rainfall Rainy Season	1288.60 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: 35 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: Plain
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: 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 area starts from Ch-1500m to Ch-2000m on the both side of the road.
6.	Agricultural Land	√		The project road passes through agriculture land between Ch- 00m to Ch-1500m.
7.	Grazing grounds		√	There is no Grazing ground along the project road as per discussion with villagers.
8.	Barren Land		√	There is no Barren land along the project road.

C. Specific description of the Road Environment

(Note: Questions number 1, 4, 6, 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)*		√	As the road passes through plain terrain ( ) 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 two protected pond identified between Ch-1350m to Ch-1370m and Ch-1680 to Ch- 1720 of the proposed road.
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 a nalla starts from Ch- 850 to Ch- 1375 along the road.
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 mention above Serial no-3, Provision for construction of culverts have been made in the estimate. ( ) 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)*	√		H.F.L .102.00 with respect to Dhanua bridge. ( ) 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 trees data - 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

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[27] 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[28] 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)*	√		The community is satisfied with the road proposed alignment and they don't want to change the alignment.
2.	Any suggestion received in finalizing the alignment		√	No written suggestion was received how ever transect walk few suggestion were made by the villagers.
3.	If suggestions received, were they incorporated into the design?	√		All the relevant suggestions has been incorporated in the alignment.

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.

Attachment I

List of Trees

Chainage (M)	Left	Right
0-500	4	4
500-1000	1	-
1000-1500	1	1
1500-2000	-	2
Total	6	7

Attachment II

List of Utilities

Chainage (M)	Left	Right
1400	Electric Pole	-
1500	-	Electric Pole
1530	-	Electric Pole
1560	-	Electric Pole
1590	-	Electric Pole
1820	Hand Pump	-

Attachment III

List of Community Structures

Chainage	Left	Right
1550	-	Cabin
1580	-	Bhagabat tungi
1900	-	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	-	-	-	-	00-100	-	-	Pump house	-	-
-	-	1 tree	-	-	100	-	-	-	-	-
-	1 tree	-	-	-	160	-	-	-	-	-
-	-	-	-	-	180	-	-	1 tree	-	-
-	-	-	-	-	220	-	-	2 tree	-	-
1 tree	-	-	-	-	450	-	-	-	-	1 tree
1 tree	-	-	-	-	650	-	-	-	-	-
-	-	-	-	-	1350	-	-	Pond	-	-
1 tree	-	EP	-	-	1400	-	-	-	-	-
EP	-	-	-	-	1500	-	-	-	EP	1 tree
-	-	-	-	-	1530	-	EP	-	-	-
-	-	-	-	-	1550	Cabin	-	-	-	-
-	-	-	-	-	1560	-	-	EP	-	-
-	-	-	-	-	1580	-	Bhagabat tungi	-	-	-
-	-	-		-	1590	-	EP	-	-	-
-	-	-	-	-	1700	-	Pond	-	-	-
-	-	-	HP		1820	1 tree	-	-		-
-	-	-	-	-	1900	-	-	-	1 tree	School

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

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Rd road at Danagarpada Dalak
Block Name: Begunia

District Name: Khurda

Total Length of the Road: 8.17 km

A. Climatic Conditions

Temperature	High: 45°C (May) Low: 10°C (Dec)
Humidity	High: 75% (Aug) Low: 30% (Dec)
Rainfall Rainy Season	1252.40 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: 40 km ( ) more than 50% ( ) less than 30%
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: Plain
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: 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 area starts from Ch-3000m to Ch-4660m on the both side of the road.
6.	Agricultural Land	√		The project road passes through agriculture land between Ch- 3120m to Ch-3360m, 5540 to 5900 &7900 to 8000m.
7.	Grazing grounds		√	There is no Grazing ground along the project road as per discussion with villagers.

No.	Type of Ecosystem	Yes	No	Explanation
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)		√	As the road passes through plain terrain ( ) No Secondary information is available and Local Community is not aware of the 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 two protected pond identified between Ch-4/500to4/580 of the proposed road.
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 a nalla starts from Ch- 7/30to Ch- 7/70 along the road.
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 mention above Serial no-3, Provision for construction of culverts have been made in the estimate. ( ) No Secondary information is available and Local Community is not aware of the matter
5.	Is the area along the project road prone to flooding? (If yes, mention flood level and Frequency)		√	NO ( ) No Secondary information is available and Local Community is not aware of the matter
6.	Are there any trees with a depth 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 trees data - <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 the matter
			√	

No.	Parameter/ Component	Yes	No	Explanation
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		√	No () No Secondary Information Available and Local Community is not aware of the matter
9.	Are there any utility structures[10] 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[11] 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 persons met and dates)	√		The community is satisfied with the road proposed alignment and they don't want to change the alignment.
2.	Any suggestion received in finalizing the alignment		√	No written suggestion was received how ever transect walk few suggestion were made by the villagers.
3.	If suggestions received, were they incorporated into the design?	√		All the relevant suggestions has been incorporated in the alignment.

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.

List Of Trees Attachment -1

Chainage (M)	Left	Right
250	2	4
280	1	-
350	2	-
420	2	2
480	1	-
560	-	2
650	2	-
800	1	-
2500	1	1
3500	4	2
7800	1	2
7950	2	1

List Of Utilities Attachment -2

Chainage(M)	Left	Right
3900		School
4050	Electric line crossing	School
3500		E.P

List Of Community Structures Attachment -3

Chainage	Left	Right
4115	Temple	

Attachment -4

Left					Chainage (M)	Right				
8-10m	6-8m	4-6m	2-4m	0-2 m		0-2m	2-4m	4-6m	6-8m	8-10m
	1Tree	1Tree			250			2Tree	2Tree	
		1Tree			280					
1Tree	1Tree				350					
		1Tree	1Tree		420		1Tree	1Tree		
		1Tree			480					
					560			1Tree	1Tree	
	1Tree		1Tree		650					
		1Tree			800					
	1Tree				2500			1Tree		
2Tree		2Tree			3500			1Tree	1Tree	E.P.
					3900				School	
			Well		4050					School
	1Tree				7800		1Tree		1Tree	
					4115					Temple
	1Tree		1Tree		7950			1Tree		

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

RURAL ROADS , ENVIRONMENTAL CHECKLIST

ROAD NAME :- MB Road to Mahapur
BLOCK NAME :- Gop
DISTRICT NAME :- Puri
TOTAL LENGTH OF THE ROAD :- 7.00 KM

A. Climatic Condition :-

Temperature	High :- 46 * C	Low :- 10 * C
Humidity	High :- 74 %	Low :- 30 %
Rainfall	1341.6 mm /year	
Rainy season	June to October	

B. Location of The Road And Generic Description of Environment :-

Sl. No	Type of Ecosystem	Yes	No	Explanation
1	Coastal area Mangrove (Along Road side)	√		Distance from Coast Line 5.0 Km 1.00 km more than 50 % 5.00 km less than 20 %
2	Type of Terrain (Plain, Hilly, Mountenecus) *(Explain the Topography of the Area and how many kilometers of the road are located in the hilly area)*		√	Altitude 2.00m above MSL The Topography of the project road is flat at almost all location.
3	Forest Area *(Explain whether the road passes through forest area or located along the forest area , Length of the road passes through or located along the forest areas & distance from the road shoulder to the forest area .)*		√	Type of Vegetation Forest is away from 5 to 7 k.m. Legal Status of the Forest Area *(Reserved Forest , National Park , Sanctuary , unclassified etc)* No Part of the project road passes through any forest area.

4	Wild life (Explain whether there are any wildlife species in the project area)		√	Name of animals: NA
5	Inhabited Area	√		Habitation villageUchhupur, Mahapur is located between CH 0/000 & 6/750
6	Agricultural Land	√		The project road passes through the Govt. Land & crop field.
7	Grazing Grounds	√		The Govt. Barren Lands are used as Grazing Grounds.
8	Barren Land	√		Most of the Flat area are seen on the right side of the road.

C. Description of the Road Environment :-

Sl. no	Parameter / Component	Yes	No	Explanation
1	Are there any areas with landslide or erosion problems along the road ?		√	Project area is not prone to landslide and erosion problems.
2	Are there any lakes/swamps beside the road ?		√	There is no lake/Swamps along the project road.
3	Are there any nallas/streams/rivers etc. along/crossing the road?		√	There is no Nallah/Stream/River along the road
4	Are there problems of water stagnation and other drainage issues on or near the road?	√		Inadequate Ventage at 0/660 so Boxcell is Provided.
5	Is the area along the project road prone to flooding?		√	No River is adjacent to Nallah
6	Are there any trees with a dia of 30cm or more with in 10m on either side from the centre line of the road alignment	√		There are 25 nos of trees are within 10mt on either side from the centre line of the road alignment but located beyond the road way width.

7	Along the road and within 100mt of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas.		√	No faunal habitat, breeding ground etc. is found within 100mt of the road shoulder.
8	Along the road and within 100mt of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		√	No, endangered species were found within 100mt
9	Are there any utility structures within 10m on either side from the center line of the road alignment?	√		20 nos of E.P. are to be shifted.
10	Are there any religious, cultural or community structures/buildings within 10m either side from the centre line of the road alignment?		√	There is a temple along the project road at Rd 2/120

D . Public consultation :-

Sl. No	Consultation Activities	Yes	No	Remarks
1	Consultation with local community was conducted before finalizing the alignment? (Provide the issue raised by the community)	√		Consultation was held with local community before finalizing the alignment. Community was satisfied the alignment.
2	Any suggestions received in finalizing the alignment ?	√		Community members have suggested to construct the road along the existing alignment
3	If suggestions received do they get incorporated into design ?	√		Community members have suggested to construct additional C.D. Works for discharge of access rain water, which has been incorporated along the existing alignment

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. 8)
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

Attachment I

List of Trees

Chainage (M)	Left	Right
0-800	3	2
800-1800	4	3
1800-3000	1	3
3000-5000	3	2
5000 - 7000	2	2
Total	13	12

Attachment II

List of Utilities

Chainage (M)	Left	Right
0-500	Electric Pole	Electric Pole
500-1200	Electric Pole	Electric Pole
1200-1800	Electric Pole	Electric Pole
1800-2800	Electric Pole	Electric Pole
2800-3600	Electric Pole	Electric Pole
3600-4800	Electric Pole	Electric Pole
4800-5800	Electric Pole	Electric Pole
5800-7000	Electric Pole	Electric Pole

Attachment III

List of Community Structures

Chainage	Left	Right
3/120	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
-	1 tree	EP	-	-	00-500	-	-	1 tree	-	-
3 tree	-	EP	-	-	500-1000	-	-	EP	1 tree	-
-	2 tree	-	-	-	1000-1800	-	-	EP	1 tree	3 tree
3 tree	Temple	EP	-	-	1800-2200	-	-	EP	2 tree	-
-	1 tree	-	-	-	2200-2900	-	EP	-	1 tree	-
-	-	EP	-	-	2900-3500	-	-	EP	-	-
-	1 tree	EP	-	-	3500-4100	-	-	-	-	3 tree
1 tree	-	-	-	-	4100-4800	-	-	EP	EP	-
-	1 tree	EP	-	-	4800-5000	-	-	-	HP	-
-	-	EP	-	-	5000-5400	-	-	EP	-	-
1 tree	-	-	-	-	5400-5900	-	EP	-	-	-
-	-	EP	-	-	5900-6200	-	-	EP	-	3 tree
-	1 tree	EP	-	-	6200-6500	-	-	-	-	-
-	-	EP	-	-	6500-7000	-	-	EP		

E.P. Electric Pole; H.P. – Hand Pump, T.W. ; Tube Well, P.H.C ; Primary Health Center

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Antulia to Rodosingha**
Block Name: Angul

District Name: Angul

Total Length of the Road: ৭.৭০ km

A. Climatic Conditions

Temperature	High: 47	Low: 15
Humidity	High: 75	Low: 40
Rainfall Rainy Season	1419 June	mm/year to October

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		No	Distance from Coastline: 245 km Costal area is very far from the project road ( ) more than 50% (Yes) 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)*		No	Altitude: Plain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		No	Type of Vegetation: Open area Legal Status of the Forest Area: Away from the road area *(Reserved, National Park, Sanctuaries, Unclassified, etc.)*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		No	Name of animals: Endangered species (if any):

No.	Type of Ecosystem	Yes	No	Explanation
6.	Inhabited Area	Yes		The road passes through side of small mountains and end of the road a village situated called pathargarh
7.	Agricultural Land	Yes		There is no agriculture land for affected the project road area.
8.	Grazing grounds	Yes		
9.	Barren Land	Yes		

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	( ) 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	
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***	Yes		Cross Drainage works provided
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		No	( ) 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***		No	

	frequency)			
				( ) No Secondary Information is available and Local Community is not aware of this matter
6.	Are there any trees with a dbh of 30 cm or more within 10 m on either side from the center line of the road alignment? *(If yes attach list of trees indicating the location (right or left side) and the chainage)*		No	
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	
				( ) 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 flora and fauna species that are classified as endangered species?		No	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[9] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*		No	
10.	Are there any religious, cultural or community structures/buildings[10] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*		No	

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment.	Yes		Consultation with local community is conducted.

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

	(Attach list of people met and dates)			
2.	Any suggestion received in finalizing the alignment	Yes		
3.	If suggestions received, were they incorporated into the design?	yes		

E. Please attach the following:

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

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

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

4) Sketch of strip map of the road covering details of atleast 10 m on either side from the center line of the road

5) Photographs of the project area showing atleast 10 m on either side from center line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

Attachment-I - only for Trees

Name of the road : Antulia to Roadsinga

Chainage (in mtr)	Left (no of trees)	Right (no of trees)
2/700 - 3/000	NIL (Village Area)	Nil
3/000 - 3/010	2	1
3/010 - 3/020	-	-
3/020 - 3/030	-	-
3/030 - 3/040	-	-
3/040 - 3/050	-	-
3/050 - 3/060	-	-
3/060 - 3/070	-	-
3/070 - 3/080	1	-
3/080 - 3/090	-	-
3/090 - 3/100	-	-
3/100 - 3/110	-	-
3/110 - 3/120	-	-
3/120 - 3/130	1	-
3/130 - 3/140	-	1
3/140 - 3/150	-	-
3/150 - 3/160	-	-
3/160 - 3/170	-	-
3/170 - 3/180	-	-
3/180 - 3/190	-	-
3/190 - 3/200	-	-
3/200 - 3/300	3	1
3/300 - 3/400	5	2
3/400 - 3/500		3
3/500 - 3/600		
3/600 - 3/700		1
3/700 - 3/800		
3/800 - 3/900	1	
3/900 - 4/000		
4/000 - 4/100	3	1
4/100 - 4/200		
4/200 - 4/300		
4/300 - 4/400		1
4/400 - 4/500	1	1
4/500 - 4/600	3	
4/600 - 4/700		
4/700 - 4/800		
4/800 - 4/900		
4/900 - 5/000		
5/000 - 5/100		1
5/100 - 5/200	1	
5/200 - 5/300		
5/300 - 5/400		
5/400 - 5/500		1
5/500 - 5/600	1	1
5/600 - 5/700		
5/700 - 5/800		1
5/800 - 5/900		
5/900 - 6/000		
6/000 - 6/100		
6/100 - 6/200		1
6/200 - 6/300		

Chainage (in mtr)	Left (no of trees)	Right (no of trees)
6/300 - 6/400	1	
6/400 - 6/500		
6/500 - 6/600		2
6/600 - 6/700		
6/700 - 6/800		
6/800 - 6/900		
6/900 - 7/000		
7/000 - 7/100		
7/100 - 7/200		
7/200 - 7/300		
7/300 - 7/400	2	3
7/400 - 7/500	1	1
7/500 - 7/600		
7/600 - 7/700		
7/700 - 7/800		
7/800 - 7/900		
7/900 - 8/000		
8/000 - 8/100	1	
8/100 - 8/200		2
8/200 - 8/300		
8/300 - 8/400		
8/400 - 8/500		
8/600 - 8/700		
8/800 - 8/900		
9/000 - 9/100	1	2
9/100 - 9/200		
9/200 - 9/300	2	
9/300 - 9/400		1
9/400 - 9/500		
9/500 - 9/600	2	2
9/600 - 9/700	3	
9/700 - 9/800		5
9/800 - 9/900		
9/900 - 10/000		
10/000 - 10/100	1	
10/100 - 10/200		1
10/200 - 10/300	1	
10/300 - 10/400	1	
10/400 - 10/500		
10/500 - 10/600		
10/600 - 10/700	1	1
10/800 - 10/900		
10/900 - 11/000		
11/000 - 11/100		
11/100 - 11/200	3	1
11/200 - 11/300		
11/300 - 11/400	4	1
11/400 - 11/500		
11/500 - 11/600		
11/600 - 11/700		
11/700 - 11/800		
11/800 - 11/900		
11/900 - 12/000	1	
Total	**47**	**39**

Attachment-II

List of Utility (School, Panchyat Ghar, Electric Pole, Hand Pum, Well etc.)

Name of the road : Antulia to Roadsinga

Chainage (in mtr)	Left	Right
2/484	Electric Pole	
2/533	Electric Pole	
2/580	Electric Pole	
2/620		Electric Pole
2/730		Tube Well
2/674	Tapdhol UP School	
2/688		Tapdhol Phandi
2/725		Tube Well
2/763		Electric Pole
2/801		Electric Pole
3/060	Electric Tower	
3/810	Pond	
3/986		Electric Pole
4/026	Barakani Kothaghar	
4/100	Electric Pole	
4/925	Electric Pole	
5/030		Tube Well
5/514	Tube Well	
5/900	Baradhip UP School	
6/090	Well	
6/120		Tube Well
7/174		Electric Pole
7/831		Rodasinga UP School
7/848	Electric Pole	Tube Well
7/858		
8/348	Tube Well	
8/352	Electric Pole	
9/695	Electric Pole	
10/265		Electric Pole

Abstract

Electric Pole = 14
UP School = 3
Kothaghar = 1
Tube Well = 7
Well = 1

Attachment-III

List of Community Structure (Temple, Musque, Chaurch etc.)

Name of the road : Antulia to Roadsinga

Chainage (in mtr)	Left	Right
6/642		Lord Shiva Mandira

Left					Chainage (in mtr)	Right				
8 - 10m	6 - 8m	4 - 6m	2 - 4m	0-2m		0-2m	2 - 4m	4 - 6m	6 - 8m	8 - 10m
			1 Tree		5/200					
			1 Tree		5/500					
			Tube well		5/514					
					5/600		1 Tree			
		School			5/900					
		Well			6/090					
					6/120			Tube well		
					6/200		1 Tree			
			1 Tree		6/400					
					6/642			Shiva mandira		
					6/600			2 Trees		
					7/174		Electric Pole			
			2 Trees		7/400		1 Trees	2 Trees		
			1 Tree		7/500		1 Tree			
					7/651			School		
			Electric Pole		7/848			Tube well		
			Tube well		8/348					
		Tube well			8/352					
			1 Tree		9/100		2 Tree			
		2 Tree			9/200					
					9/400		1 Tree			
			2 Tree		9/600			2 Tree		
			Electric Pole		9/695					
		3 Trees			9/700					
					9/800		2 trees	3 trees		
			1 Tree		10/100					
					10/265		Electric Pole			
			1 Tree		10/300					
		1 Tree			10/400					
			1 Tree		10/700		1 Tree			
			3 Tree		11/200			1 Tree		
		4 Tree			11/300		1 Tree			
			1 Tree		11/900					

Executive Engineer
R.W.Division, Angul.

Attachment-IV

Name of the road : Antulia to Roadsinga

Left					Chainage (in mtr)	Right				
8 - 10m	6 - 8m	4 - 6m	2 - 4m	0-2m		0-2m	2 - 4m	4 - 6m	6 - 8m	8 - 10m
			Electric Pole		2/484		One Tree			
			Electric Pole		2/533					
			Electric Pole		2/580					
					2/620		Electric Pole			
					[illegible]			Tube Well		
		Tapdhol UP School			2/674					
					2/688			Tapdhol Phandi		
					2/725		Tube well			
					2/763		Electric Pole			
					2/801		Electric Pole			
			2 Trees		3/010					
		Electric Tower			3/060					
			1 Tree		3/080					
		1 Tree			3/130		1 Tree			
					3/140			1 Tree		
			3 Trees		3/300		2 trees			
		5 Trees			3/400					
	Pond				3/810					
			1 Tree		3/900					
					3/966		Electric Pole			
		Kothaghar			4/025					
			Electric Pole		4/100					
		3 Trees			4/[illegible]		1 Tree			
					4/400			1 Tree		
			1 Tree		4/500		1 Tree			
			3 Trees		4/600					
		Electric Pole			4/925					
					5/030		Tube well			
					5/100		1 Tree			

RURAL ROADS: ENVIRONMENTAL CHECKLIST

A. Road Name: **Talamaninag-Uppermaninga road**
B. Block Name: Ranapur
C.
D. District Name: Nayagarh
E.
F. Total Length of the Road: 6.00km
G. Climatic Conditions

Temperature	High: 45	Low: 19
Humidity	High:	Low:
Rainfall Rainy Season	1200 June	mm/year to Septmber

H. Location of the Road and Generic description of Environment

No.	Type of Ecocystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		√	Distance from Coastline: km Costal area is very far from the project road ( ) 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: Plain
4.	Forest Area *(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?*		√	Type of Vegetation: Open area Legal Status of the Forest Area: Away from the road area *(Reserved, National Park, Sanctuaries, Unclassified, etc.)*
5.	Wildlife *(Explain whether there are any wildlife species in the project area)*		√	Name of animals: Endangered species (if any):

No.	Type of Ecocyctem	Yes	No	Explanation
6.	Inhabited Area		√	The road passes through existing village road and end of the road a village situated called P.Bankatara
7.	Agricultural Land	√		There is no agriculture land for affected the project road area.
8.	Grazing grounds		√	
9.	Barren Land		√	

I. Specific description of the Road Environment

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

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

				( ) 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)*	√		The Trees remain outside of the Berms. No No cutting or felling of Trees required.
7.	Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas? *(If yes, specify details of habitat with chainage)*		√	
				( ) No Secondary Information is available and Local Community is not aware of this matter
8.	Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species?		√	
				( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[3] within 10 m on either side from the center line of the road alignment? *(If yes, attach list with chainage)*	√		In the village potion, C.C Road is provided so that, the Electric Poles and
10.	Are there any religious, cultural or community structures/buildings[4] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	√		Community Centre in the Village remains away from the Berms of Road

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 is conducted.

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

2.	Any suggestion received in finalizing the alignment	Yes		To keep the Exisng alignment intact Roadway width as 6.00mtrand carriageway width 3.75mtr
3.	If suggestions received, were they incorporated into the design?	yes		Existing Alignment kept unchanged. The Roadway width is kept as 6.00mtr and Carriage way width as 3.75 mtr

E. Please attach the following:

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

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

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

4) Sketch of strip map of the road covering details of atleast 10 m on either side from the center line of the road

5) Photographs of the project area showing atleast 10 m on either side from center line of road alignment. Every 2 km or less of road must have atleast 1 photograph.

Attachment -1

List of trees

Chainage	Left	Right
1500	1	
1520	1	
1850	1	
2150	1	
2200	1	
2380		1
2400	1	
2780	1	
3120	1	
3165	1	
3920	1	
3930	1	
3980	1	
3990	1	
4020	1	
5020	1	
5200		1

List of Utilities

Attachment-2

Chainage	Left	Right
	NIL	

List of Community Structure

(Attachment 3)

Chainage	Left	Right
	NIL	

RURAL ROADS:ENVIRONMENTAL CHECKLIST

Road Name: DB PWD Road to Singhakuda

Block Name: Satyabadi

District Name: Puri

Total Length: 5.185km

A.Climatic conditions

Temperature	High:	40 degree	Low:15 degree
Humudity	High:	95%	Low:75%
Rain Fall	1850mm/year		
Rainy Season	June to October		

B.Location of the Road & General Description of Environment

sl.no	Type of Ecosystem	Yes	No	Explanation
1	Coastal area Mangrove(along roadside)		√	Distance from Coastline 20km
				( )more than 50%
				( )more than 20%
2	Type of Terrain-(Plain/Hilly/Mountainious 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)
4	Wildlife:(Explain whether there are any wildlife species in the project area)		√	Name of animals:- Endagered species(if any):
5	Inhabited Area	√		Habitation village Pakhimunda is located at Ch.2800 to 3800 and Singhakuda is located from ch-4150 to 4600
6	Agricultural Land	√		ch-0 to 2600 and 4600 to 5185.
7	Grazing Grounds		√	
8	Barren Land		√	

C.Specific description of the Road Environment

(Note:Question no-1,4,5,7 & 8 must be answered after discussions with the local community people):

sl no	Parameter/Component	Yes	No	Explanation
1	Are there any areas with landslide or erosion problems along the road)		√	( ) No Secondary Information is available and Local Community is not aware of this matter.
2	Are there any lakes/swamps beside the road?\(if yes,list them indicating the location(right or left sidear crossing) and the chainage.)		√	
3	Are there any nallahs/streams/rivers etc along/crossing the road? If yes,list them indicating the location(right,left or crossing) and the chainage		√	
4	Are there problems of water stagnation and other drainage issues on or near the road?\(if yes,mention the chainage)		√	
5	Is the area along the project road prone to flooding?		√	
6	Are there any trees with a dbh of 30cm or more within 10m on either side of the road alignment? (If yes list of trees indicating the location(right/left side) and the chainage	√		22 trees as per Attachment-1

7	Along the road and within 100m of the road shoulder,are there any faunal habitat areas,funal breeding ground,bird migration area, or other similar areas? (If yes,specify details of habitat with chainage)		√	
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?		√	
9	Are there any utility structures within 10m on either side from the center line of the road alignment? (If yes attach list with chainage)	√		As per Attachment-2
10	Are there any utility religious,cultural or community structurs/buildings within 10m on either side of the road alignment? (If yes attach list with chainage)	√		As per Attachment-3

D.Public Consultation

sl no	Consultation Activites	Yes	No	Remarks
1	Consultation with local community was conducted before finalizing the alignment.(Attach list of people met and dates)	√		Attached as Pallisabha held on 28.06.11
2	Any suggestion received in finalizing the alignment	√		
3	If suggestions received,were they incorporatd into the design?	√		

E.Please attach the following:

1 Sketch a map showing the bridge and the trees(list of trees indicating location(left,right side of the road) and chainage(as required under c.6)

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

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

4 sketch of strip map of the road covering details of atleast 10m on either side from the center line of the road.

1.Water tap,hand pump,electric pole,telephone pole,water pipe and other similar structures.
2.Mandir,Masjid,Church,religious/cultural/historycal monuments,school,health center,public toilet ant other similar structures.
3.photographs of the project area showing atleast 10m on eigther side from center line of road alignment.Every 2km or less road must have atleast 1 photograph.

Name of road: D.B PWD Road to Singhakuda
Packlage No: OR-26-ADB-15

LIST OF TREES

Attachment-1

Chainage	Left	Right	Remarks
120	1		to be cut
195	1		not affected
310	1		not affected
350	1		not affected
430	1		not affected
440		1	not affected
590	1		not affected
610	1		to be cut
900		1	not affected
2460		1	not affected
2470		1	not affected
2480		1	not affected
2510		1	to be cut
2520		1	not affected
2530		1	not affected
3450	1		not affected
3550		1	not affected
3700		1	not affected
3850		1	to be cut
3930	1		not affected
4230	1		not affected
4240	1		not affected
Total	11	11	out of 22,4 are to be cut

Name of road: D.B PWD Road to Singhakuda
Packlage No: OR-26-ADB-15

LIST OF UTILITIES

Attachment-2

Chainage	Left	Right	Remarks
240		E.P-1	to be shifted
2520		E.P-1	-do-
3120		E.P-1	-do-
3250		E.P-1	-do-
3410		E.P-1	-do-
3790	E.P-1		-do-
4100	E.P-1		-do-
4150	E.P-1		-do-
4180	E.P-1		-do-
4210	E.P-1		-do-
4240	E.P-1		-do-
4350	E.P-1		-do-
4480	E.P-1		-do-
4550	E.P-1		-do-
Total			14 nos of Electric poles are to be shifted

JE

AE Puri

Dayanidhi Mallick Sarpanch. [illegible] G.P

LIST OF COMMUNITY STRUCTURES

Name of road: D.B PWD Road to Singhakuda
Packlage No: OR-26-ADB-15

Attachment-3

Chainage	Left	Right	Remarks
700	School		not affected
3200	School		not affected
4020		Temple	not affected
4320		School	not affected
4450		Temple	not affected

JE

AE Puri

Dayanidhi Mallick Sarpanch. [illegible] G.P

RURAL ROADS:ENVIRONMENTAL CHECKLIST

Road Name: L-24 to Jagulapada

Block Name: Pipli

District Name: Puri

Total Length : 2.50 km

A.Climatic conditions

Temperature	High:	40 degree	Low:15 degree
Humudity	High:	90%	Low:70%
Rain Fall			1850mm/year
Rainy Season			June to October

B.Location of the Road & General Description of Environment

sl.no	Type of Ecosystem	Yes	No	Explanation
1	Coastal area Mangrove(along roadside)		√	Distance from Coastline 40 km
				( )more than 50%
				( )more than 20%
2	Type of Terrain-(Plain/Hilly/Mountainious 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 allmost 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)
4	Wildlife:(Explain whether there are any wildlife species in the project area)		√	Name of animals:- Endagered species(if any):
5	Inhabited Area		√	Jagulapada village at Ch. 2.100km,
6	Agricultureal Land	√		ch-0.600 to 1.600 km,
7	Grazing Grounds		√	
8	Barren Land		√	

C.Specific description of the Road Environment

(Note:Question no-1,4,5,7 & 8 must be answered after discussions with the local community people)

sl no	Parameter/Component	Yes	No	Explanation
1	Are there any areas with landslide or erosion problems along the road)		√	( ) No Secondary information is available and Local Community is not aware of this matter.
2	Are there any lakes/swamps beside the road?(If yes,list them indicating the location(right or left side)or crossing) and the chainage.)		√	
3	Are there any nallahs/streams/rivers etc. along/crossing the road? If yes,list them indicating the location(right,left or crossing) and the chainage		√	
4	Are there problems of water stagnation and other drainage issues on or near the road?(If yes,mention the chainage)		√	
5	Is the area along the project road prone to flooding?		√	
sl no	Parameter/Component	Yes	No	Explanation
6	Are there any trees with a dbh of 30cm or more within 10m on either side of the road alignment? (If yes list of trees indicating the location(right/left side) and the chainage	√		8 trees as per Attachment-1
7	Along the road and within 100m of the road shoulder,are there any faunal habitat areas,faunal breeding ground,bird migration area, or other similar areas? (If yes,specify details of habitat with chainage)		√	

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?		√	
9	Are there any utility structures within 10m on either side from the center line of the road alignment? (If yes attach list with chainage)	√		As per Attachment-2
10	Are there any utility religious,cultural or community structure/buildings within 10m on either side of the road alignment? (If yes attach list with chainage)	√		As per Attachment-3

D.Public Consultation

sl no	Consultation Activites	Yes	No	Remarks
1	Consultation with local community was conducted before finalizing the alignment.(Attach list of people met and dates)	√		Attached as Palisabha held on 06.07.2011
2	Any suggestion received in finalizing the alignment	√		
3	If suggestions received,were they incorporated into the design?	√		

E.Please attach the following:

1 Sketch a map showing the bridge and the trees(list of trees indicating location(left,right side of the road) and
2 List of utility structures indicating location(left or right side of the road) and chainage(as required under c.9)
3 List of community structures indicating location(left or right side of the road) and chainage(as required under
4 sketch of strip map of the road covering details of atleast 10m on either side from the center line of the road.

1.Water tap,hand pump,electric pole,telephone pole,water pipe and other similar structures.
2.Mandir,Masjid,Church,religious/cultural/historycal monuments,school,health center,public toilet ant other
3.photographs of the project area showing atleast 10m on eigther side from center line of road alignment.Every

Sarapanch
Laxminarayanpur G.P.
PIPILI. PIN

Name of road: L-24 to Jagulapada
Package No: OR-26-ADB-07

LIST OF TREES

Attachment-1

Chainage	Left	Right	Remarks
50		1	to be cut
110		1	to be cut
200	1		to be cut
210		2	to be cut
690	1		
Total	2	4	

Name of road: L-24 to Jagulapada
Package No: OR-26-ADB-07

LIST OF UTILITIES

Attachment-2

Chainage	Left	Right	Remarks
30	E.P-1		to be shifted
60	E.P-1		to be shifted
210		E.P-1	to be shifted
240	E.P-1		to be shifted
300	E.P-1		to be shifted
360	E.P-1		to be shifted
420	E.P-1		to be shifted
450		E.P-1	to be shifted
510		E.P-1	to be shifted
540		E.P-1	to be shifted
Total			10 nos of Electric poles are to be shifted

LIST OF COMMUNITY STRUCTURES

Attachment-3

Name of road: L-24 to Jagulapada
Package No: OR-26-ADB-07

Chainage	Left	Right	Remarks
140		Temple	not affected
490		Temple	not affected
630	Temple		not affected

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.

i. The borrow area should not be located in agriculture field unless unavoidable i.e. barren land is not available.

ii. The borrow pits preferably should not be located along the roads.

iii. The loss of productive and agriculture soil should be minimum.

iv. The loss of vegetation is almost nil or minimum.

v. 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 programme 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:

i. 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.

ii. 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.

iii. 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.

iv. The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants are siting of temporary buildings or structures.

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

(iv) The preservation of topsoil will be carried out in stockpile.

(v) 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).

(vi) 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.

(vii) 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/PPCB guidelines.

E. Borrow Pits along the Road

4. 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

5. The objective of the rehabilitation programme is to return the borrow pit sites to a safe and secure area, which the general 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.

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

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

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

Appendix 5.1: Environmental Management Plan

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
	Measures common to all sample roads						
	Design and Pre Construction Stage						
1.	Climate Change Consideration and Vulnerability screening	○ Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required ○ Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchyati Raj Institution)	All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ ORRDA
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	○ All through the alignment of each rural road	Pre Construction Phase	Part of Project Cost	Project Preparation Consultant/ design consultant	PIU/ ORRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		community structure. ○ The road shall follow natural topography to avoid excessive cut and fill.					
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	Pre Construction Phase	Land to be made available by the state Government	PIU, Govt. of Madhya Pradesh , and other	Environmental officer under the PIC will also coordinate and ensure implementation
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.	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.

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
						implementation Unit (PIU) of ORRDA,	
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 ***(Attach or Refer to specific sections of DPR for community structures to be shifted along with chainages for the location of such structures)***	Construction Phase	Borne by Contractor	Contractor is responsible for ensuring provision of facilities under approval by PIC / PIU	Environmental officer and other team members of PIC will monitor and ensure appropriate implementation Environmental officer will regularly interact with the local people who are likely to be affected to ensure that their interests are protected and no social resentment sets in.
7.	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	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/ ORRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ Embankment will be designed above High Flood Level (HFL) wherever, area is prone to flood.					
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. ***(indicate HFL Level and Highlight the chainage for action and linkages to DPR section)***				
9.	Establishment of Construction	○ Construction camp sites shall be located away from any local human settlements	As determined by contractor	Pre-constructi	To be included in	All facilities are to be planned and	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
	Camp, temporary office and storage area	(minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently. o Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m). o The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. o The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas. o The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. o All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible. o The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. o Personal Protective Equipments (PPEs) like helmet, boots, earplugs for workers, first aid and fire fighting equipments shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. o Provision shall be made for domestic solid waste disposal in a control manner. The	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)***	on and construction stage	contractor's cost	implemented by contractor under approval by PIU / PIC	

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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 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. o Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU / DPR Consultant shall define appropriate measures for traffic diversion before the start of the construction. o The diversion plan should ensure smooth flow of traffic, minimize accidents to road users during construction works. o Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility in day and night both.	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
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)	Throughout the project section at the location determined by contractor and approved by PIU				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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	***(Highlight the location with chainage for such requirements)***				
	Construction Stage						
12.	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	As Borrow sites and quarries (if required) location. ***(List the probable locations for borrow areas. (Highlight the***	During Design and construction Stage	Engineering cost	The selection of quarries and material selection will be the responsibility of contractor under approval of PIC /PIU/TSC Environmental officer and other team members of PIC will ensure appropriate	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
		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 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	***identified quarries, if already identified. Contractors should also indicate the quarry they are likely to use if not already identified at DPR stag)***			implementation of mitigation actions.	

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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.					
13.	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.	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 / ORRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ 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					
14	Compaction and Contamination of Soil	○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. ○ The productive land shall be reclaimed after construction activity. ○ Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. ○ 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:	Throughout the project section of the road s ***(The contractor shall include the cost for the measures as part of the construction cost)***	• Design and construction stage	• Project preparation cost and construction cost •	• Design consultant and Contractor,	PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.					
15.	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	• Design and construction stage	• Project preparation cost and construction cost	• Design consultant and Contractor,	PIU
16	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	• Near all drainage crossing , nalas and river crossings etc. ***(The contractor shall include the cost for the measures as part of the construction***	• During Construction stage	• Included in engineering cost	Contractor	PIU/ ORRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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. o 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. 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.	***cost)***				
17.	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 ***(Highlight Tree cutting locations & proposed likely plantation location)***	during the design and Construction stage	Part of engineering work cost included	ORRDA	PIU and ORRDA
18	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	Throughout the project section of the road ***(The contractor shall include the cost for the***	construction stage	construction cost	Contractor,	PIC/PIU

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		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.	***measures as part of the construction cost)***				
19.	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.					
	Operation Stage						
20.	Air and Noise Quality	o 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	o All construction camp/temporary office/material storage areas are to be restored to its original conditions. o The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner.	***(The contractor shall include the cost for the measures as part of the construction***				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location	Time Frame	Cost	Responsible for Implementing	Responsible for Monitoring
		○ 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	***cost)***				
21.	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
22.	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 3.1 Odisha: Environmental Features within 10m COI that may require shifting/protection measure

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
1	Bargarh	Tangarpali to Rujhenmal	3.5	9	9	No	0	0	0	0	0
2	Bargarh	RD Road to Nilji	5.5	0	0	No	0	0	0	0	0
3	Bargarh	RD Road to Ghugurapali	4.0	0	0	No	0	0	0	0	0
4	Bargarh	RD Road to Dhamanmunda	1.3	0	0	No	0	0	0	0	0
5	Bargarh	NH6 to Sauntpur	1.0	0	0	No	0	0	0	0	0
6	Bargarh	Gopalpur to Rushipalli	6.5	0	0	No	0	0	0	0	0
7	Bargarh	Kumbho to Pikrijharan	3.5	0	0	No	0	0	0	0	0
8	Bargarh	Jhar to Khapanpalli	3.8	22	11	No	0	0	0	0	0
9	Bargarh	Kathadera to Ludupali	1.7	2	2	No	0	0	0	0	0
10	Bargarh	Mangalpali to Rengali	3.0	23	12	No	0	0	0	0	0
11	Bargarh	NH6 at Godabhaga to Dhemsa	8.5	0	0	No	0	0	0	0	0
12	Bargarh	RD Road to Bhojpuri	6.2	0	0	No	0	0	0	0	0
13	Bargarh	Bargarh Main Canal to Kantal	1.5	13	10	No	0	0	0	0	0
14	Bargarh	Kandapal to Ichhapur	7.7	11	1	No	0	0	0	0	0
15	Bargarh	Silet to Nuabatimunda	3.8	0	0	No	0	0	0	0	0
16	Bargarh	RD Road to Kandhra	0.8	0	0	No	0	0	0	0	0
17	Bargarh	Kumir to Saramsil	4.5	5	2	No	0	0	0	0	0
18	Bargarh	PR Road to Tamper	6.1	7	5	No	0	0	0	0	0
19	Bargarh	Dahigaon to Bubuda	4.8	62	44	No	0	0	0	0	0
20	Bargarh	RD Road to Gandpali	0.8	13	5	No	0	0	0	0	0
21	Bargarh	Buden to Siletpali	2.3	29	16	No	0	0	0	0	0
22	Bargarh	PR Road to Dunguripali	1.5	0	0	No	0	0	0	0	0
23	Bargarh	RD Road to Bhalupali	2.8	0	0	No	0	0	0	0	0
24	Bargarh	RD Road to Manikchora	2.8	0	0	No	0	0	0	0	0
25	Bargarh	RD Road to Muindomohul	1.9	0	0	No	0	0	0	0	0
26	Bargarh	RD Road to Tangruapadar	2.6	0	0	No	0	0	0	0	0
27	Bargarh	SH-3 at 31 Km. to Kurlabahal	2.4	0	0	No	0	0	0	0	0
28	Bargarh	SH-3 at 64 Km. to Goibahali	0.9	24	10	No	0	0	0	0	0
29	Bargarh	SH-3 at 71 km. to Kuapali	5.0	38	18	No	0	0	0	0	0
30	Bargarh	SH-3 at Dunguripali to Katangpali	3.8	50	38	No	0	16	0	0	0
1	Bhadrak	L63 to Kantapada	2.0	0	0	No	0	0	0	0	0

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
2	Bhadrak	L-86 to Jiragaambhira	3.9	0	0	No	0	0	0	0	0
3	Bhadrak	PWD Road to Aranji	1.8	7	7	No	0	0	0	0	0
4	Bhadrak	RD Road to Ghapada	1.5	0	0	No	0	0	0	0	0
5	Bhadrak	RD Road to Pangira	2.5	0	0	No	0	0	0	0	0
6	Bhadrak	RD Road to Trikona	1.8	22	18	No	0	0	0	0	0
7	Bhadrak	Gopalbindha to Panibhandar	3.5	0	0	No	0	2	0	0	0
8	Bhadrak	Bidyutprava to Rabindranagar	3.5	0	0	No	0	0	0	0	0
9	Bhadrak	Bramhanigaon to Manmathpur	6.0	0	0	No	0	0	0	0	0
10	Bhadrak	Dosinga to Oramal	4.5	0	0	No	0	0	0	0	0
11	Bhadrak	Jalahari to Joragadia	2.5	0	0	No	0	0	0	0	0
12	Bhadrak	PWD Road to Kapagadia	1.8	0	0	No	0	0	0	0	0
13	Bhadrak	PWD Road to Mohanpur	4.5	0	0	No	0	0	0	0	0
14	Bhadrak	PWD Road to Panpur	2.0	0	0	No	0	0	0	0	0
15	Bhadrak	PWD Road to Solagaon	4.0	0	0	No	0	0	0	0	0
16	Bhadrak	RD Road to Govindabindha	2.8	0	0	No	0	4	4	0	4
17	Bhadrak	RD Road to Sribastapur	4.9	0	0	No	0	0	0	0	0
18	Bhadrak	RD Road to Naichanpur	3.5	0	0	No	0	0	0	0	0
19	Bhadrak	T1 to Mituani	3.2	0	0	No	0	0	0	0	0
20	Bhadrak	T2 to Barahanuapada	3.0	0	0	No	0	0	0	0	0
21	Bhadrak	T2 to Tulasipur	2.5	0	0	No	0	0	0	0	0
22	Bhadrak	T3 to Khadisinga	5.0	0	0	No	0	0	0	0	0
1	Bolangir	Budhisindol PS Road to Dumerpali	0.5	0	0	No	0	0	0	0	0
2	Bolangir	Deng Tikarpara PWD Road to Rengalbahal	3.6	0	0	No	0	0	0	0	0
3	Bolangir	Dhandamal to Dangarpara	0.9	0	0	No	0	0	0	0	0
4	Bolangir	L-24 to Bandhanbahal	0.8	0	0	No	0	0	0	0	0
5	Bolangir	PWD Road to Chauliudar	0.7	0	0	No	0	0	0	0	0
6	Bolangir	RD Road to Barlapali	2.8	0	0	No	0	0	0	0	0
7	Bolangir	RD Road to Bangabahal Road	3.1	0	0	No	0	0	0	0	0
8	Bolangir	Kapani to Patrapali	3.2	0	0	No	0	0	0	0	0
9	Bolangir	PS Road to Barbahal	6.1	0	0	No	0	0	0	0	0
10	Bolangir	PWD Road to Ghagra	1.5	0	0	No	0	1	0	0	0
11	Bolangir	PWD Road to Nahenabandh	1.2	0	0	No	0	0	0	0	0
12	Bolangir	RD Road to Chandrapura	2.2	0	0	No	0	0	0	0	0
13	Bolangir	Salepali to Karlamal	3.0	0	0	No	0	0	0	0	0

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
14	Bolangir	Bhoipali to aghupadar	1.5	0	0	No	0	0	0	0	0
15	Bolangir	Bhundimuhan to Kankara	2.5	0	0	No	0	0	0	0	0
16	Bolangir	Kutumdola to Duanpali	6.5	0	0	No	0	0	0	0	0
17	Bolangir	Mayabarha to Pipalkani	3.7	0	0	No	0	0	0	0	0
18	Bolangir	NH-201 to Jampadar	1.6	0	0	No	0	0	0	0	0
19	Bolangir	PWD Road to Nagphena	4.6	0	0	No	0	0	0	0	0
20	Bolangir	Ranipali Road to Kirabahal	1.5	0	0	No	0	0	0	0	0
21	Bolangir	SH-42 to Saraspitha	3.6	0	0	No	0	0	0	0	0
22	Bolangir	PS Road to Jhankirpali	2.0	0	0	No	0	0	0	0	0
23	Bolangir	PWD Road to Ainlapali	2.5	0	0	No	0	0	0	0	0
24	Bolangir	PWD Road to Goilpita	4.3	0	0	No	0	0	0	0	0
25	Bolangir	SH-14 to Bhainsapali Road	1.5	0	0	No	0	0	0	0	0
26	Bolangir	PWD Road to Dunguriguda	1.7	0	0	No	0	0	0	0	0
27	Bolangir	PS Road to Ghuna Road	0.8	0	0	No	0	0	0	0	0
28	Bolangir	PWD Road to Bharuamunda	1.0	0	0	No	0	0	0	0	0
29	Bolangir	PWD Road to Salepali	1.8	0	0	No	0	0	0	0	0
30	Bolangir	Ramchandrapur to Matupali	5.0	0	0	No	0	0	0	0	0
31	Bolangir	RD Road to Lakhanpur Road	2.7	0	0	No	0	0	0	0	0
32	Bolangir	RD Road to Tora	2.5	0	0	No	0	0	0	0	0
33	Bolangir	T-01 to Ainlasari	1.1	0	0	No	0	0	0	0	0
34	Bolangir	Tikarpara Deysand RD Road to Jurabandh	0.8	0	0	No	0	0	0	0	0
35	Bolangir	Tikarpara Deysand RD Road to Nuamunda	1.4	0	0	No	0	0	0	0	0
36	Bolangir	Tusra to Kharda	3.0	0	0	No	0	0	0	0	0
1	Jagatsinghpur	Alikana to Ranapur	2.5	0	0	No	0	6	0	0	0
2	Jagatsinghpur	Hajipur to salijanga	7.9	0	0	No	0	29	0	0	0
3	Jagatsinghpur	SH-42 to Badaghar	3.5	0	0	No	0	24	0	0	0
4	Jagatsinghpur	Janakdeipur to Basudevpur	2.3	0	0	No	0	0	0	0	0
5	Jagatsinghpur	Erasama Chatua RD Baleipur road to Badabuda	6.0	11	0	No	0	0	0	0	0
6	Jagatsinghpur	Sadeipur to Banikuda	6.5	0	0	No	0	14	0	0	0
7	Jagatsinghpur	Manda sahi to Naranpur	8.6	0	0	No	0	28	0	0	0
8	Jagatsinghpur	Bisanpur to Matagajpur	3.6	0	0	No	0	0	0	0	0
9	Jagatsinghpur	Borikina to Barilo	6.0	0	0	No	0	40	0	0	0
10	Jagatsinghpur	Manijanga to Gandakula	3.4	0	0	No	0	3	0	0	0

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
11	Jagatsinghpur	Narla to Podaruan	8.5	0	0	No	0	10	0	0	0
1	Cuttack	SH-12 to Tanapara	2.0	0	0	No	0	3	0	0	0
2	Cuttack	Borisana to Bargudikuda	5.1	0	0	No	0	6	0	0	0
3	Cuttack	Pattamundai canal embankment to Nanpur	3.0	0	0	No	0	2	0	0	0
4	Cuttack	Barahimpur to Keutakhandi	6.0	0	0	No	0	16	0	0	0
5	Cuttack	Rahania to Champatipur	4.0	0	0	No	0	16	0	0	0
6	Cuttack	Alijoda to Jahal	3.0	0	0	No	0	20	0	0	0
7	Cuttack	Oriti toJagannathpur	7.7	0	0	No	0	65	0	0	0
8	Cuttack	Malasasan Bodamundai R D Road to Gothada	4.0	0	0	No	0	19	0	0	0
9	Cuttack	Praharajpur to Fular	7.4	0	0	No	0	0	0	0	0
10	Cuttack	Nagaspur to Charirakaba	5.2	0	0	No	0	56	6	6	0
11	Cuttack	Pattamundai canal to Tunupur	2.2	0	0	No	0	6	0	0	0
1	Kendrapada	CC Road to Sridharapur	2.4	0	0	No	0	0	0	0	0
2	Kendrapada	Pradhanpatikra Dhanamandal road	5.5	0	0	No	0	0	0	0	0
3	Kendrapada	Hurasahi to Nuasasan road	11.4	0	0	No	0	124	0	0	0
4	Kendrapada	Kosida to Karimula	3.2	0	0	No	0	0	0	0	0
5	Kendrapada	Hurasahi - Indalo road to Sisua (Sansalar to Sathilo)	2.4	0	0	No	0	0	0	0	0
6	Kendrapada	SB Gopalpur to Kusailo	5.3	0	0	No	0	0	0	0	0
7	Kendrapada	R&B Road to Katakana	3.5	0	0	No	0	26	0	0	0
8	Kendrapada	Ayatan Gajarajpur Road to Rautabartani	2.2	0	0	No	0	35	0	0	0
9	Kendrapada	Indupur RD Road to Kadalibana	4.5	0	0	No	0	50	0	0	0
10	Kendrapada	Baghamari to Sailendrasarai	7.7	0	0	No	0	0	0	0	0
11	Kendrapada	R&B Road to Kanhapur	4.9	0	0	No	0	38	0	0	0
12	Kendrapada	Aradapalli to Perijpur	2.8	0	0	No	0	23	0	0	0
13	Kendrapada	RD Road Katana Chhak to Dianigiri	3.3	0	0	No	0	55	0	0	0
14	Kendrapada	PWD Road to Berhmpur	1.8	0	0	No	0	0	0	0	0
15	Kendrapada	Taradipal to Kulasahi	4.0	0	0	No	0	0	0	0	0
1	Puri	Algum PWD Road to Charbhayapada	4.5	0	0	No	0	16	0	1	0
2	Puri	Algum to Padansahi	1.5	0	0	No	4	10	0	0	0
3	Puri	Banapur to Berahampur	0.8	0	0	No	0	4	4	4	4
4	Puri	Gobardhuli to Gauri Sahi	2.0	0	0	No	0	0	0	0	0

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
5	Puri	Kadajit to Tinikudi	3.0	0	0	No	0	0	0	0	0
6	Puri	L 37 to Srikanthapur	1.9	12	5	No	0	1	0	1	0
7	Puri	L24 to kakudikusanga	3.5	0	0	No	0	1	0	0	0
8	Puri	L-74 to Madhapada	2.0	15	0	No	0	0	0	0	0
9	Puri	Maunimatha to Deypursasan	3.5	0	0	No	0	15	0	1	0
10	Puri	Narendrapur to Benakera	3.1	0	0	No	0	4	0	0	0
11	Puri	NH 203 A to Raihat	3.4	0	0	No	0	0	0	0	0
12	Puri	NH 203 to Antarpantar	2.0	0	0	No	0	12	0	1	0
13	Puri	NH 203 to Birapurasattampur	3.4	0	0	No	0	3	0	1	0
14	Puri	NH 203 to Tentulia	4.5	0	0	No	0	0	0	0	0
15	Puri	NH-203 to A.Singhpur	2.7	23	0	No	0	2	0	0	0
16	Puri	NH-203 to Orakal	3.0	0	0	No	0	3	0	3	0
17	Puri	NH-203 to Rebatiraman	2.5	0	0	No		9	0	1	1
18	Puri	NH-203 toEkchalia	1.8	0	0	No	0	0	0	0	0
19	Puri	NJ Sadak to Kalighadi	3.1	0	0	No	0	0	0	0	1
20	Puri	NJ Sadak to Malasahi	2.1	0	0	No	0	13	0	0	1
21	Puri	NJ to Radhamohanpur	3.3	0	0	No	0	0	0	0	0
22	Puri	PWD road to Manapada	1.2	18	0	No	0	0	0	0	0
23	Puri	PWD road to Puruna Sameswar	1.2	0	0	No	0	2	0	0	0
24	Puri	PWD Road to Raisimuli	0.8	0	0	No	0	0	0	0	0
25	Puri	PWD Road to Uttar pada	2.1	0	0	No	0	11	0	0	2
26	Puri	RD Road to Anua	2.6	0	0	No	0	0	0	0	0
27	Puri	RD road to Bagipada	4.5	0	0	No	0	0	0	0	0
28	Puri	RD road to Bhimdaspur	3.5	0	0	No	0	13	0	0	1
29	Puri	RD road to Khirisahi	3.2	0	0	No	0	0	0	0	0
30	Puri	RD Road to Nalitakudi	2.9	0	0	No	0	0	0	0	0
31	Puri	RD Road to Satipur	4.5	0	0	No	0	9	0	0	0
32	Puri	RD road to Solahala	2.3	0	0	No	0	8	0	0	0
33	Puri	SBC T I to Balarampur	2.3	11	5	No	0	3	0	0	0
34	Puri	T-1 to Padanpur	2.6	0	0	No	0	0	0	0	0
35	Puri	T-3 to Nuagarh	2.0	0	0	No	0	6	0	1	0
36	Puri	T-4 to Nuagaon	1.5	0	0	No	0	3	0	1	0
37	Puri	T-7 to BS Deuli	1.9	0	0	No	0	0	0	0	0
38	Puri	T9 to Manitri	3.6	0	0	No	0	0	0	0	0
39	Puri	Bagulipari to Bhutapada	3.2	17	0	No	0	20	0	0	0

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				No. of APs	No. of VAPs						
40	Puri	Othaka to Gopikantapur	4.5	0	0	No	0	6	0	1	0
41	Puri	MD road to Tikana	2.1	0	0	No	0	2	0	0	0
42	Puri	Gudubani to Solapatia	3.5	0	0	No	0	2	0	0	0
43	Puri	RD road to Aingala	6.7	0	0	No	0	0	0	0	0
44	Puri	RD road to Ogalpur	2.2	0	0	No	0	7	0	0	0
45	Puri	Mahura to Someipur	3.3	0	0	No	0	17	0	0	0
46	Puri	RD road to Oratanda	3.8	0	0	No	0	8	0	0	1
47	Puri	Bhapur to Sainsasan	5.2	0	0	No	0	18	1	0	0
48	Puri	Ketakipatna to Dubapatna	3.7	0	0	No	0	21	0	2	0
49	Puri	RD road to Banilo	2.0	0	0	No	0	10	0	0	0
50	Puri	MB Road to Gadajanga	5.8	0	0	No	0	0	0	0	0
51	Puri	Patapur to Bamnal	4.7	0	0	No	0	18	1	1	0
52	Puri	RD Road to paitabari	8.4	0	0	No	0	15	0	2	0
53	Puri	Udaypur to Sisua	3.4	0	0	No	0	16	0	0	0
1	Khurda	Kendupali to Godipokhari	3.65	0	0	No	0	0	0	0	0
2	Khurda	Madhuban Darada to Baradisahi	3.00	29	0	No	0	5	0	0	0
3	Khurda	Balianta to Kurunti	4.40	0	0	No		6	0	1	0
4	Khurda	Nuapada to Tarakari	2.20	0	0	No	0	0	0	0	0
5	Khurda	PWD road to Dalua	2.00	0	0	No	0	0	0	0	0
6	Khurda	MDR 68 at Govindpur to Narasinghapur	4.56	0	0	No	0	0	0	0	0
7	Khurda	RD road at Banamalipur to Baghabareipatna	3.26	0	0	No	0	2	0	0	0
8	Khurda	Banamalipur Balanga to Koilipada	2.55	5	16	No	0	0	0	0	0
9	Khurda	Jitkar Suanlo to Kantagada	2.60	0	0	No	0	2	0	1	0
10	Khurda	RD Road to Goudapatna	3.00	0	0	No	0	0	0	0	0
11	Khurda	Kathakhuntia to Swapneswarpur	1.80	0	0	No	0	3	0	2	1
1	Sambalpur	Badfiringibahal to Mohulmunda	2.96	**8**	**4**	No	0	0	0	0	0
2	Sambalpur	Boxma to Barghat	8.00	0	0	No	0	0	0	0	0
3	Sambalpur	Gailomundi to Pandibahal	3.70	0	0	No	0	0	0	0	0
4	Sambalpur	Khinda to Dantarmura	2.42	0	0	No	0	0	0	0	0
5	Sambalpur	Kilasama Patrapali	1.70	0	0	No	0	0	0	0	0
6	Sambalpur	Kulundi Banmal	3.50	0	0	No	0	6	0	0	0
7	Sambalpur	Left dyke road to Tihura	0.96	0	0	No	0	1	0	0	0
8	Sambalpur	Mahada to Kardakhaman	3.05	0	0	No	0	2	0	0	0

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9	Sambalpur	Mendabahal to Kutarimal	3.00	0	0	No	0	0	0	0	0
10	Sambalpur	Mundhehpali Sardabahal	3.10	0	0	No	0	0	0	0	0
11	Sambalpur	Mundoghat Potapali	1.63	0	0	No	0	0	0	0	0
12	Sambalpur	NH 6 Badakundisora	2.90	0	0	No	0	0	0	0	0
13	Sambalpur	NH6 to Bhoitikra road	0.67	0	0	No	0	0	0	0	0
14	Sambalpur	NH6 to Jharmunda	1.32	0	0	No	0	0	0	0	0
15	Sambalpur	NH6 to Khariapada road	1.60	0	0	No	0	1	0	0	0
16	Sambalpur	NH6 to Maulibhag road	2.48	0	0	No	0	1	0	0	0
17	Sambalpur	PMGSY to Bhejikudar	1.50	0	0	No	0	1	0	0	0
18	Sambalpur	RD road to Bhatasinghpada	1.20	0	0	No	0	0	0	0	0
19	Sambalpur	RD Road to Bolbanga	1.20	0	0	No	0	0	0	0	0
20	Sambalpur	RD road to Ganghusa	3.60	0	0	No	0	0	0	0	0
21	Sambalpur	RD road to Gudapali via Rengalkani	2.53	4	4	No	0	0	0	0	0
22	Sambalpur	RD road to Kanakpur	3.05	0	0	No	0	0	0	0	0
23	Sambalpur	RD Road to Kanbar	0.75	0	0	No	0	0	0	0	0
24	Sambalpur	RD road to Khasapali	1.45	0	0	No	0	0	0	0	0
25	Sambalpur	SH10 to Bansimal	3.00	0	0	No	0	0	0	0	0
26	Sambalpur	SH 10 to Pudapada	1.40	0	0	No	0	0	0	0	0
27	Sambalpur	Talsara to Jhagadatiria Road	2.05	6	4	No	0	0	0	0	0
28	Sambalpur	Dumku to Kinabaga	5.03	0	0	No	0	0	0	0	0
29	Sambalpur	RD Road to Khadiapali	1.35	0	0	No	0	0	0	0	0
30	Sambalpur	Ghichamunda to Kendmal	2.22	0	0	No	0	0	0	0	0
31	Sambalpur	PWD road to Sargipali	1.38	0	0	No	0	0	0	0	0
32	Sambalpur	RD road to Bisadihi	2.80	0	0	No	0	0	0	0	0
33	Sambalpur	Gochhara to Katupali	9.00	0	0	No	0	0	0	0	0
34	Sambalpur	PWD road to Gaudapali	2.60	0	0	No	0	0	0	0	0
35	Sambalpur	Laiza to Kholgarh	24.08	0	0	No	0	0	0	0	0
36	Sambalpur	NH-42 to Tentuliapada	3.75	0	0	No	0	0	0	0	0
37	Sambalpur	Rengali to Harijanpada	5.25	0	0	No	0	0	0	0	0
38	Sambalpur	RD Road to Musakani	1.40	0	0	No	0	0	0	0	0
39	Sambalpur	Keutabareni bypass to Sadhubahali	7.40	0	0	No	0	0	0	0	0
40	Sambalpur	Kennubereni to Chemerda	6.10	0	0	No	0	0	0	0	0
41	Sambalpur	RD road to Manaling	6.30	0		No		0	0	0	0
42	Sambalpur	RD road to Jhinkidadar	1.93	0	0	No	0	0	0	0	0

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				No. of APs	No. of VAPs						
1	Balasore	N H 60 to Belgaon Road	2.3	0	0	No	0	0	0	0	0
2	Balasore	PWD road to Balimunduli Road	3.5	0	0	No	0	29	0	0	0
3	Balasore	R D Road to Khadikapada Road	3.7	0	0	No	0	0	0	0	0
4	Balasore	R D Road at Begunia to Sonpur Road	2.5	0	0	No	0	0	0	0	0
5	Balasore	Oupada Ramachandrapur Road	1.7	0	0	No	0	0	0	0	0
6	Balasore	Bankipada to Bidubazar Road	4.5	0	0	No	0	0	0	0	0
7	Balasore	Oupada to Surispal Road	3.9	0	0	No	0	0	0	0	0
8	Balasore	PWD Road to Juriapatna Road	2.5	0	0	No	0	0	0	0	0
9	Balasore	Purusottampur to Basantapur	5.0	0	0	No	0	0	0	0	0
10	Balasore	R D Road at pariharipur Chhak to Gholei Road	1.9	0	0	No	0	0	0	0	0
11	Balasore	PWD Road to Mardarajpur	2.5	0	0	No	0	0	0	0	0
12	Balasore	PWD Road to Bankisol	5.0	0	0	No	0	0	0	0	0
13	Balasore	RD road to Dahapada	1.2	0	0	No	0	0	0	0	0
14	Balasore	Kalakad to Jharanasahi	1.8	0	0	No	0	0	0	0	0
15	Balasore	PWD road to Jamalpur	2.6	0	0	No	0	0	0	0	0
16	Balasore	Vellora to Chandipur	2.7	0	0	No	0	0	0	0	0
17	Balasore	Kaspa to Bikrampur	2.0	0	0	No	0	0	0	0	0
18	Balasore	N.H-60 to Madhupura	5.5	0	0	No	0	0	0	0	0
19	Balasore	Oupada to Dhimpura	1.0	0	0	No	0	0	0	0	0
20	Balasore	N.H-5 to Hiratikiri	1.7	0	0	No	0	0	0	0	0
21	Balasore	Junada to Dharamanandapur	1.5	0	0	No	0	0	0	0	0
22	Balasore	N.H-60 to Chorpada	1.9	0	0	No	0	0	0	0	0
23	Balasore	Bhugabandhu to Saruchampa	2.3	0	0	No	0	0	0	0	0
24	Balasore	PWD to Jagannathpur	2.5	0	0	No	0	0	0	0	0
25	Balasore	PWD to Kharadiha	2.3	0	0	No	0	0	0	0	0
26	Balasore	RD road to Dobati	1.5	0	0	No	0	0	0	0	0
27	Balasore	NH-5 Anantapur	2.7	0	0	No	0	0	0	0	0
28	Balasore	Kochiakoli Patna	1.1	0	0	No	0	0	0	0	0
29	Balasore	Bateswar Trilachanpur	7.7	0	0	No	0	0	0	0	0
30	Balasore	Achyatipur Nijorash	2.7	0	0	No	0	0	0	0	0
31	Balasore	Bartana Thala	3.6	0	0	No	0	0	0	0	0
32	Balasore	PWD road Balarampur	2.3	0	0	No	0	0	0	0	0
33	Balasore	ITR Road Nilakanthapur	6.0	0	0	No	0	0	0	0	0
34	Balasore	Tisalpur Mundahata	2.8	0	0	No	0	0	0	0	0
35	Balasore	Sardang Bhogapur	3.4	0	0	No	0	0	0	0	0

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36	Balasore	NH-5 Anantapur Mugunipur	1.9	0	0	No	0	0	0	0	0
37	Balasore	Nuahat Sujanpur	4.9	0	0	No	0	23	0	0	0
38	Balasore	Ranital-Kupari PWD Road Muhanchuan	3.0	0	0	No	0	0	0	0	0
39	Balasore	Ranital-Kupari PWD Road Kalyani	2.5	0	0	No	0	0	0	0	0
40	Balasore	Tudigadia Naharapada	6.3	0	0	No	0	0	0	0	0
41	Balasore	Darada Sartha Road at Kunduli to Shipura	2.1	0	0	No	0	0	0	0	0
1	Angul	Brahmanbil to Balinali	4	0	0	No	0	1	1	0	0
2	Angul	Tainsi Kothabhuin to Dalasinga	8.7	13	10	No	0	3	0	0	0
3	Angul	Sankhapur to Manapur	5.56	0	0	No	0	16	2	3	0
4	Angul	Rajamunda to Batimunda	7.97	0	0	No	0	0	0	0	0
5	Angul	Kosal to Sandhapal road	4.2	0	0	No	0	0	0	0	0
6	Angul	Golagadia Salakhaman road	3.5	0	0	No	0	4	0	0	0
7	Angul	Balaramprasad Kendupali via Pingua road	4.85	0	0	No	0	17	0	0	0
8	Angul	RD road Haridakatha	1.1	0	0	No	0	10	0	1	0
9	Angul	PWD Road to Brajapur	9.35	0	0	No	0	0	0	1	0
1	Kalahandi	P.W.D Road to Goipita	4.10	0	0	No	0	0	0	0	0
2	Kalahandi	Saria to Denguguda	1.20	0	0	No	0	0	0	0	0
3	Kalahandi	RD Road to Dhanarbhata	3.00	0	0	No	0	0	0	0	0
4	Kalahandi	RD Road to Kerandihapar	11.00	0	0	No	0	0	0	0	0
5	Kalahandi	Simaska to Sindhipadar	8.00	0	0	No	0	0	0	0	0
6	Kalahandi	RD road to Panigaon	2.50	0	0	No	0	0	0	0	0
7	Kalahandi	Thukguda to Uperjhapi	16.00	0	0	No	0	0	0	0	0
8	Kalahandi	Dendeguda to Gaidhar	3.50	0	0	No	0	0	0	0	0
9	Kalahandi	Gopinathpur to Budel	4.50	0	0	No	0	0	0	0	0
10	Kalahandi	Maligaon to Kansukuli	16.00	0	0	No	0	0	0	0	0
11	Kalahandi	Porkela to Siralbahal	2.50	0	0	No	0	0	0	0	0
12	Kalahandi	RD Road to Chitalpata	2.00	0	0	No	0	0	0	0	0
13	Kalahandi	Budhidar to Upperdunda	20.00	0	0	No	0	0	0	0	0
14	Kalahandi	Bargaon to Kendupati	3.20	0	0	No	0	0	0	0	0
15	Kalahandi	NH 201 to Ghantabahali	3.10	0	0	No	0	0	0	0	0
16	Kalahandi	Kandel to Sindhabali	1.50	0	0	No	0	0	0	0	0
17	Kalahandi	PWD Road to Taprang	5.50	0	0	No	0	0	0	0	0
18	Kalahandi	Kandrei to Karnikhunti	5.50	0	0	No	0	0	0	0	0

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19	Kalahandi	Kukuti to Lahardebri	4.40	0	0	No	0	0	0	0	0
20	Kalahandi	RD Road to Durduri	4.40	0	0	No	0	2	0	0	0
21	Kalahandi	Kanabira to Khamari	3.50	0	0	No	0	0	0	0	0
22	Kalahandi	Borda to Jeypadar	2.00	0	0	No	0	2	0	0	0
23	Kalahandi	PWD Road to Sirliguda	2.60	0	0	No	0	0	0	0	0
24	Kalahandi	RD Road to Dabriguda	3.60	0	0	No	0	0	0	0	0
25	Kalahandi	RD road to Munguda	2.00	0	0	No	0	0	0	0	0
26	Kalahandi	PWD Road to Kukurbhursi	3.50	0	0	No	0	0	0	0	0
27	Kalahandi	Kumudabahal chak to Nichemaska	8.00	0	0	No	0	0	0	0	0
28	Kalahandi	PWD Road to Bilat	2.50	0	0	No	0	0	0	0	0
29	Kalahandi	PWD road to Baddharpur	5.00	0	0	No	0	0	0	0	0
30	Kalahandi	Attanguda to Gachhkhola	13.50	0	0	No	0	0	0	0	0
31	Kalahandi	RD road to Khudupada	2.60	0	0	No	0	0	0	0	0
32	Kalahandi	PWD Road to Dampadar	2.50	0	0	No	0	0	0	0	0
33	Kalahandi	RD Road to Tangri	3.50	0	0	No	0	0	0	0	0
34	Kalahandi	PWD Road to Dakibundel	7.0	0	0	No	0	0	0	0	0
35	Kalahandi	Mohangiri to Phulbani boarder via Sitarbali	4.0	0	0	No	0	0	0	0	0
1	Boudh	PWD SH-41 to PWD SH-41 Dapala Road	10.3	0	0	No	0	0	0	0	0
2	Boudh	NH-224 to Kanapada	4.3	0	0	No	0	0	0	0	0
3	Boudh	Telibandha -Barapuduga R.D. road to Kasalpur	3.1	0	0	No	0	0	0	0	0
4	Boudh	NH-224 at Khuntabandha to Charada	4.4	0	0	No	0	0	0	0	0
5	Boudh	P.W.D. road NH-224 to Lundabereni	2.8	0	0	No	0	0	0	0	0
6	Boudh	PWD road ODR to Khuntiapada	2.6	0	0	No	0	0	0	0	0
7	Boudh	P.W.D. road SH-41 Kumarkeli road to Bramhani	1.15	0	0	No	0	0	0	0	0
8	Boudh	SH-41 Narayanprasad road to Gochhangi	1.45	0	0	No	0	0	0	0	0
9	Boudh	Telibandha -Barapuduga R.D. road to Budhipadar	3	0	0	No	0	0	0	0	0
10	Boudh	NH-224 to Chandigada	3.5	0	0	No	0	0	0	0	0
11	Boudh	Tileswar on Boudh Dhalpur road to Fakirpur	4	0	0	No	0	0	0	0	0
12	Boudh	NH-224 to Tainjan	1.17	0	0	No	0	0	0	0	0
13	Boudh	Udayapur Balanda road to Shardhapur	2.5	0	0	No	0	0	0	0	0
14	Boudh	SH-41 Gabjore road to Kirla	3.05	0	0	No	0	0	0	0	0
15	Boudh	Manmunnda- Baragochha Road to Narsinga pur	2.7	0	0	No	0	0	0	0	0
16	Boudh	PWD Road SH-41 Dapala Road to Rabedi	1.15	0	0	No	0	0	0	0	0

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17	Boudh	PWD road SH-41 to Ambagahana	7.6	0	0	No	0	0	0	0	0
18	Boudh	Dhalpur -Atalsar- RD Road to Kharasankulei	1.1	0	0	No	0	0	0	0	0
19	Boudh	PWD road ODR to Kanekpur road	1.2	0	0	No	0	0	0	0	0
20	Boudh	Khaliapalli PMGSY road to Talapadar	6.7	0	0	No	0	0	0	0	0
21	Boudh	Manmunda- Baragochha Road to Uchabahali	0.9	0	0	No	0	0	0	0	0
22	Boudh	NH-224 to Badadumuripalli Road	1.5	0	0	No	0	0	0	0	0
1	Jharsuguda	Kandheikela to Sukhasada	4	0	0	No	0	0	0	0	0
2	Jharsuguda	Muralipali to Sardha	1.5	0	0	No	0	0	0	0	0
3	Jharsuguda	ODR to Kankmal Road	3.9	0	0	No	0	0	0	0	0
4	Jharsuguda	RD Road to Bariahapali	2.2	0	0	No	0	0	0	0	0
5	Jharsuguda	NH200 to Sanyasipali	1	0	0	No	0	0	0	0	0
6	Jharsuguda	Attabira to Kumar	1.69	0	0	No	0	0	0	0	0
7	Jharsuguda	RD Road to Tengnamal	5.3	0	0	No	0	0	0	0	0
8	Jharsuguda	RD Road to Jamuna Road	2.1	0	0	No	0	0	0	0	0
9	Jharsuguda	NH200 to Kutrapali	5.4	0	0	No	0	0	0	0	0
10	Jharsuguda	RD Road to Tangarpali	1.5	0	0	No	0	0	0	0	0
11	Jharsuguda	NH200 to Kudabaga	4.5	0	0	No	0	0	0	0	0
12	Jharsuguda	Turekela to Fatakpada	1.4	0	0	No	0	0	0	0	0
13	Jharsuguda	SH 10 to Kherwal	2.21	0	0	No	0	0	0	0	0
14	Jharsuguda	SH 10 to Tumbarkela	1.71	0	0	No	0	0	0	0	0
15	Jharsuguda	Kandheikela to Sukhasada	4	0	0	No	0	0	0	0	0
1	Balangir	Gandharla to Jhinkapara	5.5	0	0	No	0	0	0	0	0
2	Balangir	Sireikella Goudtola RD road to Kanarla road	1.5	0	0	No	0	0	0	0	0
3	Balangir	L 81 to Brahmanipada road	1.5	0	0	No	0	0	0	0	0
4	Balangir	Phatamunda to Bhairguda road	3.0	0	0	No	0	0	0	0	0
5	Balangir	Desil Luthorbandha Rd road to Bagdel road	2.6	0	0	No	0	0	0	0	0
6	Balangir	Dhundimahul to Dumermunda road	2.2	0	0	No	0	0	0	0	0
7	Balangir	Belpada to Ganjiabahal road	1.9	0	0	No	0	0	0	0	0
8	Balangir	Salemurunga to Sanabanki road	3.5	0	0	No	0	0	0	0	0
9	Balangir	Kuturabeda to Tetelapara road	1.5	0	0	No	0	0	0	0	0
10	Balangir	RD road to Beherabhata road	2.5	0	0	No	0	0	0	0	0
11	Balangir	Kharli to Chiknibahal road	5.5	0	0	No	0	0	0	0	0
12	Balangir	Ichhapara to Sargul	3.0	0	0	No	0	0	0	0	0

Sl. No.	District	Road Name	Length (KM)	No. of Affected persons		Whether forest clearance required	No. of trees affected	EP Shifting	TP Shifting	TW Shifting	SS Shifting
				No. of APs	No. of VAPs						
13	Balangir	Andaldar to Jharbahali	2.6	0	0	No	0	0	0	0	0
14	Balangir	Phulabandh to Malkasara	3.5	0	0	No	0	0	0	0	0
15	Balangir	Andaldar to Chitramunda	3.0	0	0	No	0	0	0	0	0
16	Balangir	Ichhapara to Bhagubahal	8.6	0	0	No	0	0	0	0	0

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	All through the alignment of each rural road	Compliance to Conditions of Forest Clearance if applicable		

		of utilities or community structure. o The road shall follow natural topography to avoid excessive cut and fill.				
3.	Land acquisition	o Avoid or minimize land acquisition. o Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	All through the alignment of each rural road			
4.	Biological environment - Tree planting	o All efforts shall be taken to avoid tree cutting wherever possible. o Requisite permission from forest department shall be obtained for cutting of roadside trees. o Provision of Compensatory Afforestation shall be made on 1:3.ratio basis. o Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Throughout the project section of the road			
5.	Planning for land clearing	o The road land width shall be clearly demarcated on the ground. o The utility and community structure shifting shall be planned in consultations and concurrence of the community. o Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a prior permission of Forest department. o The vegetable cover shall be removed and disposed in consultation with community. o All public utilities shifting shall be planned with prior 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	o All efforts are made to minimize shifting of common utilities and community structures. o 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	o The alignment design shall consider options to minimize excessive cuts and fills. o The cut and fill quantities shall be used for embankment to minimize barrow earth requirement. o The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. o Adequate provision shall be made for cross drainage structure for	All through the alignment of each rural road			

		maintaining natural drainage pattern in the subproject area and preventing soil erosion. o Side drain for channelizing water to nearby natural drain in water stagnation /logging prone area. o The top soil of the cut and fill area shall be used for embankment slope protection o Embankment will be designed above High Flood Level wherever, area is prone to flood.				
8.	Hydrology and Drainage	o Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. o Provision of adequate side drainage shall be made in water stagnant/logging areas. o The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. o Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment to ensure minimum disturbance to natural drainage of surface and subsurface water of the area. o Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides. o Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. o Road level shall be fixed above HFL. Embankment slope stabilization measures shall be planned. Stabilization measures may include vegetative treatment, stone pitching, retaining wall where feasible, low cost options such as bamboo / eucalyptus tree pilling .	Near all drainage crossing , nalas and river crossings etc.			
9.	Establishment of Construction Camp, temporary office and storage area	o Construction camp sites shall be located away from any local human settlements (minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently. o Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m). o The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities.	As determined by contractor under approval of PIC/PIU/ (ref- Labelled: WASTE OIL; and hazardous sign be	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		

		○ The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas. ○ The construction camps, office and storage areas shall have 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 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.	displayed at oil handling areas and sold off to SPCB/ MoEF authorized re-refiners).	control board for setting up the camp.		
10.	Traffic Movement	○ 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. ○ 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/			
11.	Occupational Health and Safety	○ Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain and rolling terrain. ○ Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation.	Throughout the project section at the location determined by contractor and approved by PIU			

		○ The speed breakers shall be provided and directional sign boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required. ○ Provision shall be made for Hazard markers at each end of all box culverts, river crossing causeways and similar CD structures ○ Shoulder side slopes shall not be steeper than 2h:1V unless stone pitching of the slopes is provided. ○ Cement concrete pavement and V-shaped drain shall be constructed to the full width of the available roadway within densely populated habitation and as per feasibility. ○ Provision shall be made for Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing "STOP" sign and 'T-intersection' warning sign shall be installed on the village road. ○ It is proposed to approach railways for adequate safety at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both side of the railway crossing				
12.	Grievance Redress	○ Obtaining information from Village level Grievance redress committee, PIU as applicable	Each Sample road once.			

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

II. ENVIRONMENTAL MONITORING DURING CONSTRUCTION STAGE

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

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

		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** 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	Thought out the road section			

		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				
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. o Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. o Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. o The non-biodegradable and recyclable waste shall be sold off. o Fuel and lubricants shall be stored at the predefined storage location. o The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. o All efforts shall be made to minimize the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. o To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.	• Throughout the project section of the road s			
4.	Construction Debris and waste	o All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. o Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority.	• Throughout the project section of the road			

		○ 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.				
5.	Air and Noise Quality	○ Vehicles delivering loose and fine materials like sand and aggregates shall be covered. ○ Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas. ○ Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. ○ Material storage areas shall also be located downwind of the habitation area. ○ Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. ○ Diesel Generating (DG) sets shall also be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the Dg set). . Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained. ○ The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. ○ Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly.	• Near all drainage crossing , nalas and river crossings etc.			
6.	Biological environment - Tree planting	○ Compensatory Afforestation shall be made on 1:3.ratio basis as per the plannings. ○ Additional trees shall be planted wherever feasible.	Throughout the project section of the road			

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

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

III. ENVIRONMENTAL MONITORING DURING OPERATION STAGE

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

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Additional Monitoring Indicator if applicable	Compliance status	Corrective action proposed in case of delay
1.	Air and Noise Quality	○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due vehicle movement.. Speed limitation and honking restrictions may be enforced near sensitive locations.	Throughout the project section at the location determined by contractor and approved by PIU			
2.	Site restoration	○ All construction camp/temporary office/material storage areas are to be restored to its original conditions. ○ The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. ○ Obtained clearance from PIU before handling over the site to SRRDA. ○ PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required	Throughout the road stretch	Survivability report, land owner concurrence of land reversal		
	Hydrology and Drainage	○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. ○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted	Throughout the project section at the location determined by contractor and approved by PIU			
3.	Occupational Health and Safety	○ Directional sight board shall be installed on all sharp curves and bends ○ At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road.	Throughout the project section at the location determined by contractor and approved by PIU			
4.	Grievance Redress	○ Obtaining information from Village level Grievance redress committee, PIU as applicable	Each Sample road once.			

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

Appendix 6.1: Public Consultation in Odisha

District	Name	Designation	Contact Number
Bhubaneswar	Mr.S K Sarangi	Chief Engineer	
	Mr. Prusty	Executive Engineer	09437060237
	Mr. Dhal	AE, HQ	
	Mr. Tripathy	AE, HQ	09437255501
Angul	Mr A. K. Pradhan	Executive Engineer,	06764:237092
	Sri Prafulla Behera	Villager, Uchhakurum village	
Balsore	Sk. Khaled Hossain	J.E. Oupada, PIU, Balasore	
	Shri. Niranjan Mallick	Sarpanch, Janakipal	
	Smt Kamali Mohapatra	Affected Person	
	Shri Harihara Muduli	Affected Person	
	Shri Gangadhar Senapati	Affected Person	
Boudh	Mr. M K Tripathy	Executive Engineer	9437255317
	Er. Bibhi Prasad Padhi	J.E.Kantamal, Boudh PIU	
	Smt. Susama Jagadela	Sarpanch, Dahya G.P	
Khurda	Er. Harihara Sahoo	Executive Engineer	
	Er. Amarendar Mohapatra	A.E. PIU Khurda	
	Shri Satrughana Jena	Member, Panchjayat Samiti, Deuli GP	
	Shri Tikam Sahu	Villager, Garia	
	Shri Batakrushna Parida	Villager, Garia	
	Mukesh Kumar	Villager	
	Shri Basudev Behera	Affected Person	
	Shri Chaitanya Behera	Affected Person	
	Shri Nanda Baral	Affected Person	
Puri	Mr. Anadi Sahoo	Executive Engineer, Puri	09437255349
	Er. Braja Kishore Mahapatra	J. E. R.W. Pipli-1	
	Er. Bimal Chandra Tiriya	A.E. Pipli,	
	Smt Saraswati Rout	Chairperson, Satyabadi Panchayat Samiti	
	Shri Laxmidhar Das	Sarpanch, Laxmi Narayan Pur, Gram Panchayat	
Cuttack	Er. Trilochan Debata	Executive Engineer, PIU I	09437255338
	Smt Laxmi Bilasini Biswal	President, Zilla Parishad	09437020809
	Shri Nakula Rout	Sarpanch, Brahmanasailo	
Bhadrak	Er. Sukanta Behera	Executive Engineer, PIU I	09437255357
	Er. Pradeep Kumar Mohanty	A.E. Bhadrak, PIU I	
	Shri Kamalakanta Rout	Revenue Inspector, Beka	
	Shri A. K. Samal	Sarpanch, Bania, Gram Panchayat	
	Shri Kanhi Charan Behera	Villager, Nachhipur	
	Shri Chaitanya Pal	Villager, Brahmapur	
	Shri Gopabandhu Behera	Villager, Brahmapur	
Bargarh	Mr Dehuri	Executive Engineer, Padampur PIU Bargarh	09437255306
	Er. Manoj Kumar Mahananda	SDO, Sohela, PIU Bargarh	09437255436
	Er. K. K. Taria	SDO-1, PIU Bargarh	09437255427
	Mr Laxmidhar Sahu	J. E., Padampur, PIU Bargarh	09437255447