Initial Environmental Examination

August 2017

IND: Second Rural Connectivity Investment Program

West Bengal

Prepared by National Rural Road Development Agency, Ministry of Rural Development, Government of India for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 6 July 2017)

Currency unit	–	Indian Rupees (INR/Rs)
INR1.00	=	$ 0.01545
$1.00	=	INR 64.73

ABBREVIATIONS

ADB	-	Asian Development Bank
APO	-	Accident Prevention Officer
B.T.	-	Black Top
BGL	-	Below Ground Level
BIS	-	Bureau of Indian Standards
BOQ	-	Bill of Quantity
C.C.	-	Cement Concrete
CD	-	Cross Drainage
CGWA	-	Central Ground Water Authority
CGWB	-	Central Ground Water Board
Ch.	-	Chainage
COI	-	Corridor Of Impact
CPCB	-	Central Pollution Control Board
CTE	-	Consent to Establish
CTO	-	Consent to Operate
DG	-	Diesel Generating
DPR	-	Detailed Project Report
EARF	-	Environmental Assessment Review Framework
ECOP	-	Environmental Code of Practices
EIA	-	Environmental Impact Assessment
EMOP	-	Environmental Monitoring Plan
EMP	-	Environmental Management Plan
EO	-	Environmental Officer
FEO	-	Field Environmental Officer
GDP	-	Gross Domestic Product
GOI	-	Government of India
GSHAP	-	Global Seismic Hazard Assessment Program
HC	-	Hydrocarbon
HH	-	Household
IEE	-	Initial Environmental Assessment
IRC	-	Indian Road Congress
LHS	-	Left Hand Side
MCM	-	Million Cubic Meter
MFF	-	Multitranche Financing Facility
MoEF	-	Ministry of Environment and Forests
MoRD	-	Ministry of Rural Development
MoRTH	-	Ministry of Road Transport & Highways
NAAQS	-	National Ambient Air Quality Standards
NGO	-	Non-government organization
NOx	-	Nitrogen Oxides
NRRDA	-	National Rural Road Development Agency
NSDP	-	Net State Domestic Product
PIC	-	Project Implementation Consultant
PIU	-	Project Implementation Unit

PLF	-	Plant Load Factor
PM	-	Particulate Matters
PMGSY	-	Pradhan Mantri Gram Sadak Yojna
PPE	-	Personal Protective Equipment
PPTA	-	Project Preparation Technical Assistance
RCIP	-	Rural Connectivity Investment Program
RHS	-	Right Hand Side
ROW	-	Right of way
RRS I	-	Loan 2018-IND: Rural Roads Sector I Project
RRS II	-	Loan 2248-IND: Rural Roads Sector II Investment Program
SBD	-	Standard Bidding Documents
SDP	-	State Domestic Product
SO_2	-	Sulphur Dioxide
SPCB	-	State Pollution Control Board
SPS	-	ADB's Safeguard Policy Statement,2009
SRRDA	-	State Rural Road Development Agency
STDs	-	Sexually transmitted diseases
TDS	-	Total Dissolved Solids
TSC	-	Technical Support Consultants
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
WBM	-	Water Bound Macadam
WBSRRDA	-	West Bengal State Rural Road Development Agency

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EXECUTIVE SUMMARY

1. Pradhan Mantri Gram Sadak Yojana (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 Agency (NRRDA) under ministry of rural development (MORD) at central level and through state rural road development authority/agencies (SRRDA) at state level.

2. The Second Rural Connectivity Investment Program (RCIP 2) is the continuation of Rural Connectivity Investment Program (RCIP) and is a Multitranche Financing Facility (MFF) that will be implemented in the states of Assam, Chhattisgarh, Orissa, Madhya Pradesh and West Bengal.

3. The Government of West Bengal is now planning to submit to ADB the first Periodic Finance Request (PFR) that includes the proposal for about 181 rural roads totalling to 597.500 km in the state of West Bengal. The project as per classification of ADB has been categorised as 'Category B' project and therefore requires an Initial Environmental Examination (IEE). No categorisation is made under Indian 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.

4. A review of international agreements and conventions where India is a member were made to ensure compliance. These agreements are: Ramsar Conventions on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar), Convention Concerning the Protection of the World Cultural and Natural Heritage, Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES), Convention on the conservation of Migratory Species of Wild Animals (CMS 1979), and the United Nations Framework Convention on Climate Change, Convention on Biological Diversity.

5. The IEE was conducted based on Detailed Project report (DPR) and sub-project details provided by the the Technical Support Consultant. The IEE covers all activities proposed under the project. The direct area of influence or the corridor of impact (COI) has been considered as 10 m on either side of the proposed road alignment.

A. Physical Environment

6. The climate of the West Bengal state, except the Himalayan and sub-Himalayan region in the northern part of the state has a tropical climate. The tropic of cancer passes through the middle Burdwan districts and northern parts of Bankura district. The minimum annual temperature in the northern districts (Himalayan foot hill region) varies from freezing point to 17°C and over 18°C in other parts of the state. The annual mean maximum temperature ranges from 28°C in the Himalayan region to 33°C in the plains. In certain parts of the state, occasionally the mean maximum temperature can rise up to 43°C. The average rainfall in the State is 1750 mm. In the Himalayan Region i.e in northern part the average rainfall ranges from 2500 - 6000 mm. In the southern part, average rainfall ranges from 1125 - 1900 mm.

7. 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 & small scale industries. These were located in open rural area and operate only for few months. As such, the ambient air quality for

major pollutants is expected to be within limits. 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 contribute to increased noise levels over short duration limited to daytime. The existing roads do not appear to have vehicular traffic in the nighttime. The ambient noise levels are expected to be within the National Ambient Noise Standards.

8. West Bengal State has three major river basins, namely Ganga, Brahmaputra and Subarnarekha. Among these, Ganga is the largest and covers almost 80% of the state, whereas the Brahmaputra basin covers about 15% of the area and Subarnarekha basin covers about 5% of the geographical area of the State. The rural road construction proposals are normally cross small drainage channels, which eventually join the major channels/rivulets. All of these channels generally remain dry for most part of the year and drain the storm water for few weeks only during or after the monsoon.

B. Biological Environment

9. Owing to the varying altitude from the Himalayas to the coastal plains, the flora and fauna of the state is diverse. As on 2011, forests make up more than 27% of the geographical area of West Bengal, which is higher than the national average of 23%. Total recorded forest land in the state is 11,879 sq.km, of which 7,054sq.km is Reserved Forest, 3,772 sq.km. is Protected Forest and 1,053 sq.km is Unclassified State Forest, thus constituting 13.38% of the geographical area of the state.

10. The dominant flora in proposed projects comprised generally of trees planted along side of the rural road proposals, particularly the stretches along agricultural lands. Many of these are planted by the adjacent landowners and often served as a fence to their respective lands. West Bengal has 5 National Parks and 15 Wildlife sanctuaries spread over an area of 2,754.39 Sq. Km. There is no wildlife Sanctuaries/National Parks, Tiger Reserves etc. along the sample project road area.

C. Socio-economic Environment

11. The population of West Bengal of about 90 million is largely rural (73%). Tribal constitute about 5.8% of the population, and scheduled castes form about 28.6%. The healthcare system in the state is well established and is undergoing further upgrading through public private partnership. West Bengal's network of healthcare facilities comprises 433 government & non-government hospitals. The literacy rate of the state, at 77%, is at par with the national average. The percentage of population below the poverty threshold is high at 32%.

12. Agriculture is the leading occupation in West Bengal. Crops include rice, pulses, oil seeds, wheat, tobacco, sugarcane and potato. Agriculture contributes 27% to the gross domestic product of the state. Service provides 51% to the GDP while industry contributes the remaining 22%.

13. West Bengal has well-developed road and rail networks. As of 2012, the total length of surface road in West Bengal is over 92,023 km (57,180 mi); national highways comprise 2,578 km (1,602 mi) and state highways 2,393 km (1,487 mi). As of 2006, the road density of the state is 103.69 km per 100 km² (166.92 mi per 100 sq mi), higher than the national average of 74.7 km per 100 km² (120 mi per 100 sq mi). Average speed on state highways varies between 40–50 km/h (25–31 mi/h); in villages and towns, speeds are as low as 20–25 km/h (12–16 mi/h) due to the poor quality of road constructions and low maintenance.

D. Anticipated Enviromental Impacts and Mitigating Measures

14. Significant enviromental impacts were anticipated mostly during construction phase. Some of these significant impacts include a) impact on common utilities and community properties; b) loss of productive soil; c) impact on hydrology and drainage; d) compaction and contamination of soil; e) generation and management of construction debris and wastes; f) increased air pollution level; g) increased noise level; h) impact on ground and surface water quality and availability; i) loss of trees; j) increased level of vehicle traffic; and k) health and economic hazards to the community. Mitigating measures were proposed in the enviromental management measures to address all the anticipated environmental impacts.

15. Total annual emissions without the project (business as usual) at the middle of the design life of 7.5 years is estimated at 38,227.84 tons/year and with project scenario is estimated at 36,643.8 tons/year, for all 181 roads proposed for Tranche 1 of RCIP 2. The with project scenario is still far below the 100,000 tons per year threshold set in the ADB SPS 2009 and therefore not required to implement options to reduce or offset CO_2 emissions. Key engineering measures to address climate risk variables such as extreme precipitation, high temperatures and vulnerability to landslides include a) increase in embankment height in road section located in low-lying and flood prone areas; b) use of pavement binder bitumen with high viscosity grade (VG)[1] to prevent rutting and improve pavement life and appropriate for heavy vehicles; and c) increase in capacity of longitudinal (pucca) and cross drains. Provisions have also been made in the bidding documents for the contractor to prepare EMPs based on the final detailed design to address climate related risks and vulnerabilities.

16. The Ministry of Rural Development (MoRD), 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). NRRDA constituted by MoRD is the nodal agency for the implementation of the environmental management plan (EMP). West Bengal State Rural Road Development Agency (WBSRRDA) 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 WBSRRDA /PIUs, facilitating them for environmental and social safeguard compliance monitoring and due diligence. WBSRRDA appoints PIC (project implementation consultant) for supervision of construction work. PIC also helps PIU in monitoring the EMP.

17. The environmental monitoring program is prepared to monitor the environmental performance of environmental management plan. For rural roads, Environmental Monitoring Plan will be more observation oriented and it provides observation areas with frequency of monitoring at pre-construction aspects[2], construction stage and operation stage.

18. Grievance redress mechanism will be implemented from the subproject to national levels. The PIU will designate a public disclosure and complaints contact person for each subproject to help address all concerns and grievances at the subproject level. Grievances, if any, will be considered at the village level by the Grievance Redress Committee (GRC) consisting of

[1] The Indian Standard, IS 73:2013 classifies four grades of bitumen based on viscosity at 60 °C. VG 30, which is suitable for a 7-day average maximum air temperature of 38-45 °C, is the most appropriate.
[2] Aspects related to alignment selection for inclusion of new roads

members of Gram Panchayat, and Pradhan / Up-Pradhan of Gram Panchayat. The GRC will meet for addressing grievances as needed. Grievances not resolved at the village level will be addressed through the district level GRC, with the following members: Executive Engineer of the PIU, member of Zilla Parishad, member of the grievance committee of the concerned GP; and representatives of affected people. Grievances at this level need to be resolved prior to contract award. At the national level, NRRDA has made provision of registering complaint /suggestion through its website. NRRDA forwards these complains to concerned SRRDA for necessary actions. SRRDA directly or through concerned PIU initiate the appropriate action and update the complainant as well as NRRDA.

E. Conclusion and Recommendations

19. **Conclusion.** The proposed Rural Connectivity Investment Program Phase has been categorized as "B" for environment under SPS 2009. No categorization is made under the environmental legislation of India, since these small roads do not require any environmental clearance in accordance with Environment (Protection) Act and Rules, 1986 amended till date. 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 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. All sample roads included under Tranche I 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.

20. Significant impacts are not considered adverse and typical to road constructions that are simple to mitigate. Impacts related to road siting in flood and erosion prone areas are mitigated through proper design. During construction, impacts can be mitigated through good engineering practices and compliance to permits and clearances issued by the regulatory agencies. The mitigating measures are institutionalized through the EMP and EMoP, and institutional arrangements were established to implement these plans.

21. **Recommendations.** Any major changes or any additional work other than the proposed project activities indicated in the IEE and Environment Checklist (formerly Environmental Code of Practice or ECOP) will require updates in the IEE. The updated Environment Checklists and IEE will have to be submitted to NRRDA and ADB for concurrence prior to commencement of civil works.

22. Executing agency shall ensure that updated road specific EMP forms part of DPR and is available to contractor at the time of bidding. The contractor will specify the quantity and budget for various activities like rehabilitation of borrow earth pits, first aid and sanitation facilities at construction camp and temporary office/material storage place as per EMP requirements. The same shall be revised if there is any change in the project design. Any such change shall be reported to ADB as well.

I. INTRODUCTION

A. Project Background

1. Pradhan Mantri Gram Sadak Yojana (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 Agency (NRRDA) under ministry of rural development (MORD) at central level and through state rural road development authority/agencies (SRRDA) at state level.

2. The Second Rural Connectivity Investment Program (RCIP 2) is the continuation of Rural Connectivity Investment Program (RCIP) and is a Multitranche Financing Facility (MFF) that will be implemented in the states of Assam, Chhattisgarh, Orissa, Madhya Pradesh and West Bengal. 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.

3. The Government of West Bengal is now planning to submit to ADB the first Periodic Finance Request (PFR) that includes the proposal for about 181 rural roads totalling to 597.500 km in the state of West Bengal. West Bengal State Rural Development Agency (WBSRDA) is the Implementing Agency (IA) for the ADB funded subprojects in the state. The preparatory works for the proposed roads under the first tranche 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 categorised as 'Category B' project and therefore requires an Initial Environmental Examination (IEE). The Initial environmental examination (IEE) report has been prepared by using environmental checklist.

B. Project Road Identification and Location

4. PMGSY has prepared specific guidelines for the selection of roads under this programme. The key requirement is that any road will be eligible for construction or up-grading only if it is part of the Core Network[3] and satisfy the following environmental safeguards:

- 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.
- The selected road 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 Ramsar Convention);

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

- The sub projects shall only involve activities that follow Government of India laws and regulations and meets funding agency safeguard policies.

5. The WBSRRDA has selected about 597.5km of rural roads to be taken up under Second RCIP Tranche I subproject roads in West Bengal. The 597.5km comprises 181 roads spread over in 3 districts of the State. Within each district, the roads are further scattered in several blocks and subdivisions. The minimum and maximum length of the roads ranges between 0.51 km and 24.276km respectively. The list of 597.5km roads with location and length is given in **Appendix 1**.

6. **Table 1** shows the summary of roads district wise proposed for **Tranche I** funding.

Table 1: Second RCIP Tranche I Roads in West Bengal

Sl No	District	No of Roads	Total Road Length (Km)
1	Hooghly	138	355.438
2	Nadia	15	120.799
3	Murshidabad	28	121.263
Total		**181**	**597.500**

C. Rural Road Construction Proposal

7. The proposal for rural road construction works typically considers a 10-12m right of way (ROW), which includes side slopes for embankment, side drains on either side of the alignment. The roads consist both Black Top (B.T.) and Cement Concrete (C.C.) as per the ROW availability.

8. The construction proposals are confined to the existing alignment of the unpaved / partly paved tracks. Majority of these are 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's Safeguard Policies and Category of the Project

9. 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.

10. All environmentally sensitive components along each subproject roads are critically analysed to assess the magnitude and extent of likely impacts. These sample subproject roads stretches do not pass through any protected areas nor located near any archeologically important monument. As per selection guidelines, none of the selected subproject road passes through reserved forests either. Few trees cutting though may be involved. The road primarily passes through agricultural and residential areas. Most of the roads follow existing village roads and unpaved movement paths. As such, additional land requirement is also low. Hence, the project falls under category B as per ADB Safeguard Policy Statement 2009.

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

E. Objectives and Approach for Environmental Assessment

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

13. Since there is large number of subproject roads involved under Second RCIP and magnitude of each road is small, preparation of individual IEE's for each road will be difficult and time consuming. ADB had finalised Environmental Code of Practices (ECOP) checklist under RCIP I, which is modified as Environment Checklist for Second RCIP. Subprojects specific Initial Environmental Examination (IEE) is carried out as per this Environment Checklist for sample roads. These completed Environment Checklist with annexure on tree, utility and community structures, strip plans and selected photographs for 19 sample roads are enclosed as **Appendix 2** and **Appendix 3,** respectively.

14. The findings of 19 sample subprojects specific assessment suggest that similar issues exist amongst other roads with very few subproject specific issues. Therefore, IEE report has been prepared based on Environment Checklist of selected sample subproject roads (19 roads out of 181 roads) covering 10.56% of total roads in the state. Impact is assessed for all the 181 roads under proposed Tranche I. This IEE approach will be followed for conducting environmental assessment for other tranches under Second RCIP.

F. IEE Methodology and Content

15. Initial Environmental Examination has been largely structured as per Safeguards Policy Statement, 2009. The IEE report includes EMPs, and environmental monitoring plans (EMoPs) that cover most environmentally sensitive components in West Bengal state as well as specific to sample roads.

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

17. **Field visits, Primary and Secondary Data Collection**: Few of the selected sample roads were visited along with concerned PIU officials and PIC 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-government / research institutions for assessment of the baseline environment of the project locations, district and state as a whole. Finally, IEE is prepared after site observation and review of all collected relevant documents.

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

practices. Mitigation measures are proposed common to larger roads and specific to the roads. EMP is prepared considering mitigation measures and institutional framework of WBSRRDA.

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

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

G. Legal Framework and Legislative Requirements:

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

21. As per Environment (Protection) Act, 1986; the Environmental Impact Assessment Notification, 2006; amended in 2009 defines the environmental impact assessment for defined development projects. All new or expansion of National and State Highways requires Environmental Impact Assessment and Environmental Clearance from central or state level Environmental Appraisal Authority. However, small roads projects as proposed under Second 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 RCIP I and Rural Roads Sector II and Sector I Investment Programs (RRS I and RRS II) will in any case be implemented.

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

Table 2: Applicable Rules and Regulations for Second RCIP Roads

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 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	Not applicable, since no roads is selected if it passes through protected areas.

Sl. No.	Legislation	Applicability
	through protected areas or sanctuaries	
4.	The Water (Prevention and Control of Pollution) Act 1972 (Amended 1988), and the Water (Prevention and Control of Pollution) Rules, 1974	Placement of hot-mix/ spot 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 critical or semi critical from ground water potential prospective. For NOC, an application in the prescribed Proforma is to be submitted to either to the Office of the Regional Director, Central Ground Water Board (CGWB) of the state, or to Member Secretary, CGWA, New Delhi

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

H. Acknowledgement

24. The TSC gratefully acknowledge the support received from NRRDA and WBSRRDA throughout the environmental assessment process. We also acknowledge the assistance received from respective PIUs and PIC and other government agencies for primary and secondary data collection as well during public consultation.

II. DESCRIPTION OF THE PROJECT

A. General

25. The PMGSY program has mandate to provide all-weather roads to all the rural habitations within the country. Second RCIP is planned to meet above objective. Nineteen (19) sample roads with a length of 87.260 Km are identified for West Bengal under Tranche I of Second 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.

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

B. Sample Roads Selected in West Bengal State

27. The West Bengal state has selected 181 roads with a total length of **597.5** Km spread over 3 districts. Details shown in **Appendix 1.** District wise summary is given in **Table 3.**

Table 3: Summary of District Wise Rural Roads – Tranche I

Sl no	District	No. of Packages	No of Roads	Total Road Length (Km)	Maximum Road Length (Km)	Minimum Road Length (Km)
1	Hooghly	138	138	355.438	8.210	0.510
2	Murshidabad	15	15	120.799	8.260	1.300
3	Nadia	27	27	115.563	24.276	2.368
Total		**181**	**181**	**597.5**		

28. For preparation of IEE, 19 sample roads (87.260 km) covering 10.56% of the total roads under tranche I in the state have been considered. All 3 districts have been covered for selection of sample roads. Details are given in Table below

Table 4: Details of Sample Roads

Sl. No.	District Name	Road Name	Length (Km)
1	Hooghly	Uata Dadpur to Adibasi Para	1.516
2	Hooghly	Panjipukur to Balipukri Part to Balikuhri Via Haripur to Korichaberi	2.973
3	Hooghly	Bilaayatpur to Komdhara Part to Paschim Narayanpur to Kondhara	3.750
4	Hooghly	Kuchpala to Satithan Part to Chowpala to Dantra Dtc	2.427
5	Hooghly	Puinan to Porabazar Part to Hasnan More to Alipur Ricemill	2.900
6	Hooghly	Banna to Radhanagar Part to Narayanpur Store Bpr	4.100
7	Hooghly	Balagarh Cdp Part to Kaliagaar to Balagarh	2.702
8	Hooghly	Kamargachi Feeder to Somra	2.813
9	Hooghly	Muktarpur to Baneshwarpur Via Ghoshpara and Sijla	2.250
10	Murshidabad	Kashipur to Kulgachi	5.535
11	Murshidabad	Andi More to Beldanga	7.200
12	Murshidabad	SH-7 to Kanlla	5.240
13	Murshidabad	SH-11 to Golaghat	1.800
14	Murshidabad	Moheshpur to Tofapur	1.300
15	Nadia	Mahesnagar to Bedberia	10.887

Sl. No.	District Name	Road Name	Length (Km)
16	Nadia	Sabujpally More to Santipur Laxmitala Para	10.318
17	Nadia	Dwarikangar to Baliadanga	12.780
18	Nadia	Sondanga Indrapally to Balainagar	3.411
19	Nadia	Char Nandanbati to Haringhata	2.368
Total 19 roads in 3 districts			**87.260**

C. Project Description

1. Rural Road Construction Proposals

29. The proposed rural road construction work will provide 7.5 m roadway width[4] with 3.75 m carriageway in accordance with the IRC-SP 20: 2002 in plain terrain. The proposal considers a 3.75 m cement concrete pavement with lined storm water drains for stretches passing through built-up areas, waterlogged/water overtopping/ flood prone areas. The pavement design considers a base layer of variable thickness as per the design with granular sub base, 150 mm thick water bound macadam (WBM grade I & II) and finally topped with 20 mm thick bituminous pavement. Adequate cross drainage structures like pipe or slab culverts/bridge structures are considered for drainage channels across the roads. Figure 1 shows the typical cross section of the rural roads.

30. 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

31. The project roads mainly pass through plain terrain and agricultural area. The project roads have several cross drainage structures, electric posts and telephone posts 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 like electricity poles, hand pumps etc. besides the roads. Some of these may need to be shifted.

3. Alignment and Profile

32. The existing road is generally amurram/brick/partly bituminous track with some stretches of brickbat soling (description of the road surface). Thus, the project road is an upgraded 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 voluntary land acquisition requirements and thereby the possible social and/or environmental concerns.

4. Design Considerations

33. **Geometrical Design and ROW Requirements**: The geometric design standards for this project will conform to PMGSY 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*

[4] The road width may be reduced 6m as per PMGSY recent decision.

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 5** below:

Table 5: 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

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

35. **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 (CC) roads". In built up area for hygienic and safety reasons, CC pavement is proposed with a hard shoulder and appropriate line drain. A design life of 10 years is considered for the purpose of pavement design of flexible and granular pavements. The embankment height considered as 1m (average) from ground to crust except at the approaches of cross drainage structures. The embankment height will vary in flood prone area as per the HFL.

36. **Road side drain**: As the insufficient drainage of surface water leads to rapid damage of road, road side drain (**Figure 2**) are provided on the locations of habitation areas with concrete pavement. The rain water will flow along the longitudinal slope and intermittent gaps in concrete curbs

37. **Carriageway:** The carriageway is proposed as 3.75 m as per IRC-SP20: 2002. It may be even restricted to 3.0m, where traffic intensity is less than 100 motorised vehicles per day and where the traffic is not likely to increase due to situation, like dead end, low habitation and difficult terrain condition. The ROW requirement in built-up/constricted area may be even reduced to 5 m.

38. **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.

39. **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.

40. **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

41. Since these are smaller roads, NRRDA has framed specific guidelines for cost effective construction of these rural roads. As per the guideline of NRRDA, construction by more of manual means is preferred. Motor grader & tractor-towed rotavator shall be used for handling of bulk materials like spreading of aggregates in sub-base & base courses by mix-in-place method. 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/ spot 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

42. As per the information available with West Bengal State Rural Road Development Agency (WBSRRDA), RoW is largely available for all the sample roads. Additional land required for road improvement will be secured through voluntary donation from private landowners through the Community Participation Framework (CPF). The CPF establishes guidelines to ensure that donation is voluntary and negative social and economic impacts due to the project will be avoided or minimized. The community consultation processes for subproject preparation result in a set of documents that collectively serve as a plan for mitigating likely negative impacts of each subproject. This process follows the ADB social safeguard requirements mentioned below for projects involving voluntary donations:

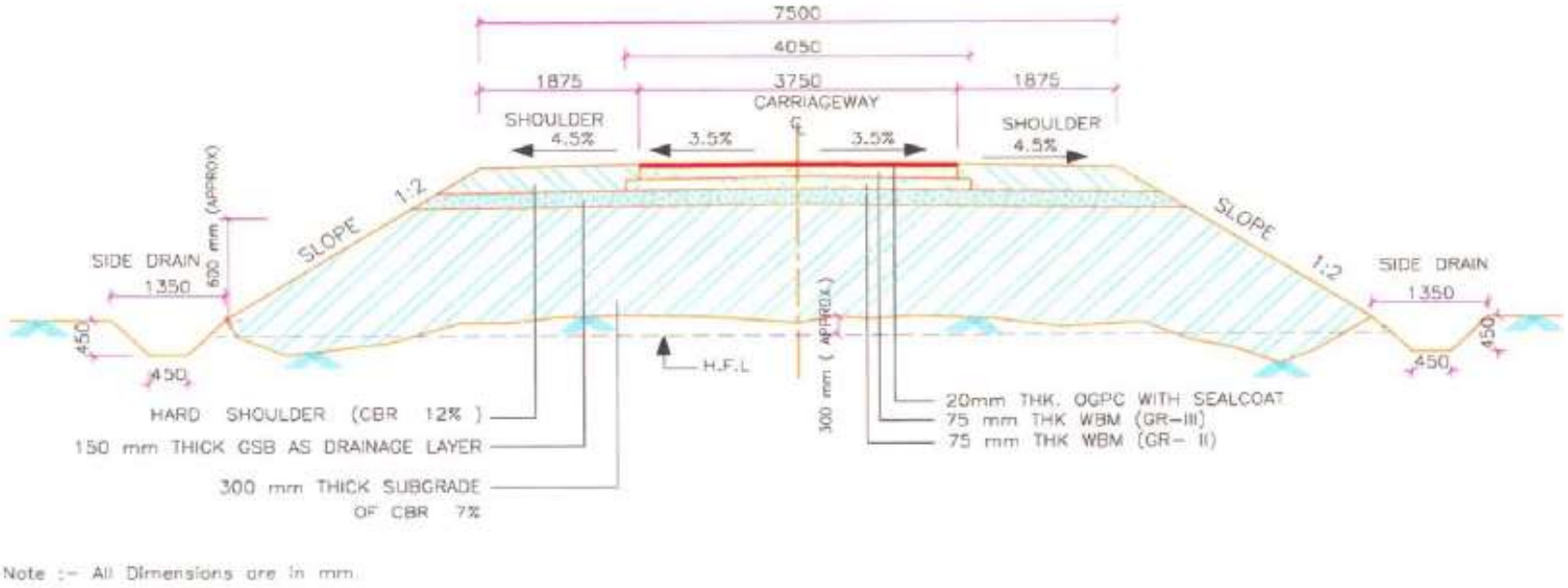
(i) full consultation with landowners and any non-titled people on site selection;
(ii) voluntary donations do not severely affect the living standards of APs and are directly linked to benefits, with community sanctioned measures to replace any losses that are agreed through verbal and written record by affected people; and
(iii) Voluntary donations are confirmed through verbal and written record and verified and adopted through constitutional process.
(iv) Adequate grievance redress mechanisms are in place.

7. Traffic

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

8. Economic Assessment

44. 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.



Note :- All Dimensions are in mm.

Figure 1: Cross-section of Rural Roads in Plain Terrain

III. DESCRIPTION OF THE ENVIRONMENT

A. General

45. Baseline environmental conditions about all facets of environment viz. physical, biological and socio-economic 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 levels especially along the project roads alignment. This will help predict likely changes in the environment due to the Second RCIP road construction and will serve as performance indicators for various components.

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

47. West Bengal is located between lat. 20°31'N and 27°12'N and long. 85°50' and 89°52' E. The geographical area of the state is 88,752 km^2 (34,267 sq mi). The state boundary touches five states of the country, namely Assam, Sikkim, Orissa, Jharkhand and Bihar. It also shares boundaries with three countries namely Nepal, Bhutan, and Bangladesh. The state forms the ethno-linguistic region of Bengal. The capital of the state is Kolkata, the third-largest urban agglomeration and the third-largest city in India. The selected Sample roads fall in Hooghly, Murshidabad and Nadia districts. Summary key environmental features of these districts are given in **Table 6.**

B. Physical Environment

1. Meteorology and Climate

48. The climate of the West Bengal state, except the Himalayan and sub-Himalayan region in the northern part of the state has a tropical climate. The Tropic of Cancer passes through the middle Burdwan districts and northern parts of Bankura district.

49. **Temperature:** The minimum annual temperature in the northern districts (Himalayan foot hill region) varies from freezing point to 17°C and over 18°C in other parts of the state. The annual mean maximum temperature ranges from 28°C in the Himalayan region to 33°C in the plains. In certain parts of the state, occasionally the mean maximum temperature can rise up to 43°C.

50. **Rainfall:** The average rainfall in the State is 1,750 mm. In the Himalayan Region i.e in northern part the average rainfall ranges from 2500 - 6000 mm. In the southern part average rainfall ranges from 1125 - 1900 mm.

51. **Relative Humidity:** Normally, May to October months are humid and January to April are dry. The relative humidity is more in northern and southern part of State as compared to western and eastern parts of the state. The maximum relative humidity ranges from 75 to 95% in morning and 50 to 65% in the evening.

Table 6: Summary Key Environmental Features of the Sample Road Districts

S. No.	Parameters	Hooghly	Murshidabad	Nadia
1.	**Location**	▪ Hooghly district is located between latitudes 23° 01‘ 20”and22° 39‘ 32” N. The easternmost proximity of the district is marked by 88° 30‘15” east longitude and its western most proximity by 87° 30‘ 20”east longitude. It is situated on the western bank of river Bhagirathi or Hooghly bordering Barddhaman and Nadia district in the north, Howrah and Purba Medinipur in the South, North 24 Parganas and Nadia in the east and Bankura and Paschim Medinipur district in the west. ▪ The district is a completely flat land with no place having more than an elevation of 200 meters. The River Hooghly borders it to the east. Another major river is 'Damodar'. The district is bordered by Howrah District to the south, Bardhaman District to the north, and to the east by the River Hooghly. Bankura District lies to the north-west, with Medinipur District to the south-west.	▪ Murshidabad is in the middle of West Bengal lying between 23º43’N and 24º52’N latitude and 87º49’E and 88º44’E longitude with HQ at Berhampur. It has a total area of 5,316.11 sq. km. ▪ Padma River flows through the entire eastern boundary, separating the district from the districts of Malda and Rajshahi (Bangladesh). Burdwan and Nadia are in the Southern side and Birbhum and the Pakur (Jharkhand) are on the western side of the District. The main river Bhagirathi divides the district in two parts namely ‘BAGRI’ on eastern side and ‘RARH’ on western side.	▪ The district is located between north latitude 24011’ and 22053’, and east longitude 89022’ and 8809’. ▪ The district is bounded on the North and North-west by the district of Murshidabad. On the North-east it is bounded by the Republic of Bangladesh, in the south and south east, by the district of North 24 Parganas.
2.	**Climate**	▪ Hooghly has a tropical savanna climate. The annual mean temperature is 26.8°C, although monthly mean temperatures range from 16°C to 33°C and maximum temperatures in Hooghly often exceed 38° C. The main seasonal influence upon the climate is the monsoon. Maximum rainfall occurs during the monsoon in August and the average annual total is above 1,500mm. Moderate northwesterly to northeasterly winds prevails for most of the year with a high frequency of calms. Summer is dominated by strong southwesterly monsoon winds. Winters are comfortable with temperatures lying between 11 to 17°C.	▪ Average temperature in hot season is 29°C while at the cold season is 20oC and average rainfall is 1500 mm	▪ The Climate of Nadia is characterized by an oppressively hot summer, high humidity all year round and well-distributed rainfall during the monsoon. The winter sets in the middle of November and continues till the end of February. The rainfall during the monsoon months from June to September constitutes about 71 percent of the annual rainfall. Maximum rain occurs in the months of July-August. Temperature ranges from 27o C to 42o C (minimum to maximum) with a maximum humidity of 96 percent.

S. No.	Parameters	Hooghly	Murshidabad	Nadia
3.	**Wild Life Sanctuaries/ National Park etc**	None	▪ None of subproject roads passes through this sanctuary.	▪ Bethuadahari Wild Life Sanctuary located in the district ▪ However, none of subproject roads passes through this sanctuary.
4	**Geomorphology** *-. Major Physiographic Units and land use*	▪ The physiography of the region is that of a typical alluvial plain with gentle ups and downs. The terrain is essentially composed of soft river borne sediments deposited under fluviatile environment. The general slope is from north west to south east. As the area is situated very near to the out fall, the dominant slope of the land is towards south with average elevation varying from 3.5 m to 2.5 m above MSL.	▪ District with its varied tectonic elements and riverine features, is a transitional zone between the Jharkhand plateau which constitutes a portion of peninsular shield in the west and Ganga-Brahamaputra alluvial plain in the north and east. In general, the Jharkhand plateau consists of the meta-sedimentary rocks of Precambrian age, Gondwana sedimentary rocks, Rajmahal basalts and upper tertiary sediments. Laterite has developed on these older rocks as well as on early Quaternary sediments. Towards south, the alluvial plain merges with Damodar-kasain-Subarnarekha deltaic plains. ▪ Major land use is agriculture	▪ The physiography of the region is that of a typical alluvial plain with gentle ups and downs. The terrain is essentially composed of soft River borne sediments deposited under fluviatile environment. The general slope is from north west to south east. As the area is situated very near to the out fall, the dominant slope of the land is towards south with average elevation varying from 3.5 m to 2.5 m above MSL.
	Geomorphology *Major Drainage*	▪ The district is broadly divided into two main natural divisions, the plains and the uplands, the river Dwarakeswar forming the dividing line between the two. The flat alluvial plains may again besub-divided into three regions, namely (i) the Dwarkeswar-Damodar interriverine plain, (ii) the Damodar-Bhagirathi interriverine plain and (iii) the Char lands ▪ Major drainage river of the district - Bhagirathi (western bank), Damodaar, Mundeswari, Darakeswar	▪ The river system in Murshidabad includes the Padma and Bhagirathi ▪ Besides, there are innumerable Khals and old river beds all over the area.	▪ The important rivers of the district are Bhagirathi, Churni, Mathabhanga, Ichamati and jalangi.
5	**Major Soil Type**	▪ As this district lies in Gangetic alluvial plains the predominant group of soil is sandy loam to	▪ Partly Gangetic alluvium and rest red lateritic	▪ Alluvium of sub-recent to recent origin consists of alternate beds

S. No.	Parameters	Hooghly	Murshidabad	Nadia
		loamy soils covering area of 32.0% and 48.0% cultivated of total area respectively. Clay soil persists in 8% area and clay loam in 12.0% area of the total cultivated areas.		of compacted clay; silt and sand and are mostly confined to the bandhs and beds of present day river channels. Texture of the materials and occurrence of mica ferruginous and calcium carbonate concretions developed from different types of alluvium. Illite is the dominant clay mineral and Kaolinite and illite as mixed clay minerals are also found in the soil of this area. The soil is fine loamy mixed gray mottled, slightly acidic sandy loam.
6	**Principal Crops**	▪ Rice is the major crop of this district and occupies about 70% of the grossed cropped area. The other important crops are wheat, potato, mustard, vegetables, sugarcane and pulses.	▪ Apart from being known for its silk and mango production, the district is also renowned for its surplus rice, jute, wheat and cotton productions.	▪ Main Agricultural products: - Rice, Wheat, oil seed, potato & vegetables
7	**Hydrogeology**	▪ District areas with moderate yield (yield between 50 - 150m3hr)	▪ Ground water occurs in this formation both under water table and confined condition. ▪ Most of the areas with moderate yield (yield between 50 - 150m3hr)	▪ Ground water occurs in this formation both under water table and confined condition. In Nadia district down to 150m there is absence of any significant clay beds making the entire aquifer upto 150m depth to occur under water table condition
8	**Existing Environmental Issues**	▪ Almost in every year the district is affected by flood in major areas of Khanakul - II, Khanakul - I, Arambagh Sub-division & Tarakeswar & Balagarh Blocks under Chandernagore & Sadar Sub-division. Specially Khanakul - I & Khanakul – II remain water logged for long days due to heavy rainfall as well as due to discharge of DVC water through Damodar, Mundeswari, Darakeswar rivers only for their low topography. This miserable flood situation in this district	▪ Key environmental issue in Murshidabad is natural river bank erosion. Murshidabad district in West Bengal has lost a lot of land to the river Ganga, as thousands of people are rendered homeless ▪ Soil erosion in the right bank of the river Ganga has rendered many people homeless.	▪ One of the major environmental issues of the district is presence of Arsenic in ground water

S. No.	Parameters	Hooghly	Murshidabad	Nadia
		causes ample miseries to the local people increasing the death toll of both human being as well as animal population every year.	▪ Its forest covers is limited to 20 sq km against total area of the district as 3733 sq. km. (i.e only 0.55%)	

Source: District Handbook, District Human Development Report, Central Ground Water Authority Report and other District/Govt., India Meteorological Department website, West Bengal: a study in urban geography, Z.T. Khan, Northern Book Centre, Delhi, 1994, pp. 221, District website of all districts, Wikipedia, State Forest Report, Govt. of West Bengal (2014)

2. Ambient 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& small scale industries existing in the area. These were located in open rural area and operate only for few months. As such, the ambient air quality for major pollutants like SO_2, RSPM and NO_X is expected to be within the limits. However, in absence of any existing data on ambient air quality levels of the project area, secondary sources were referred.

Table 7: Ambient Air Quality during 2012

Area Classification	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	RSPM ($\mu g/m^3$)
Industrial (maximum observed value)	22	80	207
Residential (maximum observed value)	12	73	117
National Ambient Air Quality Standards for Industrial and Residential Areas	80	80	100

Source: *Source: National Ambient Air Quality Monitoring Series- Status and Trends in India, 2012, CPCB, MoEF*

53. The above table reveals that the concentration of all the pollutants is higher in industrial areas especially respirable suspended particulate matter. The levels of sulphur dioxide and nitrogen dioxide are largely within the limits (NAAQS) except few readings of NOx. The higher particulate matter levels are attributed to the vehicular movement on unpaved roads and the loose dust in the agricultural fields that lead to formation of dust clouds over short periods. The same can be concluded from **Table 8** which provides a comparison of the air quality at different locations. All the locations are within the urban environment with industrial contribution at few of them.

Table 8: Ambient Air Quality Status of West Bengal in 2010-11

City	Location	Type of Area	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	RSPM ($\mu g/m^3$)
			2010	2010	2010
Asansol (Burdwan Dist.)	Asansol MC	I	8	68	132
Durgpur (Burdwan dist.)	Dew India	I	9	73	207
	Kwality Hotel	I	8	69	136
	PCBL club	R	7	60	90
Haldia (Purba Medinipore dist.)	Super Market	I	13	50	47
	WBIIDC	I	15	53	60
Howrah	Bandhaghat	I	15	85	127
	Howrah MC	I	12	80	127
	Bator	R	9	63	102
	Naskarpara	R	12	73	117
Kolkata	Behala chowrasta	I	9	72	98
	Cossipore police station	I	22	65	142
	Dunlop bridge	I	8	67	100
	Balshanbghata	R	6	52	77
National Ambient Air Quality Standards	Industrial Area (I) &Residential Area (R) (24 hourly average)		80	80	100

Source: National Ambient Air Quality Monitoring Series- Status and Trends in India, 2011, CPCB, MoEF
R – Residential and other areas, I – Industrial area,

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 contribute to increased noise levels over short duration limited todaytime. The existing roads do not appear to have vehicular traffic in the nighttime. Therefore, the ambient noise levels are expected to be within the National Ambient NoiseStandards.

4. Physiography and Geology

55. The West Bengal state can be divided into four distinct physiographic divisions **(Figure 2)** as under;

- Hilly Districts like Darjeeling, Jalpaiguri and Coochbehar in Himalayan region
- Central part of the state like, Murshidabad is mainly being alluvial plains.
- Districts like Bardhaman, Birbhum and Bankura districts forming a fringe of western plateau.
- Lower Gangetic plain of North 24 Parganas, Hooghly, Nadia districts forming the part of deltaic zone

56. Detail of physiographic characteristics in the distinct regions which cover 19 sample roads of 3 districts is elaborated in **Table 9.**

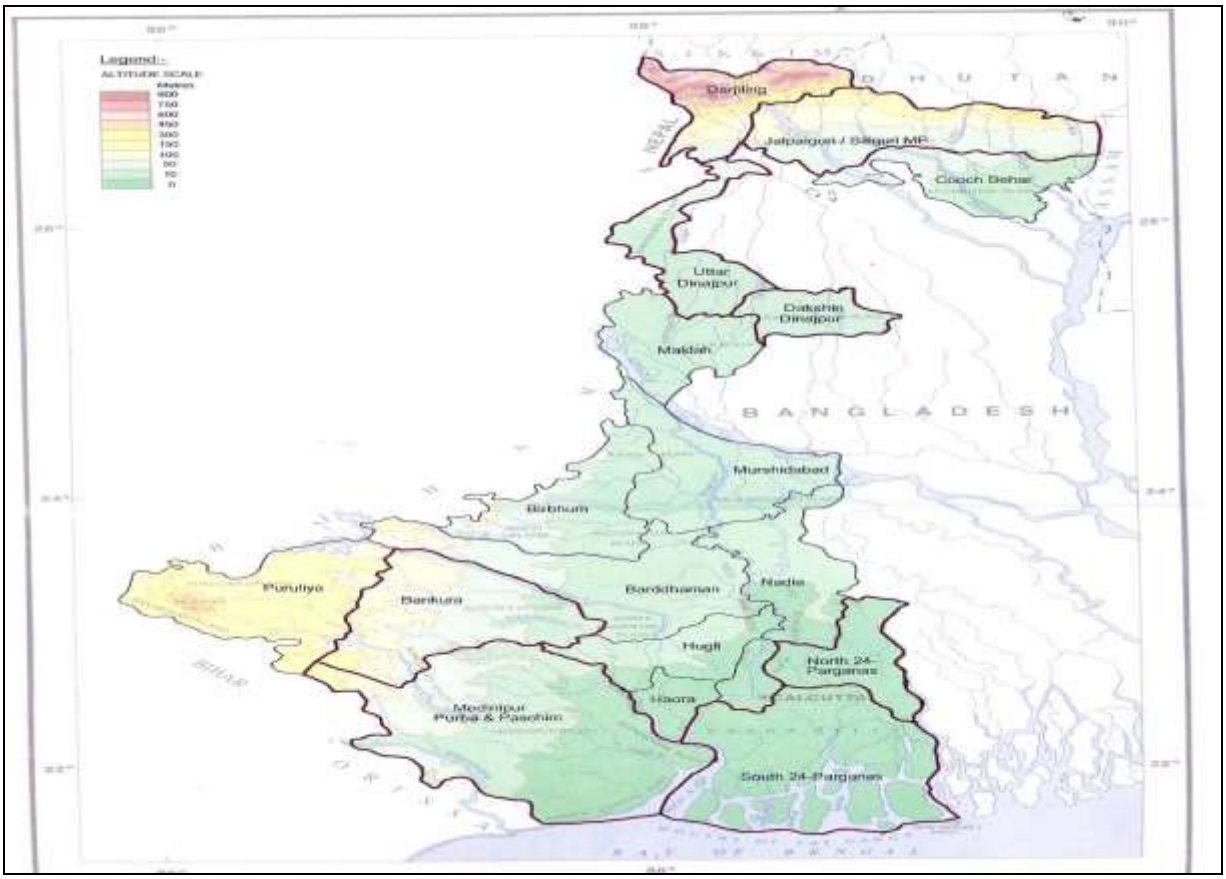


Figure 2: Physiography Map of Project Districts –West Bengal

Table 9: Physiographic Characteristics of different districts

Districts	Physiographic Characteristics
Murshidabad	The Rarh plain embraces Birbhum and parts of Murshidabad, Burdwan, Bankura, and Midnapur. It is a gift of the plateau streams. From the degraded rolling plateau, it laps eastward overlapped by the Bhagirathi plains to the east. The Ganga delta region spreads south from the Ganga-Padma to the Bay, flanked on the west by the Rarh and by Bangladesh to the east. It is a vast, flat plain, covered with a network of distributaries of the Ganga-Padma. The chief distributaries are the Bhagirathi-Hooghly, Jalangi-Bhairab, Kumar, Mathabhanga—Churni—Ichhamati. The land nowhere rises above 20 m. The slope of the country is away from the streams i.e. towards south (Bay of Bengal). A maze of creeks flow from the main streams. The inter stream areas are not high doab but saucer shaped depressions. Swamps and lakes called daha, bil or jhill often fill up these low tracts.
South 24 Parganas, North 24 Parganas, Howrah, **Hooghl**y, Purba Medinipur**, Nadia** and Sundarban	The physiography of the region is that of a typical alluvial plain with gentle ups and downs. The terrain is essentially composed of soft river borne sediments deposited under fluviatile environment. The general slope is from north west to south east. As the area is situated very near to the out fall, the dominant slope of the land is towards south with average elevation varying from 3.5 m to 2.5 m above MSL. The region is criss-crossed by a network of small streams and rivulets without falls either at river Hooghly or Haldi. Since these rivers are connected to the sea, the channels suffer daily fluctuations in water level due to tidal influence. Hence, estuarine conditions prevail here with problems of salinity and coastal hazards especially along the banks and river fronts.

57. North 24 Parganas, Nadia, Hooghly district is underlain by Quaternary sediments consisting of clay, silt and various grades of sand gravel and pebble. No hard rock geological formation is found here. Lithological log indicates the presence of a clay bed at the top of the geological succession with thickness varying from 10-40 m. Alternate clay and sand bed exists further in the downward direction. A group of granular aquifer is found between 250-650 m below ground level. The geological map of West Bengal is shown at **Figure 3.**

Figure 3: Geological Map of West Bengal

5. Soils

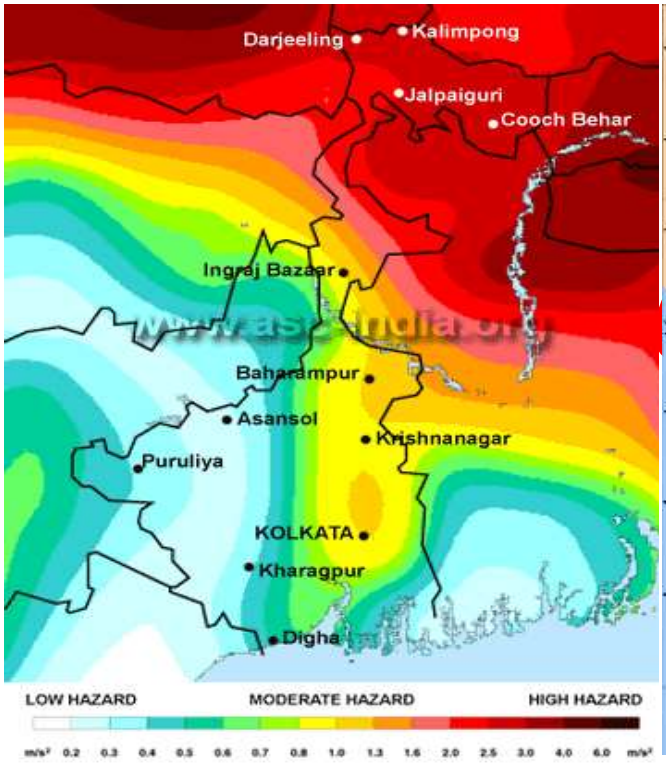
58. The major soil types within West Bengal can be classified into five groups namely ultisols, entisols, aridisols, mollisols and alfisols. These soil types can be further classified into several sub groups. The ultisols is sub-classified into brown, red, yellow and laterite soils. The entisols is sub-classified into younger alluvial, coastal alluvial and bhabar soils. The aridisols is sub-classified into saline and saline alkali soils. The mollisols is sub-classified into Tarai soils and mountain meadow soils. The alfisols is sub-classified into deltaic alluvial soils, older alluvial soils, red gravel soils, red sandy soils, and red loamy and mixed red black soils.

Table 10: The soil pattern in the state

Agro climatic Zone (Districtwise)	Soil type
Entire North Bengal (Darjeeling, Jalpaigur, Siliguri& Cooch Behar)	Acidic
Gangetic alluvium (N&S Dinajpur, **Murshidabad**, Malda, **Nadia, Hugli**, Haora, **Birbhum** , N & S 24 Parganas)	Alluvial
Vindhyan family soil (Barddhaman, Murshidabad, Medinipur (W), Haora, Birbhum & West Dinajpur)	Alluvial
Lateritic Red Soil (Birbhum, Burdwan, Medinipur, Bankura, Puruliya, Malda, North & South Dinajpur)	Alluvial
Coastal Soil (South 24 Parganas, North 24 Parganas and East Medinipur)	Coastal Saline

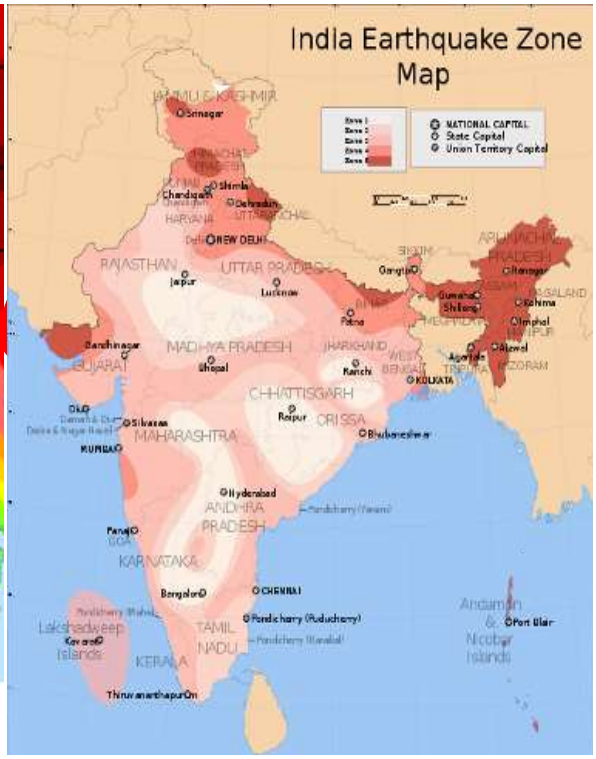
6. Seismicity

59. The seismic hazard map of India was updated by Bureau of Indian Standards (BIS) in 2000[5] . The main change was merging of Zones I & II. As per this map, the project districts (Murshidabad, Nadia and Hoogly) lie in Zone IV. The rest of the state including the city of Kolkata lies in Zone III. The Hazard and Seismic Zoning map is shown in **Figure 4** and **Figure 5** respectively.



Source: Amateur Seismic Centre, Pune

Figure 4: Hazard Zone Map



Source: IS 1893 (Part 1) 2002

Figure 5: Seismic Zone Map

7. Land use

60. The distribution of land utilization within the entire state broadly comprises of cultivable land, uncultivable land, forest land, waste land, urban area and industrial area. Land use pattern along the project road is mixed type dominated by agriculture, barren land, forest land and barren areas. **Table 11** indicates the land use patternof project districts.

Table 11: Utilization of Land in project Districts of West Bengal (In ha, 2010-11)

District	Murshidabad	Hooghly	Nadia
Area according to village papers	532,500	313,379	390,655
Area under forest	770	530	1216
Area under non-agricultural use	120,800	96,526	90,220
Barren & unculturable land	203	89	54
Land under Misc. Tree groves not include in net area sown	2000	1588	3729

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

District	Murshidabad	Hooghly	Nadia
Culturable waste land	820	1518	631
Fallow land other than current fallow	400	119	113
Current fallows	1820	594	4181
Net area sown	403,820	212,407	290,447

Source: Economic Review, Govt. of West Bengal: 2013

8. Hydro-geology and Hydrology

61. **Hydro-geology**: Based on the geological and geomorphological set up, characteristics of the aquifers and chemical character of ground water the State can be divided into two broad units.

- **Fissured Formations:** Ground water occurs in these formations in the upper weathered mantle (thickness5-10m) and at deeper levels (60-100m depth) in the fractures, fissures and joints where limited quantities of ground water (less than 20m^3/hr) may be available from borewells and large dia dugwells.
- **Porous Formations:** Ground water occurs in this formation both under water table and confined condition. In Nadia, Murshidabad (except Kandi Sub-division) districts down to 150m there is absence of any significant clay beds making the entire aquifer upto 150m depth to occur under water table condition. In the Bhabar Zone (foothills of Himalayan trench) aquifers are having very deep water table and are characterised by high seasonal variation of water table to the tune of 10-12m. In this lateritic part occurring in parts of Birbhum, Burdwan, Bankura & Medinipur districts, individual aquifers being of limited thickness and discontinuous nature. The potentiality of this aquifer is very poor. By and large yield of the tube well (down to 100-400mbgl) varies from80-100m^3/hr.

62. Based on the yield prospects the State can be divided into three parts namely:

- Areas of prolific ground water resources (yield is more than 150m^3//hr): Jalpaiguri, Coochbihar, Medinipur, N&S 24- Parganas districts
- Areas with moderate yield (yield between 50 - 150m^3hr): Comprising part of Malda, Uttar & Dakshin Dinajpur, and western part of **Murshidabad**, marginal tract of Birbhum, Burdwan, Bankura, **Nadia, Hooghly** and Medinipur districts.
- Areas with limited yield prospect (yield less than 50m^3hr) :
- Extreme marginal tracts of Medinipur, Bankura, Purulia

63. The sand zones occurring within the depth range of 127 to 290 m bgl are more pronounced and attain fairly good thickness (often 25 or more) and laterally extensive as well. These grayish micaceous sand beds which are fine to coarse grained in texture are very important from the point of ground water storage. The sand beds are separated generally by fairly persistent clayey layers. Below the depth of 290 m, the unconsolidated sediments are generally argillaceous and do not hold much scope for ground water development.

64. The ground water development in West Bengal is generally occurring through shallow tube wells (yield up to 30 cum per hour), medium tube wells (yield up to 100cum per hour) and deep heavy tube wells (yield up to 200 cum per hour). The entire region has a very good potential for ground water development with estimated present ground water utilization at less than 50% of the available resources. The entire West Bengal falls under safe category as per Central Ground Water Board (CGWB) guidelines.

65. In the coastal tract of East Medinipur, S 24- Parganas, southern part of N 24- Parganas, Bidhannagar and some parts of Haora lying in the active delta of the Ganga --- the Bhagirathi river system ground water occurs under a characteristic hydrochemical situation in which fresh water group of aquifers occurs within span of 120-300m sandwitched between saline to brackish aquifers. Yield of the tube well varies from 100-150m^3//hr. Some of the hot springs (35-41^{0}C) from deep seated fractured zones of older rocks occurs around Bakreswar, Birbhum districts.

66. **Hydrology:** West Bengal State has three major river basins, namely Ganga, Brahmaputra and Subarnarekha. Among these, Ganga is the largest and covers almost 80% of the state, whereas the Brahmaputra basin covers about15% of the area and Subarnarekha basin covers about 5% of the geographical area of the State.

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

68. Several hand operated tube wells are seen along side of the existing tracks in many of the proposed road construction proposals. These tube wells are the main source of drinking water for rural communities in the region.

69. **Flood Affected and Drought Prone areas:** The West Bengal has both chronically draught prone and flood affected areas within the state. The chronically drought prone area is, part of Bankura, Puruliadistrict. Chronically flood affected areas are parts of North 24 parganas, Purba & Pashim Medinipore, Burdwan, Hooghly and Malda districts.

70. **Water Quality:** SPCB carries out the water quality monitoring in West Bengal. pH of groundwater is observed in the range of 7.1-8.37 and meets the water quality criteria. Conductivity varies from 589-1983 µmhos/cm and meeting the criteria for beneficial uses. BOD is observed in the range of 0.2-1.8mg/l. Arsenic contamination is also seen in certain part of state. Total Coliform varies from 2-1,600 MPN/100 ml and meeting the desired criteria at all the locations. The quality of surface water is generally good and can be used for drinking water with physio-chemical treatment.

C. Biological Environment

71. The west Bengal state owing to the varying altitude from the Himalayas to the coastal plains, the flora and fauna of the state is diverse. As on 2011 forests make up more than 27% of the geographical area of West Bengal, which is higher than the national average of 23%. Total recorded forest land in the state is 11,879 sq.km, of which 7,054sq.km is Reserved Forest, 3,772 sq.km. is Protected Forest and 1,053 sq.km is Unclassified State Forest, thus constituting 13.38% of the geographical area of the state. Part of the world's largest mangrove forest Sundarbans is located in southern West Bengal.

1. Terrestrial flora

72. During the field investigations, the most dominant terrestrial flora within the project districts was recorded. The dominant flora comprised generally the trees planted along side of the rural road proposals, particularly the stretches along agricultural lands. Many of these are planted by the adjacent landowners and often perceived, as a fence to their respective lands. The common trees observed alongside of the road projects are presented in **Table 12.**

Table 12: List of common plant species available in the study area

S.No.	Botanical Name	Local Name
1	Acacia auriculiformis	Akashmani
2	Acacia catechu	Khair
3	Acacia mangium	Akashpradip
4	Ailanthus grandis	Gokul
5	Anthocephalus kadamba	Kadam
6	Artocarpus chaplasha	Lator
7	Bischofia javanica	Kainjal
8	Bombax ceiba	Simul
9	Casaurina equisetifolia	Jhau
10	Casaurina intertropica	Jhau
1	Chukrasia tabularis	Chikrassi
12	Cordia alleodora	Bohori
13	Dalbergia sissoo	Sissoo
14	Dipterocarpus macrocarpus	Garjan
15	Duabanga sonneritiodes	Lampate
16	Eucalyptus camaldulensis	Eucalyptus
17	Eucalyptus citriodora	Eucalyptus
18	Eucalyptus hybrida	Eucalyptus
19	Eucalyptus tereticornis	Eucalyptus
20	Gmelina arborea	Gamar
21	Lagerostroemia microcarpa	Benteak
22	Lagerostroemia parviflora	Sidha
23	Lagerostroemia speciosa	Jarul
24	Leucaena leucocephala	Subabool
25	Madhuca latifolia	Mahua
26	Michelia champaca	Champ
27	Schima wallichii	Chilouni
28	Shorea robusta	Sal
29	Tectona grandis	Teak
30	Terminalia arjuna	Arjun
31	Terminalia myriocarpa	Panisaj
32	Terminalia tomentosa	Pacasaj
33	Xylia dolabriformis	Lohakat
34	Ziziphus mauritiana	Narkeli

73. None of the road stretches passes through any reserved and protected forest land/area. No sample road passes through the designated forest area. The tree density within ROW of sample road project alignment is about 2-3 trees per Km.

2. Wild Life and Protected Areas

74. West Bengal has 5 National Parks and 15 Wild life sanctuaries spread over an area of 2754.39 Sq. Km (**Figure 6**)**.** There is no wildlife Sanctuaries/National Parks, Tiger Reserves etc. along the sample project road area.

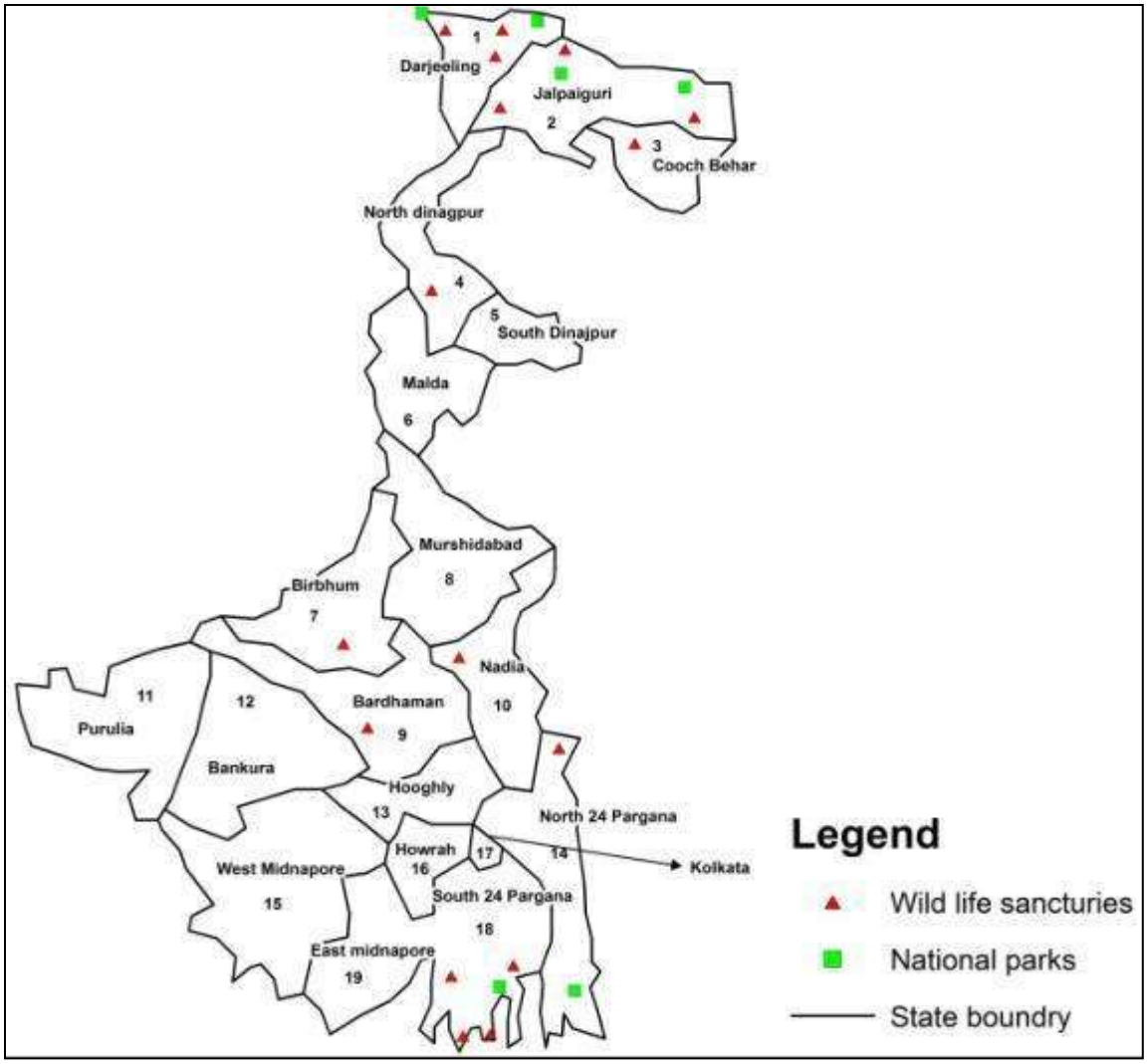


Figure 6: Protected Areas of West Bengal

75. **Table 13** provides details of National park and Sanctuaries corresponding to serial Number indicated at **Figure 6** above.

Table 13: List of Protected Areas in West Bengal

Name	Area (km^2)	District	Fauna
National Parks			
Buxa NP	117.1	Jalpaiguri	Asian Elephant, Tiger, Gaur, Wild boar, Sambar
Gorumara NP	79.45	Jalpaiguri	Tiger, Gaur, Wild boar, Sambar
Neora Valley NP	88	Siliguri (Darjeeling)	clouded leopard, red panda, musk deer, black bear, sloth bear, golden cat, wild boar, leopard cat, goral, serow, barking deer, sambar, Himalayan flying squirrel, Rufous-throated Partridge, Satyr Tragopan, Crimson-breasted Woodpecker, Darjeeling Woodpecker, Bay Woodpecker, Golden-throated Barbet, Hodgson's Hawk Cuckoo,
Singhalila NP	78.6	Siliguri (Darjeeling)	Red Panda, Leopard Cat, Barking Deer, Yellow-throated Marten, Wild Boar, Pangolin, Himalayan Black Bear, Leopard, Clouded Leopard, Serow and Takin. Tigers, Scarlet Minivet, Kalij Pheasant, Blood Pheasant, Satyr Tragopan
Sunderbans NP	1330.1	North & South 24-Paraganas	Royal Bengal Tiger; Fishing Cats, Macaques, Wild Boar, Common Grey Mongoose, Fox, Jungle Cat, Flying Fox, Pangolin, Chital
Wildlife Sanctuaries			
Ballavpur WLS	2	Birbhum	Blackbuck and Spotted deer, jackals, foxes and a variety of water birds
Bethuadahari WLS	0.67	**Nadia**	Spotted deer, Jackal, Bengal fox, Porcupine, Common Langur, Parakeets, Indian Cuckoo, BarbetsBarbets and other smaller birds and pythons
Bibhutibhusan WLS	0.64	North 24-Paraganas	spotted deer and the sanctuary is also rich in common birds
Buxa WLS	251.89	Jalpaiguri	Asian Elephant, Tiger, Gaur, Wild boar, Sambar
Chapramari WLS	9.49	Jalpaiguri	Royal Bengal Tiger, elephant, varieties of deer, reptiles and other animals
Haliday Island WLS	5.95	South 24-Paraganas	wild boar, barking and spotted deer, and rhesus monkeys
Jaldapara WLS	216.51	Jalpaiguri & Cooch Behar	Royal Bengal Tigers, elephants, deers, sambhar, barking deer, spotted deer and hog deer, wild pig, bisons
Jorepokhri WLS	0.04	Darjeeling	Himalayan Salamander (Tylototriton verrucosus), locally known as 'Gora'
Lothian Island WLS	38	South 24-Paraganas	smaller birds, specially Paradise Flycatcher,
Mahananda WLS	127.22	Darjeeling	Royal Bengal Tiger, Indian elephants, Indian bison, chital (spotted deer), barking deer, sambar, Rhesus monkey
Narendrapur WLS	0.1	South 24-Paraganas	smaller birds, specially Paradise Flycatcher, Oriole
Raiganj WLS	1.3	North Dinajpur	Asian openbill, open-bill storks, egrets, night herons and cormorants, kites, flycatchers, owls, kingfishers, woodpeckers, drongoes
Ramnabagan WLS	0.14	Burdwan	Spotted deer and Common Langur. Black Buck
Sajnekhali WLS	362.4	South 24-Paraganas	spotted deer, Rhesus Macaques, wild boar, tigers, Water Monitor Lizards, Fishing Cats, otters, crocodiles, Batagur Terrapins, and migratory birds

Name	Area (km^2)	District	Fauna
National Parks			
Senchal WLS	38.88	Darjeeling	barking deer, wild pig, himalayan black bear, leopard, jungle cat, common rhesus monkey, Assam macaque, Himalayan flying squirrel, etc.

76. Fauna of the districts comprise leopard, wolf, hyaena, jackal and other smaller species, but hyaenas and leopards are not common. Wolves are scarce, and are mostly found in the jungles north of Kanksa. Wild pigs and monkeys are numerous throughout the districts. In the hilly areas, poisonous snakes (several kinds of cobra, the karait and the deadly Russell's viper) and species of harmless grass snakes are very common. Python is also found but very occasionally.

77. The common avifauna of the districts are pea-fowl, jungle-fowl, jungle crow, house crow, treepie, common babbler, common jora, gold-fronted chloropsis, red-vented babul, red-whiskered bulbul, red spotted bluethroat, brown-backed robin, Shama, Tickell's blue flycatcher, paradise flycatcher, wood shrike, black drongo, tailor bird, streaked fantail warbler, golden oriole, common mayna, pied mayna, white-backed munia, white-throated munia, spitted munia, red munia, yellow-throated sparrow, house sparrow, woodpecker, India cuckoo, pied crested cuckoo, koel, parakeet, nilkantha, bee-eater, kingfisher, hornbill, hoopoe, horned owl, spotted owlet, jungle owlet, griffon vulture, long-billed vulture, scavenger vulture, lagger falcon, small spotted eagle, brahminy kite, pariah kite, sparrow hawk, various types of pigeon and dove, goose, duck, teal, lapwing, white necked stork and several varieties of egret and heron. The low-lying swampy areas of Burdwan being in line of migration provide a very good sheltering place for the migratory birds in winter.

3. Aquatic Biology

78. No wetland or large water body falls within the sample roads. Fisheries activities are quite common in subproject areas.

D. Socio-Economic Environment

1. Demography

79. It is a state with several unique features, such as abundant natural resources, rich biodiversity, and rich cultural diversity. The population of about 90 million is largely rural (73%). Tribal constitute about 5.8% of the population, and scheduled castes form about 28.6%. The welfare and development of tribal is an important focus area for the state government. The gender ratio of the state is higher than the national average. **Table 14** shows the demographic profile of the project districts.

Table 14: Demographic Profile of the Project Districts

Sl. No.	District	Area Sq.Km.	Population 2011			Population Density/ Sq. Km.	
			P	M	F	2001	2011
West Bengal		**88,752**	**91347736**	**46927389**	**44420347**	**903**	**1029**
1	Murshidabad	5324	7,103,807	3,627,564	3,476,243	1102	1334
2	Hooghly	3,149	5520389	2819100	2701289	1601	1753
3	Nadia	3,927	5168488	2655056	2513432	1173	1316

P- Total, M- Male, F- Female, *Source: Census, 2011*

2. Healthcare

80. The healthcare system in the state is well establish and is undergoing for further upgradation through public private partnership. West Bengal's network of healthcare facilities comprises 433 Governmental & non-Governmental hospitals. West Bengal has established some of the most modern & extremely well equipped healthcare facilities such as Apollo Gleneagles Hospital, AMRI –Apollo & BM Birla Heart Research Centre.

3. Literacy and Education

81. The state has made considerable progress in the literacy level of the state. The literacy rate of the state is almost the same as national average. **Table 15** shows human development indicators of West Bengal. The gross enrolment ratios for boys and girls are higher than the all-India average. The number of primary schools per 100 thousand population is above the average all-India level. **Table 16** shows the literacy rate of project districts of West Bengal

Table 15: Human Development Indicators of West Bengal

Indicators		Year	Unit	West Bengal	All India
Infant Mortality Rate		2002	Per'000 live birth	40	63
Life Expectancy at Birth	Male	2003	Years	65	63.87
	Female	2003	Years	69	66.91
Death Rate		2002	Per '000 pop.	6.6	8.1
Gross Enrolment Ratio (Classes I-IV)	Boys	2002-03	Per cent	98.60	97.53
	Girls	2002-03	Per cent	85.60	93.07
	Total	2002-03	Per cent	92.20	95.39
Primary School		2002-03	Per Lakh Pop.	50.25	63.42

Source: Census of India

Table 16: Literacy Rate of project districts

District	Literates 2011	Literates 2001	Literacy Rate (%) Excluding 0-6 age group) 2011	Literacy Rate (%) (Excluding 0-6 age group) 2001
West Bengal	**62614556**	**47196401**	**77.08**	**68.64**
Murshidabad	4,055,834	2,620,538	74.56	65.23
Hooghly	4140487	3333988	82.55	75.11
Nadia	3524073	2644461	75.58	66.14

Source: Census, 2011

4. Affluence

82. The percentage of population below the poverty is high at 32%. On an average, the level of affluence of a household in West Bengal is lower than that of a household in the rest of the country (**Table 17**). In both rural and urban areas of West Bengal, the proportion of households having access to safe drinking water is also less compared to the all-India scenario.

Table 17: Indicators of Affluence

Indicators		Year	Unit	West Bengal	All India
HH in houses with concrete roof		2001	Per cent	2.1	19.8
HH with drinking water in premises		2001	Per cent	32.1	39.0
HH with open drainage for waste water		2001	Per cent	23.4	33.9
HH having access to safe	Rural	2001	Per cent	36.2	73.2
Drinking water	Urban	2001	Per cent	58.8	90.0
	Total	2001	Per cent	47	77.9

Source: Census data 2001

5. Economy

83. Agriculture is the leading occupation in West Bengal. Rice is the state's principal food crop. Other food crops arepulses,oil seeds, wheat, tobacco, sugarcane and potatoes.Juteis the main cash cropof the region.Teais also produced commercially; the region is well known for Darjeelingand other high quality teas.However, theservice sectoris the largest contributor to the gross domestic productof the state, contributing 51% of the state domestic product compared to 27% from agriculture and 22% from industry.

84. Manufacturing industries playing an important economic role are engineering products, electronics, electrical equipment, cables, steel, leather, textiles, jewellery, frigates, automobiles, railway coaches, and wagons. The Durgapur centre has established a number of industries in the areas oftea,sugar,chemicals andfertilizers. Natural resources like tea and jute in and nearby parts has made West Bengal a major centre for the jute and tea industries.

6. Agriculture

85. West Bengal is nearly three percent of the nation's cultivable land. It produces more than eight per cent of the food of the country. The agricultural sector is characterized by the predominance of small and marginal farmers. The average size of holding here is also less than one hectare.

7. Mineral Resources

86. West Bengal stands third in the country in terms of mineral production. The state contributes about one-fifth to the total production of minerals in the country.Coal constitutes 99% of the minerals extracted inWest Bengal; fireclay, china clay, limestone, copper, iron, wolfram, manganese and dolomiteare mined in small quantities. There are good possibilities of obtaining mineral oil and natural gas in the areas near the Bay of Bengal, in Purba Medinipur, Sundarbans, South 24 Parganas and North Bengal plains. Research is undergoing for finding natural gas in various places.

87. West Bengalis the third largest state for coal production, accounting for about half of India's total. Coal is extracted from about 228 mines in the Raniganj and Asansol region of Burdwan district. High garde bituminous coalis mined at Raniganj, Dishergarh, Santaldih, Kulti, Barakar, Ghushik, Kajora. Coalfields stretch over an area of about 1,550km^2 (598 sq mi). The coalfields of Raniganj support the Asansol-Durgapur industrial belt by providing fuel to the industries as well as generation of thermal power.Lignite mined in Darjeeling is used to make briquettes. Coal deposits are also found along the Ajoy river in Birbhum district.

88. West Bengal ranks next to Bihar and Madhya Pradesh in production of fireclay. Most of this mineral is extracted in the Raniganj region along with few amount is also extracted from Birbhum and Purulia. China clay used in the pottery, paper, textile, rubber and pain tindustries are unearthed at Mohammad Bazar in Birbhum and Mejia in Bankura. Rest of the production comes from Purulia, Burdwan, Darjeeling and Jalpaiguri.

89. Limestone which is used in cement industry is mined in Bankura, Purulia, Darjeeling and Jalpaiguri There are copper mines in Jalpaiguri and Darjeeling. Small quantities of low quality iron-ore are mined in Bardhaman, Purulia, Birbhum and Darjeeling There are manganese in the Jhargram region of Paschim Medinipur, Purulia and Burdwan. Wolfram is mined atJhilimiliin Bankura. The state’s production ofdolomitecomes from theDooarsregion ofJalpaiguri.

90. No sample roads are located near mines.

8. Physical Infrastructure

91. West Bengal has well-developed road and rail networks. As of 2012, the total length of surface road in West Bengal is over 92,023 km (57,180 mi); national highways comprise 2,578 km (1,602 mi) and state highways 2,393 km (1,487 mi). As of 2006, the road density of the state is 103.69 km per 100 km² (166.92 mi per 100 sq mi), higher than the national average of 74.7 km per 100 km² (120 mi per 100 sq mi). Average speed on state highways varies between 40–50 km/h (25–31 mi/h); in villages and towns, speeds are as low as 20–25 km/h (12–16 mi/h) due to the poor quality of road constructions and low maintenance. As of 2012, the total railway route length is around 4,481 km (2,784 mi). **Table 18** shows physical infrastructure of the state.

Table 18: Physical Infrastructure

Indicators	Year	Unit	West Bengal	All India
Road Density	2006	Per '00 sq.km.	103.69	74.7
Railway route length	2001	Per '000 sq. km.	3.68	19.17
Village electrification	2004	Per cent	83.6	83.8
HH with electricity for lighting	2001	Per cent	24.34	55.8
No. of post offices	2002	Per Lakh Pop.	204	15.08
Tele density	2003	Per '00 Pop.	6.96	6.6

92. **Power:** The percentage of villages electrified is about 87% in the entire state. However, the percentage of households with electricity is only 27%. West Bengal has been a pioneer in power development over the years. NASSCOM-Gartner ranks West Bengal's power infrastructure as the best in the country. There has been an installed capacity of 9629.9 MW in the State in 2011.

9. Religious and Cultural festivals

93. The festivals of West Bengal embody the robust and composite cultural heritage of India. Various communities of the Indian subcontinent celebrate as many as forty festivals with complete communal concordance. The most important festivals of West Bengal are Durga Puja, Sarasvati Puja, Kali Puja and Dol Purnima.

94. There are few temples, mosque located along the project roads. Some of these may need to be shifted.

E. Salient Environmental Features of Sample Roads

95. The salient environmental features of sample roads are summarized in **Table 19**.

Table 19: Salient Environmental Features of Sample Roads

District	Block	Name of Road	Length Km	Topography	Landslide prone	Water Body	Water Stagnation Area	Forest Area	Trees	Utlity Structures	Realignment proposed
Hooghly	Polba-Dadpur	Uttar Dadpur to Adibasi Para	1.516	Plain	No	12 Ponds	No	No	17	45	No
Hooghly	Polba-Dadpur	Panjipukur to Balipukri Part to Balikuhri Via Haripur to Korichaberi	3.003	Plain	No	10 Ponds	No	No	24	71	No
Hooghly	Polba-Dadpur	Bilaayatpur to Komdhara Part to Paschim Narayanpur to Kondhara	3.750	Plain	No	7 Ponds, Canal, Giya River	No	No	107	81	No
Hooghly	Polba-Dadpur	Kuchpala to Satithan Part to Chowpala to Dantra DTC	2.427	Plain	No	3 Ponds Canal	No	No	13	31	No
Hooghly	Polba-Dadpur	Puinan to Porabazar Part to Hasnan More to Alipur Rice mill	2.06	Plain	No	7 Ponds	No	No	22	38	No
Hooghly	Dhaniakhali	Banna to Radhanagar Part to Narayanpur Store BPR	4.128	Plain	No	9 Ponds, Canal	No	No	34	86	No
Hooghly	Balagarh	Balagarh CDP Part to Kaliagaar to Balagarh	2.702	Plain	No	9 Ponds	No	No	6	34	No
Hooghly	Balagarh	Kamargachi Feeder to Somra	2.813	Plain	No	5 Ponds, 1 nallah crossing	No	No	3	19	No
Hooghly	Balagarh	Muktarpur to Baneshwarpur Via Ghoshpara And Sijla	2.432	Plain	No	6 Ponds	No	No	2	29	No
Murshidabad	Bhagwangola - II	Kashipur to Kulgachi	5.535	Plain	No	4 Ponds Bhairab River	2 locations	No	85	126	No
Murshidabad	Burwan	Andi More to Beldanga	7.200	Plain	No	3 Ponds	No	No	5	33	No
Murshidabad	Burwan	SH-7 to Kanlla	5.240	Plain	No	3 Pond, Canal	No	No	7	31	No
Murshidabad	Burwan	SH-11 to Golaghat	1.800	Plain	No	2 Pond	No	No	2	16	No

District	Block	Name of Road	Length Km	Topography	Landslide prone	Water Body	Water Stagnation Area	Forest Area	Trees	Utlity Structures	Realignment proposed
Murshidabad	Farakka	Moheshpur to Tofapur	1.300	Plain	No	2 Pond	No	No	5	33	No
Nadia	Chapra	Mahesnagar to Bedberia	10.887	Plain	No	7 Pond Canal Jalangi River	1 Location	No	64	212	No
Nadia	Santipur	Sabujpally More to Santipur Laxmitala Para	10.318	Plain	No	5 Pond	1 Location	No	20	109	No
Nadia	Ranaghat-II	Dwarikangar to Baliadanga	12.780	Plain	No	14 Ponds	No	No	145	162	No
Nadia	Krishnagar-II	Sondanga Indrapally to Balainagar	3.411	Plain	No	1 Pond	No	No	10	21	No
Nadia	Chakdaha	Char Nandanbati to Haringhata	2.368	Plain	No	5 Pond, Canal	No	No	24	43	No
Total			**85.67**								

Features summarized are within10m on either side of Centre Line.
Utility Structures include Electric poles, transformers, telephone poles and handpumps etc.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

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

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

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

A. Common Impacts during Design and Construction Phase

1. Climate change

99. **Impact**: The proposed roads are analysed considering climate change vulnerability screening checklist defined under EARF to RCIP -II. The resources (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. None of the sample roads is prone to flood. 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 fieldsand 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 sub project roads are unlikely to be vulnerable or increase the vulnerability of surrounding areas (with respect to population growth, settlement patterns, increasing runoff).

100. **Mitigation Measures:** Compensatory tree plantations[6] (1:3) will be made to compensate the loss of trees if any for the construction of subproject roads and maintaining the tree cover. Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of village Panchayat[7]. All non-sample rural roads to be included in Second RCIP, will also be screened for climate change vulnerability and necessary mitigation measures shall be adopted for minimisation of identified vulnerability if any.

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

[7] Village Panchayats are planting trees at along rural roads with funding under Mahatma Gandhi National Rural Employment Guarantee Act (NREGA) 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.

2. Finalization of Alignment

101. **Impact:** The proposed rural road will be constructed to provide 7.5 m roadway in accordance with PMGSY guidelines and technical specifications (IRC-SP 20: 2002) for plain terrains. Sample rural road are aligned to existing road (murram, some stretches of brickbat soling or broken bituminous track). Basically present roads are considered for upgradation. 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 (religious structure, school) and cutting of trees falling within road way.

102. **Mitigation Measures:** The road alignment is finalised considering availability of right of way. The ROW is reduced in built up area or constricted areas to minimize land acquisition. The road alignment is modified to avoid tree cutting, shifting of utilities or community structure to the extent feasible. 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 minimise the road width to 5m wherever required. The road is designed to follow natural topography to avoid excessive cut and fill. All future roads to be included in Second RCIP will follow above measures. In addition,these subprojects will comply with the following alignment finalisation criteria:

- 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 wild life 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

103. **Impact:** Minor impact, since no land acquisition is involved due to various measures considered for finalisation 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. At narrow stretch volunteered land donation is absolutely required. There could be some impact on the encroachers; however, most of them have also volunteered to shift from the proposed alignment.

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

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

105. **Impact**: West Bengal state has many wild life sanctuaries but none of them is located within 10 km radius of the sample project roads. None of the sample road passes through any forest land and as such, project has no impact on forest cover of the state/Country. Village social forestry is located near few roads but outside the impact zone. West Bengal is also known to have several archaeological monuments and historical monuments spread all over the state. However, none of them is located within 5 km of sample roads.

106. **Mitigation Measures**: As there are no Protected/Ecologically sensitive areas in the sub project 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

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

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

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

6. Cut and Fill and Embankment construction

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

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

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

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

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

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

- Construction camp sites shall be located away from any local human settlements (minimum 1 km away) and preferably located on lands, which are not productive barren/waste lands presently. Similarly, temporary office and storage areas shall be located away from human settlement areas (minimum 500 m).
- The construction camps, office and storage areas shall have adequate water supply, sanitation and all requisite infrastructure facilities. This would minimize dependence of construction personnel on outside resources, presently being used by local populace and minimize undesirable social friction thereof.
- The construction camps shall be located at a minimum 500m from forest land/areas to deter the construction labour in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 500m from forest land/areas.
- The construction camps, office and storage areas shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.
- All construction camps shall have rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.
- The construction camps, office and storage areas shall have health care facilities for adults, pregnant women and children.
- All construction personnel shall be subjected to routine vaccinations and other preventive/healthcare measures.
- Contractor shall arrange all personal protective equipment (PPEs) like helmet, gloves, 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

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

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

9. Associated Impacts due to Construction Activities

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

116. **Impact**: No land use will change due to the project, since required ROW is available throughout the alignment. Land use though will change temporarily of construction camp, temporary office storage areas for the period of construction. This will also result in loss of soil productivity. Soil erosion may take place along steep and un-compacted embankment slope, and wherever vegetation is cleared. Soil erosion may have cumulative effect viz. siltation, embankment damage, drainage clogging etc. The siltation, due to soil erosion may occur only in the ponds located close to the roads. There are 43 ponds located very near to ROW of 19 roads in Wes Bengal, where protection work is needed

117. **Mitigation Measures**: It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities, is restored back to its original land use before handing it over back to land owner. The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. 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

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

119. **Mitigation Measures**: Borrowing earth from agricultural land shall be minimised 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**. 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

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

121. Few of the sample roads is crossing or running close to (outside impact zone) any natural stream or river (Ref. **Table 10**). In some cases project roads are crossing local and seasonal drains. Village ponds are also located close to few roads. There as impact on Hydrology and Drainage Pattern is expected to be minimal. Flooding of road due to water stagnation and road overtopping or flooding may occur near water stagnation areas.

122. **Mitigation Measures**: Adequate provisions are proposed for bank stabilisation and prevention of silt runoff during construction and operational stage. 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. Provision of additional cross drainage structures shall be made in the areas where nearby land is sloping towards road alignment in both sides. Bank stabilisation measures like bamboo or eucalyptus tree piling based support may be used where long road stretch get are involved and CC wall are not feasible.

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

d. Compaction and Contamination of Soil

124. **Impact**: Soil in the adjoining productive lands beyond the ROW, haulage roads, and construction camp area may be compacted due to movement of construction vehicles, machineries, equipments and construction camps/storage facilities. It may get contaminated due to inappropriate disposal of liquid waste, (lubricating oil and fuel spills, waste oil and lubricant and vehicle/equipment washing effluent) and solid waste (fuel filters, oily rags) likely to be generated from repair and maintenance of transport vehicles, construction equipment and machinery.

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

containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.

e. Construction Debris and Wastes

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

127. **Mitigation Measures**: All excavated materials from roadway, shoulders, verges, drains, cross drainage shall be used for embankments formation if feasible, filling pits, and landscaping. Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. MOSRTH guidelines shall be followed for debris, wastes removal and disposal at unproductive/wastelands which shall be selected with the consent of villagers and Panchayat. The dumping site should be of adequate capacity and to be located away from residential areas (at least 1000 m away). It should also be located away from water bodies to prevent any contamination of these bodies.

f. Air Quality

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

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

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

- Vehicles delivering loose and fine materials like sand and aggregates shall be covered.
- Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads8, earthworks, stockpiles and asphalt mixing plant areas.
- Mixing plants and asphalt (hot/spot 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.

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

- 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.
- 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.
- **Permits**: Contractor must obtain "Consent to Establish" before setting up Hot Mix plant, batching plants. The consent can be obtained by applying to State Pollution Control Board in prescribed format and with requisite fee. The consent to establish must be converted to 'Consent to Operate" once condition of consent to establish is complied with.

g. Noise Quality

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

131. **Mitigation Measures**: The noise level will be intermittent and temporary and will attenuate fast with increase in distance from noise source. Further, vehicles and equipment should be fitted with silencers and maintained regularly. The workers shall be provided with personal protection devices such as earplugs and earmuffs. Workers exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly.

h. Groundwater and Surface Water Quality and Availability

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

133. **Mitigation Measures**: Requisite permission shall be obtained if applicable for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority[9] if applicable. The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. Water intensive activities shall not be undertaken during summer period to the extent feasible. Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting. Where ponds are not 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.

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

i. Biological Environment

134. **Impact:** Since the sample roads are not passing through any protected areas or forest area, there is no diversion of forest land**.** The major adverse impacts will be due to tree cutting, Siltation and contamination of water bodies may affect the aquatic life. Since there are only ponds and non-perennial water the aquatic life is minimal and no significant impact is anticipated on aquatic life. As per estimation there will be 83 nos. tree felling will be required for construction of 19 sample roads (Ref **Table 19**).

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

j. Impact on Common Property Resources

136. **Impact**: There are public utilities like electric transformer, electric poles, telephone 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. Possible impact to common property for 19 sample roads is shown in **Table 19. Appendix 3** shows total impact for construction of 181 roads for entire Tranche I.

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

B. Common Impacts during Post Construction and Operation Phase

1. Air Quality

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

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

2. Noise

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

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

3. Land, Soil, Tree Plantation

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

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

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

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

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

4. Groundwater

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

5. Hydrology and Drainage

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

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

6. Socio-Economic Impact

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

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

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

- Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp curves 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

153. The Many adverse impacts of road projects can be avoided or minimized by applying environmentally sound design, construction and operation and maintenance practises. The review of the environmental salient features specific to sample roads given in chapter III identify that mitigation measures applicable to all the road are similar in nature except variation in terms of magnitude of the measures which depends on length of the road, presence of pond, number of community structure (mostly temples, school) likely to be shifted, number and type of common utility (hand pump, electric transformer, electrical poles).

154. Water stagnation and water logging problem has been identified along some sample roads. Adequate design measures for drainage, road levels shall be taken for prevention of water logging.

155. **Table 20** provides the list of common utilities, ponds, religious structures, trees falling within 2.75 M of the either side of centreline of the sample roads (19 nos.) which may be affected and needs shifting. Boundary wall of few schools is also located near the alignment. Effort shall be made to adopt the mitigation measures listed under respective section above including measures of aligning road on one end to save the structures/trees as much as possible.

Table 20: Impacts on biological environment, utility, community and religious structures

District	Block	Name of Road	Length Km	Landslide prone	Water Body	Water Stagnation Area	Forest Area	Trees	Utlity Structures
Hooghly	Polba-Dadpur	Uttar Dadpur to Adibasi Para	1.516	No	12 Ponds	No	No	17	45
Hooghly	Polba-Dadpur	Panjipukur to Balipukri Part to Balikuhri Via Haripur to Korichaberi	3.003	No	10 Ponds	No	No	24	71
Hooghly	Polba-Dadpur	Bilaayatpur to Komdhara Part to Paschim Narayanpur to Kondhara	3.750	No	7 Ponds, Canal, Giya River	No	No	107	81
Hooghly	Polba-Dadpur	Kuchpala to Satithan Part to Chowpala to Dantra DTC	2.427	No	3 Ponds Canal	No	No	13	31
Hooghly	Polba-Dadpur	Puinan to Porabazar Part to Hasnan More to Alipur Rice mill	2.06	No	7 Ponds	No	No	22	38
Hooghly	Dhaniakhali	Banna to Radhanagar Part to Narayanpur Store BPR	4.128	No	9 Ponds, Canal	No	No	34	86
Hooghly	Balagarh	Balagarh CDP Part to Kaliagaar to Balagarh	2.702	No	9 Ponds	No	No	6	34
Hooghly	Balagarh	Kamargachi Feeder to Somra	2.813	No	5 Ponds, 1 nallah crossing	No	No	3	19
Hooghly	Balagarh	Muktarpur to Baneshwarpur Via Ghoshpara And Sijla	2.432	No	6 Ponds	No	No	2	29
Murshidabad	Bhagwangola - II	Kashipur to Kulgachi	5.535	No	4 Ponds Bhairab River	2 locations	No	85	126
Murshidabad	Burwan	Andi More to Beldanga	7.200	No	3 Ponds	No	No	5	33
Murshidabad	Burwan	SH-7 to Kanlla	5.240	No	3 Pond, Canal	No	No	7	31
Murshidabad	Burwan	SH-11 to Golaghat	1.800	No	2 Pond	No	No	2	16
Murshidabad	Farakka	Moheshpur to Tofapur	1.300	No	2 Pond	No	No	5	33
Nadia	Chapra	Mahesnagar to Bedberia	10.887	No	7 Pond Canal Jalangi River	1 Location	No	64	212
Nadia	Santipur	Sabujpally More to Santipur Laxmitala Para	10.318	No	5 Pond	1 Location	No	20	109
Nadia	Ranaghat-II	Dwarikangar to Baliadanga	12.780	No	14 Ponds	No	No	145	162
Nadia	Krishnagar-II	Sondanga Indrapally to Balainagar	3.411	No	1 Pond	No	No	10	21
Nadia	Chakdaha	Char Nandanbati to Haringhata	2.368	No	5 Pond, Canal	No	No	24	43
Total			**85.67**						

D. Climate Change Impacts and Risks

1. Climate Change Mitigation

156. The Transport Emissions Evaluation Model for Projects (TEEMP) is an excel based tool to assess CO_2 gross emissions without (business as usual or BAU) and with the project improvements (with project scenario or WPS). The tool, which was developed by Clean Air Asia and the Institute for Transportation and Development Policy, was funded by ADB. The main improvement from the project that was considered for the model are better surface roughness with less than 2.5m/km, and improved traffic speed and hence less fuel consumption. The model has also been used for CO_2 emission assessment during construction stage. The model also allows for the inclusion of impacts related to traffic congestion with and without project through provisions for inserting data on the traffic numbers, lane width, number of lanes and volume/capacity saturation limit. The model also computes for emission and emission intensity of PM and NOx.

157. The following information were used to project CO_2 emissions for Tranche 1 of the Facility:

a. RCIP 2 subprojects in West Bengal state will upgrade 181 rural roads with a total length of 597.5 km in Hooghly, Murshdabad and Nadia districts;
b. Road improvements will be confined to the existing one-lane 3.75-m road right-of-way, with lined storm water drains for stretches passing through built-up areas, waterlogged/water overtopping, and flood prone area; and
c. Road roughness will improve from the current 8.0 m/km to 2.5 m/km.

158. Traffic forecasts were generated from the economic analysis for each road section, disaggregated into vehicle types and share to the annual average daily traffic (AADT). The cumulative AADT for the state is indicated in **Table 21**.

Table 21: AADT Composition

Vehicle Type	Percentage
Motorized	
Two-wheeler	52.85
Three-wheeler	7.95
Car/Jeep/Van	8.75
Multi-axle	4.61
Bus	0
Two-axle	25.84
Total (motorized)	100
Non-motorized	
Bicycle	98.00
Bullock cart	2.00
Total (non-motorized)	100.00

159. There are 181 rural roads in West Bengal, with a total length of 597.5 km and with a carriageway width of 3.75m. Road capacity of 7,200 PCU/lane/day for rural roads was adopted for the project. The design life of the roads is 15 years.

160. Emission factors were taken from CBCP/ MOEF Draft Report on Emission Factor Development for Indian Vehicles (2007) and the Automotive Research Association of India.

Table 22: CO_2 Emission Factors

Vehicle Type	Gasoline (kg/liter)	Diesel (kg/liter)	LPG (kg)
2-wheeler	1.37		
3-wheeler	2.12	2.63	3.0
Car	2.24	2.59	
Multi-axle		3.21	
Bus		3.61	
2-axle		3.50	

161. To account for construction emission, the amount of emission per km was estimated. For rural roads, the emission factor for rural road in India (kg CO2/km) was estimated at 48.4 tons/km10. These emissions were from construction materials used (aggregates/base materials, cement, bitumen and emulsion), and fuel used for transporting construction materials.

162. Total annual emissions without the project (business as usual) at the middle of the design life of 7.5 years is estimated at 38,227.84 tons/year and with project scenario is estimated at 36,643.8 tons/year, for all 181 roads proposed for Tranche 1 of RCIP 2. The with project sceanrio is still far below the 100,000 tons per year threshold set in the ADB SPS 2009 and therefore not required to implement options to reduce or offset CO_2 emissions.

2. Climate Risks and Adaptation Needs

163. Climate risks specific to road projects in the state of West Bengal are those resulting from increased frequency and intensity of extreme weather events. Temperature and precipitation changes, increased cyclonic storms, flooding, and landslides in road sections running through the hilly regions of West Bengal, and water availability during the dry season, were identified as climate risks in the state.

164. Possible events related to climate change and their possible effects on West Bengal road infrastructure are indicated in **Table 23**. All these events either simultaneously or in isolation may generate major disastrous impacts on road infrastructure.

Table 23: Posible Climate Events and Risks to Roads in West Bengal

Climate Change Events	Risks to the Road Infrastructure
Extreme rainfall events	• Overtopping and wash away • Increase of seepage and infiltration pass • Increase of hydrodynamic pressure of roads • Decreased cohesion of soil compaction • Traffic hindrance and safety
Seasonal and annual average rainfall	• Impact on soil moisture levels, affecting the structural integrity of roads, bridges and tunnels (if any) • Adverse impact of standing water on the road base • Risk of floods from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern
Increased maximum temperature and higher number of consecutive hot days (heat waves)	• Concerns regarding pavement integrity, e.g. softening, traffic-related rutting, cracking, fracture, etc. • Thermal expansion in bridge expansion joints and paved surfaces

[10] https://www.adb.org/sites/default/files/publication/28555/estimating-carbon-footprints-road-projects.pdf

Climate Change Events	Risks to the Road Infrastructure
	• Temperature break soil cohesion and increase dust volume which caused health and traffic accidents
Extreme wind speed	Threat to stability of bridge decks Damage to road signs, lighting fixtures and supports Increase of wind speed causes increased dynamic force of water generated by waves on road embankments

165. Key engineering measures to address climate risk variables such as extreme precipitation, high temperatures and vulnerability to landslides include a) increase in embankment height in road section located in low-lying and flood prone areas; b) use of pavement binder bitumen with high viscosity grade (VG)[11] to prevent rutting and improve pavement life and appropriate for heavy vehicles; and c) increase in capacity of longitudinal (pucca) and cross drains.

166. Provisions have also been made in the bidding documents for the contractor to prepare EMPs based on the final detailed design to address climate related risks and vulnerabilities.

[11] The Indian Standard, IS 73:2013 classifies four grades of bitumen based on viscosity at 60 °C. VG 30, which is suitable for a 7-day average maximum air temperature of 38-45 °C, is the most appropriate.

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

A. Environmental Management Plan

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

168. The EMP is prepared as per Environmental Management Standard (ECOP) applicable to rural roads idefined be part of Second RCIP.

169. 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.

170. Appropriate mitigation measures are identified for all rural road construction and operation activities. The identified impacts associated with rural roads and mitigation measures are largely common to most of the roads. The EMP is detailed at **Appendix 4**. It provides action common to all roads at pre construction, construction and operation stage. Before bidding road specific EMP will be prepared by PIC and which will be attached in final DPR.

171. 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

172. 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.

173. For rural roads, Environmental Monitoring plan will be more observation oriented and it provides observation areas with frequency of monitoring at pre construction aspects[12],

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

construction stage and operation stage. A monitoring plan with monitoring indicator and frequency of monitoring is given at **Appendix 5.**

C. Institutional Arrangements and Responsibilities

174. **Institutional Arrangement.** 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.

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

176. The institutional arrangement at National Level and state level for implementation of PMGSY including Second RCIP is shown at **Figure 7.**

D. Institutional Environmental Responsibilities

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

178. **MoRD**[13] 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

- ADB is given access to undertake environmental due diligence for all subprojects, if and when needed as per EARF requirements.
- SRRDA meet all environmental assessment requirements in accordance with EARF
- It undertakes random monitoring of the implementation of the EMP
- 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

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

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

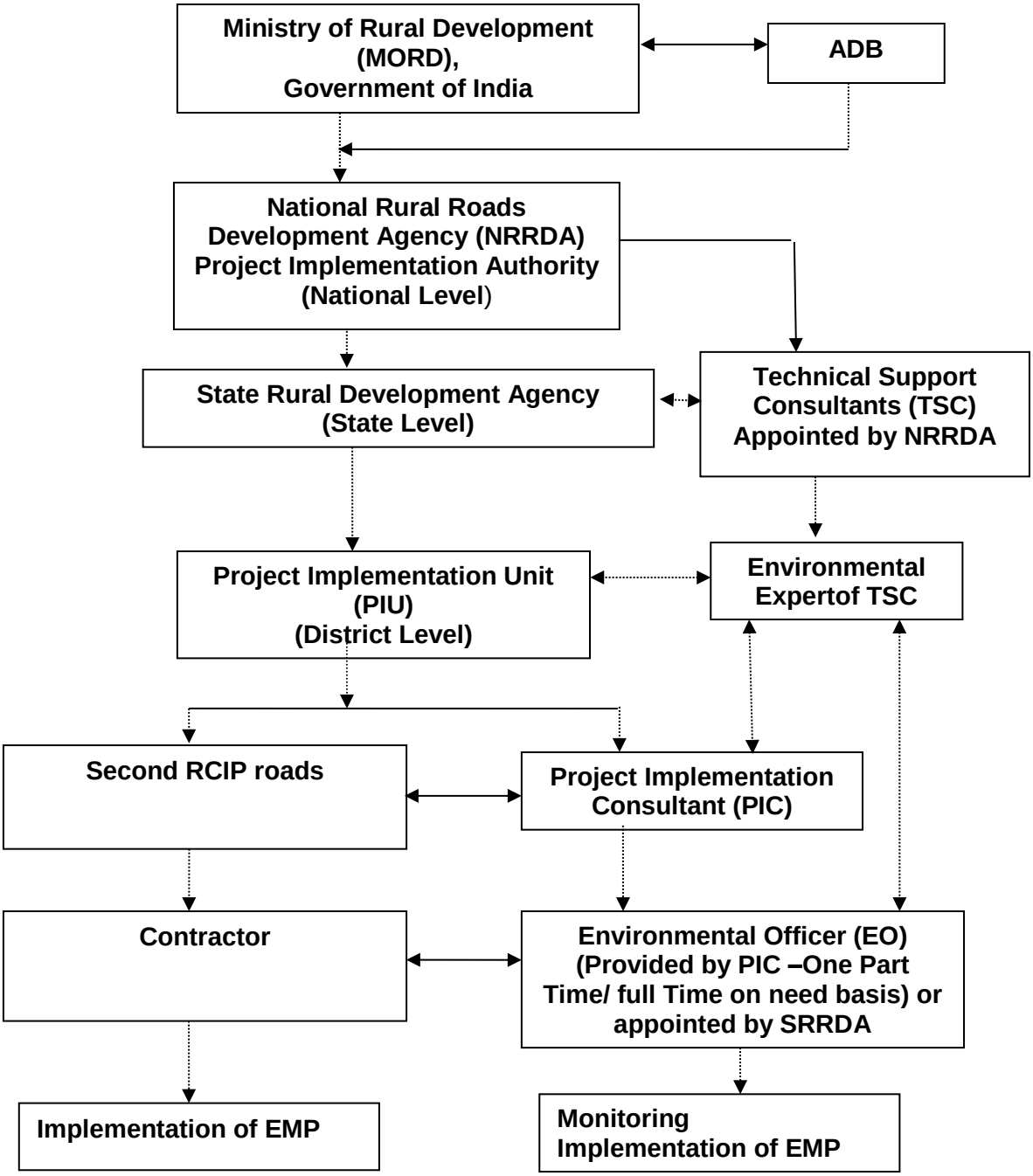


Figure 7: Institutional Arrangement for EMP Implementation

180. **SRRDA**[14] will ensure that :

- ECOP checklist is prepared for each road
- The completed ECOP checklist is included in the DPR with the help of PIC.
- Ensure that all required statutory environmental clearances are obtained and comply with clearance conditions;
- Ensure that the subproject specific EMPs and respective budget are included in the bidding documents;
- Ensure that the ECOP checklists and EMP (including general and site specific issues) are made available to the contractors;
- Undertake routine monitoring of the implementation of the EMP including spot checks on site and prepare monitoring reports at least once a year; and
- 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.
- Appoint Project Implementation Consultant (PIC) for construction supervision and assist PIUs for EMP implementation and related safeguard compliances.

181. **PIU** will be responsible to:

- Complete the ECOP checklists and prepare subproject specific EMPs (including monitoring plan) for each subproject
- Obtain necessary statutory environmental clearance prior to commencement of civil works
- Update the respective ECOP checklists and EMPs if there are any changes in alignment of the subprojects
- To conduct monitoring of all subprojects and prepare pre-, during and post-construction monitoring checklists through the project implementation consultants,
- Prepare and submit to SRRDA annual monitoring report as per ADB defined format

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

- Will provide technical assistance to SRRDA/PIU regarding environmental aspectsenvironmental permitting/clearances requirement,
- Periodically review EMP implementation status including spot site inspections.
- Conduct workshops/capacity building program at different level and functions.
- Prepare environmental Due Diligence report for each trench before implementing next trench
- Prepare state Level IEE reports

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

[14] With assistance from PIC (Project Implementation Unit)

- 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;
- Co-ordination 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 to ensure that the suggested mitigation measures in the EMP are implemented;
- 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.
- Conducting environmental training/awareness programs for the contractors, the project implementation personnel and the communities.

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

- Make adequate costs provision for EMP requirements while biding
- Ensure effective implementation of mitigation 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.

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

185. 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 Second 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 Second RCIP, environmental assessment requirement for each tranche and legal framework are given below:

186. **Selection Criteria and Environmental Assessment Requirement**. 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)

187. The following environmental Assessment requirement will be followed roads included under Second 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 50 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

188. 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)

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

(i) An Initial Environmental Examination[15] (IEE) report including the preparation of an Environmental Management Plan (EMP) and a Monitoring Plan.
(ii) Regular monitoring of implementation of the EMP and submission of monitoring reports and due diligence reports to ADB as necessary

F. Capacity Building

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

G. Consultation and Information Disclosure

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

192. All environmental assessment documents are subject to ADB's Public Communication Policy (2005) and will be made available to the public, upon request. The WBSRRDA 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 sample road IEE report on its website.

H. Grievance Redress Mechanism

193. **Subproject Level.** Public disclosure and complaints contact person will be designated by the PIU for each subproject to help address all concerns and grievances of the local communities and affected parties. Contact details will form part of the subproject identification display board that will be placed at both ends of the rural road being constructed.

194. **Village Level**. If there are environmental issues concerning road subprojects, community consultation process that is transparent, gender responsive and accessible to all stakeholders, in accordance with PMGSY guidelines and SPS 2009 will be conducted. Grievances, if any, will be considered at the village level by the Grievance Redress Committee (GRC) consisting of

[15] As per selection criteria, no Category A subproject will be included in Second RCIP.

members of Gram Panchayat, and Pradhan / Up-Pradhan of Gram Panchayat. The GRC will meet for addressing grievances as needed.

195. **District Level**. Grievances not resolved at the village level will be addressed through the district level GRC, with the following members:

(i) Executive Engineer of the PIU;
(ii) Member of Zilla Parishad;
(iii) Member of the grievance committee of the concerned GP; and
(iv) Representatives of APs will be active participants in the proceedings of grievance redressal.

196. Grievance procedures, which can be easily understood by stakeholders, and preferably in the local language, will be disseminated to affected communities. Issues need to be resolved prior to awarding of civil work contract.

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

198. The following indicative timeline to resolve grievances at different levels will be observed: Subproject level – 3 days; Village level – 1 week; District level – 1 week; and National level – 2 weeks. GRM related costs, which mostly include travel expenses and meeting related expenses such as refreshments, will be covered by PIU. The GRC meetings will only be convened onlyif and when necessary. Hence, GRC members will not be required to be present in all times during project implementation. Cost for other activities such as recording complaints, minutes of meetings, preparing reports, etc., will be carried out by the PIU / PIC. Complainant has the option to resort to legal redress at any stage.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. General

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

200. Stakeholder's consultations were held from March to June 2017. Stakeholders', including women, were consulted 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 sub projects, followed by an explanation to potential impacts. Participant's views were gathered with regard to loss of agricultural land, effect on air and noise quality of the area due to traffic, water availability, accident and risk.

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

B. Compliance with Relevant Regulatory Requirements

202. In India, public consultation is mandatory in case of Category A and B1 category projects[16] in select conditions. Being a category B project as per SPS 2009, 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

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

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

- **Construction Camp** - Impacts from the establishment and operation of the construction camps like generation and disposal of solid wastes, sewage, potable water requirements, health/hygiene, and safety is part of the contractor's responsibility highlighting the need for compliance with applicable laws. Waste and material use minimization will be promoted to decrease the volume of wastes that will be generated.

[16] 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.

- The participants did not apprehend any adverse impact due to the construction camp near to their villages. They responded positively towards providing support to these, if required, in terms of any food, water requirements.
- **Water Logging and Drainage** - Participants informed about few low lying areas where water logging takes place during monsoon season. The villagers requested for provision of adequate cross drainage structures at these locations.
- **Loss of Livelihood and Income Restoration Options** - This issue was raised by those who had encroached on the proposed alignment. However, they offered the encroached space for the proposed project, if demanded.
- **Road Safety** - Safety issues did not raised concern among the inhabitants including women.
- **Land Acquisition through voluntary donation** - 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. During construction of road contractor will try their best to save religious structure.
- **Loss of Trees Due to Road Construction** - Respondents were of the opinion that trees cutting should be avoided or else minimised. For trees to be cut compensatory plantation should be done. Some villagers expected additional plantation should be done. Recommended tree species for plantation were other local varieties.
- **Impacts on Health** - Separate consultation sessions were organised by social team to identify issues pertaining to health specifically for sexually transmitted diseases (STDs). Settlements along the rural roads were reported to be getting exposed to such diseases, as there are no long distance users on the project roads.
- **Ambient Air & Noise Quality** – The respondents viewed that these are the problems of urban areas and their villages are still untouched from this aspect. They even do not anticipate any of these problems after the completion of the project.
- **Inconvenience during Construction** - The participants viewed that they will manage it as it will be temporary.
- **Employment during Construction** - The locals expected that they should be given preference in employment during project implementation.
- **Perceptions and Expectations** - Perceptions and expectations of the community recorded during the consultation sessions can be broadly listed as:
  - The public and the affected persons appreciated and supported the project with their open hearts.
  - Community at large appreciated overall benefits to them resulting from project development;
  - They were aware of the increased access, lesser commuting time after project implementation;
- **Addressal of Issues** - The project has tried its best to address all the issues raised during consultations under the constraints of suitability from engineering point of view. Some of the provisions made under the project to address the issues and concerns of the community are given in **Table 24.** Consultations with stakeholders will continue throughout project implementation as necessary at different levels, to update and address the concerns of affected people on environment related issues.

Table 24: 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 10-12m 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.
Excavation and back filling	Monitor adherence to contract specifications
Erosion	Monitor proper management of excavated soil/silt including timely removal of material from project site
Storage and transportation of construction materials, excavated soil and silt	Monitor adequacy of measures undertaken to prevent fugitive dust
Increased pollution levels	Pollution levels are not crossing the prescribed limits of CPCB and planned plantation will screen the emission.
Noise and emissions from construction vehicle	Monitor 'Pollution under Control' certificate are current for construction vehicles
Utilities and basic infrastructure	All the utilities, electric poles, telephone lines, wells, tube wells etc. to be impacted will be relocated under the project cost.
Employment of locals during construction	Locals will be given preference for employment during the project implementation
Health check up of workers	Monitor adequacy of health check up service provided including attendance of the physician retained and the extent to which the workforce is availing this service
Health and safety requirement	Monitor adherence to all occupational and safety requirements

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

205. 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.

206. 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.

207. All sample roads included under Tranche I 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.

208. Few of the rural roads cross natural streamsand rivers. However, none of these roads is prone to flood.

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

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

211. No categorisation is made under environmental legislation of India, since these small roads do not require any environmental clearance in accordance to Indian Environmental (Protection) Act and Rules, 1986 amended till date. For felling of trees permission needs to be taken up from gram panchyat.

212. 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 minimised through design consideration and suitable mitigation measures.

213. 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.

214. NRRDA/WBSRRDA has defined institutional setup including with specified responsibility for environmental management. Existing capacity of the West Bengal State Rural Roads Development Agencies (WBSRRDA) and Project Implementation Units (PIUs) for implementing environmental safeguard issues need substantial strengthening. The capacity enhancement is proposed through focused workshops and training session. Few workshops have already been

conducted at participating states through ADB appointed Environmental specialist. Trained and experienced in-house officials should carry out more raining in future periodically.

215. The IEE also indicate that rural road construction works does not warrant further EIA study for subsequent rural road construction works in West Bengal.

B. Key Recommendations

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

217. 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.

218. These IEE is prepared based on ECOPs. 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.

219. Executing agency shall ensure that updated road specific EMP forms part of DPR and is available to contractor at the time of bidding. The contractor will specify the quantity and budget for various activities like rehabilitation of borrow earth pits, first aid and sanitation facilities at construction camp and temporary office/material storage place as per EMP requirements. The same shall be revised if there is any change in the project design. Any such change shall be reported to ADB as well.

APPENDIX 1: DETAILS OF ROADS IN WEST BENGAL SECOND RCIP (TRANCHE I)

Sl	District	Package No.	Road Name	Length (km)
1	Hooghly	WB 08 ADB 36 (A)	Rajhat School to Mahimpur Part to Jhamp to Nayapara	1.620
2	Hooghly	WB 08 ADB 36	Gopalnagar to Jhanpantalla Part to Pal Bus Stand to Maria Roy School	1.606
3	Hooghly	WB 08 ADB 36 (C)	Uata Dadpur to Adibasi Para#	1.516
4	Hooghly	WB 08 ADB 37 (A)	Patul to Paira Danga Part to Patul to Jamura	2.570
5	Hooghly	WB 08 ADB 37 (B)	Arenda Cmd Road to Bauripara Part to Jarura to Dogachia	1.400
6	Hooghly	WB 08 ADB 39 (A)	Panjipukur to Balipukri Part to Balikuhri Via Haripur to Korichaberi#	2.973
7	Hooghly	WB 08 ADB 39 (B)	Haripur to Payan Bridge Part to Balikuhri Via Haripur to Korichaberi	1.900
8	Hooghly	WB 08 ADB 41	Bilaayatpur to Komdhara Part to Paschim Narayanpur to Kondhara#	3.750
9	Hooghly	WB 08 ADB 42	Kuchpala to Satithan Part to Chowpala to Dantra Dtc#	2.427
10	Hooghly	WB 08 ADB 45	Mulgam to Khantash Part to Kashoera to Narayanpur Part to Patuldanga to Mahisdanga	3.290
11	Hooghly	WB 08 ADB 46	Puinan to Porabazar Part to Hasnan More to Alipur Ricemill#	2.900
12	Hooghly	WB 08 ADB 47	Kamria Ricemill to Hamidpur Part to Kotal Para to Kakgi Para	2.532
13	Hooghly	WB 08 ADB 48	Pataldanga Sialdanga Road also Known as Connection to Jayer Road to Digha	1.737
14	Hooghly	WB 08 ADB 49	Gamna Tinna Road Via Gehomoni Sargoria Part to Jamna to Magura	1.830
15	Hooghly	WB 08 ADB 51	Muktigira Napara More to asua also Known as Muktikuri to Anchguri	3.725
16	Hooghly	WB 08 ADB 52	Jayer to Gopaldanga Via Narkelsanda Part to Narikel Sanda to Gopalnagar	3.650
17	Hooghly	WB 08 ADB 53 (A)	Piragram to Bhuimoni Road	1.961
18	Hooghly	WB 08 ADB 53 (B)	Berui to Slngaroni	0.900
19	Hooghly	WB 08 ADB 54	Niala to Chaubera	4.500
20	Hooghly	WB 08 ADB 56	Debipur Soad Para Road Via Hazipur Gokuldanga Amonmouri also Known as Bantika to Hajipur	6.553
21	Hooghly	WB 08 ADB 57	Connection to Sh Rd to Anti Part to Patra to Namajgram And also G T Road to Kulipukur	1.777
22	Hooghly	WB 08 ADB 58	Banna to Radhanagar Part to Serampore Bamboo Pole to Smandepur#	2.250
23	Hooghly	WB 08 ADB 58	Banna to Radhanagar Part to Narayanpur Store Bpr	4.100
24	Hooghly	WB 08 ADB 60	Jodhpur to Pitha Bridge	2.750
25	Hooghly	WB 08 ADB 62	Barasatpara Kalitala to Patipur	1.500
26	Hooghly	WB 08 ADB 62	17 No Route to Beherampur Part to Kananadi Ps to Baharampore	2.250
27	Hooghly	WB 08 ADB 64	North Balarampur to Balarampur A North Side Part to Gohalpata to Mondalganthi Via Vadur Road.	1.464
28	Hooghly	WB 08 ADB 65	Dharampur to Diana Part to Banna to Dakshin Mamudpur	1.200
29	Hooghly	WB 08 ADB 65	2 Culvat to Baharampore also Known as 18 No Road to Chandpur	3.450
30	Hooghly	WB 08 ADB 65	Chapabere to Joyharipur Part to Garurhat to Rohia More	1.500
31	Hooghly	WB 08 ADB 66	Bhunyeran North to Benegachi Part to Sodepur to Samaspur	3.626
32	Hooghly	WB 08 ADB 69	Gholdigrui Po to Gopimohanpur Part to Gopimohonpur to Madhyagholdigui	0.750

Sl	District	Package No.	Road Name	Length (km)
33	Hooghly	WB 08 ADB 69 (A)	Chiladangi More to Sahapur Part to Balarampur to Chhatrashal	2.100
34	Hooghly	WB 08 ADB 70 (A)	Jashar to Harua Part to Belegachi Dhonputa to Gopalda River Bandh	1.500
35	Hooghly	WB 08 ADB 70 (B)	Haruya Primary School to Jushor Primary School Part to Bheuta Harua	1.200
36	Hooghly	WB 08 ADB 72	Krishnabati More to Dulalbati Club Part to Ranbagpur to Deulpara Football Ground	2.070
37	Hooghly	WB 08 ADB 73	Markonda to Bakharpur Krishna Ballavpur Part to S K asrafgarage to Bhangamorah Hs	2.625
38	Hooghly	WB 08 ADB 74	Cesc Ghat to Bhabanipur Primary School also Known as Charbhadantur to Connecting to Balagarh	2.381
39	Hooghly	WB 08 ADB 75	Balagarh Cdp Part to Kaliagaar to Balagarh#	2.702
40	Hooghly	WB 08 ADB 75	Behula Station to Arugnagar Koloni Via Ayda Muslim Para Part to Belghachia to Sh Connection	0.834
41	Hooghly	WB 08 ADB 76	Kamargachi Feeder to Somra#	2.813
42	Hooghly	WB 08 ADB 77	Gopalpur Hospital to Stkk Road	5.929
43	Hooghly	WB 08 ADB 78	Muktarpur to Baneshwarpur Via Ghoshpara And Sijla#	2.250
44	Hooghly	WB 08 ADB 79	Bhalki to Godpara Bridge Part to Sargordia to Kamanpara	3.196
45	Hooghly	WB 08 ADB 80	Bandhagachi Railgate to Gopalbati Via Ichapur Jaythnarayan	7.028
46	Hooghly	WB 08 ADB 82	Kamardanga to Bank to Hooghly River Part to Kamardangas to Stkk Road	3.737
47	Hooghly	WB 08 ADB 83	Punui Uttaroar Madhyapara Dhakuriapara to Stkk Road	2.732
48	Hooghly	WB 08 ADB 84	Jagannath Tarka Panchanan Road to Natunbaga Via Puratanbaga	2.529
49	Hooghly	WB 08 ADB 85	Sunia to Bamunia Part to Goghat Bakul Tala to Kurmona Blacktop	6.510
50	Hooghly	WB 08 ADB 86	Sitanagar More to Bardhigi Part to Gobindapur to Arazi Surjapur	3.280
51	Hooghly	WB 08 ADB 87	Putul Sharabattala to Hariharpur Part to Connection to Sh7 Road to Mirga	1.490
52	Hooghly	WB 08 ADB 88	Purba Amarpur to Joykrishnapur Part to Kundu Para to Shambati Ballabhibati	2.930
53	Hooghly	WB 08 ADB 89	Joykrishnapur Mondal Para to Barma Part to Purba Amarpur to Joykrishnapur	1.390
54	Hooghly	WB 08 ADB 90	Saora Bhimtala to Goulpara Kalitala Mondal Para Part to Saora to Kota	8.210
55	Hooghly	WB 08 ADB 91	Connection to Vikdas Saora Rd to Nabasan Part to Bhabadighi Nabasan to Pry School	2.980
56	Hooghly	WB 08 ADB 92	Dasghar to Metal Road Part to Kamarpukur Modhanmihan Road to Anur Metal Road	3.390
57	Hooghly	WB 08 ADB 93	Garmandaram Road to Naldubi Part to Madhubati to Naldubi	4.880
58	Hooghly	WB 08 ADB 94	Hazipur More to Paba Part to Mayandunga to Paba Via Harihar	1.430
59	Hooghly	WB 08 ADB 95	Mayna Danga to Paba J H School Part to Mayandunga to Paba Via Harihar	7.980
60	Hooghly	WB 08 ADB 96	Betra to Bandiganj End Point to Kamarpukur Part to Kokandmore to Tentulmuri	3.240
61	Hooghly	WB 08 ADB 97	Pukuriya to Pukuriya Palpara Part to Subirchak Metal Rd to Pukuria	2.930

Sl	District	Package No.	Road Name	Length (km)
62	Hooghly	WB 08 ADB 98	Metal Road to Beldhia Part to Subirchak Metal Rd to Pukuria	4.494
63	Hooghly	WB 08 ADB 99	Betra Shibmandir to Fului Hens Pukur Part to Fului Bhagara Pry Sch to Krishnanager	2.240
64	Hooghly	WB 08 ADB 100	Baramba Kadamtala to Krishanaballavbati	2.650
65	Hooghly	WB 08 ADB 101	Harit Gram to Kantong Durgapur Part to Chapsara to Nangai	1.880
66	Hooghly	WB 08 ADB 102	Dulia to Joynagar Part to Dulia to Ichapur	3.200
67	Hooghly	WB 08 ADB 102	Marah to Sod Pur Part to Sodpur to Kalubati Bt Road	1.000
68	Hooghly	WB 08 ADB 103 (A)	Diparathtala Bharhatta Hattala to Roybharsat Ibrahim Bridge	1.800
69	Hooghly	WB 08 ADB 103 (B)	Dulur Hatabazarpara to Jaramandirtala Part to Diparathtala to Rojbharsat Bridge	1.500
70	Hooghly	WB 08 ADB 104	Basta to Kurigachi	3.000
71	Hooghly	WB 08 ADB 105	Basuri Ahallyaby Road to Mora Bazar	2.600
72	Hooghly	WB 08 ADB 106 (A)	Amira to Ganeshpur	1.500
73	Hooghly	WB 08 ADB 109	Sirajpur to Maheswarpur Part to Basuri More to Hemchandra Oara	3.650
74	Hooghly	WB 08 ADB 110	Lalpur Hattala to Khanapur Play Ground Part to Bandipur Maszidtala to Gatra	2.250
75	Hooghly	WB 08 ADB 111 (A)	Krishnabati to Bargachia Part to Musha Pur to Isalim Pur	1.560
76	Hooghly	WB 08 ADB 111	Lalpur Hattala to Khanapur Play Ground	1.000
77	Hooghly	WB 08 ADB 112	Mandalika Bazar to Kodalpara	1.623
78	Hooghly	WB 08 ADB 113	Bilara More to Ahallyaby Road	3.733
79	Hooghly	WB 08 ADB 114	Bhurkhul Murgilory Tala to Mohesh Primary School Part to Chandinagar to Mahespur	1.093
80	Hooghly	WB 08 ADB 114	Radhanagar Primary School to Chandinagar Pwd Ranigate Part to Chandinagar to Mahespur	1.240
81	Hooghly	WB 08 ADB 116	Krishnapur to Shrihatta Part to Majurkhamore to Korishanapur	1.918
82	Hooghly	WB 08 ADB 117	Bamanda Primary Health Centre to Sitapur Bazar Kotulpur Gp Part to Ganeshbati to Baganda	4.500
83	Hooghly	WB 08 ADB 118	Ganeshbati to Mohanbati Part to Khurigachi Kalitala to Paschim Durgapur Jangipara	5.171
84	Hooghly	WB 08 ADB 120	In Front to Block toice to Anarbati Part to Rajpur More to Terajal	2.760
85	Hooghly	WB 08 ADB 121	Salapur Juyiveahabandh to Salapur Five Mile Bus Stoppage	4.690
86	Hooghly	WB 08 ADB 122	Shyamgram to Haraditta	4.210
87	Hooghly	WB 08 ADB 123	Fotepur Pwd Road to Ghoshpara And also Purba Haripur	1.850
88	Hooghly	WB 08 ADB 124	Dhamsa to Digruighat	2.125
89	Hooghly	WB 08 ADB 126	Baroarytala Bus Stop to Taral	2.180
90	Hooghly	WB 08 ADB 126	Dikidayara Dighirdhar to Chandrimat	1.120
91	Hooghly	WB 08 ADB 127	Batanal Panchayat tofice to Chak Hajipur Mouja	2.000
92	Hooghly	WB 08 ADB 127	Malaypur Bus Stop to Malaypur Dighirpar	1.025
93	Hooghly	WB 08 ADB 130	Kumirmore Basstop to Ramnathpuranup Nagar Part to Deeptubewel 52no Ration Shop to Kumir Mora	1.071
94	Hooghly	WB 08 ADB 130	Paschimramanathpur Manna Para to Uttar Sordar Para Part to 52no Ration Shop to Kumir Mora	1.184

Sl	District	Package No.	Road Name	Length (km)
95	Hooghly	WB 08 ADB 132	Jangalpara Kalitala to Matukantay Mohanikul Part to Maipukur to Pankur	0.997
96	Hooghly	WB 08 ADB 132	Jangalpara Gangadharpur Road Part to Maipukur to Pankur	1.800
97	Hooghly	WB 08 ADB 134	Krishnarampur Bazar to Deeptubewell	1.668
98	Hooghly	WB 08 ADB 134	Jangalpara Rathtala to Taymohani	1.035
99	Hooghly	WB 08 ADB 135	Bohpanchabria to Dudkarma Part to Laxmanpur Bhandaripara to Banpanchbaria	1.217
100	Hooghly	WB 08 ADB 135	Patul to Raghunathpur Part to Sehakhala Harirambati More And also Shamsundarpur to Kalyanbati	0.950
101	Hooghly	WB 08 ADB 136	Radhaballavpur to Suchia Part to Haripur Bandhpur Road Itwill Be Connected Masat Main Road	2.250
102	Hooghly	WB 08 ADB 139	Sinjore Kalachara Road Part to Radhaballavpur to Sichia	2.585
103	Hooghly	WB 08 ADB 140	Radhaballabhpur School to Mamudpur	3.167
104	Hooghly	WB 08 ADB 142	Bankaghach to Madhavpur Part to Janai Baskasa to Krishnaram Pur	4.973
105	Hooghly	WB 08 ADB 144	Sauta to Bhunyer A Part to Sodepur to Samaspur	2.800
106	Hooghly	WB 08 ADB 145	Thaisa Madrasa More to Monirampur Hat Part to Tisa Madrasha to Talgora Math	1.171
107	Hooghly	WB 08 ADB 145	Udghardaha Bokartala to Talgara Math Part to Tisa Madrasha to Talgora Math	1.239
108	Hooghly	WB 08 ADB 145	Dharmatas Shop to High School	1.337
109	Hooghly	WB 08 ADB 149	Chandrahati Bazar to Strk Road Part to Uttar Hazipur	1.658
110	Hooghly	WB 08 ADB 151	House to A Chaterjee Digsui to Gannegarhn Part to Raypur More to Bagri Football Ground	2.250
111	Hooghly	WB 08 ADB 153	Kual Durga Mandir to Jaypur Dal Dwara Village Part to Kabirhato to Mamudpur	0.510
112	Hooghly	WB 08 ADB 153	Jaypur Middle Road to House to Paresh Ghosh Via Sibtala Part to Kabirhati to Mamudpur	2.191
113	Hooghly	WB 08 ADB 155	Bhawanipur to Aknapur Part to Baligari Aknapor And Bhabanipur	3.930
114	Hooghly	WB 08 ADB 160	Ramnagar Battala to Ausatra Border Line Part to Saleypur Jagjivanpur	2.100
115	Hooghly	WB 08 ADB 166	Nanda Damatirdhar to Palara Part to Galaghata to Diara Via Mollasimla Po	2.900
116	Hooghly	WB 08 ADB 167	Balarampur Pirtala to Hati River Side	2.993
117	Hooghly	WB 08 ADB 172	Dewanbheri to Pawnan Part to Dewanbheri Kachari More to Bilatpur Bridge	2.630
118	Hooghly	WB 08 ADB 178	Chakrapur More to Ganeshpur Ghat Part to Chakrapur to Ganeshpur to Ketadal	2.510
119	Hooghly	WB 08 ADB 179	Tantulia School to Ganeshpur Part to Chakrapur to Ganeshpur to Ketadal	3.380
120	Hooghly	WB 08 ADB 180	Tantulia Primary School to Tantulia Chakrabortypara Part to Chakrapur to Ganeshpur to Ketadal	1.360
121	Hooghly	WB 08 ADB 181	Radhakrishanapur Guarishop to Radhakrishanapur Gayenparan And Bazar	1.640
122	Hooghly	WB 08 ADB 182	Sundarpur Culvert to Jagatpur Ferryghat	1.370
123	Hooghly	WB 08 ADB 183	Dhanayaghory High School to Ghoradaha Sibtala Part to Nandanpur to Dhnyaghari	2.200
124	Hooghly	WB 08 ADB 183	Nandanpur Rathtala to Goradaha Part to Nandanpur to Dhnyaghari	5.133

Sl	District	Package No.	Road Name	Length (km)
125	Hooghly	WB 08 ADB 185	Palashpai Keyatala to Taljogi Part to Palashpai to Mustafapur to 24pur Bazar	1.480
126	Hooghly	WB 08 ADB 186	Mostafapur Bridge to Santrapara Part to Palashpai to Mustafapur to 24pur Bazar	2.970
127	Hooghly	WB 08 ADB 187	Chinra Kalitala to Jhikira Part to Palashpai to Mustafapur to 24pur Bazar	2.460
128	Hooghly	WB 08 ADB 189	Amarpur to Kabilpur	4.425
129	Hooghly	WB 08 ADB 190	Bagpara to Garberia Part to Chatrasal Market to Daspur Primary School	1.450
130	Hooghly	WB 08 ADB 190	Connection to Bt Road to Palpara Part to Ghosh Pur Bhomara Khal to Pole Cimana	0.720
131	Hooghly	WB 08 ADB 190	24 No Gansha to Chakradua Part to Connection to Bt Road to Palpara	0.745
132	Hooghly	WB 08 ADB 192	Sankarpur to Darakeswar Riverside Part to Thakuranichak Ferry Ghat to Kachra More to Khanakul	6.859
133	Hooghly	WB 08 ADB 192	Kachra More to River Side Part to Thakuranichak Ferry Ghat to Kachra More to Khanakul	1.715
134	Hooghly	WB 08 ADB 194	Gujrath Gomati Gora to Chunghdanga Ranapara also Known as Chaubangh to Adhikaripara	1.800
135	Hooghly	WB 08 ADB 194	Gobindapur Malapur to Gobindapur Adakpara Part to Tilakchak Metal Road to Gobindapur.	1.450
136	Hooghly	WB 08 ADB 194	Joyramchak More to Kadarpur Vimtala also Known as Joyramchak to Kedarpur	1.500
137	Hooghly	WB 08 ADB 195	24 No Bus Road to Hospital Rasta also Known as Samantapara to Moyal	3.770
138	Hooghly	WB 08 ADB 201	Chandipur Bamna to Idelbati Mondalpara Part to Doulabati to Metal Road Jn	4.110
139	Murshidabad	WB 13 ADB 26	Kashipur Jora Bottola to Andulberia#	3.420
140	Murshidabad	WB 13 ADB 30	Rajdsharpara to Bholla	3.375
141	Murshidabad	WB 13 ADB 31	Azimganj Gola to Shambhunagar	3.010
142	Murshidabad	WB 13 ADB 32	Baruipara Telkal to Balarampur	5.400
143	Murshidabad	WB 13 ADB 33	Miarbagan More to Soharbasa	5.300
144	Murshidabad	WB 13 ADB 34	Choa Kanarbari More to Makpara	5.950
145	Murshidabad	WB 13 ADB 35	Rathtalapara to Dangapara	2.250
146	Murshidabad	WB 13 ADB 36	Baruipara Charusahah More to Akundaberia	6.421
147	Murshidabad	WB 13 ADB 37	Kesaipur to Tartipur Dakshin	5.615
148	Murshidabad	WB 13 ADB 38	Miarbagan More to Kedertala	4.870
149	Murshidabad	WB 13 ADB 39	Narasinghapur Bazar to Chakmathura	4.500
150	Murshidabad	WB 13 ADB 40	Piprikhali More to Ghola	5.996
151	Murshidabad	WB 13 ADB 41	Jhowbona to Chandabadj	5.134
152	Murshidabad	WB 13 ADB 42	Moktarpur More to Chatra	3.877
153	Murshidabad	WB 13 ADB 43	Chatra to Maheswerpur	2.930
154	Murshidabad	WB 13 ADB 44	Kashipur to Kulgachi	5.535
155	Murshidabad	WB 13 ADB 45	Dararkndi to Nutan Beliashyampur	5.250
156	Murshidabad	WB 13 ADB 50	Kandi Panchthupi More to Nandibeneswar	3.000
157	Murshidabad	WB 13 ADB 52	Kandi Saithiya to Badua	2.250
158	Murshidabad	WB 13 ADB 53	Haripur to Mahisar	2.400
159	Murshidabad	WB 13 ADB 58	Andi More to Beldanga#	7.200
160	Murshidabad	WB 13 ADB 60	Gopgram to Rainda (Lo25)	2.600
161	Murshidabad	WB 13 ADB 61	Simanapara to Tiadanga (Lo21)	8.260
162	Murshidabad	WB 13 ADB 62	Balarambati to Bhumihar(Lo36)	5.700
163	Murshidabad	WB 13 ADB 63	SH-7 to Kanlla#	5.240

Sl	District	Package No.	Road Name	Length (km)
164	Murshidabad	WB 13 ADB 64	SH-11 to Golaghat#	1.800
165	Murshidabad	WB 13 ADB 65	Moheshpur to Tofapur#	1.300
166	Murshidabad	WB 13 ADB 69	Kandi Panchtuphi Aucca Road to Brahanampara	2.680
167	Nadia	WB 14 ADB 31	Mahesnagar to Bedberia#	10.887
168	Nadia	WB 14 ADB 32	Sabujpally More to Santipur Laxmitala Para#	10.318
169	Nadia	WB 14 ADB 33	Thakur Tala to Jatrapur	6.012
170	Nadia	WB 14 ADB 34	Dwarikangar to Baliadanga#	12.780
171	Nadia	WB 14 ADB 35	Bishnupur Hospital Para to Goyal Para	10.242
172	Nadia	WB 14 ADB 36	Sondanga Indrapally to Balainagar#	3.411
173	Nadia	WB 14 ADB 37	Barabigha Fakir Danga to Arbetai	5.543
174	Nadia	WB 14 ADB 38	Mrigimathpara to Bagadoba	5.046
175	Nadia	WB 14 ADB 40	Sundalpur to Chak Madhubona	3.571
176	Nadia	WB 14 ADB 41	Hagnagari to Fazil Nagar Ghat	4.287
177	Nadia	WB 14 ADB 42	Palashi Math to Harinathpur	24.276
178	Nadia	WB 14 ADB 43	Simaistala to Durgapur	2.896
179	Nadia	WB 14 ADB 44	Ayurbedic Hosptal More to Rautari Dakshin	13.653
180	Nadia	WB 14 ADB 45	Char Nandanbati to Haringhata#	2.368
181	Nadia	WB 14 ADB 46	Angana Go Hater More to Jahangirpur Dakshinpara	5.509

APPENDIX 2: ECOPS OF SAMPLE ROADS IN WEST BENGAL
RURAL ROADS: ENVIRONMENT CHECKLIST

Road Name: **Andi more to Beldanga**

Block Name: **Burwan**

District Name: **Murshidabad**

Total Length of the Road: **7.200Kms.**

A. Climatic Conditions

Temperature	*High: 30°C(May) Low: 18°C(Dec)*
Humidity	*High: 85% in July* *Low: 43% in March*
Rainfall Rainy Season	*1344 mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 24m The topography of the area is flat in nature**.**
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area		√	There is no habitation area beside the alignment, some habitation areas namely kalyanpur, Bahara, Hatia some away from the proposed road
6.	Agricultural Land	√		Agricultural land exists beside the alignment discontinuously near 000m-7200m.
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)***		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) 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 no lakes/swamps beside the road, but some ponds and water bodies found during transect walk at Ch. 75m, 992m, 2588m.
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 rivers or canal, but few cross drainage structures were also found at Ch. 36m, 616m, 1075m, 1550m, 1835m, 2258m, 2940m, 3214m, 3724m, 3969m & so on.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 8 nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[17] within 10 m on either side from the centre line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 33 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the centre line of the road alignment. (List placed in attachment-2)

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

10.	Are there any religious, cultural or community structures/buildings[18] within 10 m on either side from the centre line of the road alignment? ***(If yes attach list with chainage)***	√		There are 1 nos. of religious / cultural / community structures (School, Temple, ICDS etc.) within 10m on either from the centre line of the road alignment. (List placed in attachment-3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 05.04.17(List of people attached).
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

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

Attachment I

List of Trees		
Chainage(M)	**Left (No.of Trees)**	**Right (No. of Trees)**
22		TREE
47		TREE
73		TREE
103		TREE
107	TREE	
120	TREE	
3496		TREE
3542	TREE	

Attachment II

List of Utilities		
Chainage(M)	**Left**	**Right**
1251		EP
1905	EP	
1951		EP
2011	EP	EP
4292		EP
4312	EP	
4337		EP
4411	EP	
4481		EP
4501	EP	
4568		EP
4590	EP	
4896	EP	
4900		EP
4991	EP	
5202	EP	
5401		EP
5606		EP
6129		EP
6208	EP	
6307		EP
6401	EP	
6489	EP	
6509		EP
6589	EP	
6701	EP	
6796		EP
6829	EP	
Chainage (M)	**Left**	**Right**
6981	EP	
7106	EP	
7176		EP
7190	EP	

Attachment III

List of Community Structures		
Chainage (M)	**Left**	**Right**
30	EP	
7195		SCHOOL

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					22		TREE				
					36						CD
					47		TREE				
					73		TREE				
		POND			75						
					103		TREE				
		TREE			107						
		TREE			120						
					616						CD
		POND			992			POND			
					1075						CD
					1251			EP			
					1550						CD
					1835						CD
		EP			1905						
					1951			EP			
		EP			2011			EP			
					2254						CD
		POND			2588						
					2940						CD
					3214						CD
					3314						CD
					3496			TREE			
		TREE			3542						
					3724						CD
					3969						CD
					4292			EP			
		EP			4312						
					4337			EP			CD
		EP			4411						
					4481			EP			
		EP			4501						
					4568			EP			
					4585						CD
		EP			4590						
		EP			4896						
					4900			EP			

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		EP			4991						
		EP			5202						
					5390						CD
					5401			EP			
					5606			EP			
					5755						CD
					6129			EP			
		EP			6208						
					6307			EP			
		EP			6401						
					6425						CD
		EP			6489						
					6509			EP			
		EP			6589						
					6686						CD
		EP			6701						
					6796			EP			
		EP			6829						
		EP			6981						
		EP			7106						
					7176			EP			
		EP			7190						
					7195				SCHOOL		
END POINT					**7200**	**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump, A.L - Agriculture Land; C.D - Cross Drainage structurestructure, TRF- Transformer

RURAL ROADS: ENVIRONMENT CHECKLIST

Road Name: **Balagarh CDP Part of Kaliagaarh**

Block Name: **Balagarh**

District Name: **Hoogly**

Total Length of the Road:**2.702 km**

A. Climatic Conditions

Temperature	High: 38°C (May) Low: 16°C(Dec)
Humidity	High: 78% in July Low: 30% in March
Rainfall Rainy Season	1500mm/year June to mid-September

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		√	Distance from Coastline: km. The area is far away from CRZ (Coastal Regulation Zone).
				( ) 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: 13m The topography of the area is flat in nature.
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: There is no forest area beside the alignment. 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 : **N.A.** Endangered species (if any):**None,**
5.	Inhabited Area	√		There are few villages namely Bagun para), Banerjee para Bharpara Nimtola ,Sardar para ,Tamilpara
6.	Agricultural Land	√		Some part of 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.	BarrenLand		√	There is no barren land beside the alignment.

B. 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)***		√	There is no landslide or erosion problem along the road. ( ) No Secondary Information is available and Local Community is not aware of this matter
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		√	There are no lakes/swamps beside the road. But there are some ponds and water bodies at . 433m to 562m,1410 to 1588m. (LHS).And 562 to 670m and 2023m to 2213m 2.300m.2.702m RHS Also there are some ponds and water bodies exist at ch 1410, 1597, 1685, 2044m, (LHS) & 0.419 Km, 670m, 795m, 1234m, 1578m, (RHS).
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There is no nallas/Stream/rive .etc along /crossing the road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		√	There is no water stagnation problem in the project 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)***		√	The area is not prone to flooding problem. ( ) 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 6 Nos. of trees with a dbh of 30m or more within 10m on either side of the alignment. (List placed at 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. Has been 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?		√	There is no evidence of endangered species of flora & fauna within 100m from road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[19] within 10 m on either side from the center line of the road alignment?	√		There are 34 Nos. of utility structures (EP, TP, HP, TRF etc.) within 10m on either side of the

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

No.	Parameter/ Component	Yes	No	Explanation
	(If yes, attach list with chainage)			centre line of road alignment. (List placed at Attachment II)
10.	Are there any religious, cultural or community structures/buildings[20] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***		√	There are 10 Nos of religious, cultural or community structures within 10m on either side of the alignment. (List placed at Attachment III)

C. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 08.02.20117 (list of people attached).
2.	Any suggestion received in finalizing the alignment	√		Community suggested to construct culverts, speed breakers, restoration of borrow pits as per requirement.
3.	If suggestions received, were they incorporated into the design?		√	Suggestions will be incorporated after discussion with respective PIU.

D. 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.

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

Attachment I

List of trees

Chainage(M)	Left (No. of Trees)	Right (No. of Trees)
1066m		TREE
1156m		TREE
1588m	TREE	
2213m		TREE
2223m		TREE
2233m		TREE

Attachment II

List of Utilities

Chainage (M)	Left	Right
6m	EP	
46m		EP
74m	EP	
82m		EP
112m	EP	
137m	EP	
272m		EP
352m		EP
373m	EP	
391m		EP
433m	EP	
453m	EP	
480m		EP
530m		TF
540m		HP
595m		EP
632m		EP
730m		EP
765m	HP	
811m	EP	
860m	EP	
1071m		EP
1156m	EP	
1421m		EP
1438m		EP
1768m	HP	
1782m		EP
1963m		
2023m		EP
2044m		
2081m		EP
2093m		TF
2161m	HP	
2187m	EP	
2263m	EP	
2588m	EP	

Attachment III

List of Community Structures

Chainage (M)	Left	Right
79m	KALI BADI	
178m		CLUB
220m	MOSJID	
460m		I.C.D.S
1438m	I.C.D.S	
1454m	CLUB	
1548m		TEMPLE
1588m	SOSTI TOLA	
1768m		SIBTOLA
1963m		TEMPLE

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0 m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		6m						
					46m		EP				
			EP		74m						
		KALI BADI			79m						
					82m		EP				
			EP		112m						
				EP	137m						
					178m		CLUB				
			MOSJID		220m						
					272m		EP				
					352m	EP					
				EP	373m						
					391m	EP					
					419m		POND				
				EP	433m						
			EP		453m						
					460m		I.C.D.S				
					480m		EP				
					530m		TF				
					540m		HP				
					562m						CD
					595m		EP				
					632m		EP				
					670m		POND				
		MANGO GARDEN			679m						
					730m		EP				
			HP		765m						
					795m		POND				
			EP		811m						
			EP		860m						
					890m			MANGO GARDEN			
					966m		POWER STN.				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0 m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					1066m		TREE				
					1071m		EP				
			EP		1156m		TREE				
					1234m		POND				
					1298m						CD
			POND		1410m						
					1421m		EP				
		I.C.D.S			1438m		EP				
			CLUB		1454m						
					1534m						CD
					1548m			TEMPLE			
					1578m		POND				
			SOSTI TOLA/TREE		1588m						
			POND		1597m						
					1634m		POND				
					1685m						CD
			HP		1768m			SIBTOLA			
					1782m		EP				
					1963m			TEMPLE			
					2023m		EP				
			POND		2044m						
					2081m		EP				
					2093m		TF				
			HP		2161m						
			EP		2187m						
					2213m	TREE					
					2223m	TREE					
					2233m	TREE					
			EP		2263m						
					2316m						CD
			EP		2588m						
			END POINT		2702m		END POINT				

RURAL ROADS: ENVIRONMENT CHECKLIST

Road Name: **Banna To Radhanagar part of Narayanpur store BPR**

Block Name: **Dhanikhali**

District Name: **Hoogly**

Total Length of the Road: **4.128Kms.**

A. Climatic Conditions

Temperature	*High: 36°C(May) Low: 14°C(Dec)*
Humidity	*High: 92% in July* *Low: 45% in March*
Rainfall Rainy Season	*1550mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 13m The topography of the area is flat in nature.
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:There is no forest area beside theproject road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment .
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals:N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		There are some inhabited areas at ch.000m-332m (Chowtara) 1871m-2110m (Banna), 2714m – 4128m (Banna)
6.	Agricultural Land	√		Agricultural land exists beside the alignment discontinuouslynear 332m-1871m, 2110m-2714m,
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was notobserved beside the alignment.

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)***		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) 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 no lakes/swamps beside the road, but some ponds and water bodies found during transect walk at Ch. 2128m, 2727m, 3197m, 3510m, 3692m (LHS) & 100m, 166m, 368m, 485 & so on(RHS).
3.	Are there any nallas/streams/rivers etc. along/crossing the road? **(*If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There are no rivers, but there are canals crossing the alignment at Ch. 386m-416m. In addition to it few cross drainage structures were also found at Ch. 693m, 1088m, 1220m, 1421m, 1804m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**	√		Water stagnation problem was found between ch. 212m–300m & 348m-484m on the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 34 nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species offlora orfauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[21] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 86 nos. of utility structures (EP, HP, TP, TF etc.)within 10m on either sidefrom the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[22] within 10 m on either side from the center line of the road alignment?	√		There are 9 nos. of religious / cultural / community structures (School,Temple, ICDS etc.) within 10m on either from the center line

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

No.	Parameter/ Component	Yes	No	Explanation
	(If yes attach list with chainage)			of the road alignment. (List placed in attachment-3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 14.03.17(List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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(M)	**LHS**	**RHS**
16	TREE	
570		TREE
763		TREE
769		TREE
794		TREE
797		TREE
806		TREE
809		TREE
824		TREE
829		TREE
830		TREE
874		TREE
883		TREE
905		TREE
906		TREE
907		TREE
910		
975		TREE

List of Trees		
Chainage(M)	**LHS**	**RHS**
976		TREE
1077		TREE
1207	TREE	
1252		TREE
1266		TREE
1569	TREE	
1581		TREE
1897	TREE	
2057		TREE
2091		TREE
2780	TREE	
3185		TREE
3536		TREE
3552		TREE
3556		TREE
3572		TREE
3843		TREE

Attachment 2

List of Utilities		
Chainage (M)	**Left**	**Right**
7		EP
48		EP
79	EP	
123	EP	
166	EP	
278	EP	
544		EP
568		EP
635	EP	EP
703		EP
1088		HP
1091		EP
1121	EP	
1159		EP
1160		HP
1191	EP	
1241		EP
1295	EP	
1339		EP
1456	EP	
1535	EP	
1770		EP
1815	EP	
1864		EP
1911	EP	
1956	EP	
1964		EP
2047		HP
2110		EP
2533		EP

List of Utilities		
Chainage (M)	**Left**	**Right**
2578	EP	
2715		
2727		EP
2764		HP
2791	EP	
2803		HP
2806		
2809	EP	
2856	EP	
2883		EP
2890	TRF	
2893		
2898		EP
2941	HP	
2944	EP	
2985	EP	
3001	EP	
3043		EP
3095	EP	
3105		
3134	EP	
3144	EP	
3154	EP	
3175	EP	
3210		EP
3230	HP	
3234	EP	
3264	EP	
3317	EP	
3381	EP	
3387		EP
3404		EP
3427		EP
3453		EP
3482	EP	
3494	HP	
3516	EP	
3600	EP	
3638	EP	
3647	EP	
3661	EP	
3712		EP
3717	EP	
3727		EP
3730	HP	
3763		EP
3796	EP	
3839	EP	
3850		EP
3857		EP
3872	EP	

List of Utilities		
Chainage (M)	**Left**	**Right**
3887	EP	
3914	EP	
3948		EP
3982	HP	
4040	EP	HP
4076	EP	
4110		EP

Attachment 3

List of Community Structures		
Chainage (M)	**LHS**	**RHS**
306		SAMABAY SAMITY
2464		BURING GHAT
3105		Club
3348	FP SCHOOL	
3387	TEMPLE	
3566		club
4035		TEMPLE
4092		Library
4128		FP SCHOOL

Attachment – 4

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					7		EP				
		TREE			16						
					48		EP				
		EP			79						
					100				POND		
			EP		123						
			EP		166						
					200			POND			CD
			EP		278						
					306		SAMABAY SAMITY				
					368			POND			
					370						CD
					485		POND				
					544		EP				
					568		EP				
					570		TREE				
					590						CD
			EP		635		EP				
					703			EP			
					763		TREE				
					769		TREE				
					794		TREE				
					797		TREE				
					806		TREE				
					809		TREE				
					824		TREE				
					829		TREE				
					830		TREE				
					874		TREE				
					883		TREE				
					905		TREE				
					906		TREE				
					907		TREE				
					910						CD
					975		TREE				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					976		TREE				
					1069			POND			CD
					1077		TREE				
					1088			HP			
					1091			EP			
			EP		1121						
					1159			EP			
					1160		HP				
			EP		1191						
		TREE			1207						
					1241		EP				
					1252			TREE			
					1266		TREE				
			EP		1295						
					1321						CD
					1339		EP				
			EP		1456						
		EP			1535						
			TREE		1569						
					1581			TREE			
					1770		EP				
					1774						CD
			EP		1815						
					1864		EP				
			TREE		1897						
			EP		1911						
		EP			1956						
					1964		EP				
					2047			HP			
					2057		TREE				
					2071		POND				CD
					2091			TREE			
					2110		EP				
			POND		2188						
					2358-2430			PLAY GROUND			

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					2464		BURING GHAT				
					2528			POND			
					2533		EP				
			EP		2578						
					2715						CD
					2719		POND				
			POND		2727			EP			
					2764			HP			
		TREE			2780						
			EP		2791						
					2803		HP				
					2806						CD
			EP		2809						
		EP			2856						
					2883		EP				
			TRF		2890						
					2893						CD
					2898			EP			
			HP		2941						
			EP		2944						
			EP		2985						
			EP		3001						
					3043		EP				
		EP			3095						
					3105			COMMUNITY STACTURER			
			EP		3134						
		EP			3144						
		EP			3154						
			EP		3175						
					3185		TREE				
		POND			3197						
					3202		POND				
					3210		EP				
			HP		3230						
			EP		3234						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		3264						
			EP		3317						
			FP SCHOOL		3348						
			EP		3381						
			TEMPLE		3387			EP			
					3404		EP				
					3427		EP				
					3453		EP				
		EP			3482						
			HP		3494						
			POND		3510						
			EP		3516						
					3535		POND				
					3536			TREE			
					3552		TREE				
					3556		TREE				
					3566		club				
					3572		TREE				
		EP			3600						
			EP		3638						
			EP		3647						
			EP		3661						
		POND			3692						
					3712			EP			
		EP			3717						
					3727		EP				
			HP		3730						
					3763		EP				
			EP		3796			POND			
					3814						CD
		EP			3839						
					3843		TREE				
					3850			EP			
					3857			EP			
			EP		3872						
			EP		3887						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
8m to 10m	**6m to 8m**	**4m to 6m**	**2.75m to 4m**	**0m to 2.75m**	**Chainage (M)**	**0m to 2.75m**	**2.75m to 4m**	**4m to 6m**	**6m to 8m**	**8m to 10m**	**CD**
		EP			3914						
					3919			POND			
					3948		EP				
			HP		3982						
					4035			TEMPLE			
			EP		4040		HP				
					4059						CD
			EP		4076						
					4092		Library				
					4110		EP				
					4128			FP SCHOOL			
END POINT					4128	**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Bilaayatpur To Komdhara Part Of Paschim Narayanpur To Kondhara**

Block Name**:** **Pollba-Dadpur**

District Name: **Hooghly**

Total Length of the Road: **3.750 Km.**

A. Climatic Conditions

Temperature	*High: 38°C (May) Low: 16°C(Jan)*
Humidity	*High: 78% in July* *Low: 24% in March*
Rainfall Rainy Season	*1500 mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 12 m (*above msl*) The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any): **None**
5.	Inhabited Area	√		Inhabited areas of the small villages (Bilaayatpur, Komdhara, Mathurkur, Adra) are concentrated beside the alignment near Ch. 000 to 460m, 0710m to 2560m, 2745m to 3070m, 3150m to 3226m.
6.	Agricultural Land	√		The project road passes through the inhabited areas of small villages namely Bilaayatpur, Komdhara, Mathurkur, Adra as well as beside the agricultural lands (Both side) from Ch. 3246m to 3750m. Bamboo bushes and vacant land also exists at some places.
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment.
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)***		√	There is no landslide problem since there is no hilly 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*)**	√		Some small & big ponds exist beside the project road near Ch. 22m, 135m, 191m, 290m, 425m, 472m, 716m and so on. One canal Crosses the road near Ch 0488m.Giya river flows parallel to the project road near Ch. 2725m to 2820m (LHS). Swampy area was noted near Ch. 1720m to 1770m (RHS) during the transect walk.
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***	√		One canal Crosses the road near Ch 0488m.Giya river flows parallel to the project road near Ch. 2725m to 2820m (LHS).
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**		√	Water stagnation problem was not observed. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is not flood prone. (According to discussion with villagers). But some portion of the project corridor was flooded by the Giya river in the year 2000. ( ) 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 107 nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)***		√	There are no such areas within 100m from 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[23] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 81 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[24] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are 14 nos. of religious / cultural / community structures (School, Temple Health Centre, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 10.02.2017 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work. Local people suggested to extend the project road up to Ch.5000m.
3.	If suggestions received, were they incorporated into the design?	√		Suggestions received and final decision will be taken after discussion with respected PIU.

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(M)	Left (No.of Trees)	Right (No. of Trees)
35		TREE
135	TREE	
160	TREE	
179		TREE
191		TREE
490	TREE	
757	TREE	
462	TREE	
934	TREE	
942	TREE	
980	PALM TREE	
984	PALM TREE	TREE
986	PALM TREE	
1015	TREE	EP
1045	TREE	
1190	TREE	
1200-1219	4 PALM TREE	
1246	TREE	
1290	TREE	
1467	TREE	
1472	PALM TREE	
1480	PALM TREE	
1513	PALM TREE	
1593	TREE	
1620	TREE	
1624	PALM TREE	
1660	PALM TREE	
1713	TREE	
1720	TREE	TREE
1736		TREE
1770		PALM TREE
1774		PALM TREE
1781		PALM TREE
1810		PALM TREE
1820		PALM TREE,
1984		TREE
1997-2000		5 PALM TREES
2105		TREE
2134		TREE
2142		TREE
2200		TREE
2210-2238		3 PALM TREES
2245-2282	2 PALM TREES	4 PALM TREES
2340	PALM TREE	
2394		TREE
2490		TREE
2510	TREE	
2560		TREE
2570	TREE	
2611	TREE	
2620	TREE	TREE

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
2622	TREE	TREE
2625		TREE
2628		TREE
2630	TREE	TREE
2641		TREE
2651		TREE
2660		TREE
2674		TREE
2676		TREE
2693		TREE
2720	TREE	
2728	TREE	
2732	TREE	
2745	TREE	
2821	TREE	
3063		TREE
3080	TREE	
3111	TREE	
3226		TREE
3270	TREE	
3318		TREE
3320	TREE	
3326	TREE	
3330	TREE	
3337		TREE
3340	TREE	
3351		TREE
3359	TREE	
3372		TREE
3381	TREE	
3394		TREE
3410	TREE	
3641		TREE
3677		TREE
3690		TREE
3709		TREE
3715	TREE	
Total	54	53

Attachment 2

List of Utilities

Chainage(M)	Left	Right
0	HP	
22		EP
30		EP
64	EP	
135		EP
160		EP
183		TAP
191	EP	
237	EP	
272		EP
311	EP	

List of Utilities

Chainage(M)	Left	Right
350		EP, TAP
367		EP
421		HP
425		EP
460		EP
716		EP
757		EP
804		EP
843		EP
853		EP
980		EP
1045		EP
1085		EP
1131		EP
1219		EP
1262		EP
1282	HP	
1290		EP
1319		EP
1373		EP
1418		EP
1472		EP
1513		EP
1552		EP
1598		EP
1624		EP
1666	EP	
1681	HP	
1698		EP
1764		EP
1806		EP
1832	EP	
1865	HP	
1870		EP
1908		EP
1961	EP	
1988	EP	
1993		HP
2094	EP	
2134	EP	
2188	EP	
2240		EP
2245-2282	EP	
2414	EP	
2438		EP
2484		EP
2500	EP	
2556		EP
2584	EP	
2628	EP	
2641	HP	
2720		EP

List of Utilities

Chainage(M)	Left	Right
2725		EP
2728		TRF
2732		EP
2745		HP
2783		EP
2822	EP	
2871	EP	
2915		EP
2920	EP	
3012		EP
3063	EP	
3111		EP
3150	HP	
3157	EP	
3226	EP	
3246	TAP	
3300	EP	
Total	30	51

Attachment 3

List of Community Structures

Chainage(M)	Left	Right
396	HARIMANDIR	
410		P.SCHOOL
478	RELIGIOUS PLACE	
1262	RELIGIOUS PLACE	
1870	CLUB	
1881	P.SCHOOL	
1961		TEMPLE
1967	P.SCHOOL	
2041		RELIGIOUS PLACE
2651	ICDS	
2674	P.SCHOOL	
2693	TEMPLE	
2700	RELIGIOUS PLACE	RELIGIOUS PLACE
TOTAL	10	4

Attachment 4

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			HP		0						
				POND	22		EP				
					30	EP					
					35	TREE					
			EP		64						
			TREE	POND	135		EP				
			TREE		160		EP				
					179		TREE				
					183		TAP				
			EP	POND	191		TREE				
			EP		237						
					272		EP				
		HP	POND		290						
			EP		311						
					350		EP, TAP, POND				
					367		EP				
		HARI MANDIR			396						
					410		P.SCHOOL				
					421	HP					
			POND		425		EP				
					460		EP				
			POND		472						
				RELIGIOUS PLACE	478						
					488						CD
			TREE		490						
			POND		716		EP				
			TREE		757		EP				
			TREE		462						
					804	EP					
					843		EP				
					853		EP				
			TREE		934						
			TREE		942						
			PALM TREE		980		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			PALM TREE		984		TREE				
			PALM TREE		986						
			TREE		1015	EP					
			TREE		1045		EP				
					1085		EP				
					1131		EP				
			TREE		1190						
			4 PALM TREE		1200-1219						
					1219		EP				
			TREE		1246						
			RELIGIOUS PLACE		1262		EP				
			HP		1282						
			TREE		1290		EP				
					1319		EP				
					1373		EP				
					1418		EP				
				TREE	1467						
			PALM TREE		1472		EP				
			PALM TREE		1480						
			PALM TREE		1513	EP					
					1552		EP				
			TREE		1593						
					1598		EP				
			TREE		1620						
			PALM TREE		1624		EP				
			PALM TREE		1660						
			EP		1666						
			HP		1681						
					1698		EP				
				TREE	1713						
			TREE		1720		TREE				
					1736		TREE				
					1764		EP				
					1770		PALM TREE				
					1774		PALM TREE				
					1781		PALM TREE				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					1806		EP				
					1810		PALM TREE				
					1820		PALM TREE, POND				
				EP	1832		POND				
			HP		1865						
			CLUB		1870		EP				
				P.SCHOOL	1881						
					1890		POND				
					1908		EP, POND				
			EP		1961	TEMPLE					
			P.SCHOOL		1967		POND				
					1984	TREE					
			EP		1988						
					1993		HP				
					1997-2000		5 PALM TREES, POND				
					2041		RELIGIOUS PLACE				
			EP		2094						
					2105	TREE					
			EP		2134	TREE					
					2142	TREE					
			EP		2188		POND				
					2200		TREE				
					2210-2238		3 PALM TREES, POND				
					2240		EP				
			2 PALM TREES, EP, POND		2245-2282		4 PALM TREES, 2 PONDS				
			PALM TREE		2340						
					2394	TREE					
			EP		2414						
			TAP		2424						
					2438		EP, POND				
					2484	EP					

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					2490		TREE				
			EP		2500						
			TREE		2510						
					2556		EP				
					2560	TREE					
TREE					2570					TREE	
			EP		2584						
			TREE		2611						
			TREE		2620	TREE					
			TREE		2622	TREE					
					2625		TREE				
			EP		2628	TREE					
			TREE		2630	TREE					
			HP		2641	TREE					
			ICDS		2651	TREE					
					2660		TREE				
				P.SCHOOL	2674		TREE				
					2676	TREE					
			TEMPLE		2693		TREE				
	RELIGIOUS PLACE				2700		TREE, RELIGIOUS PLACE				
			TREE		2720		EP				
					2725		EP				
			TREE		2728		TRF				
				TREE	2732		EP				
			TREE		2745		HP				
					2783		EP				
					2820						CD
			TREE		2821						
			EP		2822						
			EP		2871						
					2915		EP				
			EP		2920						
					3012		EP				
			EP		3063		TREE				
			TREE		3080						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			TREE		3111		EP				
			HP		3150						
			EP		3157						
			EP		3226		TREE				
			TAP		3246						
			TREE		3270						
			EP		3300						
					3318		TREE				
			TREE		3320						
			TREE		3326						
			TREE		3330						
					3337		TREE				
			TREE		3340						
					3351		TREE				
			TREE		3359						
					3372		TREE				
			TREE		3381						
					3394		TREE				
			TREE		3410						
					3641		TREE				
					3677		TREE				
			POND		3690		TREE				
					3709	TREE					
			TREE		3715						
END OF THE ROAD					3750	**END OF THE ROAD**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Char Nandanbati to Haringhata**

Block Name**:** **Chakda**

District Name: **Nadia**

Total Length of the Road: **2.368 Km.**

A. Climatic Conditions

Temperature	*High: 35°C (May) Low: 16°C(Jan)*
Humidity	*High: 91% in July* *Low: 58% in March*
Rainfall Rainy Season	*1427mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 12 m (*above msl*) **The topography of the area is flat in nature.**
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: **There is no forest area beside the project road.** Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* **There is no forest area abutting the alignment.**
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **N.A.** There is no forest area beside or away from the project corridor. Endangered species (if any): **None**
5.	Inhabited Area	√		Inhabited areas of the small villages (Majerchar Kanchari Para, Majerchar Dakshin Para,Char Kanchrapara, Bansbaria Rathtala)are concentrated beside as well as away from the alignment in scattered manner
6.	Agricultural Land	√		The project road passes beside the agricultural land near Ch. 221m to 692 (Both Side)
7.	Grazing grounds	√		Grazing ground exist near Ch. 1084m (RHS) beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)*		√	There is no landslide problem since there is no hilly 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)*	√		Some small & big ponds exist beside the project road near Ch. 425m, 951m,1270m, 1671m, 2295m.Few ponds are deep and dry and accordingly community have suggested to keep provision for protective works (like ballah pilling etc.) beside the above water-bodies to save them as well as the road shoulder.
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*	√		CD structures were noted near Ch. 0m, 1210m, 2350m. Small canal was found parallel to the alignment near Ch. 2168m to 2229m (RHS).
4.	Are there problems of water stagnation and other drainage issues on or near the road? (*If yes, mention chainage)*		√	Water stagnation problem was not observed. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? *(If yes, mention flood level and frequency)*		√	The area along the project road is not flood prone. (According to discussion with villagers). ( ) 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 24 nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)*		√	There are no such areas within 100m from 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[25] within 10 m on either side from the center line of the road alignment?	√		There are 43 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the center line of the road alignment. (List placed in attachment-2)

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

	(If yes, attach list with chainage)			
10.	Are there any religious, cultural or community structures/buildings[26] within 10 m on either side from the center line of the road alignment? *(If yes attach list with chainage)*	√		There are 07 nos. of religious / cultural / community structures (School, Temple Health Centre, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. *(Attach list of people met and dates)*	√		Consultation with local community was conducted on 07.04.2017 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?	√		Suggestions received and have been 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.
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(M)	Left (No.of Trees)	Right (No. of Trees)
21	TREE	
94	TREE	
103	TREE	
118	TREE	
128	TREE	
152	TREE	
172		TREE
238		TREE
264		TREE
290	TREE	

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

294		TREE
305	TREE	
316		TREE
408		TREE
415		TREE
692	TREE	
951	TREE	
1671		RELIGIOUS TREE
1704		TREE
2061	TREE	
2092	TREE	
2104	TREE	
2110	TREE	
2122	TREE	
TOTAL	**15**	**9**

Attachment 2

List of Utilities

Chainage(M)	Left	Right
10		HP
27	EP	
128		EP
215		EP
221	EP	
271	EP	
311		EP
316	EP	
390	EP	
702	EP	
781	EP	
805		EP
830		HP
970	EP	
1012	EP	
1030		EP
1047		EP
1064		EP
1084		EP
1092		EP
1143	EP	
1229		EP
1270		EP
1304		EP
1389		EP
1425	TP	TRF
1475		HP
1484		EP
1506		EP
1650		EP
1791	EP	
1898	HP	
1937	EP	
1989	EP	
2008	EP	

List of Utilities

Chainage(M)	Left	Right
2104		EP
2110		EP
2137	EP	
2168	EP	
2204		EP
2229		EP
2295		EP
TOTAL	**18**	**25**

Attachment 3

List of Community Structures

Chainage(M)	Left	Right
930	RELIGIOUS	
1110	BALAK SANGHA	
1463		TEMPLE
1484		CLUB
1658		CLUB
1937	P.SCHOOL	
2168	TEMPLE	
TOTAL	**4**	**3**

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Connection with SH 7 to Kanlla**

Block Name: **Burwan**

District Name: **Murshidabad**

Total Length of the Road: **5.240 Kms.**

A. Climatic Conditions

Temperature	*High: 30°C(May) Low: 18°C(Dec)*
Humidity	*High: 85% in July* *Low: 43% in March*
Rainfall Rainy Season	*1344mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 24m **The topography of the area is flat in nature.**
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: **There is no forest area beside the project road.** Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* **There is no forest area abutting the alignment.**
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: **N.A.** **There is no forest area beside or away from the project corridor.** Endangered species (if any):**None**
5.	Inhabited Area	√		**There is a inhabited area namely Rainda at ch. 000m-748m**
6.	Agricultural Land	√		**Agricultural land exists beside the alignment from ch. 776m to 2600m.**
7.	Grazing grounds		√	**Grazing ground was not observed beside the alignment**
8.	Barren Land		√	**Barren land was not observed beside the alignment.**

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)***		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) 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 no lakes/swamps beside the road, but some ponds found during transect walk at Ch. 256m, 2142m, 4048m.
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 rivers, but Canal parallely exist from ch.1285m to 1800m, few cross drainage structures were also found at Ch. 2378m, 2555m, 4068m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 7 nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) 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 centre line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 31 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the centre line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[28] within 10 m on either side from the centre line of the road alignment? ***(If yes attach list with chainage)***	√		There are 2 nos. of religious / cultural / community structures (School, Temple, ICDS etc.) within 10m on either from the centre line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 06.04.17(List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

other similar structures.

Attachment I

List of Trees		
Chainage(M)	**Left (No.of Trees)**	**Right (No. of Trees)**
13	Tree	
2127	Tree	
2148	Tree	
3209	Tree	
3706		Tree
3729	Tree	
4468		Tree

Attachment 2

List of Utilities		
Chainage(M)	**Left**	**Right**
46	EP	
101	HP	
145	TRF	
192		EP
345		EP
399		EP
403	EP	EP
3133	EP	
3189	EP	
3369		EP
3412		EP
3608		EP
3698	EP	
3812		EP
4017	EP	
4111		EP
4222		EP
4379		HP
4396	EP	
4484	EP	
4522		EP
4587	EP	
4592		EP
4693		EP
4699	EP	
4782		EP
4819		EP
4879	EP	
4929		EP
5142		EP

Attachment 3

List of Community Structures		
Chainage(M)	**Left**	**Right**
30	EP	
4681		TEMPLE
5117	TEMPLE	

Attachment 4

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			TREE		13						
			EP		46						
			HP		101						
		TRF			145						
					192		EP				
					256		POND				
					345		EP				
					399		EP				
			EP		403		EP				
		DEEP TUBE WELL			455						
			TREE		2127						
					2142		POND				
			TREE		2148						
					2378						CD
					2555						CD
			EP		3133						
			EP		3189						
			TREE		3209						
					3369		EP				
					3412		EP				
					3608		EP				
			EP		3698						
					3706		TREE				
			TREE		3729						
					3812		EP				
			EP		4017						
			POND		4068						CD
					4111		EP				
					4222		EP				
					4379		HP				
			EP		4396						
					4468		TREE				
			EP		4484						
					4522		EP				
			EP		4587						
					4592		EP				
					4681		TEMPLE				
					4693		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		4699						
					4782		EP				
					4819		EP				
			EP		4879						
					4929		EP				
			TEMPLE		5117						
					5142		EP				
END POINT					**5240**	**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure, TRF- Transformer

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Connection with SH11 to Golaghat**

Block Name: **Burwan**

District Name: **Murshidabad**

Total Length of the Road: **1.800 Kms.**

A. Climatic Conditions

Temperature	*High: 30°C(May) Low: 18°C(Dec)*
Humidity	*High: 85% in July* *Low: 43% in March*
Rainfall Rainy Season	*1344mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 24m The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		There is a inhabited area namely Golaghat at ch. 1368m-1800m
6.	Agricultural Land	√		Agricultural land exists beside the alignment from ch. 000m to 1367m.
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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?		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
	(***If yes, indicate the location (right or left side) and the chainage)***			
2.	Are there any lakes/swamps beside the road? (***If yes, list them indicating the location (right or left side)and the chainage***)		√	There are no lakes/swamps beside the road, but there is a pond exists beside the alignment at Ch. 212m, 312m.
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 rivers or canal, but few cross drainage structures were also found at Ch. 343m, 958m, 1069m, 1355m, 1515m, 1612m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 02 nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[29] within 10 m on either side from the centre line of the road alignment? (***If yes, attach list with chainage)***	√		There are 16 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the centre line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[30] within 10 m on either side from the centre line of the road alignment? ***(If yes attach list with chainage)***	√		There are 2 nos. of religious / cultural / community structures (School, Temple, ICDS etc.) within 10m on either from the centre line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 03.04.17(List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

Attachment 1

List of Trees		
Chainage(M)	**Left (No. of Trees)**	**Right (No. of Trees)**
1310	TREE	
1315	TREE	

Attachmen2

List of Utilities		
Chainage(M)	**Left**	**Right**
1246		EP
1367		EP
1462	EP	
1496	EP	
1528	EP	
1543		EP
1561		EP
1591	EP	
1598		EP
1623	EP	
1642		EP
1661		EP
1678	EP	
1736	EP	
1768	EP	
1791	EP	

Attachment 3

List of Community Structures		
Chainage(M)	**Left**	**Right**
30	EP	
1451		SCHOOL
1791		TEMPLE

Attachment 4

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					343						**CD**
					958						CD
					1069						CD
					1246		EP				
					1300			Pond			
			Tree		1310						
			Tree		1315						
					1355						CD
					1367		EP				
					1451			School			
			EP		1462						
			EP		1496						
					1515						CD
			EP		1528						
					1539			Pond			
					1543		EP				
					1561		EP				
			EP		1591						
					1598		EP				
					1612						CD
			EP		1623						
					1642		EP				
					1661		EP				
			EP		1678						
			EP		1736						
			EP		1768						
			EP		1791		Temple				

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure,TRF- Transformer

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Dwarkinagar to Baliadanga**

Block Name**:Ranaghat II**

District Name: **Nadia**

Total Length of the Road: **12.280 Km.**

A. Climatic Conditions

Temperature	*High: 38°C(May) Low: 11°C(Dec)*
Humidity	*High: 85% in July* *Low: 43% in March*
Rainfall Rainy Season	*1970mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 14m The topography of the area is flat in nature.
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: There is no forest area beside theproject road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		Inhabited areas of the small villages are concentrated beside the alignment near Ch.0000m-630m.(Dwarkinagar), Ch.770m.-1200m(Nokari)1200m-1900m(Mathkumra) Ch.1920m-2270m(Dhakuria).3200m-5270m(Srdharpur).5400m-6700m(Talpara), and so on
6.	Agricultural Land	√		Agricultural land exists beside the alignment discontinuouslynear Ch.620m-770m, 2300m3100m, 8725m, 8940m, 10850m-12280m.
7.	Grazing grounds	√		There was no any grazing ground beside the alignment.
8.	Barren Land		√	Barren land was notobserved beside the alignment.

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)***	√		There is no landslide problem since there is no hilly terrain. Erosional problem was noted near ch11700m (according to discussion with villagers). ( ) 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 no lakes/swamps beside the road, but some ponds and water bodies found during transect walk at Ch.199m, 364m, 1920m, 4554m, 5500m(RHS) & 260m, 3703m, 7500m, 8035m, 8163m, 8219m, 9103m, 9158m & so on(LHS).
3.	Are there any nallas/streams/rivers etc. along/crossing the road? (***If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There are no rivers, but few cross drainage structures were also found at Ch. 211m, 239m, 676m, 900m, 1920m, 1980m, 4790m, 5199m & so on.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***	√		Water stagnation problem was not observed beside the alignment ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 are145nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species offlora orfauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[31] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are162nos. of utility structures (EP, HP, TP, TF etc) within 10m on either sidefrom the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[32] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are09nos. of religious / cultural / community structures (School, Temple Mosque, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 15.02.17 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

List of Trees		
Chainage(M)	**Left (No.of Trees)**	**Right (No. of Trees)**
211	Tree	
315	Tree	
350	Tree	
419		Tree
626		Tree
628	Tree	Tree
631		Tree
669	Tree	
671		Tree
1080		Tree
1541	Tree	
1581		Tree
1590	Tree	
1700	Tree	
1730		Tree
1750		
1813	Tree	Tree
1832		Tree
1836	Tree	
1855		Tree
2010	Tree	
2016	Tree	
2022	Tree	
2026	Tree	
2012	Tree	
2138		Tree
2141		Tree
2167	Tree	
2170	Tree	
2200	Tree	
3242	Tree	
3248		Tree
3256	Tree	
3270	Tree	
3300	Tree	
3410		Tree
3420	Tree	
3428	Tree	
3430		Tree
3440		Tree
3445	Tree	
3475		Tree
3485	Tree	
3545		Tree
3558	Tree	
3803	Tree	
3830	Tree	
3833		Tree
3878	Tree	
3901		Tree
3986		Tree

List of Trees		
Chainage(M)	**Left (No.of Trees)**	**Right (No. of Trees)**
4047		Tree
4076		Tree
4086	Tree	
4307		Tree
4338		Tree
4340	Tree	
4409		Tree
4450		Tree
4586		Tree
4637		Tree
4650	Tree	
4670		Tree
4678	Tree	
4693		Tree
4752		Tree
4790		Tree
4822	Tree	
4858		Tree
4888	Tree	
4895		Tree
4905		Tree
4907	Tree	
4992	Tree	
5000		Tree
5048		Tree
5050	Tree	
5133		Tree
5154	Tree	
5153		Tree
5400	Tree	
5405	Tree	
5530	Tree	
5582	Tree	
5629	Tree	
5700	Tree	
5800	Tree	
5835	Tree	
5915	Tree	
5980	Tree	
6028	2 Tree	
6090	Tree	Tree
6100	Tree	
6172	Tree	
6173		Tree
6202	Tree	Tree
6223	Tree	
6300	Tree	
6362	Tree	
6515	Tree	
6555	Tree	
6600	Tree	

List of Trees		
Chainage(M)	**Left (No.of Trees)**	**Right (No. of Trees)**
6780	Tree	
6800	Tree	
6833	Tree	
6842	Tree	
6860	Tree	
6952	Tree	
6988	Tree	
7008	Tree	
7029	Tree	
7422		Tree
7538	Tree	
7600	Tree	
7624		Tree
7879		Tree
7952	Tree	
7972	Tree	
8226	Tree	
8238	Tree	
8332	Tree	
8547	Tree	
9162	Tree	
9203	Tree	
9205		Tree
9264	Tree	
9266		Tree
9312		Tree
9338		Tree
9968	Tree	
10052	Tree	
10160		Tree
10259	Tree	
10400		Tree
10600	Tree	
10714		Tree
10737		Tree
10777		Tree
11314		Tree
11348	Tree	
11359		Tree

Attachment 2

List of Utilities

Chainage(M)	**Left**	**Right**
68	EP	
80	EP	
94	EP	HP
181	EP	
190		HP
217	EP	
272	EP	
300	EP	
355		EP

List of Utilities

Chainage(M)	Left	Right
380		EP
384		HP
387		EP
439	EP	
450	TRF	
461	EP	
493		EP
511	EP	
540		EP
548		EP
556		EP
576	EP	
595	EP	
620		TAP
780		EP
788	EP	
795		EP
800		EP
856	EP	
900		
985		EP
1080	EP	
1100	EP	
1110		EP
1120	EP	
1200		EP
1300		EP
1400		EP
1500	EP	
1530		EP
1549		EP
1730	EP	
1750		EP
1790	EP	
1839		EP
1920		EP
2100	EP	
2134	EP	
2166		EP
2202		EP
2270	EP	
3221	EP	
3225		EP
3265		EP
3300		EP
3370		EP
3560		HP
3643	EP	
3686		EP
3700	EP	
3703		
3802		EP

List of Utilities

Chainage(M)	Left	Right
3845	EP	
3849		EP
3878		EP
3961		EP
3972		HP
3980	EP	
4052	EP	
4089		EP
4122		EP
4132		EP
4185		EP
4201		EP
4300	EP	
4307	TRF	
4599	EP	
4608	EP	
4662		HP
4700	EP	
4729	EP	EP
4800	EP	
4820		EP
5118		EP
5298		EP
5324		EP
5390		EP
5491	EP	
5500	EP	
5547	EP	
5613	EP	
5717	EP	
5745	EP	
5893	EP	
6017	EP	
6050	EP	
6103	EP	
6211	EP	
6240	EP	
6780		EP
6842		EP
6878	EP	EP
6988		EP
7237		EP
7286		EP
7330		EP
7390		EP
7453		EP
7527		EP
7533		EP
7538		EP
7600		EP
7646		EP
7900		EP

List of Utilities

Chainage(M)	Left	Right
7910		EP
7952		EP
7972		EP
8163		EP
8222		EP
8259		EP
8341		EP
8439		EP
8568		EP
8656		EP
8875	EP	
8948	EP	
8992	EP	
9009	EP	
9050	EP	
9091	EP	
9135	EP	
9162		TRF
9300	EP	
9315		EP
9386	EP	
9413	EP	
9448		EP
9637		EP
9968	EP	
9972		EP
10045	EP	
10051		EP
10102	EP	
10111		EP
10163	EP	
10212	EP	
10236		EP
10300	EP	
10458	EP	
10463		EP
10532		EP
10816	EP	
10852	EP	
10855		EP
10866		EP
10928		EP
10966		EP
12068	EP	
12100	EP	
12154	EP	
12186	EP	
12200	EP	

List of Community Structures

Chainage(M)	Left	Right
30	EP	
1900	TEMPLE	
2000	FP SCHOOL	
3711		MOSQUE
4002		SCHOOL
5392	TEMPLE	
7652	SAJAL DHARA	
9200		TEMPLE
9513		SCHOOL
10643	TEMPLE	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		68						
			EP		80						
			EP		94		HP				
			EP		181						
					190		HP				
					199				POND		
				TREE	211						CD
			EP		217						
					239						CD
			POND		260						
			EP		272						
			EP		300						
				TREE	315						
				TREE	350						
					355		EP				
					364			POND			
					380		EP				
					384				HP		
					387		EP				
					419	TREE					
			EP		439						
			TRF		450						
			EP		461						
					493				EP		
			EP		511						
					540		EP				
					548		EP				
					556		EP				
			EP		576						
			EP		595						
					620		TAP				
					626	TREE					
			TREE		628		TREE				
					631	TREE					
				TREE	669						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					671	TREE					
					676						CD
					780		EP				
			EP		788						
					795		EP				
					800		EP				
			EP		856						
					900						CD
					985		EP				
			EP		1080	TREE					
			EP		1100						
					1110		EP				
			EP		1120						
					1200		EP				
					1300	EP					
					1400		EP				
			EP		1500						
					1530		EP				
				TREE	1541						
					1549		EP				
					1581		TREE				
				TREE	1590						
				TREE	1700						
			EP		1730	TREE					
					1750		EP				
			EP		1790						
				TREE	1813	TREE					
					1832	TREE					
				TREE	1836						
					1839			EP			
					1855	TREE					
	TEMPLE				1900						
					1920			EP	POND		CD
					1980						CD
			FP SCHOOL		2000						
				TREE	2010						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
				TREE	2016						
			TREE		2022						
				TREE	2026						
				EP	2100						
				TREE	2012						
				EP	2134						
					2138	TREE					
				EP	2141	TREE					
					2166		EP				
			TREE		2167						
				TREE	2170						
				TREE	2200						
					2202		EP				
			EP		2270						
			EP		3221						
					3225		EP				
				TREE	3242						
					3248		TREE				
				TREE	3256						
					3265		EP				
				TREE	3270						
				TREE	3300		EP				
					3370		EP				
					3410	TREE					
		TREE			3420						
		TREE			3428						
					3430	TREE					
					3440	TREE					
			TREE		3445						
					3475			TREE			
				TREE	3485						
					3545	TREE					
				TREE	3558						
					3560		HP				
		EP			3643						
					3686	EP					
			EP		3700						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		POND			3703						
					3711			MOSQUE			
					3802	EP					
				TREE	3803						
				TREE	3830						
					3833	TREE					
		EP			3845						
					3849	EP					
		TREE			3878	EP					
					3901			TREE			
					3961			EP			
					3972			HP			
		EP			3980						
					3986	TREE					
					4002				SCHOOL		
					4047			TREE			
		EP			4052						
					4076				TREE		
		TREE			4086						
					4089			EP			
					4122				EP		
					4132				EP		
					4185				EP		
					4201	EP					
				EP	4300						
			TRF		4307	TREE					
					4338	TREE					
				TREE	4340						
					4409	TREE					
					4450	TREE					
					4554			POND			CD
					4586	TREE					
	EP				4599						
		EP			4608						
					4637		TREE				
			TREE		4650						
					4662		HP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					4670		TREE				
			TREE		4678						
					4693	TREE					
			EP		4700						
			EP		4729		EP				
					4752		TREE				
					4790	TREE					CD
			EP		4800						
					4820		EP				
				TREE	4822						
					4858	TREE					
				TREE	4888						
					4895	TREE					
					4905		TREE				
				TREE	4907						
			TREE		4992						
					5000		TREE				
					5048	TREE					
			TREE		5050						
					5118		EP				
					5133	TREE					
			TREE		5154						
					5153		TREE				
					5199						CD
					5298		EP				
					5324		EP				
					5390	EP					
			TEMPLE		5392						
				TREE	5400						
				TREE	5405						
				EP	5491						
			EP		5500			POND			
				TREE	5530						
			EP		5547						
				TREE	5582						
			EP		5613						
				TREE	5629						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			TREE		5700						
			EP		5717						
			EP		5745						
			TREE		5800						
				TREE	5835						
			EP		5893						
			TREE		5915						
				TREE	5980						
			EP		6017						
			2 TREE		6028						
			EP		6050						
		TREE			6090		TREE				
		TREE			6100						
			EP		6103						
			TREE		6172						
					6173		TREE				
			TREE		6202		TREE				
		EP			6211						
			TREE		6223						
		EP			6240						
		TREE			6300						
			TREE		6362						
			TREE		6515						
			TREE		6555						
			TREE		6600						
			TREE		6780		EP				
			TREE		6800						
			TREE		6833						
			TREE		6842		EP				
			TREE		6860						
		EP			6878			EP			
			TREE		6952						
		TREE			6988		EP				
			TREE		7008						
			TREE		7029						
					7237		EP				
					7286		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					7330		EP				
					7390		EP				
					7422	TREE					
					7453			EP			
		POND			7500						CD
					7527		EP				
					7533	EP					
					7533						
				TREE	7538		EP				
				TREE	7600	EP					
					7624		TREE				
					7646		EP				
		SAJAL DHARA			7652						
		PLAY GROUND			7813						
					7879	TREE					
					7900		EP				
					7910		EP				
				TREE	7952		EP				
				TREE	7972		EP				
		POND			8035						
					8058						CD
		POND			8163		EP				
					8217						CD
		POND			8219						
					8222		EP				
				TREE	8226						
				TREE	8238						
					8259		EP				
			TREE		8332						
					8341		EP				
					8439		EP				
					8542						CD
			TREE		8547						
					8568		EP				
					8656		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					8716						CD
				EP	8875						
			EP		8948						
				EP	8992						
			EP		9009						
				EP	9050						
			EP		9091						
		POND			9103						
			EP		9135						
		POND			9158						
				TREE	9162		TRF				
					9200		TEMPLE				
				TREE	9203						
					9205	TREE					
					9236						CD
				TREE	9264						
					9266		TREE				
			EP		9300						
					9312		TREE				
					9315		EP				
PLAY GROUND					9338		TREE				
			EP		9386						
				EP	9413						
					9448		EP				
					9513			SCHOOL			
					9637		EP				
			EP/TREE		9968						
					9972		EP				
			EP		10045						
					10051		EP				
				TREE	10052						
			EP		10102						
					10111		EP				
					10160		TREE				
			EP		10163						
			EP		10212						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					10236		EP				
			TREE		10259						
		POND			10296						
			EP		10300						
					10400		TREE				
			EP		10458						
					10463		EP				
					10532			EP			
					10589						CD
		TREE			10600						
			TEMPLE		10643						
					10714		TREE				
					10737		TREE				
					10777		TREE				
			EP		10816						
			EP		10852						
					10855			EP			
					10866			EP			
					10928			EP			
					10966			EP			
					11029						CD
					11314			TREE			
		TREE			11348						
					11359			TREE			
					11738						CD
		EP			12068						
		EP			12100						
		EP			12154						
		EP			12186						
		EP			12200						
END POINT					**12280**	**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure TRF-Transformer

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Puinan to Porabazar part of Hasnan more to Alipurricemill**

Block Name:**Polba-dadpur**

District Name: **Hoogly**

Total Length of the Road: **2.060Kms.**

A. Climatic Conditions

Temperature	*High: 38°C(May) Low: 16°C(Dec)*
Humidity	*High: 92% in July* *Low: 45% in March*
Rainfall Rainy Season	*1500mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 13m The topography of the area is flat in nature**.**
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:There is no forest area beside theproject road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		There are some inhabited areas at ch.000m-1105m (Hasnan) 1217m-1501m (Miarber) 2009m-2060m (Alipur).
6.	Agricultural Land	√		Agricultural land exists beside the alignment discontinuouslynear 1105m-1217m, 1501m-2009m.
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was notobserved beside the alignment.

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)***		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) 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 no lakes/swamps beside the road, but some ponds and water bodies found during transect walk at Ch. 842m, 890m, 1001m, 1019m, 1876m.(RHS) and at ch. 197m, 1001m(LHS).
3.	Are there any nallas/streams/ rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There are no rivers, but few cross drainage structures were also found at Ch. 151m, 222m, 296m, 507m, 596m, 905m, 1314m, 1390m, 1635m, 1857m, 2096m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? ***(If yes, mention chainage)***		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 are22nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species offlora orfauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[33] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are38nos. of utility structures (EP, HP, TP, TF etc.)within 10m on either sidefrom the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[34] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are5 nos. of religious / cultural / community structures (School,Temple, ICDS etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

D. Public Consultation

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

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 10.02.17(List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

List of Trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
145	TREE	
151	TREE	
169		TREE
716		TREE
727		TREE
829		TREE
834		TREE
842		TREE
815		TREE
870		TREE
891	TREE	
927		TREE
954	TREE	
961		TREE
974		TREE
988		TREE
1019	TREE	
1077	TREE	
1175		TREE
1446		TREE
1627		TREE
1876		TREE

Attachment II

List of Utilities

Chainage(M)	Left	Right
30	EP	
78	EP	
96	EP	
101	EP	
145	EP	
155		EP
197		EP
236	EP	
305	EP	
329	EP	
378		EP
398	EP	
425		EP
434		EP
438	EP	
474	EP	
507	EP	
547	EP	
582	EP	
593	EP	
629		EP
663		EP
704	EP	
727	EP	
886		EP

List of Utilities

Chainage(M)	Left	Right
890		
905	EP	
1012		EP
1044	EP	
1087	EP	
1260		EP
1292	EP/HP	
1341	EP	
1351	EP	
1382		HP
1400		EP
1463	EP	
1481	EP	
1538		EP

Attachme nt III

List of Community Structures

Chainage(M)	Left	Right
30	EP	
336	TEMPLE	
545	TEMPLE	
596		TEMPLE
663		TEMPLE
673		TEMPLE

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		30						
					75			PLAY GROUND			
			EP		78						
			EP		96						
			EP		101						
		EP			145						
		TREE			151						
					153						CD
					155			EP			
					169			TREE			
	POND				197			EP			
					222						CD
		EP			236						
					296						CD
		EP			305						
			EP		329						
	TEMPLE				336						
					378			EP			
		EP			398						
					425			EP			
					434			EP			
		EP			438						
		EP			474						
		EP			507						CD
	TEMPLE				545						
		EP			547						
		EP			582						
		EP			593						
					596				TEMPLE		CD
					629			EP			
					663			EP	TEMPLE		
					673				TEMPLE		
		EP			704						
					716			TREE			

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		EP			727			TREE			
					758				TEMPLE		
					829			TREE			
					834			TREE			
					842			TREE	POND		
					857			TREE			
					874			TREE			
					886				EP		
					890				POND		
		TREE			891						
		EP			905						CD
					927			TREE			
		TREE			954						
					960			TREE			
					974			TREE			
					988			TREE			
	POND				1001					POND	
					1012			EP			
		TREE			1019			POND			
		EP			1044						
		TREE			1070						
		EP			1087						
					1175			TREE			
					1260			EP			
		EP/HP			1292						
					1314						CD
		EP			1341						
		EP			1351						
					1382				HP		
					1390						CD
					1400				EP		
					1446			TREE			
		EP			1463						
		EP			1481						
					1538			EP			
		TREE			1627						
					1635						CD

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					1857						CD
					1876			TREE	POND		
					2026						CD
END POINT						**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure TRF- Transformer

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Kashipur To Kulgachi**

Block Name**:** **Bhagwangola - I**

District Name: **Murshidabad**

Total Length of the Road: **5.530 Km.**

A. Climatic Conditions

Temperature	*High: 30°C (May) Low: 18°C(Jan)*
Humidity	*High: 88% in July* *Low: 27% in March*
Rainfall Rainy Season	*1344mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 24 m (*above msl*) The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment .
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		Inhabited areas of the small villages (Kashipur, Badarkismatpur, Ramnapara, Madhyagobindapur, Kulgachi) are concentrated beside as well as away from the alignment in scattered manner.
6.	Agricultural Land	√		The project road passes through the inhabited areas of small villages namely Kashipur, Badarkismatpur, Ramnapara, Madhyagobindapur, Kulgachi as well as beside the agricultural lands near Ch 762m to 905m (RHS) 905m to 1301m (LHS) 1422m to 1608m (Both Side) & so on Bamboo bushes, Mango Garden and vacant land also exists at some places.
7.	Grazing grounds	√		Grazing ground exist near Ch. 2240m (RHS) beside the alignment.
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)***		√	There is no landslide problem since there is no hilly 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)***		√	Few ponds exist beside the project road near Ch. 996m (Both Side), 1039m (RHS), 3952m, 4432m (LHS). Lake or swampy area was not observed during the transect walk.
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***	√		Bhairab river flows far away from the project road. Cross drainage structures exist near Ch.1499m, 2158m, 3542m & 5217m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***	√		Water stagnation problem was noted near Ch. 4047m, 4233m (LHS). ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is not flood prone. Last flood was witnessed in the year 2000 (According to discussion with villagers). ( ) 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 85 nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)***		√	There are no such areas within 100m from 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[35] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 126 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the center line of the road alignment. (List placed in attachment-2)

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

No.	Parameter/ Component	Yes	No	Explanation
10.	Are there any religious, cultural or community structures/buildings[36] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are 05 nos. of religious / cultural / community structures (School, Temple Health Centre, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 22.02.2017 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?	√		Suggestions received and have been incorporated into the design. Final decision will be taken after discussion with the PIU.

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.

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

Attachment I

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
0.00m	TREE	
22m	TREE	
29m	TREE	

Attachment II

List of Utilities

Chainage(M)	Left	Right
18m		EP
215M	TP	
235m	EP	
267m	TP/EP	
302m	EP	HP
337m	EP	
340m		EP
362m	EP	
510m	EP	
560m	EP	
598m	EP	
644m	EP	
691m	EP	
1121m		TF
1138m	EP	
1186m	EP	
1368m		EP

Attachment III

List of Community Structures

Chainage(M)	Left	Right
99m		S.S.K
185m		TEMPLE
369m		CLUB
2192m	PLAY GROUND	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage(M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
				TREE	0.00m						
					18m	EP					
				TREE	22m						
					24m		POND				
				TREE	29m						
					99m			S.S.K			
					132m		POND				
					185m		TEMPLE				
				POND	210M						
				TP	215M						
				EP	235m						
			TP/EP		267m						
			EP		302m		HP				
					322m	POND					
				EP	337m						
					340m	EP					
			EP		362m						
					369m		CLUB				
			EP		510m						
			EP		560m						
			EP		598m						
			EP		644m						
			EP		691m						
					778m						CD
					844m						CD
					1121m		TF				
					1126M						CD
				EP	1138m						
			EP		1186m						
					1368m		EP				
				EP	1382m						
			POND		1823m						CD
					2060m						CD
		PLAY GROUND			2192m						
			POND		2285m						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage(M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					2556m						CD
					2731m						CD
			END POINT		2813m		END POINT				

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Khamargachi Feeder to Somra**

Block Name: **Balagarh**

District Name: **Hoogly**

Total Length of the Road:**2.813 km**

A. Climatic Conditions

Temperature	High: 38°C (May) Low: 16°C(Dec)
Humidity	High: 78% in July Low: 30% in March
Rainfall Rainy Season	1500mm/year June to mid-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. The area is far away from CRZ (Coastal Regulation Zone). ( ) 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: 13m The topography of the area is flat in nature.
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: There is no forest area beside the alignment. 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 :N.A. Endangered species (if any):None,
5.	Inhabited Area	√		There are few villages namely Baguntali, Mukti Kunda, ParanPur, uttarGopalpur
6.	Agricultural Land	√		part of 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.	BarrenLand		√	There is no barren land beside the alignment.

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?		√	There is no landslide or erosion problem along the road.

No.	Parameter/ Component	Yes	No	Explanation
	(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)***		√	There are no lakes/swamps beside the road. But there are some ponds and water bodies at ch.210m,2285 , (LHS) & 24m,132m,322m (RHS).
3.	Are there any nallas/streams/rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There is a nallah cross by the road at ch.1.609Km (adjacent to railway track).
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There is no water stagnation problem in the project 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)***		√	The area is not prone to flooding problem. ( ) 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 3 nos. of trees with a dbh of 30m or more within 10m on either side of the alignment. (List placed at 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. Has been 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?		√	There is no evidence of endangered species of flora & fauna within 100m from road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[37] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 19nos. of utility structures (EP, TP, HP, TRF etc.) within 10m on either side of the centre line of road alignment. (List placed at Attachment II)
10.	Are there any religious, cultural or community structures/buildings[38] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***		√	There are 4 nos of religious, cultural or community structures within 10m on either side of the alignment. (List placed at Attachment III)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 09.02.20117. (list of people attached).
2.	Any suggestion received in finalizing the alignment	√		Community suggested to construct culverts, speed breakers, restoration of borrow pits also

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

No.	Consultation Activities	Yes	No	Remarks
				suggested to raise the embankment height from ch. (844-1108)M.
3.	If suggestions received, were they incorporated into the design?		√	Suggestions will be incorporated after discussion with respective PIU.

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

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
0.00m	TREE	
22m	TREE	
29m	TREE	

Attachment II

List of Utilities

Chainage(M)	Left	Right
18m		EP
215M	TP	
235m	EP	
267m	TP/EP	
302m	EP	HP
337m	EP	
340m		EP
362m	EP	
510m	EP	
560m	EP	
598m	EP	
644m	EP	
691m	EP	
1121m		TF
1138m	EP	
1186m	EP	
1368m		EP

Attachment III

List of Community Structures

Chainage(M)	Left	Right
99m		S.S.K
185m		TEMPLE
369m		CLUB
2192m	PLAY GROUND	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
				TREE	0.00m						
					18m	EP					
				TREE	22m						
					24m		POND				
				TREE	29m						
					99m			S.S.K			
					132m		POND				
					185m		TEMPLE				
				POND	210M						
				TP	215M						
				EP	235m						
			TP/EP		267m						
			EP		302m		HP				
					322m	POND					
				EP	337m						
					340m	EP					
			EP		362m						
					369m		CLUB				
			EP		510m						
			EP		560m						
			EP		598m						
			EP		644m						
			EP		691m						
					778m						CD
					844m						CD
					1121m		TF				
					1126M						CD
				EP	1138m						
			EP		1186m						
					1368m		EP				
				EP	1382m						
			POND		1823m						CD
					2060m						CD
		PLAY GROUND			2192m						
			POND		2285m						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					2556m						CD
					2731m						CD
			END POINT		2813m		END POINT				

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **KuchpalaToSatithan part of Chowpala to dantra**

Block Name: **Polba-dadpur**

District Name: **Hoogly**

Total Length of the Road: **2.427Kms.**

A. Climatic Conditions

Temperature	*High: 36°C(May) Low: 14°C(Dec)*
Humidity	*High: 92% in July* *Low: 45% in March*
Rainfall Rainy Season	*1550mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 13m The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals:N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		There are some inhabited areas at ch.590m-1220m (Bhusali) 2254m-2427m (Satithan).
6.	Agricultural Land	√		Agricultural land exists beside the alignment discontinuouslynear 000m-590m, 1220m-2254m,
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was notobserved beside the alignment.

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)***		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted. ( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
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 no lakes/swamps beside the road,but some ponds and water bodies found during transect walk at Ch. 570m, 1128m, (RHS) and at ch.2395(LHS).
3.	Are there any nallas/streams/rivers etc. along/crossing the road? (***If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There are no rivers, but there are canals crossing the alignment at Ch. 386m-416m. In addition to it few cross drainage structures were also found at Ch. 693m, 1088m, 1220m, 1421m, 1804m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage***)		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 are13nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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***)		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species offlora orfauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[39] within 10 m on either side from the center line of the road alignment? (***If yes, attach list with chainage)***	√		There are31nos. of utility structures (EP, HP, TP, TF etc.)within 10m on either sidefrom the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[40] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are6nos. of religious / cultural / community structures (School,Temple, ICDS etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 08.02.17(List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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

List of Trees		
Chainage(M)	**LHS**	**RHS**
334M	TREE	
368M	TREE	
1065M		TREE
1109M		TREE
1487M		TREE
1598M	TREE	
1973M		TREE
2104M	TREE	
2192M	TREE	
2223M	TREE	
2234M	TREE	TREE
2336M	TREE	

Attachment II

List of Utilities		
Chainage(M)	**Left**	**Right**
510M	DEEP TUBE WELL	
518M	TRF	
775M		EP
808M		EP
822M		HP
833M	EP	
855M	EP	
875M		EP

List of Utilities		
Chainage(M)	**Left**	**Right**
905M	EP	
921M	EP	
941M	EP	
956M		EP
983M		EP
985M		EP
1015M	EP	
1017M		EP
1034M	EP	
1039M		EP
1053M	EP	
1056M	HP	
1057M	EP	
1105M		EP
1124M		HP
1168M	EP	
1312M		EP
1347M		EP
1411M		EP
1469M		TRF
1551M		EP
2278M		EP
2315M	EP	

Attachment III

List of Community Structures		
Chainage(M)	**LHS**	**RHS**
850M	TEMPLE	
947M	TEMPLE	
983M	SCHOOL	
1116M		ICDS
1137M	PLAY GROUND	
1172M	CLUB	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		TREE			334M						
		TREE			368M						
					386M-416M						MINOR BRIDGE
					508M						CD
		DEEP TUBE WELL			510M						
		TRF			518M						
					570M				POND		
					693M						CD
					775M	EP					
					808M	EP					
					822M		HP				
				EP	833M						
			TEMPLE		850M						
				EP	855M						
					875M	EP					
				EP	905M						
				EP	921M						
				EP	941M						
			TEMPLE		947M						
					956M	EP					
			SCHOOL		983M		EP				
					985M		EP				
			EP		1015M						
					1017M	EP					
				EP	1034M						
					1039M		EP				
				EP	1053M						
			HP		1056M						
				EP	1057M						
					1065M	TREE					
					1088						CD
					1105M		EP				
					1109M		TREE				
					1116M				ICDS		
					1124M		HP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		PLAY GROUND			1137M						
			EP		1168M						
					1178M		POND				
			CLUB		1172M						
					1220M						CD
					1312M			EP			
					1347M			EP			
					1411M			EP			
					1421M						CD
					1469M			TRF			
					1477M				BRICK CLINS		
					1487M			TREE			
					1551M			EP			
			TREE		1598M						
					1804M						CD
					1973M			TREE			
			TREE		2104M						
			TREE		2192M						
			TREE		2223M						
			TREE		2234M			TREE			
					2278M			EP			
			EP		2315M						
			TREE		2336M						

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Muktarpur to Baneswarpur via Ghoshpara and Sijla**

Block Name: **Balagarh**

District Name: **Hoogly**

Total Length of the Road:**2.432 km**

A. Climatic Conditions

Temperature	High: 38°C (May) Low: 16°C(Dec)
Humidity	High: 78% in July Low: 30% in March
Rainfall Rainy Season	1500mm/year June to mid-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. The area is far away from CRZ (Coastal Regulation Zone). ( ) 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: 13m The topography of the area is flat in nature.
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: There is no forest area beside the alignment. 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 :N.A. Endangered species (if any):None,
5.	Inhabited Area	√		There are few villages namely
6.	Agricultural Land	√		Some part of 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.	BarrenLand		√	There is no barren land beside the alignment.

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?		√	There is no landslide or erosion problem along the road. ( ) No Secondary Information is available and Local Community is not aware of this matter

No.	Parameter/ Component	Yes	No	Explanation
	(If yes, indicate the location (right or left side) and the chainage)			
2.	Are there any lakes/swamps beside the road? ***(If yes, list them indicating the location (right or left side)and the chainage)***		√	There are no lakes/swamps beside the road. But there are some ponds and water bodies but there are some ponds and water bodies exist at ch 298,1783,2091,2170m LHS & 0.392 Km, 1.360KM (RHS).
3.	Are there any nallas/streams/ rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***	√		There is no nallas/Stream/river .etc along /crossing the road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	There is no water stagnation problem in the project 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)***		√	The area is not prone to flooding problem. ( ) 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 is only two tree with a dbh of 30m or more within 10m on either side of the alignment. (List placed at 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. Has been 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?		√	There is no evidence of endangered species of flora & fauna within 100m from road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[41] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 29 Nos. of utility structures (EP, TP, HP, TRF etc.) within 10m on either side of the centre line of road alignment. (List placed at Attachment II)
10.	Are there any religious, cultural or community structures/buildings[42] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***		√	There is an ITI college within 10m on either side of the alignment. (List placed at Attachment III)

D. Public Consultation

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

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

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 10.02.2017.(list of people attached).
2.	Any suggestion received in finalizing the alignment	√		Community suggested to construct culverts, speed breakers, restoration of borrow pits as per requirement.
3.	If suggestions received, were they incorporated into the design?		√	Suggestions will be incorporated after discussion with respective PIU.

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

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
52m		TREE
290m	TREE	

Attachment II

List of Utilities

Chainage(M)	Left	Right
30m		EP
92m		EP
290m	HP	
301m	EP	
360m		EP
375m	TF	
427m	EP	
456m	EP	
541m	EP	
583m	EP	
610m	EP	
647m		EP
689m		EP
737m		EP
843m	EP	EP
1005m		EP
1010m		TF
1031m	EP	
1046m	EP	
1405m	EP	

List of Utilities

Chainage(M)	Left	Right
1478m	EP	
1533m		EP
1707m	EP	
1718m	TF	
1930m	EP	
1941m		EP
1964m	EP	
1993m		EP
TOTAL	17	12

Attachment III

List of Community Structures

Chainage(M)	Left	Right
185m		ITI COLLEGE
1031m		ITI COLLEGE

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					30m		EP				
					52m		TREE				
					92m		EP				
					164m						CD
					185m		ITI COLLEGE				
					282m						CD
			POND		298m						
			TREE/HP		290m						
			EP		301m						
					360M		EP				
			TF		375M						
			EP		427M						
			EP		456M						
					534m						CD
			EP		541m						
			EP		583m						
			EP		610m						
					647m		EP				
					689m		EP				
					737m		EP				
					790m						CD
			EP		805m						
			EP		843m		EP				
					990m						CD
					1005m		EP				
					1010m		TF				
			EP				ITI COLLEGE				
			EP		1046m						
					1360m		POND				
			EP		1405m						
			EP		1478m						
					1533m		EP				
					1630m						CD
			EP		1707m						
			TF		1718m						
			POND		1783m						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		1930m						
					1941m		EP				
			EP		1964m						
					1993m		EP				
			POND		2091m						
			POND		2170m						
			END POINT		2432m		END POINT				

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Mahesnagar to Bedberia**

Block Name**: Chapra**

District Name: **Nadia**

Total Length of the Road: **10.887 Km.**

A. Climatic Conditions

Temperature	*High: 35°C (May) Low: 16°C(Jan)*
Humidity	*High: 91% in July* *Low: 58% in March*
Rainfall Rainy Season	*1427mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 11 m (*above msl*) The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		Inhabited areas of the small villages (Maheshnagar, Hatisala-ghoshpara, Nutangram, Baraandulia, Bedberia) are concentrated beside the alignment as well as away from the alignment in scattered manner at different locations.
6.	Agricultural Land	√		The project road passes through the inhabited area and agricultural areas at different locations. Agricultural area exists near ch 1548-1742m, 2527-3037m,4905-5003m,6759-6962m,7710-9300mand so on. Bamboo thicket and vacant land also exists at some places.
7.	Grazing grounds		√	There is no Grazing ground beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)***		√	There is no landslide problem since there is no hilly 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 are some small & big ponds/bil (large waterbody) beside the alignment near Ch.70m, 227m, 354m, 1255m,1742m, 1771-2035m and so on. Few ponds are deep and dry.
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***	√		Small canal crosses the road at Ch 0912 m, 1375m. Remnants of one paleo-stream crosses the project road at Ch. 0145m. Jalangi river flows parallel to the road at some places. Some ditches filled up with water as well as dry were noted beside the project road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**	√		Water stagnation problem was observed beside the alignment near Ch. 9954m. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is not flood prone though Jalangi river exists very close to the project road (According to discussion with villagers). ( ) 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 64 nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)***		√	There are no such areas within 100m from 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[43] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 212 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[44] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are 22 nos. of religious / cultural / community structures (School, Temple Health Centre, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

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

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 15.02.2017 & 16.02.2017 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?	√		Suggestions received and have been 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.
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

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
260	TREE	
310		TREE
340		TREE
345		TREE
452	TREE	
460	TREE	
602	TREE	
608	TREE	
612	TREE	
664	TREE	
678	TREE	
681	TREE	
687	TREE	
759		TREE
932	TREE	
1268	TREE	
1464		TREE
1464	TREE	TREE
1540	TREE	
1795		TREE

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
1864	TREE	
2143		TREE
2240		TREE
2270	TREE	
2338-2400		MANGO GARDEN
3028		TREE
3100	TREE	
3150		TREE
3240	TREE	
3740-3772		MANGO GARDEN
3848	TREE	
4154	TREE	TREE
4203	TREE	
4210	TREE	
4240		TREE
4870	TREE	
5112	TREE	
5122		TREE
5195	TREE	
5228	TREE	
5491		TREE
5523		TREE
5619		TREE
6095	TREE	
6125	TREE	
6173		TREE
6410	TREE	
6519	TREE	TREE
6532		TREE
6592	TREE	
6720		TREE
6948	TREE	
7166	TREE	
7492	TREE	
7710	TREE	
7810		TREE
7939		TREE
8100	TREE	
9495	TREE	
10710	TREE	
10884	TREE	
TOTAL	39	25

Attachment II

List of Utilities

Chainage(M)	Left	Right
45		EP
106	EP	
159		EP
227	TRF	
236		EP
272		EP

List of Utilities

Chainage(M)	Left	Right
351	EP	
467	HP	
495		EP
515		EP
540		HP
597	EP	
632	EP	
694		EP
759	EP	
779	EP	
819		EP
840		TAP
854	EP	
886	EP	
905	EP	
938		TAP
945	EP	
972		EP
990	EP	
1005		EP
1020	EP	EP
1045	EP	
1086	EP	
1110		EP
1145		TAP
1150		EP
1210		EP
1271		EP
1317		EP
1366	EP	
1402		EP
1431	EP	
1447	TAP	
1464	EP	
1488	EP	
1540		
1548	EP	
1575		EP
1590	EP	
1631		EP
1642	EP	
1665		EP
1695		EP
1732		EP
1742		EP
1771		TRF
1835	EP	EP
1843	TRF	
1894		EP
1966	EP	
1997		EP
2030	EP	

List of Utilities

Chainage(M)	Left	Right
2079	EP	
2980		2 EP
3010	EP	
3028	EP	
3050	EP	
3054		EP
3082	EP	EP
3100		HP
3109		EP
3127	EP	EP
3163	EP	
3195	EP	
3207		TRF
3260		EP
3305	EP	
3344		EP
3364	EP	
3401	EP	
3420	EP	
3451	EP	
3472	EP	
3490	EP	
3515		EP
3548	EP	
3588		EP
3605		EP
3622	EP	
3669	TRF	
3712		EP
3720		EP
3739		EP
3761	EP	
3848		EP
3882	EP	
3918	EP, TP	
3954		EP
3991	EP	
4021	EP	
4035	EP	
4058	EP	
4100	EP	
4283		EP
4290	EP	
4298	EP	
4333	EP	
4362	EP	
4390	TP	
4414	EP	
4517	EP	
4557		EP
4584	EP	
4617	EP	

List of Utilities

Chainage(M)	Left	Right
4642	EP	
4688	EP	
4720		EP
4771	EP	
4820		EP
4861		EP
4905		EP
4950		EP
5003		EP
5024		EP
5054	EP	
5064	EP	
5096	EP	
5122	EP	
5135	EP	
5147		EP
5177		EP
5199	EP	
5204		HP
5239	EP	
5284	EP	
5307		EP
5342	EP	
5399		EP
5434	EP	
5563		EP
5619	EP	
5642		EP
5732	EP	
5750	EP	
5782	EP	
5795		EP
5812	TAP	
5840	EP	EP
5891	EP	
5917		EP
5942	EP	
5962	TRF	EP
5989	EP	
6012		EP
6060		EP
6088	EP	
6157	EP	
6198	EP	
6312	HP	
6477	EP	
6557	EP	
6592		EP
6625	EP	
6720	EP	
6759		TRF
6930		EP

List of Utilities

Chainage(M)	Left	Right
6945		EP
6962		EP
6987	EP	
6998		EP
7105	TP	
7120		EP
7135		EP
7240	EP	
7291	EP	
7385	EP	TRF
7395	TAP	
7477		EP
7510	HP	
7542	EP	
7567		TAP
7595		EP
7598	TRF	
9400		EP
9458	TRF	
9510	EP	
9522	EP	
9558	EP	
9590	EP	
9648		EP
9690	EP	
9718		EP
9855	EP	
9927	EP	
9977		EP
10250	TAP	EP
10265	TRF	
10281	EP	
10352	EP	
10542		EP
10657		EP
10689	TAP	
10694	EP	
10733		EP
10757		EP
10780		EP
10816		EP
10884		EP
TOTAL	118	94

Attachment III

List of Community Structures

Chainage(M)	Left	Right
0	MOSQUE	
693		MOSQUE
1090		MOSQUE
1156		P.SCHOOL
1163		CLUB

1944	CLUB	
2158	DURGA MANDIR	
3213		BURIAL GROUND
4021		P.SCHOOL
4513		HOMEO CLINIC
4636	TEMPLE	
4861		HOMEO HALL
5003	BED COLLEGE	
5563		HIGH SCHOOL
5605	GIRLS HIGH SCHOOL	
5870		B.ED COLLEGE
6519	TEMPLE	
7166	P.SCHOOL	
7185	RELIGIOUS	
9458		IDGHA
9881	MOSQUE	
10477	MOSQUE	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		MOSQUE			0						
					45		EP				
					70		POND				
			EP		106						
					145						CD
					159		EP				
			TRF		227		POND				
					236		EP				
		TREE			260						
					272		EP				
					310		TREE				
					340		TREE				
					345			TREE			
			EP		351						
					354		POND				
	TREE				452						
	TREE				460						
		HP			462						
					495		EP				
					515		EP				
					540		HP				
			EP		597						
					602			TREE			
					608		TREE				
					612		TREE				
			EP		632						
			TREE		664		EP				
		TREE			678						
			TREE		681						
				TREE	687						
					693	MOSQUE					
					694		EP				
			EP		759		TREE				
			EP		779						
					819		EP				
					840		TAP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		854						
			EP		886						
			EP		905						
					912						CD
			TREE		932						
					938		TAP				
			EP		945						
					972		EP				
			EP		990						
					1005		EP				
			EP		1020		EP				
			EP		1045						
			EP		1086						
					1090		MOSQUE				
					1110		EP				
					1145		TAP				
					1150		EP				
					1156		P.SCHOOL				
					1163		CLUB				
					1210		EP				
					1255		POND				
			TREE		1268						
					1271		EP				
					1317		EP				
			EP		1366						
					1375						CD
					1402		EP				
			EP		1431						
			TAP		1447						
			EP		1464						
			TREE		1464			TREE			
			EP		1488						
	TREE				1540						
		EP			1548						
					1575		EP				
			EP		1590						
					1631		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		1642						
					1665		EP				
					1695		EP				
					1732		EP				
			POND		1742		EP				
		LEARGE WATER BODY			1771-2035						
					1771		TRF				
					1795		TREE				
			EP		1835		EP				
			TRF		1843						
TREE					1864						
					1894		EP				
			CLIB		1944						
			EP		1966						
					1997		EP				
			EP		2030						
			POND		2075						
			EP		2079						
					2079-2158	POND					
					2143				TREE		
			DURGA MANDIR		2158						
			POND		2179						CD
					2240		TREE				
	TREE				2270						
					2338-2400			MANGO GARDEN			
					2980		2 EP				
			EP		3010						
			EP		3028			TREE			
					3037						CD
			EP		3050						
					3054		EP				
			EP		3082		EP				
					3098		POND				
		TREE			3100		HP				
					3109		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		3127		EP				
					3150			TREE			
			EP		3163		POND				
			EP		3195						
					3207		TRF				
			POND		3213		BURIYAL GROUND				
			TREE		3240						
			POND		3260		EP				
			POND		3272						
			EP		3305						
					3344		EP				
			EP		3364						
			EP		3401						
			EP		3420						
			EP		3451						
			EP		3472						
			EP		3490						
					3515		EP				
			EP		3548						
			POND		3550-3605						
					3588		EP				
					3605		EP				
					3605-3622		POND				
			EP		3622						
			TRF		3669						
					3712		EP				
					3720		EP				
					3739		EP				
					3740-3772			MANGO GARDEN			
			EP		3761						
		TREE			3848		EP				
					3851	POND					
			EP		3882						
			EP, TP		3918						
					3954		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					3962		POND				
			EP		3991						
			EP		4021		P.SCHOOL				
			EP		4035						
			EP		4058						
			POND		4082						
			EP		4100						
			POND		4136		POND				
			TREE		4154		TREE				
					4169		POND				
			TREE		4203						
			TREE		4210						
					4240		TREE				
					4250		POND				
					4283		EP				
			EP		4290						
			EP		4298						
			EP		4333						
			EP		4362						
			TP		4390						
			EP		4414						
					4513		HOMEO CLINIC				
					4517		EP				
					4557		EP				
			EP		4584						
			EP		4617						
			TEMPLE		4636						
			EP		4642						
			EP		4688						
					4720		EP				
			EP		4771						
					4820		EP				
					4861		EP				
			TREE		4870		HOMEO HALL				
					4905		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					4950		EP				
		B.ED COLLEGE			5003		EP				
					5024		EP				
					5046		POND				
			EP		5054						
			EP		5064						
			EP		5096						
	TREE				5112						
			EP		5122		TREE				
			EP		5135						
					5147		EP				
					5177		EP				
			TREE		5195						
			EP		5199						
					5204			HP			
			TREE		5228						
			EP		5239						
			EP		5284						
					5307		EP				
			EP		5342						
					5399		EP				
			EP		5434						
					5491		TREE				
					5523		TREE				
					5563		EP, HIGH SCHOOL				
			GIRLS HIGH SCHOOL		5605						
			EP		5619		TREE				
					5642		EP				
			EP		5732						
			EP		5750						
			EP		5782						
					5795		EP				
			TAP		5812						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		5840		EP				
					5870		B.ED COLLEGE				
			EP		5891						
					5917		EP				
			EP		5942						
			TRF		5962		EP				
			EP		5989						
					6012		EP				
					6060		EP				
			EP		6088						
		TREE			6095						
		TREE			6125						
			EP		6157						
					6173		TREE				
			EP		6198						
			HP		6312						
			TREE		6410						
			EP		6477						
			TEMPLE, TREE		6519		TREE				
					6532		TREE				
			EP		6557						
			TREE		6592		EP				
			EP		6625						
			EP		6720		TREE				
					6759		TRF				
					6930		EP				
					6945		EP				
			TREE		6948						
					6962		EP				
			EP		6987						
					6998		EP				
			TP		7105						
					7120		EP				
					7135		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
		TREE, P.SCHOOL			7166						
			RELIGIOUS		7185						
			EP		7240						
			EP		7291						
			EP		7385			TRF			
			TAP		7395						
			POND		7477		EP				
			TREE		7492						
		HP			7510						
			POND		7530-7595						
			EP		7542						
					7567		TAP				
					7595		EP				
			TRF		7598						
			TREE		7710						
					7766		POND				
					7810			TREE			
					7939				TREE		
		TREE			8100						
					9173						CD
					9400		EP				
			TRF		9458		IDGHA				
		TREE			9495						
			EP		9510						
			EP		9522						
			EP		9558						
			EP		9590						
					9648		EP				
			EP		9690						
					9718		EP				
			EP		9855						
			MOSQUE		9881						
			EP		9927						
					9977		EP				
			POND		10015						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			LARGE WATER BODY		10095-10352						
					10167						CD
			TAP		10250		EP				
			TRF		10265						
			EP		10281						
			EP		10352						
			MOSQUE		10477						
			POND		10542		EP				
					10657		EP				
					10684						CD
			TAP		10689						
			EP		10694						
			TREE		10710						
					10733		EP				
					10757		EP				
					10780		EP				
					10816		EP				
		TREE			10884		EP				
END OF THE ROAD					10887	**END OF THE ROAD**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Mohespur to Tofapur**

Block Name: **Farkka**

District Name: **Murshidabad**

Total Length of the Road: **1.300 Kms.**

A. Climatic Conditions

Temperature	*High: 30°C(May) Low: 18°C(Dec)*
Humidity	*High: 85% in July* *Low: 43% in March*
Rainfall Rainy Season	*1344mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 24m The topography of the area is flat in nature**.**
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any):None
5.	Inhabited Area	√		There is a inhabited area namely Arjunpur and Tofapur
6.	Agricultural Land		√	No agricultural or cultivable area was observed during the transect walk
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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?		√	There is no landslide problem since there is no hilly terrain. Erosion problem was also not noted.

No.	Parameter/ Component	Yes	No	Explanation
	(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)***		√	There are no lakes/swamps beside the road, but two ponds found during transect walk at Ch. 62m, 629m.
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 rivers or canal, but a cross drainage structures were also found at Ch. 519m.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage)***		√	Water stagnation problem was not observed beside the alignment, ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	There are no such areas within 100m from the road shoulder. ( ) 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 05 nos of trees with a dbh of 30cm or more within 10m on either side from the centre line of the road alignment. (List placed in 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)***		√	There are no such areas within 100mfrom 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[45] within 10 m on either side from the centre line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 33 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the centre line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[46] within 10 m on either side from the centre line of the road alignment? ***(If yes attach list with chainage)***	√		There are 6 nos. of religious / cultural / community structures (School, Temple, ICDS etc.) within 10m on either from the centre line of the road alignment. (List placed in attachment-3)

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment.	√		Consultation with local community was conducted on 07.04.17(List of people attached)

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

No.	Consultation Activities	Yes	No	Remarks
	(Attach list of people met and dates)			
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?		√	Final decision will be taken after discussion with respective PIU.

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 at least 10 m on either side from the centre line of the road.
5) Photographs of the project area showing at least 10 m on either side from centre 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 (No.of Trees)**	**Right (No. of Trees)**
250	TREE	
555	TREE	
820	TREE	
912	TREE	
1210	TREE	

Attachment II

List of Utilities		
Chainage(M)	**Left**	**Right**
10	EP	
19	EP	
60	EP	
65		EP
67	EP	
79		EP
92	EP	
117	EP	
178	EP	
201	EP	
303	EP	
313		EP
401		EP
397	EP	
401	EP	EP
473	EP	
539	EP	
560		EP
592		EP

List of Utilities		
629	EP	
712		EP
759		EP
800		EP
892		EP
931		EP
981	EP	
999		EP
1087	EP	
1097		EP
1149		EP
1215		EP
1300		TRF

Attachment III

List of Community Structures		
Chainage(M)	**Left**	**Right**
30	EP	
55	GRAVE YARD	
265	MOSQUE	
408	SCHOOL	
431	MOSQUE	
840		ICDS
868		SSK

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		10						
			EP		19						
			GRAVE YARD		55						
			EP		60						
					62			POND			
					65		EP				
			EP		67						
					79		EP				
			EP		92						
			EP		117						
			EP		178						
			EP		201						
			TREE		250						
		MOSQUE			265						
			EP		303						
					313		EP				
					401		EP				
			EP		397						
			EP		401		EP				
			SCHOOL		408						
		MOSQUE			431						
			EP		473						
					519						CD
			EP		539						
			TREE		555						
					560		EP				
					592		EP				
			EP		629			POND			
					712		EP				
					759		EP				
					800		EP				
			TREE		820						
					840		ICDS				
					868		SSK				
					892		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			TREE		912						
					931		EP				
			EP		981						
	PHE				990						
					999		EP				
			EP		1087						
					1097		EP				
					1149		EP				
		TREE			1210						
					1215		EP				
					1300			TRF			
END POINT					**1300**	**END POINT**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure, TRF- Transformer

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: **Panjipukur to Balipukri part of Balikuhri via Haripur to Korichaberi**

Block Name**:** **Pollba-Dadpur**

District Name: **Hooghly**

Total Length of the Road: **3.003 Km.**

A. Climatic Conditions

Temperature	*High: 38°C (May) Low: 16°C(Jan)*
Humidity	*High: 78% in July* *Low: 24% in March*
Rainfall Rainy Season	*1500 mm/year* *June to mid-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: The area is far away from CRZ (Coastal Regulation Zone)
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: 12 m (*above msl*) The topography of the area is flat in nature.
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: There is no forest area beside the project road. Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area abutting the alignment.
4.	Wildlife (*Explain whether there are any wildlife species in the project area*)		√	Name of animals: N.A. There is no forest area beside or away from the project corridor. Endangered species (if any): None
5.	Inhabited Area	√		Inhabited areas of the small villages (Panjipukur, Kharri, Betha) are concentrated beside the alignment near Ch. 000 to 0120m, 0423m to 0495m, 0631m to 0700m, 0922m to 1021m, 1170m to 1680m and so on.
6.	Agricultural Land	√		The project road passes through the inhabited areas of small villages namely Panjipukur, Kharri, Betha as well as beside the agricultural lands near Ch 148 to 485m, 1690 to 1795m, 1823m to 1850m & so on Bamboo bushes and vacant land also exists at some places.
7.	Grazing grounds	√		Grazing ground exist near Ch 1190m (LHS) 2580m (LHS) beside the alignment
8.	Barren Land		√	Barren land was not observed beside the alignment.

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)***		√	There is no landslide problem since there is no hilly 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*)**		√	Some small & big ponds exist beside the project road near Ch. 035m, 065m, 0148m, 310m, 495m, 887m, 935m, 1032m, 1098m, and so on. One vast water body was observed near Ch 2741m (LHS). Lake or swampy area was not observed during the transect walk.
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 no nalla/stream/river etc. along/crossing the road.
4.	Are there problems of water stagnation and other drainage issues on or near the road? (***If yes, mention chainage*)**	√		Water stagnation problem was noted near Ch. 2870m. ( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***		√	The area along the project road is not flood prone. (According to discussion with villagers). ( ) 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 24 nos of trees with a dbh of 30cm or more within 10m on either side from the center line of the road alignment. (List placed in 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)***		√	There are no such areas within 100m from 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?		√	There is no evidence of endangered species of flora or fauna within 100m from the road shoulder. ( ) No Secondary Information Available and Local Community is not aware of this matter
9.	Are there any utility structures[47] within 10 m on either side from the center line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 71 nos. of utility structures (EP, HP, TP, TF etc.) within 10m on either side from the center line of the road alignment. (List placed in attachment-2)
10.	Are there any religious, cultural or community structures/buildings[48] within 10 m on either side from the center line of the road alignment? ***(If yes attach list with chainage)***	√		There are 16 nos. of religious / cultural / community structures (School, Temple Health Centre, etc.) within 10m on either from the center line of the road alignment. (List placed in attachment-3)

D. Public Consultation

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

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 09.02.2017 (List of people attached)
2.	Any suggestion received in finalizing the alignment	√		Local people suggested for provision of sufficient safety measures (speed breaker, extra width near curve etc) filling of borrow pits after construction work.
3.	If suggestions received, were they incorporated into the design?	√		Suggestions received and have been 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.
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

List of trees

Chainage(M)	Left (No.of Trees)	Right (No. of Trees)
75	TREE	
85	TREE	
120	TREE	
255		TREE
495		TREE
744		TREE
765		TREE
900	TREE	
1005		TREE
1021		TREE
1210	TREE	
1280		TREE
1290		TREE
1439	TREE	
1456	TREE	
1832	TREE	
2070		TREE
2100		TREE
2107		TREE
2260		TREE
2396		TREE
2442		TREE
2450		TREE
2867		TREE
TOTAL	8	16

Attachment II

List of Utilities

Chainage(M)	Left	Right
0		EP
10	TP	
24	EP	
52	TP, HP	
65	EP	
95		EP
110	EP	
132	EP	
219	HP	
310		EP
351		EP
392		EP
423		EP
447	EP	
485		EP
635		HP
792	EP	
867		EP
887	EP	HP
922		EP
999	TP	EP
1085	EP	
1120	EP, HP	
1137	HP	
1162	EP	
1230	EP	
1270	EP	
1321	EP	
1330		EP
1363		TP
1394	EP	
1410		EP
1415		EP
1480	EP	
1510	EP	
1570		EP
1595		EP
1637	EP	
1680	.	EP
1700		EP
1715		EP
1740	EP	
1795		TRF
1800		PUMP HOUSE
1805	EP	HP
2012	EP	
2020	EP	
2112		HP
2283		EP
2333	EP	
2364	EP	

List of Utilities

Chainage(M)	Left	Right
2396	HP	
2417	EP	
2438		EP
2450	EP	
2520	HP	
2741		EP
2807		TP
2853	EP	
2867	EP	
2872	EP	
2934	EP	PUMP HOUSE
2940		TP
2962		EP
2993		EP
TOTAL	38	33

Attachment III

List of Community Structures

Chainage(M)	Left	Right
225-255	BURIAL GROUND	
631		ICDS
820	IDGHA	
825	HELTH CENTER	
972	KHARRI P SCHOOL	
1105	ICDS	
1270		PARTY OFFICE
1740	BURIAL GROUND	
1823		ICDS
1992	P. SCHOOL	
2364	BURIAL GROUND	
2374	MOSQUE	
2526	ICDS	
2580- 2690		BURIAL GROUND
2677-2690	BURIAL GROUND	
2962	HELTH CENTER	
TOTAL	12	4

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					0		EP				
			TP		10						
			EP		24						
			POND		35-52						
			HP	TP	52						
			POND, EP		65						
			TREE		75						
			TREE		85						
					95		EP				
				EP	110						
			TREE		120						
			EP		132						
					148	POND					
			HP		219						
			BURIAL GROUND		225-255						
					255		TREE				
			POND		310		EP				
					351		EP				
					392	EP					
					423		EP				
			EP		447						
			POND		485		EP				
					495			TREE			
			HIGH		552		TENSION				
					631		ICDS				
					635				HP		
					640						CD
					744		TREE				
					765			TREE			CD
			EP		792						
			IDGHA		820						
			HELTH CENTER		825						
					867		EP				
			POND, EP		887		HP				
			TREE		900						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					922		EP				
					935		POND				
			KHARRI P SCHOOL		972						
			TP		999		EP				
					1005		TREE				
					1021		TREE				
				POND	1032			POND			
			EP		1085						
			POND		1098						
			ICDS		1105						
		EP	HP		1120						
			HP		1137						
			EP		1162		POND				
			GRAZING GROUND		1190						
			TREE		1210						
			EP		1230						
			POND		1245						
			EP		1270		PARTY OFFICE				
					1280		TREE				
					1282						CD
					1290			TREE			
			EP		1321	POND					
					1330	EP					
			POND		1363		TP				
			EP		1394						
			POND		1400-1456						
					1410		EP				
			TREE		1439						
					1445		EP				
			TREE		1456						
		EP			1480						
				POND	1500						
			EP		1510						

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					1570		EP				
			POND		1595		EP				
			EP		1637						
					1680		EP				
			POND		1690						
					1700		EP				
					1715		EP				
			EP, BURIAL GROUND		1759						
					1795		TRF				
			POND		1800			PUMP HOUSE			
			EP		1805			HP			
					1823		ICDS				
			TREE		1832						
			P. SCHOOL		1992						
			EP		2012						
				EP	2020						
					2049		POND				
					2070		TREE				
					2100		TREE				
					2107	TREE					
					2112		HP				
					2224						CD
					2260		TREE				
					2283			EP			
			EP		2333						
			BURIAL GROUND	EP	2364						
			MOSQUE		2374						
			HP		2396		TREE				
POND			EP		2417						
					2420						CD
					2438		EP				
					2442		TREE				
			EP, POND		2450					TREE	

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					2460					MANGO TREES	
			HP		2520						
			ICDS		2526						
			GRAZING GROUND		2580						
					2580-2690		BURIAL GROUND				
			BURIAL GROUND		2677-2690						
			POND		2700	POND					
					2741		EP				
					2807		TP				
					2814						CD
			EP		2853						
			EP		2867			TREE			
			POND		2870						
				EP	2872						
			EP		2934		PUMP HOUSE				
					2940		TP				
			HELTH CENTER		2962		EP				
					2993		EP				
END OF THE ROAD					3003	**END OF THE ROAD**					

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure,

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: SabujPally More To Santipurpur Laxmitola Para
Block Name: Santipur
District :Nadia
Length of the road:10.318Km.

A. Climatic Conditions

Temperature	High: 38°C Low: 11°C
Humidity	High: 85% in July Low: 43% in March
Rainfall Rainy Season	1970 m m / year June to mid-September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		√	The area is far away from CRZ (Coastal Regulation Zone). ( ) 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: 14m The topography of the area is flat in nature.
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: N.A Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)* There is no forest area beside or away from the alignment.
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	√		There are small villages namely Dhakuria,(0-1.900) Purba Pareshnathpur(1.900-3.500), Fulia (3.500-5.500), Kadampur (5.500-8.092), Batna (8.092-9.553) Laxmitala tola para (9.55-10.318)Km,etc**.** exists in scattered manner beside the alignment**.**
6.	Agricultural Land	√		There are few patches of agriculture land in the alignment between Ch (0.075m –0.426m)(1.000-1300m) (1400m – 2.030m) (RHS).
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment.
8.	Barren Land		√	There is no barren land beside the alignment.

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)***	√		The area along the Project road is not prone to the landslide or erosion Problems.
				( ) 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 no lake or swampy area beside the alignment but many small & big ponds / Water body were found at Ch.56m,116m 213m. 1263m 3054m etc(RHS).existing beside the alignment.
3.	Are there any nallas/ streams /rivers etc. along/crossing the road? ***(If yes, list them indicating the location (right, left or crossing) and the chainage***	√		However there is no Nallas/``Streams/rivers etc. crossing the road, but there are some CD structure at ch.1584m, 1767m, 1868m, 1953m, 2410m, 3034m, 3657m, 6202m, 8043m, 8092m etc.
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 any water stagnation.
				( ) 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)***	√		Some Part of the Project road (ch.9599-10045) is prone to the flooding problems. Last flood observed in the year 2000.
				( ) 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 canter line of the road alignment? ***(If yes attach list of trees indicating the location (right or left side)and the chainage***)	√		There are 20 nos. of trees with a dbh of 30cm or more within 10m on either side of the road alignment.(List Placed at 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)***		√	There are no such areas within 100m from 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?		√	There is no endangered species of flora or fauna within 100m from the road shoulder.
				( ) No Secondary Information Available and Local Community is not aware of this matter
9..	Are there any utility structures[i] within 10 m on either side from the canter line of the road alignment? ***(If yes, attach list with chainage)***	√		There are 109 nos. utility structures (EP, TP, HP) within 10m on either side of the alignment. (List Placed at Attachment II)
10.	Are there any religious, cultural or community structures/buildings[ii] within 10	√		There are 26 numbers of community / religious structures within 10m on either side from the centre line of the road alignment. Temple exists at Ch 1294m,

No.	Parameter/ Component	Yes	No	Explanation
	m on either side from the canter line of the road alignment? ***(If yes attach list with chainage)***			1550m, 4760m, 5122m, 5177m, 5290m, 5432m, 7853m, 10293m, (RHS), 2285m, 2657m, 5548m, 5716m, (LHS). primary school exists at ch. 676m, 7526m, (LHS) & 5072m (RHS).

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 15.02.2017. List of people attached.
2.	Any suggestion received in finalizing the alignment	√		Villagers suggested to provide speed breaker, protection wall and sufficient protective works etc. as per requirement.
3.	If suggestions received, were they incorporated into the design?		√	Suggestion will be incorporated after discussion with PIU.

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 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(M)	Left (No.of Trees)	Right (No. of Trees)
137m	TREE	
426m		TREE
1294m		TREE
1901m-1953m	7 TREE	
3054m-3058m		3 TREE
5999m		TREE
6202m		
6478m-6500m	2 TREE	
7086m	TREE	TREE
7609m	TREE	
8614m	TREE	

Attachment

List of Utilities

Chainage(M)	Left	Right
40m		EP
122m		EP
148m		EP
152m		TF
171m		EP
213m		EP
219m		
268m		EP
301m		EP
326m	TF	
332m		EP
395m	EP	
455m	HP/EP	
558m		EP
598m		EP
697m	EP	
749m		EP
800m	EP	
859m		EP
946m		EP
1036m		EP
1086m		EP
1183m		EP
1225m		EP
1272m	EP	
1314m	EP	
1355m	EP	
1390m	EP	
1416m	EP	
1837m		EP
1854m		EP
1901m		TAP
1907m		EP
1920m	EP	
1958m		EP
1977m	EP	

List of Utilities

Chainage(M)	Left	Right
2030m		EP
2065m	EP	
2118m		EP
2190m		EP
2210m		EP
2242m	EP	
2268m	EP	
2320m		EP
2341m		EP
2497m	EP	
2521m		EP
2570m	EP	
2593m		EP
2665m		EP
2676m		EP
2681m		EP
2709m		EP
2729m	EP	
2760m		EP
2768m	EP	
2803m	EP	
2807m	EP	
2972m	EP	
3019m	EP	
3205m	EP	
3319m	EP	
3330m	EP	
3365m	EP	
3394m	EP/TP	
3411m	EP	
3428m	EP	
3469m	EP	
3550m3584m	TF	
3657m	EP	
3720m	EP	
3780m		EP
4035m	EP	
4084m	EP	
4100m		EP
4130m		EP
4142m		TF
4760m	EP	
4772m		EP
4789m		EP
4817m		EP
4866m	EP	
4950m		EP
4981m		EP
5023m	EP/TP	
5146m	TP	
5196m	TP	
5315m		EP

List of Utilities

Chainage(M)	Left	Right
5332m		EP
5375m	EP	
5378m	EP	
5503m	EP	
5817m		EP
6202m		
6526m-6661m	EP	
6740m		EP
6798m	EP	
6850m		EP
7145m		EP
7331m		EP/TF
7945m		EP
7994m	EP	
9822m		EP
9971m	EP	
10149m		EP
10155m		EP
10193m		EP

Attachment III

List of Community Structures

Chainage(M)	Left	Right
676m	DHAKURIA PRIMARY SCHOOL	
990m	SOHID BADI	
1294m		TEMPLE
1550m		TEMPLE
2285m	TEMPLE	
2657m	TEMPLE	
3550m3584m	LIBRREARY	CINEMA HALL
4065m		UNION BANK
4221m		B.D.O OFFICE
4760m		TEMPLE
5072m		P.SCHOOL
5122m		TEMPLE
5177m	M.R SHOP	
5290m		TEMPLE
5432m		TEMPLE
5548m	TEMPLE	
5716m	TEMPLE	
7203m	MOSJID	
7526m	P.SCHOOL	
7737m	M.R SHOP	
7853m		TEMPLE
9472m		BURIAL GROUND
9886m		BURIAL GROUND
10119m	BADI	
10293m		TEMPLE

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					40m		EP				
					56m		POND				
					116m		POND				
					122m		EP				
			TREE		137m						
					148m		EP				
					152m		TF				
					171m		EP				
					213m	EP	POND				
					219m				HITENTION LINE		
					268m		EP				
					301m		EP				
			TF		326m						
			MANGO GURDEN		332m		EP				
			EP		395m						
			PLAY GROUND		400m						
					426m	TREE					
			HP/EP		455m						
					558m		EP				
					598m		EP				
			DHAKURIA PRIMARY SCHOOL		676m						
			EP		697m						
					749m		EP				
			EP		800m						
					859m		EP				
					907m		BAMBU BUSH				
					946m		EP				
			SOHID BADI		990m						
					1036m		EP				
					1086m		EP				
					1183m		EP				
					1225m		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					1263m		POND				
			EP		1272m						
					1294m		TEMPLE/TREE				
			EP		1314m		PLANTATION				
			EP		1355m						
			EP		1390m						
			EP		1416m						
		HITENTION LINE			1457m			HITENTION LINE			
			PLANTATION		1550m		TEMPLE				
					1584m						CD
					1767m						CD
					1837m		EP				
					1854m		EP				
					1868m						CD
					1901m		TAP				
					1907m		EP				
			EP		1920m						
			7 TREE		1901m-1953m						CD
					1958m		EP				
			EP		1977m						
					2030m		EP				
			EP/PLANTATION		2065m						
					2118m		EP				
					2190m		EP				
					2210m		EP				
			EP		2242m						
			EP		2268m						
			TEMPLE		2285m						
					2320m		EP				
					2341m		EP				
					2410m						CD
			EP		2497m						
					2521m		EP				
			EP		2570m						
					2593m		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			TEMPLE		2657m						
					2660m				CO-OPARATIVE		
					2665m		EP				
					2676m		EP				
					2681m		EP				
					2709m		EP				
			EP		2729m						
					2760m		EP				
			EP		2768m						
			EP		2803m						
			EP		2807m						
			EP		2972m						
			EP		3019m						
					3034m						CD
					3054m-3058m	3 TREE	POND				
			EP		3205m						
			EP		3319m						
			EP		3330m						
			EP		3365m						
			EP/TP		3394m						
			EP		3411m						
			EP		3428m						
			EP		3469m						
		LIBRARY	TF		3550m3584m		CINEMA HaLL				
			EP		3657m						CD
					3700m		PLAY GROUND				
			EP		3720m						
					3780m		EP				
			EP		4035m						
					4065m			UNION BANK			
			EP		4084m						
					4100m		EP				
					4130m		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
					4142m		TF				
					4221m		B.D.O OFFICE				
			EP		4760m		TEMPLE				
					4772m		EP				
					4789m		EP				
					4817m		EP				
			EP		4866m						
					4950m		EP				
					4981m		EP				
			EP/TP		5023m						
					5072m		P.SCHOOL				
					5091m		PLAY GROUND				
					5122m		TEMPLE				
			TP		5146m						
			M.R SHOP		5177m						
			TP		5196m						
					5290m		TEMPLE				
					5315m		EP				
					5332m		EP				
			EP		5375m						
			EP		5378m						
					5432m		TEMPLE				
			EP		5503m						
			TEMPLE		5548m						
			TEMPLE		5716m						
					5817m		EP				
					5999m		TREE				
					6202m						CD
			2 TREE		6478m-6500m						
			EP		6526m-6661m		POND				
			EP		6798m						
					6850m		EP				
			TREE		7086m		TREE				
					7145m		EP				

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			MOSJID		7203m						
					7331m		EP/TF				
			P.SCHOOL		7526m						
			TREE		7609m		POND				
			M.R SHOP		7737m						
					7853m		TEMPLE				
			MANGO GARDEN		7909m		POND				
					7945m	EP					
			EP		7994m		POND				
					8000m		POND				
					8043m						CD
					8092m						CD
					8092m-8370m		MANGO GARDEN				
					8370m						CD
			TREE		8614m						
			MANGO GARDEN		9183m-9472m		MANGO GARDEN				
					9472m		BURIAL GROUND				
			MANGO GARDEN		9558m-9535m		MANGO GARDEN				
					9708m						CD
					9822m		EP				
					9881m						CD
					9886m		BURIAL GROUND				
			EP		9971m						
					10045m						CD
			BADI		10119m						
					10149m		EP				
					10155m		EP				
					10193m		EP				
					10293m		TEMPLE				
			END POINT		10318m		END POINT				

RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Sondunga Indira Pally to Balainagar
Block Name: Krishnanagar-ll
District :Nadia
Length of the road: 3.416Km.

A. Climatic Conditions

Temperature	High: 38°C Low: 11°C
Humidity	High: 85% in July Low: 43% in March
Rainfall Rainy Season	1970 m m / year June to mid-September

B. Location of the Road and Generic description of Environment

No.	Type of Ecosystem	Yes	No	Explanation
1.	Coastal area Mangrove (along roadside)		√	The area is far away from CRZ (Coastal Regulation Zone).
				( ) 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: 14m **The topography of the area is flat in nature.**
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: N.A Legal Status of the Forest Area: *(Reserved, National Park, Sanctuaries, Unclassified, etc.)*
				There is no forest area beside or away from the alignment.
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	√		There are small villages namely Saondunga, Dungapara, Belpukur etc**.** exists in scattered manner beside the alignment**.**
6.	Agricultural Land	√		There are few patches of agriculture land beside the alignment .
7.	Grazing grounds		√	Grazing ground was not observed beside the alignment.
8.	Barren Land		√	There is no barren land beside the alignment.

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?	√		The area along the Project road is not prone to the landslide or erosion Problems.

No.	Parameter/ Component	Yes	No	Explanation
	(*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*)**		√	There is no lake or swampy area beside the alignment but there is a pond at ch.553m .(LHS) beside the alignment.
3.	Are there any nallas/ streams /rivers etc. along/crossing the road? **(*If yes, list them indicating the location (right, left or crossing) and the chainage***	√		However there is no Nallas/Streams/rivers etc. crossing the road, but there are some CD structure at ch. 1119m, 2050m, 2721m, 2878m,3063m.. etc.
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 any water stagnation.
				( ) No Secondary Information is available and Local Community is not aware of this matter
5.	Is the area along the project road prone to flooding? ***(If yes, mention flood level and frequency)***	√		The area along the project road is prone to the flooding problems. Last flood observed in the year 2000.
				( ) 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 canter line of the road alignment? **(*If yes attach list of trees indicating the location (right or left side) and the chainage***)	√		There are **8 nos**. of trees with a dbh of 30cm or more within 10m on either side of the road alignment**. (List Placed at 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)***		√	There are no such areas within 100m from 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?		√	There is no endangered species of flora or fauna within 100m from the road shoulder.
				( ) No Secondary Information Available and Local Community is not aware of this matter
9..	Are there any utility structures[iii] within 10 m on either side from the canter line of the road alignment? ***(If yes, attach list with chainage)***	√		There are **21 nos**. utility structures (EP, TP, HP) within 10m on either side of the alignment**. (List Placed at Attachment II)**
10.	Are there any religious, cultural or community structures/buildings[iv] within 10 m on either side from the canter line of the road alignment? ***(If yes attach list with chainage)***	√		There are 7 numbers of community / religious structures within 10m on either side from the centre line of the road alignment. there are sani temple at ch.322m, Baroary temple at ch.345m. Bayam Samity club at ch.3310m,(LHS) again samity at ch. 2646m, Belpukur High School at ch 2768m. temple at ch. 2821m,kali temple at ch.3048m.(RHS) beside the alignment

D. Public Consultation

No.	Consultation Activities	Yes	No	Remarks
1.	Consultation with local community was conducted before finalizing the alignment. ***(Attach list of people met and dates)***	√		Consultation with local community was conducted on 18.04.2017. List of people attached.
2.	Any suggestion received in finalizing the alignment	√		Villagers suggested to provide speed breaker, protection wall and sufficient protective works etc. as per requirement.
3.	If suggestions received, were they incorporated into the design?		√	Suggestion will be incorporated after discussion with PIU.

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 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(M)	Left (No.of Trees)	Right (No. of Trees)
1224m	TREE	
1275m	TREE	
1350m	TREE	
1460m	TREE	
2143m		TREE
2196m	TREE	
2496m		TREE
2522m	TREE	

Attachment II

List of Utilities

Chainage(M)	Left	Right
49m	EP	TF
68m	EP	
98m	EP	
154m		EP
158m	TP	
206m	EP	
226m		TP
522m	EP	
544m	EP	
2234m		EP
2288m		
2332m	EP	
2387m		EP
2426m	TP	
2480m	EP	
2600m	EP	
2878m	EP	
3056m	EP	
3225m		EP
3267m		EP
3357m	EP	

Attachment III

List of Community Structures

Chainage(M)	Left	Right
322m	TEMPLE	
345m	BAROARY	
2646m		SOMITY
2768m		PLAY GRAUND
2821m		TEMPLE
3048m		TEMPLE
3310m	SOMITY	

Attachment IV

8m to 10m	6m to 8m	4m to 6m	2.75m to 4m	0m to 2.75m	Chainage (M)	0m to 2.75m	2.75m to 4m	4m to 6m	6m to 8m	8m to 10m	CD
			EP		49m		TF				
			EP		68m						
			EP		98m						
					154m		EP				
			TP		158m						
			EP		206m						
					226m		TP				
			TEMPLE		322m						
			BAROARY		345m						
			EP		522m						
			EP		544m						
			POND		653m						
					1112m						CD
			TREE		1224m						
			TREE		1275m						
			TREE		1350m						
			TREE		1460m						
					2050m						CD
					2143m		TREE				
			TREE		2196m						
					2234m		EP				
					2288m						CD
			EP		2332m						
					2387m		EP				
			TP		2426m						
			EP		2480m						
					2496m		TREE				
			TREE		2522m						
			EP		2600m						
					2646m		SOMITY				
					2721m						CD
					2768m		PLAY GRAUND		HS.SCHOOL		
					2821m		TEMPLE				
8m to 10m	**6m to 8m**	**4m to 6m**	**2.75m to 4m**	**0m to 2.75m**	**Chainage (M)**	**0m to 2.75m**	**2.75m to 4m**	**4m to 6m**	**6m to 8m**	**8m to 10m**	**CD**

			EP		2878m						
					2888m						CD
			TREE PANTATION		2900m						
					3048m		TEMPLE				
			EP		3056m						
					3063m						CD
					3225m		EP				
					3267m		EP				
			SOMITY		3310m						
			EP		3357m						
			END POINT		3416m		END POINT				

EP - Electric Pole; TP - Telephone Post; H.P - Hand Pump: A.L - Agriculture Land; C.D - Cross Drainage Structure

APPENDIX 3: GUIDELINES FOR BORROW AREAS MANAGEMENT

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.

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

1. CONTRACTOR'S RESPONSIBILTY

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;

- 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.
- 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.
- 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.
- 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.

2. BORROWING FROM DIFFERENT LAND-FORMS

A. Borrow Areas located in Agricultural Lands

- The preservation of topsoil will be carried out in stockpile.

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

B. Borrow Areas located in Elevated Lands

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

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

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

- The preservation of topsoil will be carried out in stockpile.

- 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).
- Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
- Small drains shall be cut through the ridges of facilitate drainage.
- 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.
- 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.

3. 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.

7. 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 4: ENVIRONMENTAL MANAGEMENT PLAN

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
I	**Design and Preconstruction 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 (Panchayati Raj Institution)	All through the alignment of each rural road	Design costs.	PIU, Design consultants	PIU, WBSRRDA
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 wild life sanctuaries, national park, notified ECO sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area.. ○ Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009. ○ Alignment finalization considering availability of right of way and in consultation with local people. ○ ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. ○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure.	All through the alignment of each rural road	Design costs	PIU, Design consultants	PIU, WBSRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		○ The road shall follow natural topography to avoid excessive cut and fill.				
3.	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	Land to be made available and necessary costs if any to be borne by the state	PIU	PIU, WBSRRDA, PIC, TSC
4.	Clearing of vegetation and removing trees	○ 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. ○ The vegetative cover shall be removed and disposed in consultation with community.	All through the alignment of each rural road *(Enter chainages where tree cutting and diversion of forest land is required & proposed plantation location if details are available)*	Costs for Forestry clearance for diversion of forest land, obtaining tree cutting permit to be borne by state. Costs for compensatory forestation to be borne by state or by PRI – NREGA scheme.	Forestry clearance and permit to be obtained by the PIU. Compensatory plantation to be carried out in coordination with PRI under schemes such as NREGA or local Forestry Department	PIU, PIC, TSC
5.	Shifting of utilities and common property resources	○ The road land width shall be clearly demarcated on the ground. ○ All efforts will be made to minimize shifting of utilities and common property resources ○ Utility and community structure shifting shall be planned in consultations and concurrence of the community ○ Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin.	*(Enter chainages where shifting of utility structures and common property resources are required. Enter total numbers of each structure required for shifting/removal)*	Costs to cover shifting and reconstruction of common property resources must be included under project costs.	PIU, contractor, utility agencies (Internal procedures to be discussed and agreed between the above parties)	PIU, PIC, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
6.	Design and planning of embankment construction	○ The alignment design shall consider options to minimize excessive cuts and fills. ○ The cut off material shall be planned to be used for embankment to minimize borrow earth requirement. ○ The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. ○ The top soil of the cut and fill area shall be used for embankment slope protection ○ Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible.	All through the alignment of each rural road *(Enter the chainages that are prone to floods)*	Part of Project Cost	PIU, Design Consultants	PIU, WBSRRDA
7.	Hydrology and Drainage	○ Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. ○ The discharge capacity of the CD structure shall be designed accordingly. ○ Provision of adequate drainage structures 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. ○ 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.	Near all drainage crossings, nalas, rivers, streams and ponds. *(Enter chainages where earthern/structural cross drains, longitudinal drains, streams, ponds and rivers exist)*	Included in project costs.	PIU, Design consultants	PIU, WBSRRDA
8.	Establishment of Construction Camp,	○ Construction camp sites shall be located away from any local human settlements and	For all roads	To be included in	Contractor	PIU, PIC, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
	temporary office and storage area	forested areas (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 and forested areas (minimum 0.5 km). 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, 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 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 controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. o Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.		contractor's cost		

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
9.	Traffic Management and Road Safety	○ Identify the areas where temporary traffic diversion may be required. ○ Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction. ○ 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. ○ 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 both during the day and night. ○ It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed	As proposed under DPR and determined by contractor and approved by PIC/PIU/ *(Enter the chainages which may require traffic diversions where possible)*	To be included in contractor's cost	Contractor	PIU, PIC, TSC
II.	**Construction Stage**					
10.	Sourcing and transportation of construction material	**Borrow Earth:** ○ The borrow earth shall be obtained from identified locations and with prior permission of landowner and clear understanding for its rehabilitation. ○ 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	*(Enter chainage or probable locations of borrow areas. Enter name and location of identified quarries.)*	To be included under contractors costs	Contractor	PIC, PIU, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		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. o 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 be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. **Aggregate :** o The stone aggregate shall be sourced from existing licensed quarries				

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage **Transportation of Construction Material** ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. ○ Prior to construction of roads, topsoil shall be preserved and shall be used for other useful purposes like using in turfing of embankment. ○ 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.				
11.	Loss of Productive Soil, erosion and land use change	○ The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. ○ It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. ○ Cut and fill shall be planned as per IRC provisions and rural road manual. ○ All steep cuts shall be flattened and benched. ○ Shrubs shall be planted in loose soil area. ○ IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. ○ 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.	All though the alignment of each project road	To be included under contractors costs	Contractor	PIU / WBSRRDA

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
12.	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. ○ Fuel and lubricants shall be stored at the predefined storage location. ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.	All though the alignment of each project road	To be included under contractors costs	Contractor,	PIU, PIC, TSC
13.	Construction Debris and waste	○ 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	All though the alignment of each project road	To be included under contractors costs	Contractor	PIU, PIC, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		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.				
14.	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/spot 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 where available. Construction vehicles and machineries shall be periodically maintained.	Throughout the project road section	To be included under contractors costs	Contractor	PIU, WBSRRDA
15.	Tree plantation	○ Compensatory Afforestation shall be made on 1:3.ratio basis	*(Enter the number of trees*	Costs to be covered by	PIU to coordinate	PIU, PIC, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		○ Additional trees shall be planted wherever feasible. ○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years	*requird for planting and location of plantation site if available)*	state or PRI under schemes such as NREGA	compensatory forestation with PRI under schemes such as NREGA or local Forestry Department	
16.	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 slope stabilisation, etc shall be taken for prevention of siltation in water bodies.	Throughout the project road	To be included under contractors costs	Contractor	PIU, PIC, TSC
17	Occupational Health and Safety	○ 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. ○ Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas.	In all project roads	Costs to be borne by Contractor	Contractor	PIC, PIU, TSC

SL. NO.	Project Action/Environmental Attributes	Mitigation Measures	Location/ numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		○ Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste.				
III	**Post Construction and Operation Stage**					
18.	Air and Noise Quality	○ Awareness signboard to be provided for slow driving near the habitat areas to minimize dust generation due to vehicle movement. Speed limitation and honking restrictions may be enforced near sensitive locations.	At the location determined by contractor and approved by PIU	construction cost	Contractor,	PIC, PIU, TSC
19.	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. ○ Obtain clearance from PIU before handling over the site to WBSRRDA. ○ PIC to undertake survivability assessment and report status to PIU of compensatory tree plantation (at completion of construction) with recommendation for improving the survivability of the tree if required	All locations of construction camps/temporary office/ material storage, and borrow areas	To be borne by the contractor	Contractor	PIU, PIC, TSC
20.	Hydrology and Drainage	○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. ○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted	At project road locations with drainage structures	To be covered under road maintenance costs.	PIU	PIU, WBSRRDA
21	Community 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	construction cost	Maintenance Contractor, PIU	PIC/PIU

APPENDIX 5: 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	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
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 (Panchayati Raj Institution)	All through the alignment of each rural road		
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 wild life 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.	All through the alignment of each rural road		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. ○ The road shall follow natural topography to avoid excessive cut and fill.			
3.	Land acquisition	○ Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	All through the alignment of each rural road		
4.	Clearing of vegetation and removing trees	○ 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. ○ The vegetative cover shall be removed and disposed in consultation with community.	All through the alignment of each rural road *(Enter chainages where tree cutting and diversion of forest land is required & proposed plantation location if details are available)*		
5.	Shifting of utilities and common property resources	○ The road land width shall be clearly demarcated on the ground. ○ All efforts will be made to minimize shifting of utilities and common property resources ○ Utility and community structure shifting shall be planned in consultations and concurrence of the community ○ Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin**.**	*(Enter chainages where shifting of utility structures and common property resources are required. Enter total numbers of each structure required for shifting/removal)*		
6.	Design and planning of embankment construction	○ The alignment design shall consider options to minimize excessive cuts and fills. ○ The cut off material shall be planned to be used for embankment to minimize borrow earth requirement. ○ The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.	All through the alignment of each rural road *(Enter the chainages that are prone to floods**)***		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ The top soil of the cut and fill area shall be used for embankment slope protection Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible.			
7.	Hydrology and Drainage	○ Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. ○ The discharge capacity of the CD structure shall be designed accordingly. ○ Provision of adequate drainage structures 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. ○ 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.	Near all drainage crossings, nalas, rivers, streams and ponds. *(Enter chainages where earthern/structural cross drains, longitudinal drains, streams, ponds and rivers exist)*		
8.	Establishment of Construction Camp, temporary office and storage area	○ Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently). ○ Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km). ○ The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. ○ 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.	For all roads		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided 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 controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. ○ Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.			
9.	Traffic Management and Road Safety	○ Identify the areas where temporary traffic diversion may be required. ○ Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction. ○ 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. ○ 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 both during the day and night. ○ It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible	As proposed under DPR and determined by contractor and approved by PIC/PIU/ *(Enter the chainages which may require traffic diversions where possible)*		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed			
10.	Grievance Redress	○ Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.		

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 : Once during construction after completion of about 50% of construction
Project Details:…….
Road Stretch Name : …….
Monitoring Report Quarter No.: ……..

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
1.	Sourcing and transportation of construction material	**Borrow Earth:** ○ The borrow earth shall be obtained from identified locations and with prior permission of landowner and clear understanding for its rehabilitation. ○ 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. ○ The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. ○ Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. ○ A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). ○ Borrowing of earth will not be done continuously through out the stretch.	***(Enter chainage or probable locations of borrow areas. Enter name and location of identified quarries.)***		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ Ridges of not less than 8m widths will be left at intervals not exceeding 300m. ○ Small drains will be cut through the ridges, if necessary, to facilitate drainage. ○ The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). ○ The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. ○ Fly ash will be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. **Aggregate :** ○ The stone aggregate shall be sourced from existing licensed quarries ○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage **Transportation of Construction Material** ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. ○ Prior to construction of roads, topsoil shall be preserved and shall be used for other useful purposes like using in turfing of embankment. ○ 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	○ 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.	All though the alignment of each project road		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ 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. ○ 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.			
3.	Compaction and Contamination of Soil	○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. ○ The productive land shall be reclaimed after construction activity. ○ Fuel and lubricants shall be stored at the predefined storage location. ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.	All though the alignment of each project road		
4.	Construction Debris and waste	○ Excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for	All though the alignment of each project road		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		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. o The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. o For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.			
5.	Air and Noise Quality	o Vehicles delivering loose and fine materials like sand and aggregates shall be covered. o Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas. o Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. o Material storage areas shall also be located downwind of the habitation area. o 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. 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	Throughout the project road section		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		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 where available. Construction vehicles and machineries shall be periodically maintained.			
6.	Tree plantation	○ Compensatory Afforestation shall be made on 1:3.ratio basis. ○ Additional trees shall be planted wherever feasible. ○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years	***(Enter the number of trees requird for planting and location of plantation site if available)***		
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 slope stabilisation, etc shall be taken for prevention of siltation in water bodies.	Throughout the project road		
8.	Occupational Health and Safety	○ 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.	In all project roads		

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		○ 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.			
9.	Grievance Redress	○ Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.		

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: Once, one month after completion of construction
Project Details :…….
Road Stretch Name: …….
Monitoring Report No.: ……..

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
1.	Air and Noise Quality	○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due to 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. ○ Obtain clearance from PIU before handling over the site to WBSRRDA. ○ 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	All locations of construction camps/temporary office/ material storage, and borrow areas		
3.	Tree plantation	○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years ○ Data on plantation survivability to be collected	*(Enter the number of trees requird for planting and location of plantation sites)*		
4.	Hydrology and Drainage	○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season.	At project road locations with drainage structures		

		○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted			
5	Community 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		
6	Grievance Redress	○ Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.		

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

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