# INITIAL ENVIRONMENTAL EXAMINATION

May 2015

# IND: Rural Connectivity Investment Program - Project 3

Batch – 3 Roads, Madhya Pradesh

Prepared by the National Rural Road Development Authority, Government of India for the Asian Development Bank

## CURRENCY EQUIVALENTS

as of May 2015

| Currency unit | — | Indian rupee (Rs) |
|---|---|---|
| Rs 1.00 | = | $ .01572 |
| $1.00 | = | Rs 63.5981 |

## ABBREVIATIONS

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

| | | |
|---|---|---|
| SRRDA | – | State Rural Road Development Agency |
| SBD | – | Standard Bidding Documents |
| SO2 | – | Sulphur di-Oxide |
| SPM | – | Suspended Particulate Matter |
| TA | – | Technical Assistance |
| TOR | – | Terms of Reference |
| TSC | – | Technical Support Consultants |
| UG | – | Upgradation |
| WBM | – | Water Bound Macadam |
| ZP | – | Zilla Parisad |

**WEIGHTS AND MEASURES**

km – kilometer
m – meter

**NOTE**

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

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# EXECUTIVE SUMMARY

## A. Background

1. The Government of India (GOI) launched PMGSY in year 2000 with the objective of providing all-weather road connectivity to all rural habitations with a population of more than 500 persons in plains and 250 persons in hill states. This program is being implemented through National Rural Road Development Authority (NRRDA) under Ministry of Rural Development (MORD) at central level and through State Rural Road Development Authority/Agencies (SRRDA) at state level. The Rural Connectivity Investment Program (RCIP) is continuation of Rural Road Sector II Program (RRS IIP) and is a multi-tranche financing facility (MFF) that aims to construct or upgrade to the all-weather standard about 9,000 km of rural roads connecting around 4,800 habitations in the states of Assam, Chhattisgarh, Odisha, Madhya Pradesh and West Bengal. Under RCIP Project 1 (Loan 2881-IND) sub-projects cover about 3,530 km in total (426.43 km in Assam, 1,009 km in Chhattisgarh, 1,187 km in Madhya Pradesh, 757 km in Odisha, and 151 km in West Bengal) while the RCIP Project 2 (Loan 3065-IND) covers about 3,693 km in total (499 km in Assam, 429 km in Chhattisgarh, 654 km in Madhya Pradesh, 1,184 km in Odisha, and 930 km in West Bengal). The amount funded for the states under ADB RCIP Project 1 is approximately $381.44 million while funding under Project 2 is about $275 million. The subprojects are at various stages of implementation.

2. The Government is now planning to submit to ADB the Third Periodic Finance Request (PFR) that includes the proposal for 613 roads with a total length of 1736.68 km spread over 25 districts in the state of Madhya Pradesh. MPRRDA is the implementing agency (IA) for the ADB funded subprojects in the state. The preparatory works for the proposed roads under the third tranche have been completed for the state. Tranche III as per classification of ADB has been categorised as ‘Category B’ project and therefore requires an Initial Environmental Examination (IEE).

3. These roads has been selected following PMGSY guidelines for the selection of roads under this programme and satisfy the following environmental safeguards: i) the selected road shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance; ii) the selected road shall not pass through any designated wildlife sanctuaries, national parks, notified ecological sensitive areas or area of internationally significance (e.g., protected wetland designated by the Wetland Convention); and iii) the sub projects shall only involve activities that follow Government of India laws and regulations and meets funding agency safeguard policies

## B. Description of Project

4. The proposal for rural road construction works typically considers a 10-12 m right of way (ROW), which includes side slopes for embankment, side drains on either side of the alignment. The roads consists both Black Top (B.T.) and Cement Concrete (C.C.) as per the ROW availability. The construction proposals are confined to the existing alignment of the unpaved tracks. The broad specifications for road alignment selection, pavement design, construction methodology, and geometric design are in accordance with the “Specification for Rural Roads” published by IRC on behalf of the Ministry of Rural Development, Government of India (GoI). The design details presented in this chapter highlights the PMGSY specifications. Minor changes will apply depending on road specific issues and design consideration. Since topography of Assam state is largely flat, the design details applicable to flat terrain.

5. The proposed rural road construction work will provide 7.5 m roadway width (this may be reduced to 6 m as per latest guidelines) with 3.75 m carriageway in accordance with the IRC-SP 20: 2002 in plain terrain. The proposal considers a 3.75 m cement concrete pavement with lined storm water drains for stretches passing through built-up areas, waterlogged/water overtopping/ flood prone areas. The pavement design considers a base layer of variable thickness as per the design with granular sub base, 150 mm thick water bound macadam (WBM grade I & II) and finally topped with 20 mm thick bituminous pavement. Adequate cross drainage structures like pipe or slab culverts/bridge structures are considered for drainage channels across the roads. Few minor bridges are also proposed to be constructed.

6. 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 IRC guidelines IRC: SP: 72 – 2007 or IRC SP:77 “Design of Gravel Road” and IRC SP:62-2004 “Cement Concrete roads”. In built up area for hygienic and safety reasons, C.C pavement is proposed with a hard shoulder and appropriate line drain. A design life of 10 years is considered for the purpose of pavement design of flexible and granular pavements. The embankment height considered as 1m (average) from ground to crust except at the approaches of cross drainage structures. The embankment height will vary in flood prone area as per the HFL. The design speed considered is as per recommended design speed of 50 Km/h.

## C. Description of Environment

7. Madhya Pradesh has a topography that is crossed from north to south by plains separated by upland areas. The climate is extreme in the north of Madhya Pradesh. It is cool and breezy in the central parts and humid in the eastern and southern regions. The state has three main seasons namely Winter from November to February with average temperatures ranging from 10° to 27° C (50° to 81° F), Summer from March-to-May with average temperature ranging from 29° C to 48° C (85° F to 118° F), Monsoon from June to September with average temperature ranging from 19° C to 30° C (66° F to 86° F) with average annual rainfall of 1200mm. All the four districts has similar climate with minor variation in temperatures.

8. Most of the project area lies in vast open agricultural land and is largely free from air pollution sources other than traffic and few brick-kilns existing in the area. As such, the ambient air quality (for parameters SO2, RSPM and NOX ) is expected to be within the limits in most of rural and semi urban areas. The ambient noise levels are also xii expected to be within the National Ambient Noise Standards due to absence of any high noise sources in proposed roads vicinity.

9. As per seismic hazard map of India updated by Bureau of Indian Standards The project region falls in Zones II & III i.e., low to moderate risk zone.

10. The major land use in the state is agriculture (about 48.48%) followed by forests (28.17%). Land use pattern along the project road is also mixed type dominated by agriculture, barren forest land and residential areas.

11. Madhya Pradesh is criss-crossed by India‟s four major rivers namely Narmada, Tapti, Sone and Mahanadi along-with their numerous tributaries. None of the rural road crosses any natural stream except two roads, which crosses Keth River and Chamla rivers. Sample roads are mostly crossed by seasonal small channels. The ground water is largely being used for drinking purposes in the rural areas which is being extracted through hand pumps. The state is currently exploiting 46% of the available ground water resources. As per the central ground

water board (CGWB) report, the groundwater quality of all the project districts Sagar, Sidhi, Dhar and Damoh, in both shallow and deeper aquifers is good and suitable for drinking, irrigation and industrial purposes.

12. Madhya Pradesh is endowed with rich and diverse forest resources. The latest estimates of Forest Survey of India (FSI), published in the State of Forest Report (SFR) 2003, suggest that the total forest cover of M.P. is 76,429 sq. km., which is 24.79% of the land area - dense forest constituting 13.57% and open forest 11.22%. There are 9 National Parks and 25 Sanctuaries spread over an area of 10,862 sq. km constituting 11.40% of the total forest area and 3.52% of the geographical area of the state. No wetland or large water body falls in and around the selected project roads area. Fisheries activities are also minimal in subproject areas. The project area lies in tropical climate zone. It has a medium range of flora and fauna. There are 22 road stretches in Project 3 that passes through forest land/area requiring tree felling. In all cases the number of tree cutting have been minimized by modifying road alignment.

13. Madhya Pradesh has a total population of 60 Mn persons. It has one of the largest tribal populations in the country. Out of the 50 districts in the State, 19 are predominantly tribal. Eighty-nine blocks (approx. 28%) of the total 313 development blocks are tribal blocks. The State literacy rate presently is 64.11% (source: Census 2001), which is close to the national literacy rate of 64.8 %. About 18.8, million people is considered living below poverty line in Madhya Pradesh, which constitutes about 43% of total population. State has well-developed postage and telephone system. Subprojects areas also has good access to these facilities. Educational facilities are available in the village areas as well. However, rural population has to depend on urban areas for undergraduate level education. The economy of Madhya Pradesh is primarily agriculture based. About half of the land area is cultivable. The state has various industrially developed estates as well. The major industrial produce includes cement, pigiron, steel ingots, news print, and sugar. Industrialization is low in the subproject areas. However, there is high potentiality for the growth of cottage and small industries in subproject areas. Better communication and transport facilities may be contributory in this growth.

## D. Anticipated Environmental Impacts and Mitigation Measures

14. 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 are planned to follow the existing alignments and will be of 6 to 7.5 m width only. The impacts are largely expected to be during construction phase, which can be mitigated through engineering measures and adoption of best construction practices.

15. All project roads are subjected to environmental screening using the ECOP checklist. A sample size of 10% was selected by the MPRRDA with support from the Project Implementation Consultant (PIC) from which this state level IEE was based. Separate environmental checklist were prepared for bridges with length greater than 50m. All sample roads included under RCIP were selected based on ecological and climate change consideration defined under EARF. Accordingly, none of the sample roads passes through protected areas or encroaches precious ecology (sensitive or protected areas) or any historical or archeologically protected areas. No forestland diversion is involved either.

16. By the 2050s, downscaled global climate change models predicts a general increase in temperature in Madhya Pradesh including annual average low, average high, maximum, and minimum temperatures. The GCM ensemble also predicts a substantial increase in annual

rainfall from 9,350 mm to 10,819 mm. The natural hazards that will be compounded by the projected increase in rainfall and temperature are flooding, landslide, and vegetation fire, and tsunami. The central district of Jabalpur and Khandwa are prone to flooding having 5-50 flooding events per 100 years. To address these risks, RCIP Tranche 3 has allocated Rs 55.850 million of which RS18.750M is for constructing cross and side drains, Rs279.370M is for bridges and culverts, Rs247.840M is for increasing road embankment height, and 12.540 is for slope stabilization.

17. 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. There are 3 roads under Project 3 that passes through any forest land and all have secured forest clearances. None of Project 3 roads are located within 10 km radius of any wildlife sanctuaries or protected areas.

18. Site clearing operations may have impact on common utilities, community properties, and land use. These will be avoided by limiting most of the construction activities along the alignment and strictly implementing the utility and road furniture shifting plan; ground staking of RoW; prior informed consent on vegetation clearing, tree felling with permission from Forest Department, and utility shifting; and preservation and re-use of all topsoil.

19. Impacts related to health, safety of the labourers at the construction campsites, availability of safe drinking water, sanitation, and collection, storage, and disposal of oily wastes addressed in the EMP mostly through good housekeeping and linking with local health protection programs. All construction camps and hotmix plant will be set up at least 500 m away from habitat or forest areas. 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 to avoid or minimize disturbance to existing traffic. 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. To minimize deterioration of air quality during construction the following will be implemented as part of the civil works: i) use of covered haul trucks, ii) regular sprinkling of water on active construction fronts and materials storage areas; iii) hot mix plants and diesel generating sets comply with stack height requirements and secure clearance from the State Pollution Control Board, and iv) mandatory use of PPEs to all construction workers.

20. 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. Balance cut and fill will be followed to the extent possible to minimize borrowing. Adequate provision shall be made for cross drainage structures for maintaining natural drainage pattern in the subproject area and preventing soil erosion.

21. The provision of adequate cross drainage structures shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. Road levels shall be designed considering HFL. Low costs measures like use of bamboo or eucalyptus tree will be adopted for

embankment protection and control of soil erosion. Other slope stabilisation measure like vegetative protection will be installed when necessary as deemed by the PIC. None of the sample roads is crossing any natural stream except Damdih road, which run close to Haf River. This road may be prone for flooding.

## E. Environmental Management Plan and Institutional Arrangements

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

23. The environmental monitoring program is prepared with aim 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 construction stage and operation stage.

24. NRRDA/SRRDA has defined institutional setup including with specified responsibility for environmental management. Existing capacity of the State Rural Roads Development Agencies (SRRDAs) and Project Implementation Units (PIUs) for implementing environmental safeguard issues need substantial strengthening. The capacity enhancement is proposed through focused workshops and training session. Few workshops have already been conducted at participating states through ADB appointed Environmental specialist.

25. Grievance Redress Mechanism is also defined for receiving public concerns at state, PIU, and central level.

## F. Public Consultation and Information Disclosure

26. The project has immense acceptability among the local people. They perceived that in addition to providing all weather connectivity, the sub-project road would bring positive socioeconomic changes in the area. The project has tried its best to address all the issues raised during consultations under the constraints of suitability from engineering point of view.

## G. Conclusion

27. 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. 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. 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.

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

# 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)1 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. The National Rural Road Development Authority (NRRDA) is implementing the Project under Ministry of Rural Development (MORD) at central level and through State Rural Road Development Authority/Agencies (SRRDA) at state level[2].

2. The Rural Connectivity Investment Program (RCIP) is a continuation of the Rural Road Sector II Program (RRS IIP) and is a multi-tranche financing facility (MFF) that will construct or upgrade to the all-weather standard about 9,000 km of rural roads connecting around 4,800 habitations in the states of Assam, Chhattisgarh, Orissa, Madhya Pradesh, and West Bengal (collectively called RCIP states). RCIP will also improve the institutional arrangements and business processes through capacity building of the SRRDAs. The project will enhance capacities related to design, operation, safeguard, financial, road safety, and asset management matters. Investments in rural roads will improve connectivity and cut transport costs by providing improved connectivity between habitations, markets, and urban towns.

3. RCIP Tranche 1 financed part of the cost of: (i) construction of 3,461 km of rural roads in the five project states, (ii) consultancy services, and (iii) capacity building of implementing agencies by establishing rural connectivity training and research centers (RCTRCs) and rural roads network management units (RRNMUs). The Loan for Tranche 1 (Loan 2881-IND) totalling $252 million was signed in April 2013 and became effective on 5 June 2013. RCIP Tranche 2 (Loan 3065-IND) totaling $275 million was approved on 25 November 2013. Until May 2014 Tranche 1 has awarded 515 out of 532 or about 97% of the total contracts while for RCIP Tranche II has 498 out of 716 or about 70%.

4. The Government is submitting the third Periodic Finance Request (PFR) to cover 1,381.36 km of rural roads in the state of Madhya Pradesh. The Madhya Pradesh Rural Road Development Agency (MPRRDA) is the implementing agency (IA) for the ADB funded subprojects in the state. Tranche III as per classification of ADB has been categorised as 'Category B' project and therefore requires an Initial Environmental Examination (IEE).

5. This IEE report was prepared by M/s Operations Research Group (P) Ltd., the Technical Support Consultants (TSC) appointed by National Rural Road Development Agency (NRRDA) under the ADB loan assistance.

## B. Project Roads Identification and Location

[1] Prime Minister's Rural Road Program
[2] Madhya Pradesh Rural Road Development Authority

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

i. The selected road shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.
ii. The selected shall not pass through any designated wildlife sanctuaries, national parks, notified ecological sensitive areas or area of internationally significance (e.g., protected wetland designated by the Wetland Convention);
iii. The sub projects shall only involve activities that follow Government of India laws and regulations and meets funding agency safeguard policies.

7. The Madhya Pradesh Rural Road Development Agency (MPRRDA) has selected about 482 kms of rural roads under RCIP Tranche 3. The 482 kms of roads are distributed in 25 of the 51 districts of the State. Within each district, the roads are further scattered in several blocks and sub-divisions. Under tranche-3, the longest road is 13.00 km (Khatkhari to (Ghagham) Uskakathar in Hanumana block of Rewa district-Package MP-32504) followed by 11.70 km (L081 Badarwas Rampuri to Kirola in Badrawas block of Shivpuri district-Package MP-40505), while the shortest is 0.50 km (Kanasiya to Laxmipura Rupakhedi to Palduna in Tarana Block of Ujjain District). The average length works out to 2.83 km. The gist's of selected total length of 1736.68 Km is detailed at Appendix 1.

## C. Rural Road Construction Proposal

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

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

## D. ADB Safeguard Policies and Category of the Project

10. The Asian Development Bank has defined its safeguard requirements under its *Safeguard Policy Statement 2009* (*SPS 2009*) requiring 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,

[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

where possible; and (ii) minimize, mitigate, or compensate adverse project impacts on the environment and affected people when avoidance is not possible. The ADB *SPS 2009* classify a project into category A, B or C depending on potential environmental impacts.

11. All environmentally sensitive components along each subproject road are assessed to define the magnitude and extent of likely impacts. Selection criteria require none of the roads pass through or near any protected areas, archeologically important monument, and reserved forests. Few tree cutting is allowed provided they are not protected or endangered species. The road primarily passes through agricultural and residential areas. Most of the roads follow existing alignment and land acquisition is minimal. The RCIP Tranche III for the state of Madhya Pradesh is classified as environmental category B based on ADB SPS 2009.

12. No environmental categorisation is made under the Government of India (GoI) environmental legislations since rural road upgrading and construction are not covered by the Indian Environmental (Protection) Act and Rules, 1986 as amended.

## E. Objectives and Approach for Environmental Assessment

13. The prime objectives of the environmental assessment is to identify likely environmental impacts during design, construction, and operation stages of each rural road and formulate cost effective mitigation and monitoring measures and institutional mechanism for efective implementation of recommended measures.

14. Since there is large number of subproject roads involved under RCIP and magnitude of each road is small, preparation of individual IEE's for each road is inappropriate. ADB has prepared an Environmental Code of Practices (ECOP) checklist under Rural Road Sector (RRS) ProjectII II that was modified for RCIP. The ECOP is a distillation of the lessons learned in managing environmental impacts from past rural road projects. Each subproject was subjected to rapid environmental screening guided by the ECOP checklist. Sample ECOP checklist with annexures on tree, utility and community structures, strip maps and photographs for each selected sample road are provided in Appendix 2.

15. The findings from the ECOP Checklist from the sample projects provide the basis to prepare state-level IEE reports and EMP. The EMP is generic and forms part of the bidding documents to guide the project implementation consultant (PIC) and project implemention unit (PIU) prepare road specific EMPs provided in the detailed project reports (DPRs).

## F. IEE Methodology and Content

16. The state specific IEE was structured based on *ADB SPS, 2009* and *ADB's Environmental Assessment Guidelines (2003)*. The IEE reports including EMPs, and monitoring plans, cover the most environmentally sensitive components in state as well as specific to subproject roads.

- **Corridor of Impact:** The direct area of influence or the corridor of impact (COI) has been considered as 10 m on either side of the proposed sample roads alignment Based on the proposed cross-section.
- **Field Visits, Primary and Secondary Data Collection**: A total of 10% of the nominated roads were selected to comprise the sample population where the environmental examination is to be conducted. Each sample road was visited by PIC along with concerned PIU officials for environmental assessment. Individual road specific strip map was prepared during the field visit to capture the

information related to tree inventory, utility and community structures located along the proposed road alignment, surface water bodies, and ecological sensitivities. Secondary environmental information pertaining to the environmental issues, protected area, forests areas were collected from various government and non-governmental / research institutions for assessment of the baseline environment of the project locations, district and state as a whole.

- **Data Analysis, Impact identification and Mitigation Measures**: Information collected were analysed and impacts identified. Mitigation measures were proposed common to larger roads and specific to the roads. EMP is prepared considering mitigation measures and institutional framework of SRRDA.

17. 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

18. 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.

19. As per Environment (Protection) Act, 1986; the Environmental Impact Assessment Notification, 2006; amended in 2009 defines the environmental impact assessment for 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, rural road projects proposed under RCIP do not require environmental assessment or clearance based on the Notification and instead the mainstream environmental concerns specific procedures that were formulated under Rural Connectivity Investment Program (RCIP) will be implemented.

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

**Table 1: Applicable Environmental[4] Laws and Regulations to RCIP Road**

| Sl. No. | Legislation | Applicability |
|---|---|---|
| 1. | 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 |

[4] PMGSY Roads are not covered by the EIA Notification. As all eligible roads under the RCIP are prohibited from entering wilidlife protected areas and sanctuaries, no permit under the Wildlife Act is needed.

| Sl. No. | Legislation | Applicability |
|---|---|---|
| | | 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 through afforestation as per permission condition. |
| 2. | The Water (Prevention and Control of Pollution) Act 1972 (Amended 1988), and the Water (Prevention and Control of Pollution) Rules, 1974 | Placement of hot-mix plants, quarrying and crushers, batch mixing plants, discharge of sewage from construction camps requires *No Objection Certificate (Consent to Establish and Consent to Operate)* from State Pollution Control Board prior to start of construction or setting up specific facility. *Authorisation* will also be required for disposal of Hazardous Waste like waste oil etc. from State Pollution Control Board |
| 3. | The Air (Prevention and Control of Pollution) Act, 1981, (Amended 1987), and the Air (Prevention and Control of Pollution) Rules, 1982 | |
| 4. | The Noise Pollution (Regulation and Control) Rules, 2000 (Amended 2002) | |
| 5. | The Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (Amended 2009), and the Batteries (Management and Handling) Rule, 2001 | |
| 6. | Guidelines for Ground Water Extraction Prescribed by Central Ground Water Authority under the power granted under Environment (Protection) Act 1986 | *Permission* from Central Ground Water Authority (CGWA) is required for extracting ground water for construction purposes, from declared as Semi-critical, Critical and Overexploited areas from ground water potential prospective. For NOC, An application in the prescribed Performa is to be submitted either to the Office of the Regional Director, (CGWB) of the concerned state, or to Member Secretary, CGWA, New Delhi |
| 7 | The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Workmen Compensation Act | Fixing hours for normal working day, weekly paid rest, overtime pay, basic welfare and amenities, temporary living accommodation on-site, PPEs, penalties for vilolation, and liability of employers in workmen injuries arising from employment. |

21. The PMGSY Scheme and Guidelines (2004) No. 12025/8/2001-RC, Ministry of Rural Development (MORD) also defines environmental requirements in road selection and regulatory compliance.

# II. DESCRIPTION OF THE PROJECT

## A. General

22. The PMGSY program has mandate to provide all-weather roads to all the rural habitations within the country. RCIP is planned to meet above objective. Under RCIP tranche 3 in Madhya Pradesh, about 1736.68 km of roads have been identified for implementation under RCIP. The broad specification for road alignment selection, payment design, construction methodology, geometric design etc. are same and is as per the "Specification for Rural Roads" published by IRC on behalf of the Ministry of Rural Development, Government of India. The design details presented in this chapter are as per above specifications. Minor changes will apply depending on road specific issues and design consideration.

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

## B. Sample Roads Selected in Madhya Pradesh State

24. The Madhya Pradesh state has selected 613 roads with a total length of 1736.68 km spread over 25 districts as summarized at Table 2 below and detailed at Appendix 1.

**Table 2: : Summary of District Wise Proposed Rural Roads- Tranche 3**

| Sl. No. | District | No of Roads | Total Length (km) | Average Road Length (Km) | Road Length (Km) | |
|---|---|---|---|---|---|---|
| | | | | | Max | Min |
| 1 | Ashoknagar | 24 | 75.20 | 5.50 | 1.20 | 24 |
| 2 | Betul | 17 | 41.70 | 4.25 | 1.00 | 17 |
| 3 | Bhind | 19 | 44.80 | 5.00 | 0.90 | 19 |
| 4 | Chhattarpur | 19 | 47.42 | 4.93 | 0.75 | 19 |
| 5 | Chhindwara | 22 | 58.76 | 6.70 | 0.90 | 22 |
| 6 | Datia | 8 | 25.30 | 4.95 | 2.00 | 8 |
| 7 | Dewas | 27 | 73.53 | 6.35 | 0.75 | 27 |
| 8 | Guna | 18 | 55.80 | 8.40 | 1.20 | 18 |
| 9 | Hoshangabad | 17 | 43.10 | 4.50 | 1.08 | 17 |
| 10 | Jabalpur | 14 | 31.31 | 4.80 | 0.51 | 14 |
| 11 | Katni | 12 | 39.30 | 10.80 | 1.10 | 12 |
| 12 | Khandwa | 8 | 25.21 | 4.82 | 2.20 | 8 |
| 13 | Khargone | 14 | 37.69 | 5.10 | 1.04 | 14 |
| 14 | Narsinghpur | 34 | 98.50 | 7.00 | 1.00 | 34 |
| 15 | Rajgarh | 13 | 37.13 | 4.60 | 1.30 | 13 |
| 16 | Ratlam | 9 | 20.50 | 3.70 | 1.28 | 9 |
| 17 | Rewa | 15 | 54.45 | 13.00 | 1.00 | 15 |
| 18 | Sagar | 16 | 35.84 | 6.20 | 0.53 | 16 |
| 19 | Seoni | 28 | 72.18 | 4.90 | 0.70 | 28 |
| 20 | Shajapur | 18 | 42.67 | 4.50 | 0.55 | 18 |
| 21 | Shivpuri | 5 | 16.60 | 5.00 | 1.20 | 5 |
| 22 | Singrauli | 30 | 126.37 | 10.05 | 1.03 | 30 |
| 23 | Ujjain | 37 | 96.73 | 7.80 | 0.50 | 37 |
| 24 | Umaria | 37 | 116.74 | 10.70 | 0.90 | 37 |
| 25 | Vidisha | 21 | 64.54 | 6.45 | 1.25 | 21 |
| **Total/Average** | | 482 | 1381.36 | 6.40 | 1.03 | 482 |

## C. Project Description

### 1. Rural Road Construction Proposals

25. The proposed rural road construction work will provide 3.75 to 7.5 m roadway width[5] with 3.75 m carriageway in accordance with the Indian Road Congress (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, and flood prone areas. The pavement design considers a base layer of variable thickness design with granular sub-base, 150 mm thick water bound macadam (WBM grade I and and II) and finally topped with 20 mm thick bituminous pavement. Adequate cross drainage structures like pipe or slab culverts/bridge structures are considered for drainage channels across the roads. Few minor bridges are also proposed for construction. Figure 1 shows the typical cross section of the rural roads.

26. The rural road construction works will be in conformance with the Rural Roads Manual and Technical Specifications (IRC: SP20: 2002) for Rural Roads published by 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

27. The project roads mainly pass through plain or riverine terrain and agricultural area. The project roads have several cross drainage structure, electric post and telephone post along the existing alignment. There are some community physical structures like Temple, Mosque, primary or secondary schools beside the roads alignment, but will not be affected due to the widening of roads. There are some utilities besides the roads. Some of these may need to be shifted. There are 27 roads passing through forest area (Appendix 1) but are already having movement paths so land acquisition is not required still permission from the forest department has been obtained/being obtained. Permission grated are conditional need to be strictly followed.

### 3. Alignment and Profile

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

### 4. Design Considerations

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

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

for this road are described below. The requirement of ROW as per PMGSY guidelines considered for the design is given at Table 3 below:

**Table 3: 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*

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

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

32. **Road side drain**: As the insufficient drainage of surface water leads to rapid damage of road, road side drain (Figure 1) are provided on the locations of habitation areas with concrete pavement. The rainwater will flow along the longitudinal slope and intermittent gaps in concrete curbs.

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

34. **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.

35. **Surfacing**: Slow setting bitumen emulsion will be applied as primer on water bound layer. Rapid setting bituminous emulsion will 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.

36. **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

37. For rural roads NRRDA has framed specific guidelines for cost effective construction of these rural roads preferring manual means. Motor grader and tractor-towed rotavator are used for handling of bulk materials like spreading of aggregates in sub-base and base courses by mix-in-place method. Ordinary smooth-wheeled roller is used for compaction if the thickness of the compacted layer does not exceed 100 mm. It is also considered that hot mix plant of medium type and capacity with separate dryer arrangement for aggregate is used for bituminous surfacing work that can be easily shifted. A self-propelled or towed bitumen pressure sprayer is used for spraying the materials in narrow strips with a pressure hand sprayer. For structural works, concrete is mixed in a mechanical mixer fitted with water measuring device. Excavation is manually or mechanically using suitable medium size excavators.

### 6. Available Right of Way

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

### 7. Traffic

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

### 8. Economic Assessment

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

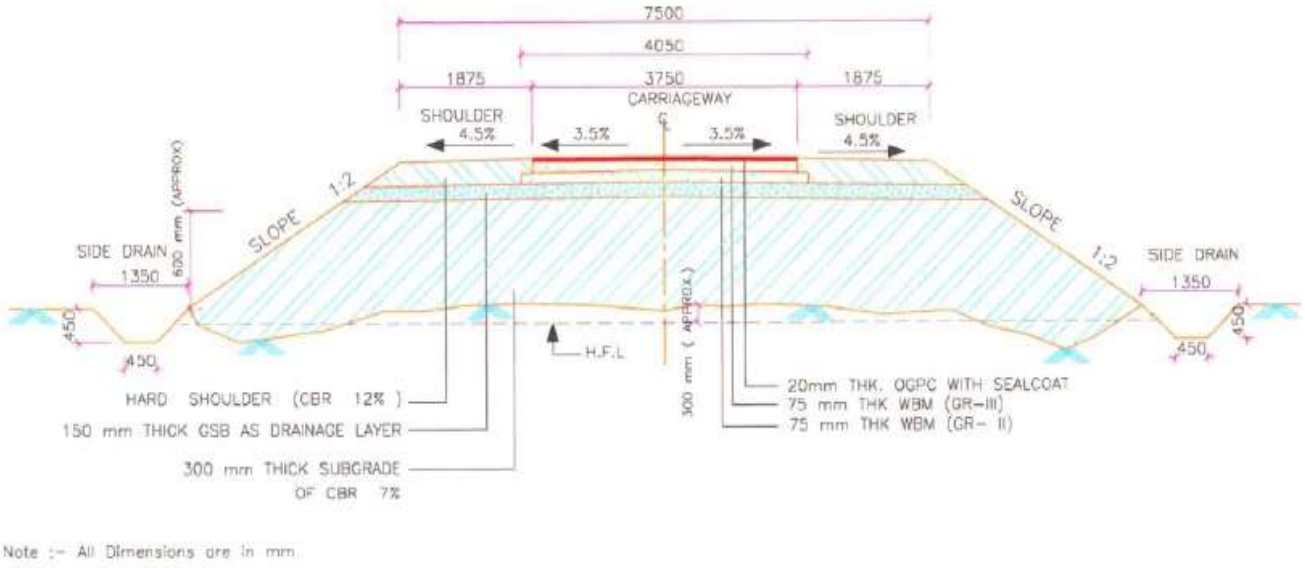



**Figure 1: Cross-section of Rural Roads**

# III. DESCRIPTION OF THE ENVIRONMENT

## A. Background

41. Baseline environmental conditions about all facets of environment viz. physical, biological and socio-economic were established using primary and secondary sources. Efforts to collect the latest information both at regional as well as local level especially along the project corridor were made tro allow better prediction of likely changes in the environment due to the project and will serve as performance indicators for various components.

42. The project roads are located almost all over the state covering 18 out of the 27 districts. The baseline information at the state level and road-specific environmental salient features are provided in this chapter.

43. Madhya Pradesh is located between lat. 21°04'N and long. 74°02' and 82°49' E, The geographical area of the state is 308,144 km 2 (118,975 sq mi) which constitutes 9.38% of the land area of the country. The forest area of the state is 95,221 km 2 (36,765 sq mi) constituting 31% of the geographical area of the state and 12.44% of the forest area of the country. The state boundary touches six states of the country, namely Chhattisgarh, Maharashtra, Andhra Pradesh, Orissa, Jharkhand & Uttar Pradesh. List of the sample roads is as under;

| Sr. No. | District | Road Name | Length (Km) |
|---|---|---|---|
| 1 | Ashoknagar | L088-L085 to Lidhorakalan | 3.50 |
| 2 | Ashoknagar | L125-T008 to Kudai | 4.10 |
| 3 | Betul | Neemjhiri to Bodna | 5.00 |
| 4 | Betul | Sohagpur to Junawani | 3.40 |
| 5 | Bhind | Etawah Gwalior Road To Chasar | 1.300 |
| 6 | Bhind | Jakhmoli To Khodan | 0.9 |
| 7 | Chhatarpur | Ganj Jhamtulli to Rampura | 2.15 |
| 8 | Chhatarpur | Benigunj road to Bamnora | 3.7 |
| 9 | Chhindwara | Kachram To Damuamal | 2.125 |
| 10 | Chhindwara | Satnur T01 T0 Malegaon | 6.700 |
| 11 | Datia | Indergarh Goraghat Road to Pipra | 4.10 |
| 12 | Dewas | Vijaygarh Muriya to Chaubara Road | 2.87 |
| 13 | Dewas | Kachnariya to Rajapur Road | 0.75 |
| 14 | Dewas | Nanadharakhedi to Nevari Road | 1.825 |
| 15 | Guna | L096-T-09 Guna-Umri-sirsi rd to Ari | 2.60 |
| 16 | Guna | L031-T-01 Khatoli-A.B.Road to Sagar | 2.80 |
| 17 | Guna | L070-T-07 Chachoda-Miragwas to Kusmpura | 1.500 |
| 18 | Hoshangabad | SH-22 to Khapa Rd. To Singwada | 3.450 |
| 19 | Hoshangabad | SH-19 To Dabka | 4.25 |
| 20 | Jabalpur | Sakri to Lalpur | 2.10 |
| 21 | Jabalpur | Konikala to Itwa Imlia | 4.800 |
| 22 | Katni | PWD Rd to Gopalpur | 6.30 |
| 23 | Khandwa | Khandwa Aashapur Road To Badgaon Road | 4.900 |
| 24 | Khargone | Khandwa Indore S.H.27 to Lohari | 4.90 |
| 25 | Khargone | Bagod to Methawan | 3.800 |
| 26 | Narsinghpur | Kodras kala to Mehgaon | 1.40 |
| 27 | Narsinghpur | NH.26 km. 352 to Agariya | 1.00 |
| 28 | Narsinghpur | Ghapindrai to Malhaua | 2.100 |
| 29 | Narsinghpur | Rakai to Basedi | 4.400 |

| Sr. No. | District | Road Name | Length (Km) |
|---|---|---|---|
| 30 | Rajgarh | Narsinghgarh To Vijaygarh | 3.100 |
| 31 | Rajgarh | NH-12 To Peepalbey | 1.500 |
| 32 | Rajgarh | Bhandawat To Laxman Pura | 2.200 |
| 33 | Ratlam | Jaora Alote Road to Bisalkheda | 1.00 |
| 34 | Ratlam | Batwadia to Roopdi | 2.100 |
| 35 | Rewa | L-083 (Badagawan) To Bela | 5.00 |
| 36 | Rewa | Tilkhan To Guhiya | 3.100 |
| 37 | Sagar | Chauki to Shikarpur | 4.20 |
| 38 | Sagar | Jaisinagar to Jera | 6.20 |
| 39 | Sagar | B 07 to Hinoti | 1.250 |
| 40 | Sagar | MDR Dhanora to Karai | 2.000 |
| 41 | Seoni | T-23 to Gangerua | 2.70 |
| 42 | Seoni | T-18 Seoni Chhindwada to Chargaon | 2.900 |
| 43 | Seoni | Lakhanwada (T18) to Pindrai | 3.200 |
| 44 | Shajapur | Kharsoda to Salsalai | 1.700 |
| 45 | Shajapur | Koriya to Gulana | 4.800 |
| 46 | Shajapur | Choki Nasirabad to Akhtiar Pur | 5.500 |
| 47 | Shivpuri | T03 Bhadota Road To Berasiya | 4.90 |
| 48 | Shivpuri | Shivpuri-Seopur Road (T04) to Chhinari | 2.500 |
| 49 | Singrauli | Pondi Path to Kamai | 5.500 |
| 50 | Singrauli | Khatai to Chikani | 4.400 |
| 51 | Singrauli | Ghoghara to Patehara | 2.000 |
| 52 | Ujjain | Jagoti (Mahudi) to Hingoniya | 3.60 |
| 53 | Ujjain | Badnagar Kesor Road to Birgodanadu | 1.630 |
| 54 | Ujjain | Bolasa to Khokariya | 4.500 |
| 55 | Ujjain | Ujjain - Maxi to Khajuria - Kumawat | 1.950 |
| 56 | Umaria | Tammannara to Urdani | 6.20 |
| 57 | Umaria | Bandhwatola to Baghwar | 2.400 |
| 58 | Umaria | Uphari to Ujaniya | 3.100 |
| 59 | Umaria | Bagaiha To Salkhaniya | 3.63 |
| 60 | Vidisha | Sironj-Lateri Rd. To Jhukar Hauj | 2.00 |
| 61 | Vidisha | Sunpura Road To Bais | 1.25 |
| 62 | Vidisha | SH-19 (Kagpur) To Kanari | 3.300 |
| **Grand total** | | | **85.15** |

44. Summary key environmental features of the project districts are given in Table 4.

## B. Physical Environment

### 1. Meteorology and Climate

45. Madhya Pradesh has a topography that is crossed from north to south by plains separated by upland areas. The climate is extreme in the north of Madhya Pradesh. It is cool and breezy in the central parts and humid in the eastern and southern regions. Best time to visit is between Septembers to February. The state has three main seasons:

- **Winter:** November to February are the months of winter during which the average temperatures range from 10° to 27° C (50° to 81° F). Winters are usually pleasant and dry.

- **Summer:** The March-to-May season is hot and dry. Summers are hot, with an average temperature of 29°C (85°F) and a high temperature that at times reaches 48°C (118°F).
- **Monsoon season:** The climate is monsoonal between June to September. During the monsoon season temperatures average 19° to 30° C (66° to 86° F). Madhya Pradesh receives an average annual rainfall of about 1200 mm (nearly 50 in), of which 90% falls during the monsoon season.

**Table 4: Summary Key Environmental Features of the Project Districts**

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| Ashoknagar | Ashoknagar is located on the northern part of Madhya Pradesh between Sindh and the Betwa rivers. It comes under the northern part of Malwa plateau, though main part of its district lies in the Bundelkhand Plateau. Geographically, the district is situated between the latitude 24.34 N and longitude 77.43 E. Ashok Nagar district is surrounded by the Shivpuri, Guna, Vidisha and Sagar Districts of Madhya Pradesh and touches the Uttar Pradesh Boundary. | The year is popularly divided into three seasons: summer, the rains, and winter. Summer extends over the months mid-March to May . The average daily temperature during the summer months is 35°C, which typically rises to around 46 °C on a few days. The rainy season starts with the first showers mid-June and extends to the middle of September. Most of the rain falls during the southwest monsoon spell, and ranges from about 100 cm in the west to about 165 cm in the east. Ashok- | None | Ashoknagar is situated at the average elevation of 507 metres(1640 ft) above sea level. It is in the plateau region. It has an agricultural topography. The plateau is an extension of the Deccan Traps, formed between 60 and 68 million years ago at the end of the Cretaceous period. | The Betwa flows along the eastern boundary separating it from Sagar District and Lalitpur District of Uttar Pradesh. The Sindh is the main river flowing along the western boundary. | Alluvium | Field Crops: Kharif, soybean, Urd, Maize, Moong, Rabi, Wheat, Gram, Lentil, Mustard<br><br>Fruits: Mango, Giava, Orange, Banana<br><br>Vegettables: Potato, Tomato, Onion<br><br>Spices: Chili, Coriander, Ginger, Garlic | |

[6] http://nbaindia.in/uploaded/state-wise/MP/1.list_Protectedareas_MP.pdf
[7] http://dolr.nic.in/dolr/downloads/spsp/Madhya%20Pradesh_SPSP.pdf
[8] http://agricoop.nic.in/Agriculture%20Contingency%20Plan/MP/

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | | nagar and surrounding areas receive an average of 140 cm of rainfall a year. Winter is the longest of the three seasons, extending for about five months October to mid-March. The climate is sub-tropical. In summers, the temperature reaches 47°C, while dropping to 4°C in the winter. Rainfall is adequate and sometimes less. | | | | | | |
| Betul | Betul is one of the marginally located southern districts of Madhya Pradesh, lying almost wholly on the Satpura plateau. It occupies nearly the whole width of the Satpura range between the valley of the Narmada on the north and the bearer plains on the south. It forms the southernmost part of the Bhopal Division. The District extends between 21-22 and 22- | | | | The Western boundary is associated for some distance with the Ganjal river (Southern), a tributary of Tapti, and then with the watershed line between the Morand and the Ganjal (Northern), the tributaries | Shallow Black | Field Crops: Soybean, Sorghum, Maize, Rice, Pigeonpea, Niger, Wheat, Chieckpea, Sugarcane, Pea, Lentil<br><br>Fruits: Mango, Guava, Orange<br><br>Vegetables: Cabbage, Potato, Brinjal, Tomato, Chili, Garlic, Coriander, Cauliflower, Pea | Water supply (>500m to fetch water)<br><br>Sewage<br><br>Air pollution from Thermal Power Plant in Sarni<br><br>Deforestation |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | 24 degrees north Latitude and between 77-10 and 78-33 degrees East Longitude | | | | of the Narmada. The Northern boundary is marked by the course of the Morand river, and by the TAWA river beyond Dhodra Mohar Railway station. The Eastern Boundary runs through small streams and hills among which Khurpura and Rotia Nalas are of some significance. | | | |
| Bhind | This district of Madhya Pradesh is geographically known for its Ravines, Fertile land and dense Forests. Bhind was one among the 16 districts of United State of Madhya Bharat which was constituted on 28th May 1948. | | National Chambal WLS | | | Aluvium | Field Crops: Paddy, Jowar, Bajra, Arhar, Til, Wheat, Oat, Gram, Pea, Lentil, Mustard, | |
| Chhindwara | Chhindwara district was formed on 1st November 1956. It is located on the South- | | Pench (Priyadarshini) NP | From the Geographical point of view Chhindwara | There are five major rivers which flow through the | Shallow Black | Field Crops: Soybean, Maize, Cotton, Sorghum, Rice, | Chhindwara block over exploited groundwater |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | West region of 'Satpura Range of Mountains'. It is spread from 21.28 to 22.49 Deg. North (longitude) and 78.40 to 79.24 Deg. East (latitude) and spread over an area of 11,815 Sq.Km. This district is bound by the plains of Nagpur District (in Maharashtra State) on the South, Hoshangabad and Narsinghpur Districts on the North,  Betul District on the West and Seoni Districts on the East. | | | district can be divided into three main regions - 1) The plains near Nagpur region comprising of Tahsils Sausar and Pandhurna, 2) the central region comprising of Chhindwara, Southern part of Amarwara region and and Northern part of Sausar region. This region is also known as the Satpura mountain region and 3) The third region is mostly the Northern region comprising of hilly terrain. | district namely Kanhan, Pench, Jam, Kulbehra, Shakkar and Doodh. | | Wheat, Chickpea, Sugarcane, Pea<br><br>Fruits: Orange, Guava, Mango, Water Chestnut<br><br>Vegetables: Potato, Chili, Garlic, Ginger, Onion | Deforestation |
| Datia | Datia is the District headquarter of the Datia District. The town is 69 Km from Gwalior, 325 Km south of new Delhi and 320 Km north of Bhopal.It is an ancient town, mentioned in the mahabharata as Daityavakra. | | | The district has an area of 2,038 km² | The Datia district comes under the Gangetic drainage system and is drained by the Sind, the Pahuj, the Mahuar and the Betwa. The former | Mixed Red and Black | Field Crops: Black Gram, Groundnut, Sesame, Wheat, Gram, Pea, Mustard<br><br>Fruits: Guava, Lime, Aonla<br><br>Vegetables: Tomato, Potato, | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | | | | | two, however form the drainage system of the main body of the district. The rivers are almost seasonal and have heavy run off only during the peak period of July and August in the rainy season. | | Brinjal, Table Pea, Cauliflower<br><br>Spices: Coriander, Chili, Garlic | |
| Dewas | Dewas is situated on the Malwa plateau in the West-central part of Indian state of Madhya Pradesh, about 143 km south west from state capital, Bhopal and 35 km from Indore the commercial capital of the state. | | Kheoni WLS | Dewas lies northeast of Indore, southeast of Ujjain, and southwest of Shajapur. The city is located on the level plains of the Malwa plateau; to the south, the land rises gently to the Vindhyan Range, | The main river in dewas is Kshipra, which is known as holy river. Chambal, Kali and Sindh rivers flow north through the district on their way to the Ganges. | Medum Black | Field Crops: Soybean, Cotton, Maise, Jowar, Wheat, Gram<br><br>Fruits: Mango, Guava, Orange, Lemon, Pomegranate, Aamla, Papaya<br><br>Vegetables: Tomato, Potato, Onion, Ladyfinger, Brinjal, Greenpeas, Cauliflower | |
| Guna | Guna is located at 24.65°N 77.32°E. It has an average elevation of 474 metres (1555 ft). | District has a sub-tropical climate with hot summers from late March to | | Area of district is 11065 sq Km. Out of which 27.7% is forest land. | Main rivers of the district are Parvati, Sindh, Kuno, Chaupat & | Medium and Deep Black | Field crop: Soybean, Blackgram, Maize, Jowar, Greengram, | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | District Shivpuri, is located at North, Ashoknagar & Vidisha is at East, Kota at West and Rajgarh & Bhopal is at South. | early July, the humid monsoon season from late June to early October, and a cool dry winter from early November to late February. Summers start in late March, Temperatures peak in May and June with daily averages being around 33–35 °C (93–95 °F), and end in late June with the onset of the monsoon. Guna r eceives 970 mm (39 in) of rain every year, most of which is concentrated in the monsoon months from late June to early October | | District is 476 m at sea level and Bundelkhand plateau is at East and Malwa plateau is at west and at center is plain. | Ghodapachhad etc. | | Wheat, Lentil. Mustard, Coriander<br><br>Fruits: Mango, Guava,<br><br>Vegetables: Potato. Tomato, Onion | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| Hoshangabad | Hoshangabad district lies in the central Narmada Valley and on the northern fringe of the Satpura Plateau. It lies between the parallels of 22 degree 15 minute and 22 degree 44 minute east. In shape, it is an irregular strip elongated along the southern banks of Narmda river. Its greatest length from south-east to north-east is 160 kms. | The climate of Hoshangabad district is normal. All the seasons come in the district. An average height from the sea level is 331 mts.and avearge rain fall is 134 cms. The average maximum and minimum temperatures are 32 deg.C and 19 deg.C respectively. Overall, the climate of the district is neither more hot nor more cool except the winter season of the Pachmarhi. | Satpura NP, Bori WLS | | In Hoshangabad district, there are two main rivers namely the Narmada and the Tawa., which join each other at the village Bandra Bhan. In the spot, a holy mela also organise on the occassion of Kartik purnima. Other small rivers are the Dudhi and the Denwa.A very big lake is also at Pachmarhi, which is one of the main tourist place of the district | Deep Black | Field Crops: Rice, Pigeonpea, Maize, Wheat, Chickpea, Sugarcane, Lentil, Pea<br><br>Fruits: Mango, Guava, Lemon, Orange<br><br>Vegetables: Potato, Onion, Tomato, Brinjal, Jackfruit | |
| Jabalpur | Jabalpur is divided into four tehsils, namely Sihora, Patan, Jabalpur and Kundam<br><br>Jabalpur is surrounded by Katni in the north & north-east, Damoh in the north and norh-west, Narsimhapur in | The climate is dry sub-humid and the average annual rainfall ranges between 1050 to 1100 mm<br><br>The climate is tropical to semi-arid dry, and | | Jabalpur forms part of the Kaimur Plateau and Satpura hills | The district falls mostly in the Narmada watershed area. Other smaller rivers are Gaur, Hirann, Sindor etc. | The soil is medium to deep black | Major Field Crop: Rice, Blackgram, Kodo-Kutki, Pigeonpea, Niger, Maize, Sorghum, Wheat, Chickpea, Lentil, Pea, Mustard, Linseed | 28% population are urban poor |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | the south-west, Seoni in the south and Mandla in the south-east | average annual rainfall ranges between 850 and 900 mm<br><br>The climate is semiarid and average annual rainfall rnages between 850 and 900 mm | | | Shivna river is main drainage system of Mandsaur | | Fruits: Mangoi, Guava, Citrus<br><br>Vegetables: Potato, Onion, Chili, Ginger, Garlic | |
| Katni | Katni districtBand is located in the Northeastern part of Madhya Pradesh it forms the northern district of Jabalpur commissionerate division. Mudwara was the biggest (areawise) Tahsil of Jabalpur before katni came as district in 1998. The district extends from 23 °37'N to 24 °80' N and from 79 °57' E to 80 °58' E. and hight from sea level is 392 m. There are three major rivers in Mudwara Katni, Chhoti Mahanadi And Umdar and the name katni of mudwara is given after the Katni River, which is two km away from mudwara. The shape of this district is roughly oval. | Climate of Katni is average it gains all the seasonal advantage from it. Average rainfall in Katni district varies 754.5 to 1439.7 | Bandhavgarh NP | Katni is also known as city of lime so many types of minerals are hidden in the heart of Katni like dolomite bauxite latrite clay, fire clay soapstone quartz batrize colsite etc | | Mixerd Red and Black, Deep Black | Main crops of katni are paddy wheat ,gram and pulses. In cash crop mainly vegetables are grown and sent to market of Satna District and Umaria also . | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| Khandwa | Khandwa District is situated South West of the state of Madhya Pradesh The District is in Indore Division of Madhya Pradesh. maximum and minimum height above mean sea level is 905.56 m and 180.00 m respectively. The District is bounded on the east by the Betul and Hoshangabad District of Hoshangabad division, and Burhanpur District of Indore Division on south, on the west by West Nimar District of Indore division,and on the north by Dewas District of the Indore Division | The climate of the District is pleasant and healthy. The District falls in the drier part of India. Average annual rainfall in the District is 980.75 mm. The northern part of the District receives more rainfall than the southern part. The monsoon season starts approximately by 10th June every year and extends up to early October. The days are quite humid. The maximum temperature recorded in the month of May is 42O C and minimum recorded in the month of December as 10OC | | | Two major rivers, the Narmada and Tapti are flowing parallel to each other from east to west through the District. | Medium Black | Cotton, Soybean, Sorghum, Wheat, Gram, Arhar<br><br>Fruits: Mango, Guava, Orange, Sweetlime, Lemon, Grapes, Pomegranate, Custard Apple, Papaya, Citrus | |
| Khargaon | The district is situated between 21°22' and 22°35' north latitudes and 74°25' and 76°14' east longitudes. The district is surrounded | | | Area of the district is 8030 km². | | Medium Black | Field Crop: Cotton, Wheat, Soybean, Sorghum, Maize, Pigeon Pea, Gram, Ground | Khargone and Maheshwar blocks are semi-critical groundwater |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | by Dhar, Indore and D ewas in the north, state of Maharashtra state in the south, Khandwa, Burhanpur in the east and Barwani in the West. | | | | | | Nut, Green Gram, Black Gram<br><br>Fruits: Mango, Guava, Banana, Papaya<br><br>Vegetables: Chilli, Corianger, Ginger, Garlic | |
| Narsinghpur | Narsinghpur district is situated in the central part of Madhya Pradesh & Madhya Pradesh is located in the Central part of India. Latitude 22º.45 North 23º.15 North, longitude 78º.38 East 79º.38 East, Area 5125.55 sq Km, 359.8 meters above the sea. | | | | | Deep Black | Field Crops: Soybean, Pigeon Pea, Blackgram, Rice, Sorghum, Chickpea, Wheat, Lentil, Sugarcane, Pea<br><br>Fruits: Mango, Guava, Citrus<br><br>Vegetables: Potato, Okra, Onion, Brinjal, Sweetpotato, Tomato | |
| Rajgarh | **Rajgarh** is located at western part of Madhya Pradesh. It borders the state of Rajasthan, and the districts of Shajapur, Sehore, and Bhopal. Rajgarh District extends between the parallels of latitude 23027' 12" North and 24017' 20" North and | | | | | Medium Black | Field Crops: Soybean, Maize, Sorghum, Chickpea, Wheat, Lentil, Pigeonpea, Moong, Urd<br><br>Fruits: Lemon citrus, Mango, Guava, Ber, Aonla, Anar, | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | between the meridians of longitude 76011' 15" and 77014' East. The total geographical area of the District is 6,154 sq.km. with a population of 15,45,814 according to census 2011. It is 145 KMs from the state capital Bhopal | | | | | | Custard apple | |
| Ratlam | Ratlam is situated in North-West region of Madhya Pradesh from 23 05' North to 23 52' North Longitude and 74 31' East to 75 41' East Latitude. It is bounded by Mandsaur District in North, Jhabua and Dhar on the South, Ujjain on the East, Chhitorgarh and Banswara District of Rajasthan on the West, Shajapur District of Madhya Pradesh and Jhalawar District of Rajasthan on the North. | The Average temperature of Ratlam is 55 F. The average rainfall of the District is 90 cm. Most of the rain occur in the month of July and August. | Sailana WLS | Total Area of Ratlam District is s 4861 Sq.km. which is 1.11% of Total Area of Madhya Pradesh. | | Medium Black | Main crop of Ratlam is Soyabin, Wheat, Gram and Maize. It is also well known for Strawberry and Grapes | Jawara; Piploda have over-exploited groundwater<br><br>Industrial pollution in Doshigem, Ghatala, Bajankhedi, Jadwasa Kala and Khurd |
| Rewa | Rewa lies between 24'18 and 25'12 north latitudes and 81'2 and 82'18 east longitudes in the north-east of the division of the same name . The district is bounded on the north and east by | | | The district can be divided into the four natural parts-kymore pahar, Binjh Pahar, Rewa Plateau and Lower-Northern Plain | | Medium Black Soil | | 2% of rural population have private latrines |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | the state of Uttar Pradesh, in the south Sidhi district and in the west with Amarpatan and Raghurajnagar tahsils of Satna district. In shape the district can be compared to an isosceles triangle, with its base along the Satna border and the two longer arms converging towards Mauganj in east | | | | | | | |
| Sagar | The district of Sagar(previously Saugor) lies in the north central region of Madhya Pradesh.A major road and agricultural trade centre, it has industries such as oil and flour milling, saw-milling , ghee processing , handloom cotton weaving, railway and engineering works. It is known in all over India due to its University named as Dr. Harisingh Gaur University,Army Cantonment and Bhagyodyay Tirth." | | | | | Medium and Deep Black | Field Crops: Soybean, Blackgram, Rice, Maize, Sorghum, Chieckpea, Wheat, Lentil, Pea. Linseed<br><br>Fruits: Citrus, Papaya, Guava, Mango, Aonla<br><br>Vegetables: Potato, Onion, Otmato, Okra, Brinjal, Cauiflower, Chili, Coriander | Water supply (>500m to fetch water) |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| Seoni | The district is situated on a narrow, North-South section of satpura plateau in the South of Jabalpur Division. The District lies between latitude 21 36' & 22 57' North and longitude 79 19' & 80 17' East. | | Pench Tiger Sanctuary which lies 195 Km from Jabalpurand 92 Km from Nagpur which is a worth visiting place during March-June. | | Wainganga river is the lifeline of Seoni district. It originates at "Mundara" village in Seoni district. Asia's largest mud dam has been built on this river at Bhimgarh village in Chhapara block of the district. | Mixed Red and Black | Field Crops: Rice, Soybean, Kodo Kutki, Maize, Pigeon Pea, Wheat, Chickpea, Lentil Linseed, Pea<br><br>Fruits: Orange, Mango, Lemon, Guava, Anola<br><br>Vegetables: Tomato, Onion, Brinjal, Chili, Cucumber | Water supply (>500m to fetch water) |
| Shajapur | Shajapur District is a part of the Central Madhya Pradesh Plateau- Ratlam plateau Micro region according to the present scheme of regional delineation. The district is situated in the northwestern part of the state and lies between latitudes 32"06' and 24" 19' North and longitude 75" 41' and 77" 02' East. The district is bounded by Ujjain and Agar-Malwa in the west, Dewas and Sehore in the South, Rajgarh in the North and Sehore district in | | | The entire district is a part of Deccan Trap of Cretaceous Eocene age. The alluvium of ecent period is, however, found along the river Parbati in a narrow strip. Physio-cultural diversities in the district have led to sub-divide it into the following sub-micro regions:- Agar plateau Shajapur Forested Upland Kali | | The district has deep black and shallow black brown and alluvial soils of the northern region | Field Crops: Soybean, Jowar, Maize, Gram, Wheat<br><br>Fruits: Mango, Guava, Orange, Sweet Lime, Lemon, Lemon, Grapes, Pomegranate, Aamla, Custard Apple, Papaya<br><br>Vegetables: Tomato, Potato, Ladyfinger, Brinjal, Green Peas, Cauliflower, Cabbage, Kaddu Vargoya, Bitter | Barod block over-exploited groundwater |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | the east. | | | Sindh Basin Shajapur Upland | | | Goard | |
| Shivpuri | District lies between Latitude 24.6 - 25.6 degrees & Longitude 77.0-78.4 degrees and Sea level Height is 521.5. The district is bounded on the North by Morena, Gwalior and Datia districts, on the East by Jhansi district of U.P, on the West by Kota district of Rajasthan and on the South by Guna district. | | Madhav NP, Karera WLS | | | Aluvium | Soyabean, Grain, Urad, Moong, Jower, Maize, Groundnut, Til are main crops | |
| Ujjain | The district is bounded by the districts of Shajapur on the northeast and east, Dewas to the southeast, Indore to the south, Dhar to the southwest, and Ratlam to the west and northwest. | | | The district has an area of 6,091 km², | | Medium Black | Field Crops: Soybean, Maize, Sorghum, Wheat, Gram, Mustard<br><br>Fruits: Mango, Guava, Orange, Sweet Lime, Lemon, Grapes, Pomegranate, Custard Apples, Papaya<br><br>Vegetables: Tomato, Potato, Ladyfingre, Brinjal, Green Peas, Sweet Potato, Cauliflower, Bitter Goard | Ujjain; Badnagar blocks over-exploited groundwater |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| Umaria | Umaria district is located to the North East of Madhya Pradesh. Mathematically the coordinates of the District extend from 23o38' to 24o20' North and 80o28' to 82o12' East. | | The district has extensive forests. About 42% of the total area is covered by forests only. The famous Bandhavgarh National Park (Tala) is located in the district. | It has geographical area of 4548 sq.km. The greatest length of the district is about 150 km. from north to south and the greatest width is about 60km from east to west. The District is rich in minerals. The most important mineral found in the district is coal and as a result 8 mines are being operated by South Eastern Coalfield Limited in the district. | | Red ad yellow, Medium Black | Field Crops: Rice, Kodo Kutki, Maize, Pigeonpea, Blackgram, Sesame, Wheat, Mustard, Chickpea, Lentil, Linseed<br><br>Fruits: Mango, Water Chestnut, Aonla, Papaya, Guava, Lemon, Banana, Pomegranate, Jackfruit, Custard apple, Karonda | Deforestation |
| Vidisha | Vidisha district of Madhya Pradesh extends between Latitude 230 21' and 240 22' North and Longitude 770 15' 30" and 780 18' East. The District is situated in Eastern part of the fertile Malwa Region. The Tropic of Cancer passes through the Southern stretch of the | | | | | Medium and Deep Black | Field Crops: Soybean, Blackgram, Maize, Sorghum, Pigeonpea, Chickpea, Wheat, Lentil, Pea<br><br>Fruits: Mango, Guava, Lime<br><br>Vegetables: | |

| Districts | Location | Climate | Ecologically Sensitive Area (Wildlife Sanctuaries / National Park etc)[6] | Geomorphology (Major Physiographic Units and land use) | Major Drainage | Major Soil Type [7] | Principal Crops[8] | Key Environmental Issues |
|---|---|---|---|---|---|---|---|---|
| | District about 2 km South of the District Head Quarters. It is bounded in the North by Guna District in the South by Raisen District and in the East by Sagar District | | | | | | Onion, Tomato, Chilli, Potato, Brijal | |

Source: District/Govt. Website

## 2. Air Quality

46. Most of the project area lies in vast open agricultural land and is largely free from air pollution sources other than traffic and as such, the ambient air quality (for parameters $SO_2$, RSPM and $NO_2$ ) is expected to be within the limits in most of rural and semi urban areas. However, in absence of any existing data on ambient air quality levels of the project area, secondary sources were referred.

**Table 5: Ambient Air Quality**

| Area Classification | SO2 (µg/m3) | NO2 (µg/m3) | RSPM(µg/m3) |
|---|---|---|---|
| Industrial ( maximum observed value) | 30 | 27 | 265 |
| Residential ( maximum observed value) | 8 | 20 | 105 |
| National Ambient Air Quality Standards for Industrial and Residential Areas | 80 | 80 | 100 |

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

47. 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 however, well within the limits (NAAQS). The higher particulate matter levels are attributed to the vehicular movement on unpaved roads and the loose dust in the agricultural fields that lead to formation of dust clouds over short periods. The same can be concluded from Table 6, which provides a comparison of the air quality at different locations.

**Table 6 : Ambient Air Quality Status of Madhya Pradesh in Previous Years**

| City | Location | Type of Area | SO2 | NO2 | RSPM | SPM |
|---|---|---|---|---|---|---|
| | | | 2008 | 2008 | 2008 | 2008 |
| Bhopal | Govindpura | I | 7 | 17 | 91 | 205 |
| | Arera colony | R | BDL | 34 | 129 | 356 |
| | Hamidia road | R | 9 | 20 | 124 | 308 |
| | T.T. Nagar | R | 5 | 11 | 62 | 120 |
| Dewas | Eid Parry(I)Ltd | I | 20 | 27 | 96 | 218 |
| | Vikas Nagar | R | 15 | 22 | 72 | 187 |
| | Gwalior Dindyal Nagar | R | 8 | 18 | 133 | 234 |
| | Maharaj Bada | R | 9 | 14 | 92 | 306 |
| Indore | Polo ground | I | 12 | 22 | 240 | 357 |
| | Kothari market | R | 12 | 22 | 217 | 325 |
| | Scheme no. 78 | R | 6 | 12 | 131 | 203 |
| Jabalpur | Vijay Nagar | R | BDL | 25 | 136 | 297 |
| Nagda | Chem. D Labor club | I | 30 | 18 | 113 | 158 |
| | Grasim guest house no 2 | R | 15 | 25 | 92 | 132 |
| | Grasim Kalyan Kendra | R | 22 | 32 | 97 | 141 |
| Sagar | Pt. Deendayal Nagar | R | 3 | 17 | 115 | 232 |
| Satna | Sub divisional Off. | I | 4 | BDL | 265 | 410 |
| | Regional office | R | BDL | BDL | 115 | 166 |
| Ujjain | District office | I | 15 | 16 | 154 | 317 |

| City | Location | Type of Area | SO2 2008 | NO2 2008 | RSPM 2008 | SPM 2008 |
|---|---|---|---|---|---|---|
| | Regional office | R | 7 | 9 | 70 | 151 |
| | Mahakal temple | S | 12 | 12 | 82 | 174 |
| Singrauli | Jayant township | R | | | 78 | 386 |
| | NTPC Vidyanagar | R | | | 86 | 326 |
| | Waidhan | R | | | 49 227 | |
| **National Ambient Air Quality Standards** | **Industrial Area ( I ) & Residential Area ( R) ( 24 hourly average)** | **80** | **80** | **80** | **100** | **Not Prescribed** |

Source: National Ambient Air Quality Monitoring Series, CPCB

R – Residential and other areas, I – Industrial area, L- Low, M- Moderate, H – High and C – Critical levels of pollution based on exceedence factor (calculated for n > 50 days).

### 3. Noise

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

### 4. Topography and Geomorphology

49. The State of Madhya Pradesh is the second largest state of the country. It covers an area of 30.82 million hectare, which constitutes 9.37% of the land area of the country. “Madhya Pradesh” by virtue of its geographical location can be termed as “Heart of India”. The state is surrounded by Gujarat in the west, Rajasthan in the northwest, Uttar Pradesh in the northeast, Chhattisgarh in the east and Maharashtra in the south. Landlocked in the central part of the country, Madhya Pradesh has topography that crossed from north to south by plains separated by upland areas. Geographically, Madhya Pradesh consists of a plateau with a mean elevation of 1,600 ft above sea level, interspersed with the mountains of the Vindhya and the Satpura ranges with the Chhattisgarh plains to the east. The hills give rise to the main river systems - the Narmada and the Tapti, running from east to west, and the Chambal, Sone, Betwa, Mahanadi, and the Indravati west to east. Ground elevation varies from 270 m to 750 m above mean sea level.

50. The soils of state are rich and fertile. The state has a variety of soils ranging from rich clayey to gravely. The major groups of soils found in the state can be divided in to following four categories i.e. alluvial, medium and deep black; shallow and medium black; and mixed red and black. Categorically state has two agro-climatic zones namely (i) Central Plateau & Hill Region, and (ii) Western Plateau & Hill Region. These two zones have been further sub-grouped and the description regarding area and its soil and geological features.

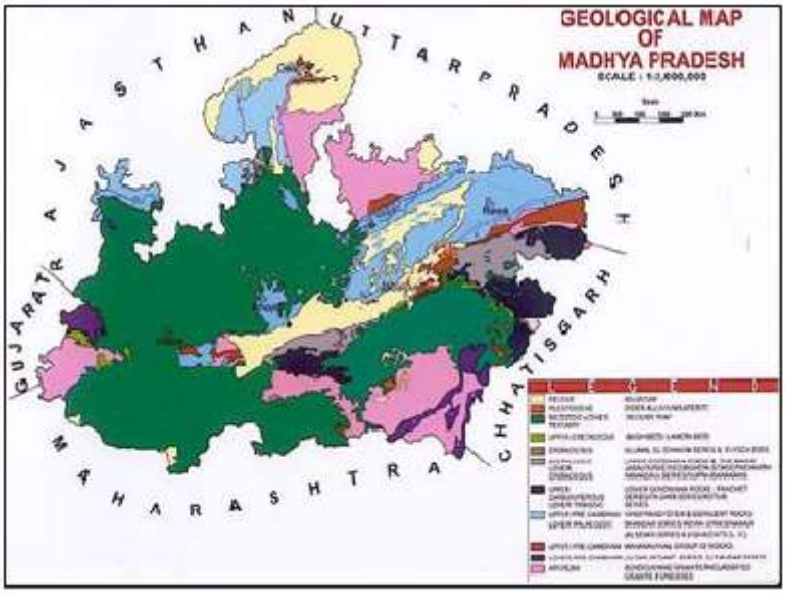



**Figure 2: Geographical / Geological Map of Madhya Pradesh**

## 5. Geology

51. The geology /soil of the state of Madhya Pradesh is given below:

**Table 7: Distribution of Major Geological Units**

| Zone | Sub-group (Region) | District covered | Rainfall (mm) | Climate | Type of Soil |
|---|---|---|---|---|---|
| Central Plateau and Hill Region | Bundelkhand | Chattarpur, Datia, Tikamgarh | 700 | Dry sub-humid | Mixed red & Black |
| | Chhattisgarh Hills | Mandla, Dindori | 1570 | Moist sub-humid | Red & Yellow |
| | Kaimur Plateau & Satpura Hills | Jabalpur, Panna, Satna, Rewa, Sidhi, Seoni, Katni, Balaghat, Shahdol, Anuppur, Umariya | 1100 | Dry sub-humid | Medium Black |
| | Vindhya Plateau | Bhopal, Damoh, Raisen, Sagar, Sehore, Vidisha | 1130 | Dry sub-humid | Shallow to Medium Black |
| | Satpura Plateau | Betul, Chhindwara, Narsinghpur | 1220 | Dry sub-humid | Shallow to Medium Black |
| | Central Narmada Valley | Hosangabad, Harda | 1300 | Dry sub-humid | Deep Black |
| | Gird | Morena, Bhind, Gwalior, Guna, Shivpuri, Ashoknagar , Sheopur | 670 | Semi-arid | Medium Black alluvial |
| Western Plateau and Hill Region | Jhabua Hills | Jhabua | 988 | Semi-arid | Medium to deep black |
| | Malwa & Nimar Plateau | Indore, Dhar, Ujjain, Ratlam, Dewas, Mandsaur, Rajgarh, Shajapur, Khandwa, Khargone, Neemuch, Badwani, Burhanpur | 874 | Semi-arid | Medium to deep black |

### 6. Soils

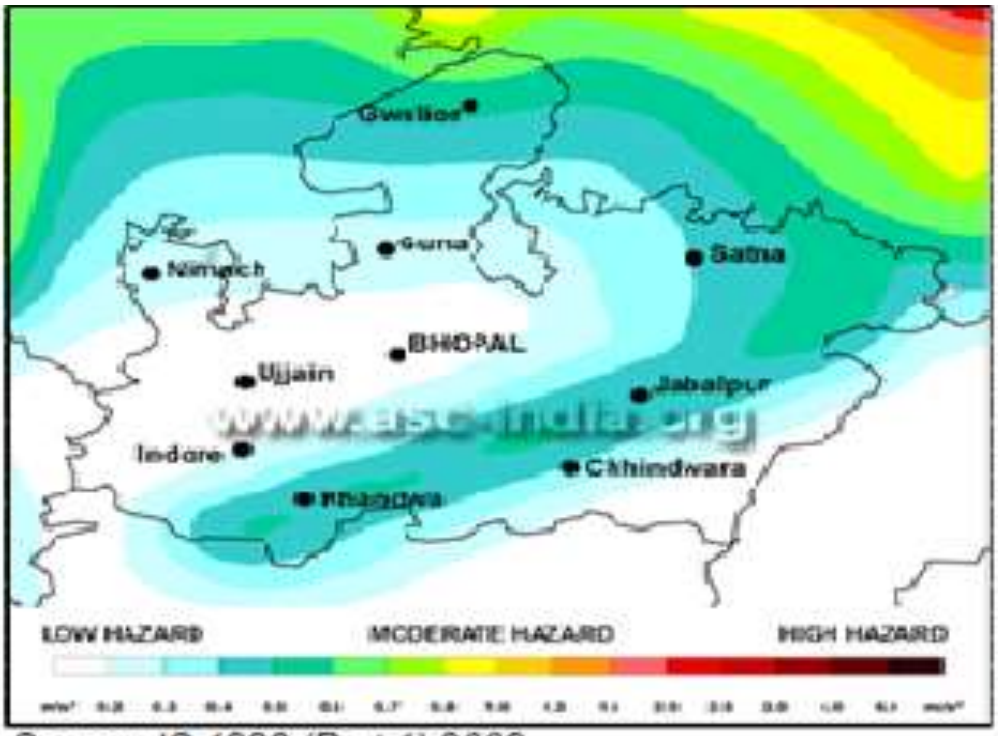
52. The major soil types within the project districts can be classified into three groups namely: vertisol, altisol, and entisols. These soil types are further classified into red yellow loamy and black cotton soils. The entisols is sub-classified into younger alluvial, and laterite soils. The Atlisols is sub-classified into lateritic and alluvial soils. The vertisol is sub-classified into baslic black cotton soil, older alluvial soils. Textures of soils are medium to heavy grained.

### 7. Earthquake and Seismicity

53. The seismic hazard map of India was updated by Bureau of Indian Standards (BIS) in 2000[9] The main change was merging of Zones I and II. As per this updation, Zone II and III (low to moderate Risk) stretches across the length of the MP State (**Figure III.2**). According to GSHAP data, the state of Madhya Pradesh falls in a region of low to moderate seismic hazard.


**Figure 3 : Seismic Zone Map**

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




Source: IS 1893 (Part 1) 2002

**Figure 4 : Hazard Zone Map**

### 8. Land use

54. The most of the geographical area, 307,560 sq. km or about 98% of the state is available for utilization. Agriculture is the major land use in state followed by forests. The area under various land uses in the state is presented in the Table 8**.** Land use pattern along the project sample roads are mostly agriculture and residential areas with only 3 roads passing through forest land and these are: 0.900 -2900m chainage of Neemjhiri-Bodna, Betul; 1800-5400 Ch. of PWD Road-Gopalpur, Katni; and 1100-2200Ch. of Narsinghgarh-Vijaygarh, Rajgarh.

**Table 8: Land Use Pattern in the State**

| Land Use | Area in '000 ha | Percentage |
|---|---|---|
| Total Geographical area | 30,825 | |
| Reporting area for land Utilization | 30,756 | 99.78 |
| Forests | 8683 | 28.17 |
| Not Available for cultivation | 3350 | 10.87 |
| Permanent pastures and other grassing land | 1360 | 4.41 |
| Land under miscellaneous tree crops & groves | 19 | 0.06 |
| Culturable wasteland | 1177 | 3.82 |
| Fallow lands other current fallows | 621 | 2.01 |
| Current fallows | 599 | 1.94 |
| Net area sown (as per agriculture census 1995-96 expect total cropped area) | 14,945 | 48.48 |

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

## 9. Hydrology and Water Quality

55. Madhya Pradesh is criss-crossed by India's four major rivers namely Narmada, Tapti, Sone and Mahanadi along with their numerous tributaries. Availability of water in from these rivers to the state is more than 81000 million cubic meters annually, out of which approximately 56,857million cubic meters i.e. 69.74% could be utilized.

56. None of the sample roads crosses any natural stream except two roads, which crosses Keth River and Chamla rivers. Of the 22 sample roads, 18 crosses seasonal small channels while 10 roads required field channels to allow irrigation pipes and canals to connect agricultural lands on both sides of the road. Ground water being extracted through hand pumps or tubewell is the main source of water supply to villagers. Not a single handpump or tubewell in the sample roads will require shifting.

## 10. Surface Water Quality

57. In Madhya Pradesh, pollution is increasing in most of surface water resources in major towns due to increasing urbanization trend. The estimated surface water available for use is around 306682 Million Cubic Meter (MCM). None of the water sources are safe for drinking or bathing without conventional water treatment. Rivers such as Narmada, Sone,Tapti Chambal, Ken and Betwa are found to be polluted at different stretches due to industrial, domestic and agricultural pollution. Among all the rivers, Narmada and Ken River are the most polluted.

## 11. Groundwater Quality and Availability

58. The total net ground water availability of Madhya Pradesh (1998) is 31093575.60 ha of which total current Ground Water Draft is 1437520.00 ha. The state is currently exploiting 46% of the available ground water. On 70% dependable yield, groundwater usage is around 66%. In hilly and undulating regions, springs, rivulets, and wells provide drinking water. Most households in rural areas now rely on hand pumps for their supply of drinking water.

59. Among the 50 districts of the state, current ground water condition is safe in 40 districts. In 10 districts the ground water condition is in critical in 5 blocks and overexploited in 24 blocks. In sample project districts, five blocks namely: Badnawar, Dhar, Manawar, Nalcha, and Tirla in district Dar falls under overexploited category.

60. Fluoride, salinity and iron affect the quality of water in Madhya Pradesh. There are 4,018 villages with 7,746 sources in 22 districts that have been affected by fluoride; 562 villages with 1,269 sources in 13 districts that have been affected by salinity; and 856 villages with, 449 sources in eight districts that have been affected by iron.

61. As per the central ground water board (CGWB) report, the groundwater quality of all the project districts Sagar, Sidhi, Dhar and Damoh, in both shallow and deeper aquifers is good and suitable for drinking, irrigation and industrial purposes. The Decadal (1995-2005) water table condition during pre-monsoon is shown in Figure 5.

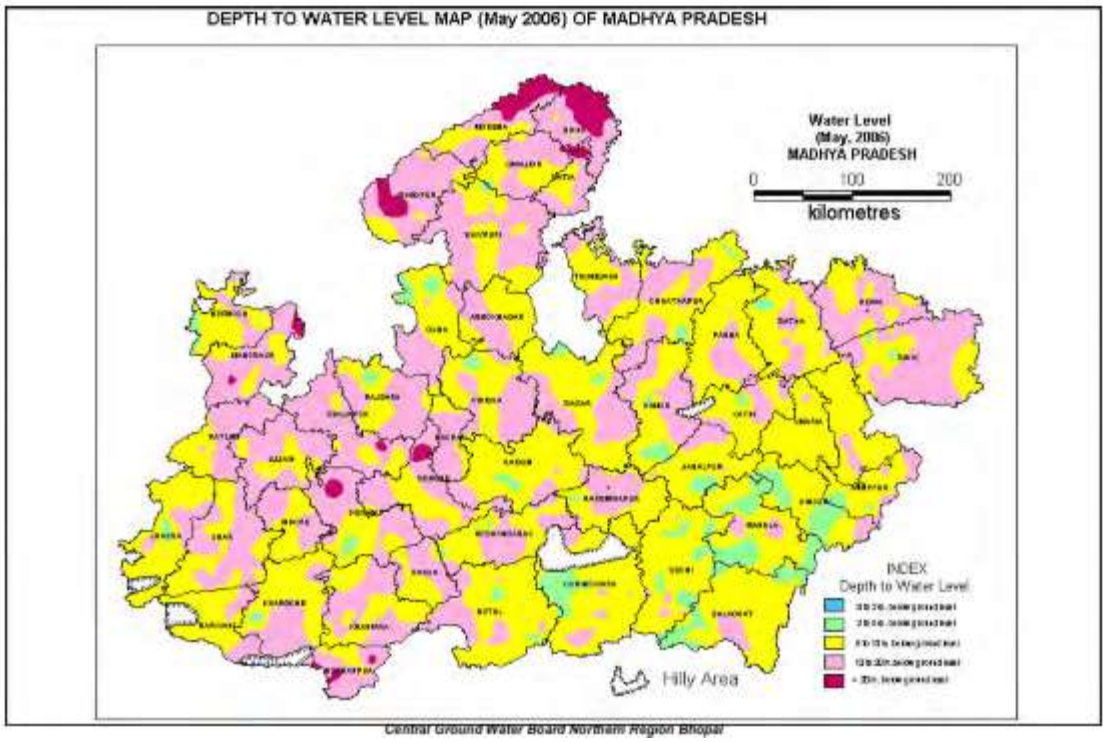



**Figure 5 : Decadal Water Table Conditions in the Project Districts**

### 12. Hydrogeology

62. The largest state of the country is underlain by formations in age ranging from Achaean to Recent. One fifth of the area is occupied by granite gneisses and meta-sedimentary rocks, whereas one tenth by Gondwanas comprising sand stones, lime stones & marbles. The Deccan Trap covers a larger part of the State whereas the Quaternary alluvium covers 6% of the State area. The alluvial deposits form prolific aquifers where tube wells can yield in the range of 50-80 m3/hr. The yield of tube wells in sand stones of Gondwanas ranges between 20-30 m3/hr; whereas in limestone of Gondwanas, it varies between 50-80 m3/hr. The yield of tube wells in select area ranges between 20-30 m3/hr.

## C. Ecological Resources

63. Variability in climatic and edaphic conditions brings about significant difference in the forest types of the state. There are four important forest types: Tropical Moist, Tropical Dry, Tropical Thorn, and Subtropical broad leaved hill forests. The forest area can also be classified based on the composition of forest and terrain of the area. Based on composition, there are three important forest formations namely Teak forest, Sal forest and miscellaneous forests. Bamboo bearing areas are widely distributed in the state. To obviate pressure on the natural forests, plantations have been undertaken in forest and non forest areas to supplement the availability of fuel wood, small timber, and fodder.

64. The forest cover has been classified in dense forest and open forest. The latest estimates of Forest Survey of India (FSI), published in the State of Forest Report (SFR) 2003, suggest that the total forest cover of M.P. is 76,429 sq. km., which is 24.79% of the land area - dense forest constituting 13.57% and open forest 11.22%. In addition to these two categories of cover, the land having canopy cover of less than 10% is classified as scrub. The area under

scrub is not included in the forest cover. Central, eastern and southern parts of the state are rich, whereas northern and western parts are deficient in forest. Figure 6 shows the forest map of the state. Project districts largely have open forests.

65. The project area lies in tropical climate zone.It has a medium range of flora and fauna. Flora, fauna and vegetation types found in the areas have been described separately below. However, none of the roads consists of any rare, endangered or threatened floral species.

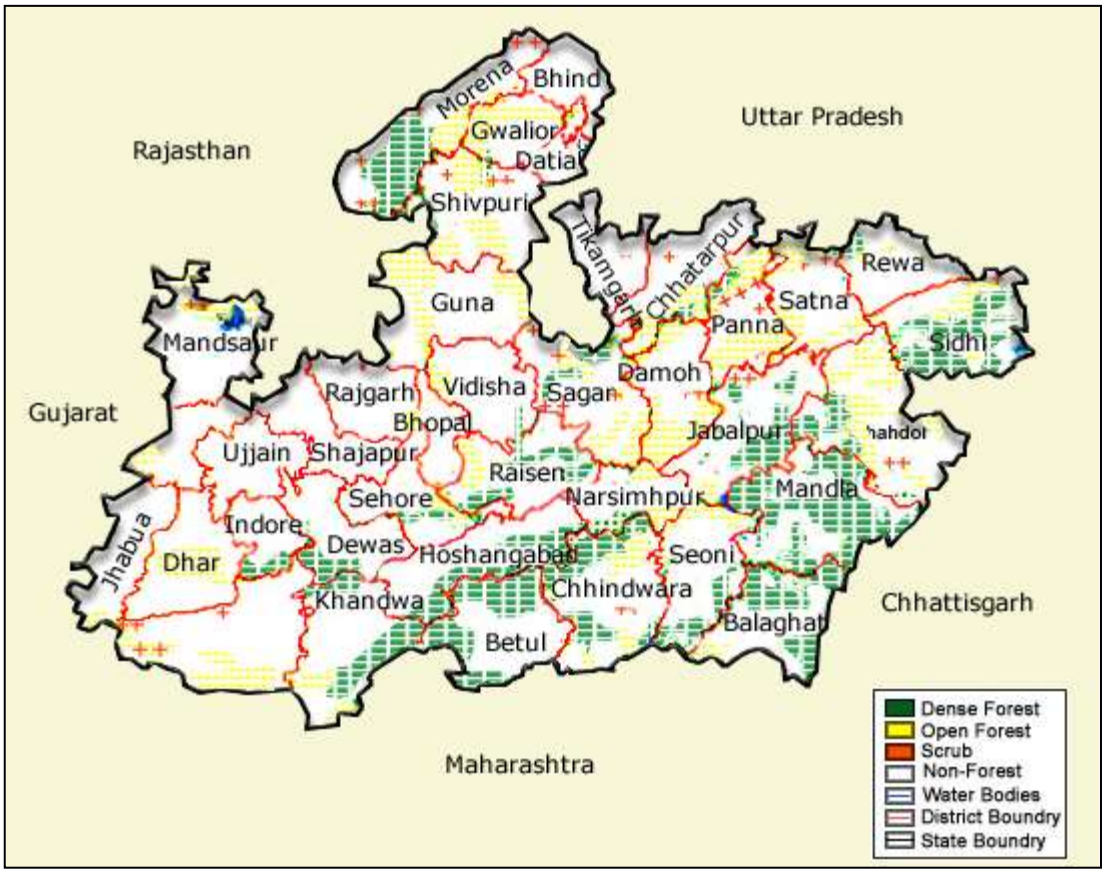



**Figure 6: Forest Map of Madhya Pradesh**

66. Of the 22 sample roads, only three roads have stretched passing through forest land, but none will require tree cutting[10]. The habitat type is mainly modified habitat due to the presence of agricultural fields and opening up of the forest land by the project roads. The list of commonly found flora within 10m from the sample road center line is given at Table 9.

**Table 9: List of Commonly Found Flora**

| S. No. | Local Name | Botanical Name | Family |
|---|---|---|---|
| **Large Trees** | | | |
| 1. | Achar | *Buchanania lanzan (spreg)* | Anacardiaceae |
| 2. | Arjun | *Terminalia arjuna (Bedd)* | Combretaceae |
| 3. | Aam | *Mangifera indica (Linn)* | Anacardiaceae |

[10] The two sample project passes through small patches of forests land which already been converted to non forest land after obtaining necessary permission from forest department.

| S. No. | Local Name | Botanical Name | Family |
|---|---|---|---|
| 4. | Awla | *Emblica officinalis* | Euphorbiaceae |
| 5 | Imli | *Tamarindus indica (Linn)* | Caesalpiniaceae |
| 6. | Kardhai | *Anogeissus pendula* | Combrataceae |
| 7. | Kala siras | *Albizia lebbek* | Leguminosae (Mimoseae) |
| 8. | Kevlor | *Bauhinia purpurea* | Caesalpinaceae |
| 9. | Kumbhi | *Careya arborea* | Myrtaceae |
| 10. | Kullu | *Sterculia urens* | Stcrculiaceae |
| 11. | Kem | *Mitragyna parvifolia* | Rubiaceae |
| 12. | Khair | *Acacia catechu* | Leguminosae (Mimoseae) |
| 13. | Gular | *Ficus glomerata* | Moraceae |
| 14. | Gunja | *Gardenia pinnata* | Burseraceae |
| 15. | Jamun | *Syzygium cuimini* | Myrataceae |
| 16. | Tendu | *Diospyros melanoxeon* | Ebenaceae |
| 17. | Dhavda | *Anogeissus latifolia* | Combretaceae |
| 18. | Dhobin | *Dalbergia paniculata* | Leguminosae (Papilionaceae) |
| 19. | Nilgiri | *Eucalyptus spp* | Myrtaceae |
| 20. | Neem | *Azadirachta indica* | Meliaceae |
| 21. | Palas | *Butea monosperma* | Leguminosea (papilionaceae) |
| 22. | Pangra | *Erythrina Suberosa* | Leguminosae (Pipilionaceae) |
| 23. | Pipal | *Ficus religiosa* | Moraceae |
| 24. | Bad | *Ficus bengalensis* | Moraceae |
| 25. | Bahera | *Terminalia belerica* | Combretaceae |
| 26. | Babul | *Acacia nilotica* | Legumenosae (Mimoseae) |
| 27. | Bel | *Aegle marmelos* | Rutaceae |
| 28. | Bhirra | *Chloroxylon Swietenia* | Meliaceae |
| 29. | Maharukh | *Ailanthus excelsa* | Simarubiaceae |
| 30. | Mahua | *Madhuca indica* | Sapotaceae |
| 31. | Shisham | *Delbergia latifolia, Roxb* | Leguminosae (Papilionaceae) |
| 32. | Safed Siras | *Albizzia procera, Benth* | Leguminosae (Mimoseae) |
| 33. | Sagwan | *Tectona grandis* | Verbenaceae |
| 34. | Saj | *Terminalia tomentosa* | Combretaceae |
| 35. | Salai | *Boswellia serrata* | Burseraceae |
| 36. | Seja | *Lagerstroemia parviflora* | Lythraceae |
| 37. | Semal | *Bombax cieba* | Malvaceae |
| 38. | Haldu | *Adina Cardifolia* | Rubiaceae |
| **Small Tree** | | | |
| 39. | Amaltash | *Cassia fistula* | Leguminosae (Caesalpiniaceae) |
| 40. | Astara | *Bauhinia malabarica* | Leguminosae (Caesalpiniaceae) |
| 41 | Asta | *Bauhinia racermosa* | Leguminosae (Caesalpiniaceae) |
| 42. | Ghont | *Zizyphus xylopyra* | Rhamnaceae |
| 43. | Ber | *Zizyphus jujube* | Rhamnaceae |
| 44. | Lokhandi | *Ixora arborea* | Rubiaceae |
| 45. | Sehra | *Bauhinia retusa* | Leguminosae (Caesalpiniaceae) |
| **Shrubs and Herbs** | | | |
| 46. | Adusa | *Adhatoda vasica* | Acanthaceae |
| 47. | Arandi | *Ricinus Communis* | Euphorbiaceae |
| 48. | Aak | *Calotropis gigantean* | Asclepiadaceae |
| 49 | Gokhru | *Tribulus terrestris* | Zygophllaceae |
| 50. | Zhadneri | *Zizyphus nummularia* | Rhamnaceae |
| 51. | Tulsi | *Ocimum Sanctum* | Labiatae |
| 52. | Thuar | *Euphorbia nerifolia* | Euphorbiaceae |
| 53. | Dhavai | *Woodfordia fruticosa* | Lythraceae |

| S. No. | Local Name | Botanical Name | Family |
|---|---|---|---|
| 54. | Nirgudi | *Vitex negundo* | Verbenaceae |
| 55. | Neel | *Indigofera pulchella* | Leguminosae |
| 56. | Pawar | *Cassia tora* | Leguminosae (Caesalpiniaceae) |
| 57. | Beshram | *Ipomoea pescaparae* | Convolvulaceae |
| 58. | Bhatkatiya | *Solanum nigrum* | Solanaceae |
| 59. | Vidyasini | *Lantana camara* | Verbenaceae |
| 60. | Shatavari | *Asparagus recemosus* | Liliaceae |
| 61. | Sitafal | *Anona Squamosa* | Anonaceae |
| 62. | Harsingar | *Nyctanthes arbortristis* | Oleacaae |
| 63. | Ratanjot | *Jatropha curacas* | Evphorbiaceae |
| 64. | Gunja | *Abrus precatorious* | Leguminosea |
| 65. | Amrbel | *Cuscuta reflexa* | Convolvulaceae |

67. In case where trees will be cleared from the non-sample roads, a clearance for felling of trees will be secured by the Contractor.

### 1. Terrestrial/Avian fauna

68. The general faunal assessment was carried out in blocks where the sample roads are located. Secondary information supports the following species are known to occur and given in Table 10.

**Table 10: List of Common Fauna of Project Districts**

| S. No. | Local Name | Zoological Name | Family |
|---|---|---|---|
| **Mammals** | | | |
| 1. | Common Langur | *Presbytia entellus* | Colobidae |
| 2. | Rhesus macaque | *Macaca mulatta* | Circopthecidae |
| 3. | Common Mongoose | *Herpestes edwardsi* | Herpestidae |
| 4. | Common five Stripped squirrel | *Funambulus pennanti* | Sciuridae |
| 5. | Field rat | *Bandicota bengalensis* | Muridae |
| 6. | Common house rat | *Rattus rattus-refescena* | Muridae |
| 7. | Common Indian hare | *Lepus nigricollis* | Leporidae |
| **Reptiles** | | | |
| 1. | Indian python | *Python molurus* | Pythonidae |
| 2. | Common skink | *Mabuya carinata* | Scincidae |
| 3. | Rat snake | *Ptyas mucosus* | Colubridae |
| 4. | House Lizard | *Hemidactyhus flaviviridis* | Gekkonidae |
| 5. | Garden Lizard | *Calotes versicolor* | Agamidae |
| 6. | Indian cobra | *Naja naja* | Elapidae |
| 7. | Moniter Lizard | *Varanus bengalensis* | Varanidae |
| **Avifauna** | | | |
| 1. | White Egret | *Egretta alba* | Ardeidae |
| 2. | Little Egret | *Egretta garzetta* | Ardeidae |
| 3. | Common or Grey Quail | *Cotuenix coturnix* | Phasianidae |
| 4. | Red wattled Lapwing | *Vanellus indicus* | Charadridae |
| 5. | Blue Rock Pigeon | *Columba livia* | Collumbidae |
| 6. | Indian Ring Dove | *Streptopelia decaocto* | Collumbidae |
| 7. | Spotted Dove | *Streptopelia chinensis* | Collumbidae |
| 8. | Large Indian Parakeet | *Psittacula eupatria* | Psittacidae |
| 9. | Rose Ringed Parakeet | *Psittacula Krameri* | Psittacidae |
| 10. | Blossom Headed Parakeet | *Psittacula cyanocephala* | Psittacidae |
| 11. | Koel | *Eudynamys scolopaceae* | Cuculidae |

| S. No. | Local Name | Zoological Name | Family |
|---|---|---|---|
| 12. | Coucal | *Centropus sinensis* | Cuculidae |
| 13. | Small Blue King Fisher or Common Kingfisher | *Alcedoatthis* | Alcedinidae |
| 14. | White Breasted Kingfisher | *Halcyon smyrnensis* | Alcedinidae |
| 15. | Green Bee Eater | *Merops orientalis* | Meropidae |
| 16. | Indian Pitta | *Pitta brachyuran* | Pittiade |
| 17. | King Crow; Black Drongo | *Dicrurus adsimilis* | Dicruidae |
| 18. | Large Racket tailed Drango | *Dicrurus paradiseus* | Dicruidae |
| 19. | Common Mynah | *Aeridotheres tristis* | Sturnidae |
| 20. | Jungle Mynah | *Aeridotheres* | Sturnidae |
| 21. | House Crow | *Corvus splendens* | Corvidae |
| 22. | Jungle Crow | *Corvus macrorhynchos* | Corvidae |
| 23. | Red vented Bulbul | *Pyenonotus cafer* | Pycnontidae |
| 24. | Jungle Babbler | *Turdoidesstriatus* | Muscicapidae Timalinae |
| 25. | Pied Bush Chat | *Saxicola caprata* | Muscicapidae |
| 26. | Magpie Robin | *Copsychus-saularis* | Muscicapidae Turdinae |
| 27. | Indian Robin | *Saxicola fulicatus* | Muscicapidae Turdinae |
| 28. | Grey Wagtail | *Motacilla cinerea* | Motacillidae |
| 29. | Purplesun Bird | *Nectarinia asiatica* | Nectarinidae |
| 30. | House Sparrow | *Passer domesticus* | Passerinae |
| 31. | Red Munia | *Estrilda amandava* | Estrildinae |

## 2. Wild Life and Protected Areas

69. Madhya Pradesh is a pioneer state in the national movement for conservation of flora and fauna. Conservation oriented legal provisions were made in the erstwhile Acts regulating hunting of game-birds and wild animals. There are 9 national parks and 25 sanctuaries spread over an area of 10,862 sq. km constituting 11.40% of the total forest area and 3.52% of the geographical area of the state (Figure III.6). Efforts are under way to increase the protected area network to 15% of the forest or 5% of the geographical area as suggested by State Wildlife Board. There is no wildlife Sanctuaries/National Parks, Tiger Reserves, etc. along the project area.


**Legend:** National Park Sanctuaries

**SL No shown above are synchronised with Sl. No in the table below**

**Figure 7: Protected Areas of Madhya Pradesh**

70. Table 11 provides details of national park and sanctuaries corresponding to serial Number indicated at Figure 7 above.

**Table 11: List of Protected Areas in Madhya Pradesh**

| **I. List of National Park in M. P. (Sl. No. Below Correspond to Figure above)** | | | |
|---|---|---|---|
| **S.No.** | **Name and District of National Park** | **Area in Sq.Km.** | **Fauna** |
| 1 | Kanha National Park, District Mandla | 940 km² | Tiger, Panther, Gaur, Chital, Sambar, Nilgai, Chinkara, Barking Deer, Swamp Deer, (Barasingha), Wild Boar & variety of upland birds. |
| 2 | Bandhavgarh National Park, District Umaria | 437 km² | Tiger, Panther, Gaur, Chital, Sambar, Nilgai, Chinkara, Barking Deer, Wild Boar & variety of upland birds. |
| 3 | Panna National Park, District Panna, Chhatarpur | 543 km² | Tiger, Chital, Chinkara, Sambar and the Sloth Bear |
| 4 | Pench Tiger Reserve, District Seoni, Chhindwara | 293 km² | Tiger, Panther, Bison, Chital, Sambhar,Nilgai, Chinkara, Barking Deer, Chowsingha, Wild Boar & variety of upland birds. |
| 5 | Satpura National Park, District Pachmarhi | 524 km² | Tiger, Leopard, Sambar, Chital, Bherki, Nilgai, Four-horned antelope, Chinkara, Bison (gour), Wild Boar, Wild Dog, Bear, Black Buck, Fox, Porcupine |
| 6 | Sanjay National Park, District Sidhi | 1938 km² | Tiger, Panther, Sambar, Chital, Gaur, etc. |
| 7 | Madhav National Park, District Shivpuri | 354 km² | Panther, Chital, Sambar, Nilgai,Chinkara, Black Buck, Chausingha, Wild Boar, Crocodiles in lake, & variety of upland birds. |
| 8 | Van Vihar National Park, District Bhopal | 4.45 km² | Tiger, Panther, Lion, Bear, Hyena etc. |
| 9 | Mandla Plant Fossils National Park, District Mandla | 0.27 km² | Plant Fossils |
| **II. List of Wild Life Sanctuaries in M.P. (Sl. No. Below Correspond to Figure above)** | | | |
| **S. No.** | **Sanctuary** | **SL. No.** | **Sanctuary** |
| 1. | Bori | 13. | Panpatha |
| 2. | Bagdara | 14. | Kuno |
| 3. | Phen | 15. | Pench |
| 4. | Ghatigaon | 16. | Ratapani |
| 5. | Gandhisagar | 17. | Sanjay Dubri |
| 6. | Karera | 18. | Singhori |
| 7. | Ken Ghariyal | 19. | Son Ghariyal |
| 8. | Kheoni | 20. | Sardarpur |
| 9. | Narsinghgarh | 21. | Sailana |
| 10. | N. Chambal | 22. | Ralamandal |
| 11. | Nauradehi | 23. | Orchha |
| 12. | Pachmari | 24. | Gangau |
| 25. | V. Durgawati | | |

### 3. Aquatic Biology

71. No wetland or large water body falls in and around the selected project roads area. Fisheries activities are also minimal in subproject areas.

## D. Socio-economic Environment

### 1. Demography

72. As per details from Census 2011, Madhya Pradesh has population of 7.27 Crores, an increase from figure of 6.03 Crore in 2001 census. Total population of Madhya Pradesh as per 2011 census is 72,626,809 of which male and female are 37,612,306 and 35,014,503 respectively. In 2001, total population was 60,348,023 in which males were 31,443,652 while females were 28,904,371. The total population growth in this decade was 20.35 percent while in previous decade it was 24.34 percent. The population of Madhya Pradesh forms 6.00 percent of India in 2011. In 2001, the figure was 5.87 percent. Total area of Madhya Pradesh is 308,252 sq. km. Density of Madhya Pradesh is 236 per sq km which is lower than national average 382 per sq km. In 2001, density of Madhya Pradesh was 196 per sq km, while nation average in 2001 was 324 per sq km. The demographic profile of the state in comparison with the national average is shown in Table 12**.**

**Table 12: Demographic Profile**

| Indicator | MP | India |
|---|---|---|
| Total Population (In Crore) (Census 2011) | 7.26 | 121.01 |
| Decadal Growth (%) (Census 2011) | 20.30 | 17.64 |
| Crude Birth Rate (SRS 2011) | 26.9 | 21.8 |
| Crude Death Rate (SRS 2011) | 8.2 | 7.1 |
| Natural Growth Rate (SRS 2011) | 18.7 | 14.7 |
| Infant Mortality Rate (SRS 2011) | 59 | 44 |
| Maternal Mortality Rate (SRS 2007-09) | 269 | 212 |
| Total Fertility Rate (SRS 2011) | 3.1 | 2.4 |
| Sex Ratio (Census 2011) | 930 | 940 |
| Child Sex Ratio (Census 2011) | 912 | 914 |
| Schedule Caste population (in crore) (Census 2001) | 0.91 | 16.6 |
| Schedule Tribe population (in crore) (Census 2001) | 1.22 | 8.43 |
| Total Literacy Rate (%) (Census 2011) | 70.63 | 74.04 |
| Male Literacy Rate (%) (Census 2011) | 80.53 | 82.14 |
| Female Literacy Rate (%) (Census 2011) | 60.02 | 65.46 |

### 2. Healthcare

73. As of 2001, there are 180 hospitals, 183 primary health care (PHC), 1,166 new PHC and 14 mobile health units in the entire state. There are 13,786 hospital beds with 7,560 people per doctor and 2,663 people per hospital bed which is much higher than the all-India average of 1,361 and therefore far from satisfactory. The state is well behind the aims of National Health Policy of providing universal health care and access to medical services. Life expectancy in the State has crawled to 57 years against national average of 61. The fact worrying the Government is the infant mortality rate (IMR) [2] at 96 per thousand which is the highest in India. Contaminated water contributes substantially to the ill heath of the society. Lack of sanitation is another factor which affects the rural people mostly. The habit of people to defecate in the open is one sure reason for spreading of water borne diseases. It is important to provide flush latrines in villages and motivate people to use them.

### 3. Literacy and Education

74. Literacy rate in Madhya Pradesh has seen upward trend and is 69.32 percent as per 2011 population census. Of that, male literacy stands at 78.73 percent while female literacy is at

54.49 percent. In 2001, literacy rate in Madhya Pradesh stood at 63.74 percent of which male and female were 75.35 percent and 54.61 percent literate respectively. In actual numbers, total literates in Madhya Pradesh stands at 42,851,169 of which males were 25,174,328 and females were 17,676,841.

### 4. Economy

75. As evident from the recent report released by Department of Economics and Statistics on district level GSDP for 1999-2000 to 2007-08, 31 out of 45 districts in the state are not able to cope up with the pace of state level per capita income growth. These districts have low per capita income compared to state figures. In 15 districts, the situation is worse as average income is less than Rs. 40 per person per day. Tribal districts are dominating the list of poor performing districts. Reasons cited for such dismal performance are heavy dependency on agriculture, more extent of unirrigated agriculture, less or no industrialisation and poor expansion of service sector.

### 5. Agriculture

76. Agriculture is the main occupation in the state. About half of the land area is cultivable. The extent of availability of cultivable land varies depending on topography, rainfall, and soils. The larger cultivable land is found in the Chambal valley, Malwa Plateau, Rewa Plateau, and Chhattisgarh Plain. The prime crop of the state is cereals (about 41%), followed by pulses (about 20%), oilseed (about 30%) and vegetables, fruits, fodder, and other horticultural crops (about 9%).

### 6. Industry

77. The Madhya Pradesh has various industrially developed estates. The major industrial produce includes cement, pigiron, steel ingots, news print, and sugar. Industrialization is low in the subproject areas. However, there is high potentiality for the growth of cottage and small industries in subproject areas. Better communication and transport facilities may be contributory in this growth.

### 7. Public facilities

78. State has well-developed postage and telephone system. Subprojects areas also has good access to these facilities. Educational facilities are available in the village areas as well. However, rural population has to depend on urban areas for undergraduate level education. The urban area has well organised water supply systems. However, rural areas including subproject areas still depends on hand pumps.

### 8. Archaeological/Historical monuments

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

### 9. Temples/Shrines/Idols/Statues

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

### 10. Power

81. MP state has total power generation capacity of 6305 MW. However, state is still power deficient. About 97.43% villages in the state are electrified.

## E. Salient Environmental Features of Sample Roads

82. The salient environmental features of sample roads are summarized in Table 13 below.

**Table 13: Salient Environmental Features of Sample Roads**

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| 1 | Ashoknagar | Ashoknagar | L088-L085 to Lidhorakalan | The topography of the project road is flat at almost all locations.There are no trees loss identified along the alignment. |
| 2 | Betul | Betul | Neemjhiri to Bodna | Terrain is plain. Forest area is located between Ch-900m to Ch-2900m both sides along the proposed alignment. Inhabited area lies between Ch-3800m to Ch-5000m with connecting village Bodna. The agriculture land lies between Ch-00m to Ch-800m both side along the proposed alignment.Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-00m to Ch-200m, Ch-400m to Ch-600m, Ch-800m to Ch-1000m, Ch-1000m to Ch-1200m(2 CD) , Ch-1200m to Ch-1400m, Ch-1400m to Ch-1600m(2 CD), Ch-1600m to Ch-1800m(2 CD), Ch-1800m to Ch-2000m(2 CD), Ch-2000m to Ch-2200m, Ch-2200m to Ch-2400m(2 CD), Ch-2400m to Ch-2600m(3 CD), Ch-2600m to Ch-2800m(2 CD), Ch-3000m to Ch-3200m, Ch-3600m to Ch-3800m, Ch-3800m to CH-4000m, Ch-4600m to Ch-4800m. Community suggested FC – Between Ch-3800m to Ch-4000m. There are 124 trees of 30 cm dbh or more within 10m from C/L on both sides along the proposed alignment. No tree loss along the proposed alignment. |
| 3 | Bhind | Bhind | Etawah Gwalior Road To Chasar | The topography of the project road is flat at almost all locations. There is no trees loss identified at the alignment. |
| 4 | Chhindwara | Parasia | Kachram To Damuamal | The topography of the project road is |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | flat at almost all locations.No tree cutting is needed. |
| 5 | Datia | Seondha | Indergarh Goraghat Road to Pipra | The topography of the project road is flat at almost all locations.<br>Inhabited area lies between Ch-2000m to Ch-2200m RHS and Ch-3900m to Ch-4100m both side with connecting villages Chak-Pipra, Pipra along the proposed alignment respectively.<br>The agriculture land lies between Ch-00m to Ch1900m on both sides, Ch-1900m to Ch-2100m LHS and Ch-2100m to Ch-3900m both sides along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-00m to Ch-100m, Ch-400m to Ch-500m, Ch-700m to Ch-800m, Ch1600m to Ch-1700m, Ch-2100m to Ch-2200m, Ch-2800m to Ch-2900m, Ch-3100m to Ch3200m, Ch-3900m to Ch-4000m<br>Community suggested FC – Between Ch1900m to Ch-2000m, Ch-3100m to Ch-3200m, Ch-3200m to Ch-3300m, Ch-3400m to Ch3500m. There are 23 trees of 30 cm dbh or more witjin 10m from C/L on both sides along the proposed alignment. No tree loss along the proposed alignment. |
| | Dewas | Tonkhurd | Vijaygarh Muriya to Chaubara Road | The topography of the project road is flat at almost all locations.Inhabited area lies between Ch-1900m to Ch-2400m LHS and Ch-2400m to Ch-2870m on both sides with connecting villages Vijaygarh Muriya along the proposed alignment. The agriculture land lies between Ch-00m to Ch-800m RHS, Ch-800m to Ch-1900m on both sides and Ch1900m to Ch-2500m RHS along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-00m to Ch-100m, Ch-100m to Ch-200m, Ch-400m to Ch-500m, Ch700m to Ch-800m, Ch-900m to Ch-1000m, Ch1100m to Ch-1200m, Ch-1400m to Ch-1500m, Ch-1500m to Ch-1600m, Ch-1600m to Ch1700m, Ch-1800m to Ch-1900m.<br>Community suggested FC – Between Ch1300m to Ch-1400m, Ch-1700m to Ch-1800m. No tree loss observed |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | along the alignment |
| 6 | Guna | GUNA | L096-T-09 Guna-Umri-sirsi rd to Ari | The topography of the project road is flat at almost all locations.Inhabited area lies between Ch-00m to Ch-400m and Ch- 2400m to Ch-2600m with connecting villages Negua and Ari respectively along the proposed alignment. The agriculture land lies between Ch-400m to Ch2400m both side along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-00m to Ch-100m, Ch-100m to CH-200m, Ch-300m to Ch-400m, Ch-700m to Ch800m, Ch-1400m to Ch-1500m, Ch-1700m to Ch1800m, Ch-2500m to Ch-2600m. Community suggested FC- Ch-00m to Ch-100m, Ch-400m to Ch-500m, Ch-800m to Ch-900m, Ch1300m to Ch-1400m, Ch-1500m to Ch-1600m, Ch1800m to Ch-1900m, Ch-2100m to ch-2200m, Ch2200m to Ch-2300m. Tree cutting will involved 3 trees along the proposed alignment. |
| 7 | Hoshangabad | Sohagpur | SH-22 to Khapa Rd. To Singwada | Inhabited area lies between Ch-3000m to Ch-3450m both side with connecting village Singwada. The agriculture land lies between Ch-00m to Ch-1200m both side along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-800m to Ch-1000m. Proposed FC:CH-1600m to Ch-1800m. There is no trees loss identified at the alignment. |
| 8 | Jabalpur | Shahpura | Sakri to Lalpur | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-2000 to CH-2100m both side with connecting village Lalpur. The agriculture land lies between Ch-2000m to Ch2200m both side along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-200m to Ch-300mCh-300m to Ch-400m, Ch-500m to Ch600m, Ch-1000m to CH-1100m, Ch-1300m to Ch1400m, ch-1900m to Ch-2000m. Proposed FC: Ch-500m to CH-600m, Ch-900m to Ch1000m, Ch- |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | 1400m to ch-1500m, Ch-1600m to Ch1700m, Ch-1900m to Ch-2000m. No tree loss/utility shifting. |
| 9 | Katni | Badwara | PWD Rd to Gopalpur | Forest area identified between Ch-1800m to CH5400m RHS which is 20m to 30m far away from the alignment. Inhabited area lies between Ch-600m to Ch-700m Madari tola LHS and CH-5900m to CH-6300m both side. The agriculture land lies between Ch-5600m to Ch5900m both side along the proposed alignment. Grazing ground was found between Ch-00m to Ch600m both side, Ch-600m to Ch-700m RHS, CH-800m to CH-1800m both side, CH-1800m to Ch-5400m LHS and ch-5400m to ch-5600m at both side along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-00m to Ch-200m, Ch-600m to ch800m, ch-800m to ch-1000m, Ch-5600m to Ch-5800m, CH-6200m to Ch-6300m, Ch-00m to Ch-200m, Ch-400m to Ch600m, Ch-2400m to CH-2600m, Ch-3200m to Ch3400m, Ch-3400m to Ch-3600m, Ch-4000m to CH4200m, Ch-4200m to ch-4400m, Ch-4400m to ch4600m, Ch-4600m to Ch-4800m. No tree cutting/ utility shifting |
| 10 | Khandwa | Khandwa | Khandwa Aashapur Road To Badgaon Road | Inhabited area lies between Ch-00m to Ch-200m and Ch-4000m to Ch-4900m with connecting village Rai and Badgaon. The agriculture land lies between Ch-200m to Ch4000m both side along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-200m to Ch-400m, Ch-400m to CH600m, Ch-800m to Ch-1000m, Ch-1200m to Ch-1400m, Ch-1600m to Ch-1800m (2CD), Ch-1800m to Ch2000m, Ch-200m to Ch-2200m, Ch-2600m to Ch2800m, Ch-2800m to Ch-3000m, Ch-3000m to Ch3200m, Ch-3200m to ch-3400m, CH-3600m to CH3800m ExistingCD: Ch-400m to CH-600m, Ch-2200m to Ch2400m,Ch-2400m to Ch-2600m, Ch-4200m to Ch4400m, Ch-4400m to Ch-4600m. Proposed FC: Ch-3800m |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | to Ch-4000m. There is 6 trees loss identified between Ch-3200m toCh-3400m and Ch-3400m to Ch-3600m LHS at the alignment. |
| | Khargoan | Barwah | Khandwa Indore S.H.27 to Lohari | The topography of the project road is flat at almost all locations. There is no trees loss identified at the alignment. |
| 11 | Narsinghpur | Narsinghpur | Kodras kala to Mehgaon | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-1200m to Ch-1400m both side with connecting villages Mehgaon along the proposed alignment. The agriculture land lies between Ch-100m to Ch1100m both side along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-200m to Ch-300m, Ch-600m to Ch-700m, Ch-900m to Ch-1000m. Community suggested FC – No FC proposed. No tree cutting/ utility shifting |
| 12 | Rajgarh | Narsinghgarh | Narsinghgarh To Vijaygarh | Hilly terrain found between CH-1100m to CH-2200m RHS which is 20m far away from the alignment. Forest area located between Ch-1100m to Ch-2200m at RHS which is 20m far away from the alignment. Inhabited area lies between Ch-00m to Ch-300m RHS,Ch-2500m to Ch-3100m both side Connecting village Narsinghgarh and Vijaygarh respectively. The agriculture land lies between Ch-00m to Ch-400m LHS, Ch-300m to Ch-1000 RHS, Ch-500m to Ch1000m LHS along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-400m to Ch-500m, Ch-1000m to Ch-1100m, Ch-1600m to CH-1700m, Ch-2000m to Ch-2100m. Proposed FC: Ch-700m to Ch-800m. No tree cutting/ utility shifting. |
| 13 | Ratlam | Alote | Jaora Alote Road to Bisalkheda | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-700m to Ch-1000m with connecting village Bisalkheda along the proposed alignment. The agriculture land lies between Ch-00m to Ch-600m LHS along the proposed alignment. Few water bodies are crossing the |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | proposed alignment and cross drainage structures are provided at Ch-00m to Ch-100m, Ch-100m to Ch200m, Ch-500m to Ch-600m, Ch-700m to Ch-800m, Ch900m to Ch-1000m. No tree cutting/utility shifting |
| 14 | Rewa | Sirmour | L-083 (Badagawan) To Bela | Inhabited area lies between Ch-00m to Ch-400m, Ch-2600m to Ch-3000m, and Ch-3400m to Ch-500m with connecting village Bela. The agriculture land lies between Ch-00m to Ch-400m LHS, Ch-400m to Ch-2600m Both side, Ch-3000m to Ch-3400m both side and Ch-3400m to Ch-5000m LHS along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-00m to Ch-200m, ch-400 to Ch-600m, ch-800m to Ch-1000m, ch-1000m to CH-1200m and Ch-3800m to CH-4000m, Ch-400m to Ch-600m, Ch-600m to Ch800m, Ch-800m to Ch-1000m, Ch-1200m to Ch-1400m Ch-1400m to Ch-1600m, Ch-1600m to Ch-1800m (2CD), ch-2000m to ch-2200m, cH-2400m to Ch-2600m, ch-2600m to Ch-2800m, Ch-3400m to ch-3600m, ch3800m to ch-4000m, Ch-4000m to ch-4200m, Ch4400m to ch-4600m, Ch-4600m to Ch-4800m and Ch4800m to Ch-5000m. Proposed FC: Ch-1200m to Ch-1400m, Ch-2400m to Ch-2600m, Ch-3200m to Ch-3400m. No tree cutting/utility shifting. |
| 15 | Sagar | Rahatgarh | Chauki to Shikarpur | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-4000m to Ch-4200m on both side with connecting villages Shikarpur along the proposed alignment. The agriculture land was not located along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-00m to Ch-100m, Ch-400m to Ch-500m,Ch-700m to Ch-800m, Ch1000m to Ch-1100m, Ch-1300m to Ch-1400m, Ch1500m to Ch-1600m, Ch-2400m to Ch-2500m, Ch 2900m to Ch-3000m, Ch-3100m to Ch-3200m, Ch3200m to Ch-3300m. Tree cutting/utility shifting. |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| 16 | Sagar | Jaisinagar | Jaisinagar to Jera | The topography of the project road is flat at almost all locations. There is no trees loss identified at the alignment. |
| 17 | Seoni | SEONI | T-23 to Gangerua | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-2200m to Ch-2700m on both side with connecting villages Gangerua along the proposed alignment. The agriculture land lies between Ch-100m to Ch1800m and Ch-2100m to Ch-2200m on both side along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-2600m to Ch2700m with exixting CD at Ch-00m to Ch-100m, Ch-1600m to Ch-1700m, Ch-1700m to Ch1800m. Community suggested FC at Ch-600m to Ch-700m, Ch-1000m to Ch-1100m. No tree shifting/ utility shifting. |
| 18 | Shajapur | Moman Barodiya | Kharsoda to Salsalai | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-400m to Ch-600m, Ch-1000m to Ch-1300m, Ch-1600m to Ch-1700m both side with connecting villages Kharsoda along the proposed alignment. The agriculture land lies between Ch-00m to Ch900m on both side along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-00m to Ch-100m, Ch-100m to Ch-200m, Ch-200m to Ch-300m, Ch1100m to Ch-1200m, Ch-1600m to Ch-1700 (2 CD). No tree cutting/utility shifting |
| 19 | Shivpuri | Kolaras | T03 Bhadota Road To Berasiya | Inhabited area lies between Ch-00m to Ch-300m, Ch 800m to Ch-900m, and Ch-4900m with connectingvillage Goragoan and Barasiya colony. The agriculture land lies between Ch-350m to Ch4900m along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-2200m to Ch-2300m, Ch-500m to Ch-600m, Ch-700m to Ch800m, Ch-1900m to Ch-2000m, Ch-4400m to Ch4500m and Ch-4600m to Ch-4700m. Proposed FC: Ch-400m to Ch-500m, |

| S.I. | District/ PIU | Block | Road Name | Salient Environmental Features |
|---|---|---|---|---|
| | | | | Ch-900m to Ch1000m, ch-150m to Ch-1600m, Ch-3000m to Ch3100m, Ch-3500m to Ch-3600m. No tree cutting/utility shifting |
| 20 | Ujjain | MP-43518 | Jagoti (Mahudi) to Hingoniya | The topography of the project road is flat at almost all locations. Inhabited area lies between Ch-3100m to Ch-3600m both side with connecting villages Hingoniya along the proposed alignment. The agriculture land lies between Ch-00m to Ch600m, Ch-700m to Ch-3100m on both sides and Ch600m to Ch-700m RHS along the proposed alignment. Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at Ch-100m to Ch-200m, Ch-600m to Ch-700m, Ch-1300m to Ch-1400m, Ch-2100m to Ch-2200m, Ch-2300m to Ch2400m, Ch-2900m to Ch-3000m. Community suggested FC at Ch-500m to Ch-600m, Ch-900m to Ch-1000m, Ch-1000m to Ch-1100m, Ch-1500m to Ch-1600m, Ch1800m to Ch-1900m, Ch-2400m to Ch-2500m, Ch-3100m to Ch-3200m. No tree cutting/utility shifting. |
| 21 | Umaria | Karkeli | Tammannara to Urdani | No tree cutting/utility shifting |
| 22 | Vidisha | Sironj | Sironj-Lateri Rd. To Jhukar Hauj | Inhabited area lies between Ch-1800m to Ch-2000m both side Connecting villageJhukar hauj. The agriculture land lies between Ch-00m to Ch-600m both side and CH-1000m to Ch-1800m along the proposed alignment. Few water bodies are crossing the proposed alignment and cross drainage structures are provided at Ch-00m to Ch-100m, Ch-400m to Ch500m, Ch-1100m to Ch-1200m and Ch-1600m to Ch1700m. Proposed FC: Ch-300m to Ch-400m. No tree cutting/utility shifting. |

83. The overall summary of the key environmental features within 10m corridor of impacts of the tranche 3 roads in Madhya Pradesh is presented in Appendix 3.

# IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

84. Road improvements work brings substantial economic and social benefits to rural communities and ultimately to the nation as a whole. Experience from past rural road upgrading projects however indicated risk for adverse impacts mostly related during the construction phase and the loss of avenue trees. Impacts are limited as the eligibility screening criteria defined in the environmental assessment and review framework avoids significant adverse impacts and proposed road improvements are confined along existing alignments. 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.

85. All project roads are subjected to environmental screening using the ECOP checklist. A sample size of 10% was selected by the ARRDA with support from the Project Implementation Consultant (PIC) from which this state level IEE was based. Separate environmental checklist were prepared for bridges with length greater than 50m. A standard EMP that forms part of the ECOP Checklist guided the preparation of the EMP provided in this report. As the MFF also calls for construction of training and research centers, separate assessments and EMPs will be prepared and may be integrated in the state-level IEEs as the designs and construction schedule are finalized.

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

## A. Common Impacts during Design and Construction Phase

### 1. Climate change projection

87. **Temperature**. By the 2050s, there is a general increase in temperature in Madhya Pradesh with the annual average low, average high, maximum, and minimum temperatures increasing from the 1961-1990 reference values by 2.68$^{o}$C, 1.94$^{o}$C, 2.20$^{o}$C, 2.81$^{o}$C, respectively. The number or warm days is also expected to be more frequent increasing from 9.89% to 43.54% more chances of the daily maximum temperature exceeding the 90$^{th}$ percentile of reference maximum temperature.

88. **Precipitation**. The GCM ensemble predicts a substantial increase in annual rainfall from 9,350 mm to 10,819 mm.

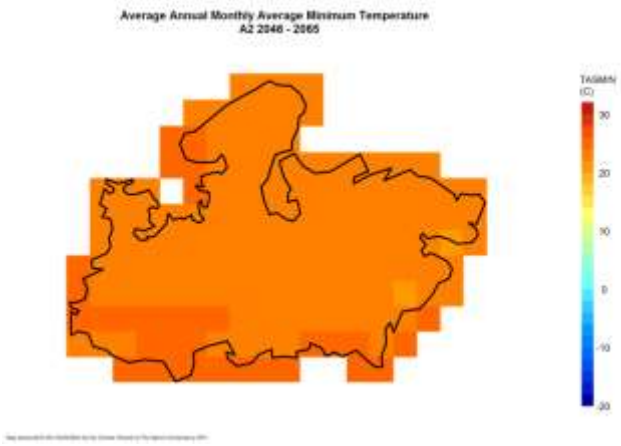



**Figure 8: Predicted Future Average Annual Low Temperature, $^{o}$C, A2 2046-2065**

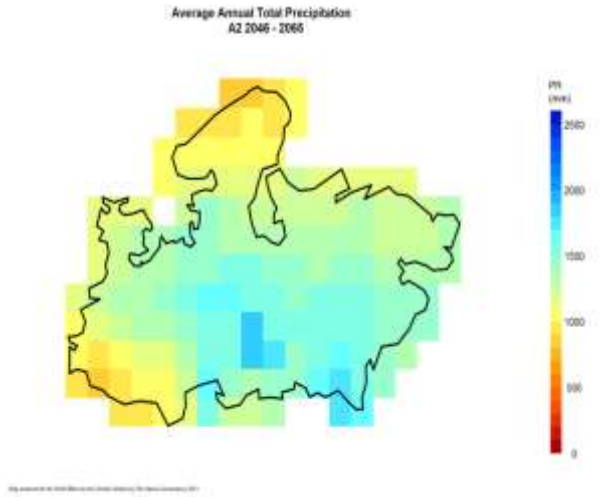



**Figure 9: Predicted Change in Total Annual Precipitation, mm A2 2046-2065**

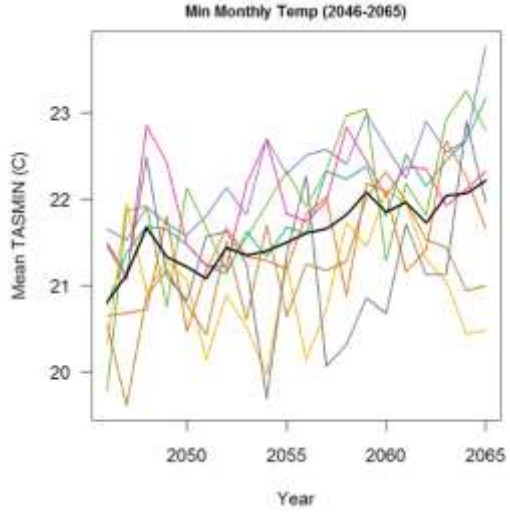



**Figure 10: Future Trend of Maximum Annual Low Temperature, A2, 2046-2065**

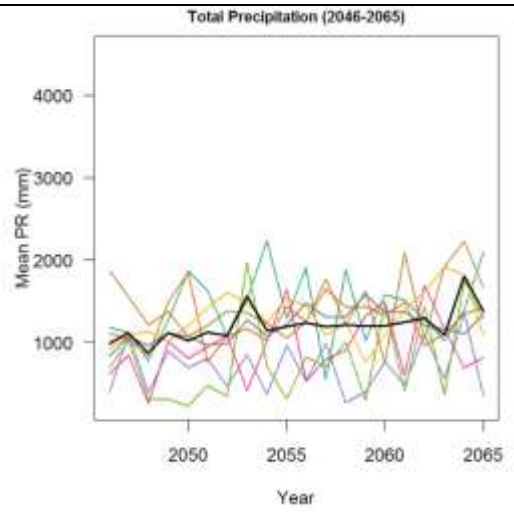



**Figure 11: Future Trend in Total Precipitation, A2, 2046-2065**

89. Geographically, the highest temperatures will be experienced in Neemuch district and increase in rainfall in Narsinghpur and Chhindwara districts.

### 2. Natural Hazards and Climate Risks

90. The natural hazards that will be compounded by the projected increase in rainfall and temperature are flooding, landslide, and vegetation fire, and tsunami. The central district of Jabalpur and Khandwa are prone to flooding having 5-50 flooding events per 100 years. The capital city of Jabalpur is the only place in the city that is at risk of earthquake. The western band of Jabalpur, Narsinghpur, Hoshagabad, and Betul have high risk of vegetation fire.

**Figure 12: Flood Risk, Madhya Pradesh**

**Figure 13: Exposure to Landslide, Madhya Pradesh**

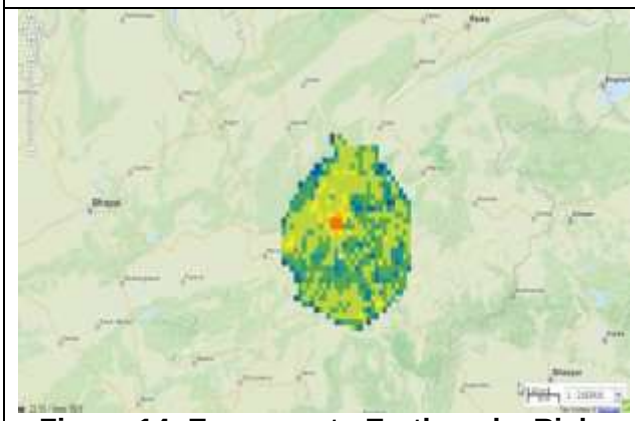


**Figure 14: Exposure to Earthquake Risk, Madhya Pradesh**

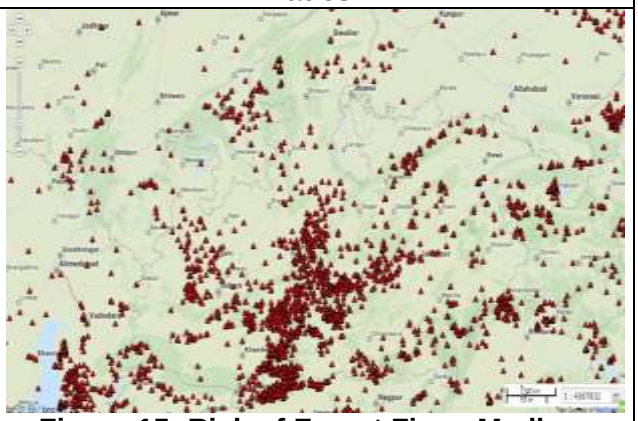


**Figure 15: Risk of Forest Fires, Madhya Pradesh**

91. **Mitigation Measures.** The succeeding Table presents the civil works component that address identified climate change risks. Although no attempt was made to segregate additional cost implications due to climate change from standard engineering design practices as stipulated in the IRC, the cost of addressing flooding and erosion for the RCIP Tranche 3 in the State is Rs 55.850 million of which RS18.750M is for constructing cross and side drains, Rs279.370M is for bridges and culverts, Rs247.840M is for increasing road embankment height, and 12.540 is for slope stabilization.

92. Compensatory tree plantations[11] (1:3) will be made to compensate the loss of trees cut for construction of subproject roads. Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of village Panchayat.[12] All non-sample rural roads to be included in RCIP will also be screened for climate change vulnerability and necessary mitigation measures shall be adopted for minimization of identified vulnerability if any.

[11] 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.

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

## Table 14: Cost of Climate Change Adaptation, Madhya Pradesh RCIP Tranche III, in Rs Lakh

| Road Name | District | Block | Length (Km) | Project Cost in the DPR | Length (m) located in flood prone Area | Length (m) located in landslide prone area | Length (m) located in Tsunami prone area | Cost of measures to address the risks (Cost is included in respective cost of coloum no. 9,10,11,12) (Rs.) (in Lakhs) | | | | COST in DPR (Rs) (in lakhs) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cost of cross and Side Drains | Cost of bridges/ culverts | Increasing embank-ment height | Slope stabilization (pitching, turfing etc.) | Cost of cross and Side Drains | Cost of bridges/ culverts | Increasing embank-ment height | Slope stabilization (pitching, turfing etc.) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 |
| T07 To Dadargaw an | Jabalpur | Kundam | 2.00 | 78.53 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 1.17 | 17.58 | 13.31 | 0.00 |
| T03 To Sanjari | Jabalpur | Kundam | 2.00 | 94.88 | 120 | 0 | 0 | 0.50 | 10.00 | 2.00 | 0.00 | 0.99 | 22.84 | 14.90 | 0.00 |
| Beerner To Saraswahi | Jabalpur | Panagar | 0.95 | 41.08 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.21 | 5.27 | 0.00 |
| MDR 1 To Khairi | Jabalpur | Patan | 0.51 | 21.89 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 1.75 | 2.07 | 2.05 | 0.00 |
| L-049 Gadapipariya(NH-12) To Katangi | Jabalpur | Shahpura | 2.25 | 86.33 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 1.75 | 11.36 | 16.99 | 0.00 |
| Purwa To Junwani | Jabalpur | Jabalpur | 1.10 | 53.93 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 1.17 | 15.08 | 8.04 | 0.00 |
| T07 To Batai | Jabalpur | Kundam | 4.15 | 175.68 | 0 | 150 | 0 | 0.00 | 0.00 | 0.00 | 3.75 | 1.75 | 27.93 | 33.36 | 3.75 |
| T-02 To Khari | Jabalpur | Kundam | 0.85 | 33.95 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 3.82 | 6.47 | 0.00 |
| Konikala To Itwa Imlia | Jabalpur | Patan | 4.80 | 222.57 | 400 | 50 | 0 | 1.20 | 20.00 | 6.00 | 0.74 | 2.92 | 75.18 | 37.64 | 0.74 |
| Sh-37 To Ganj Khamaria | Jabalpur | Patan | 2.80 | 114.16 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.88 | 15.28 | 21.17 | 0.18 |
| MDR To Timari | Jabalpur | Patan | 0.65 | 34.07 | 0 | 200 | 0 | 0.00 | 0.00 | 0.00 | 6.38 | 0.88 | 1.91 | 3.52 | 6.38 |
| Sakri To Lalpur | Jabalpur | Shahpura | 2.10 | 77.69 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.64 | 17.90 | 0.00 |
| Managawan (NH12) To Imaliya 18 | Jabalpur | Shahpura | 3.40 | 137.62 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.58 | 20.06 | 26.17 | 0.00 |
| T02 MDR Tilwara Chargawa Rod To Nunpur | Jabalpur | Shahpura | 0.80 | 34.91 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 1.17 | 4.78 | 5.30 | 0.00 |
| Kitola Panumariya To Padriakala | Jabalpur | Sihora | 3.20 | 120.69 | 0 | 50 | 0 | 0.00 | 0.00 | 0.00 | 0.85 | 0.82 | 22.04 | 16.32 | 0.85 |
| Sihora Silondi Road To Bahtuli | Jabalpur | Sihora | 2.65 | 117.53 | 0 | 50 | 0 | 0.00 | 0.00 | 0.00 | 0.64 | 2.63 | 25.59 | 19.43 | 0.64 |
| Tatal | | | 34.210 | 1445.510 | 520.000 | 500.000 | 0.000 | 1.700 | 30.000 | 8.000 | 12.360 | 18.750 | 279.370 | 247.840 | 12.540 |

### 3. Estimated Greenhouse Gas Emissions

93. The projected increase in traffic is expected to increase the amount of greenhouse gas (GHG) emitted to the environment. Using the Transport Emissions Evaluation Models for Projects (TEEMP), an excel-based freeware developed by the Clean Air Asia, together with ITDP, ADB, Cambridge Systematics and UNEP-GEF, the emission intensities are provided in the succeeding Table 15.

94. The estimated greenhouse gas emissions includes road construction[13] for 3 scenarios: business-as-usual which considers the project traffic[14] traveling over existing road conditions which hampers travel speed, emissions without induced traffic which assumed at 0.2 traffic elasticity to occur on Year 3, and emissions with induced traffic.

**Table 15: CO2 Estimated Emission Intensity, RCIP Tranche 3; Assam**

| Details | CO2 | | |
|---|---|---|---|
| | Business-As-Usual | Project (without Induced Traffic) | Project (with Induced Traffic) |
| tons/km | 4.50 | 15.21 | 15.47 |
| tons/year | 580.18 | 1,960.36 | 1,993.02 |
| tons/km/year | 0.41 | 1.38 | 1.41 |
| g/pkm | 26.12 | 88.24 | 84.93 |

95. Estimated CO2 emission from the implementation of RCIP Tranche III –Madhya Pradesh is about 2,000 tons annually which is almost 4 times higher than the business-as-usual. The CO2 emissions savings from lower fuel consumption due to road roughness and increase on capacity was off-set by the construction related emissions in upgrading the 1,381 kms rural roads.

### 4. Finalization of Alignment

96. **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 terrain. Sample rural road are aligned to existing road mostly having earthen track with some stretches of brickbat soling. Most of the existing sample road passes through plain terrain primarily agriculture and residential areas. None of the sample roads passes close to any protected monument or through protected areas. Impacts due to road alignment and design is expected to be minor and limited to shifting of some common utilities, community structures (temple, school) and cutting of trees falling within road way.

97. **Mitigation Measures**: The road alignment is finalised considering availability of RoW. The RoW is reduced in built-up area or constricted areas to minimize land acquisition. The road alignment is modified to minimize tree cutting, shifting of utilities or community structure. The road is designed to follow natural topography to avoid excessive cut and fill. All non-sample roads to be included in RCIP will follow above measures. In addition these subprojects will comply with the following alignment finalisation criteria :

[13] 11,000 tons of $CO_2$/km road built
[14] As projected in the feasibility study

a. The road will be part of district core network and will comply with PMGSY guidelines
b. Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.
c. Subproject will not pass through any designated 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.
d. Subproject to comply with local and National legislative requirements (such as forest clearance for diversion of forest land ) and ADB's Safeguard Policy Statement 2009.

### 5. Land Acquisition

98. **Impact**: 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. There could be some impact on the encroachers; however, most of them have also volunteered to shift from the proposed alignment. Due diligence on these aspects have been conducted separately and reported in the social compliance reports.

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

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

100. **Impact:** None of the sample road passes through any forest land except 3 roads and as such, project has minimal impact on forest cover. Madhya Pradesh 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.

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

### 7. Land Clearing Operations

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

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

- The land clearing operation should be undertaken as per the defined road alignment and community structure, utility and road furniture shifting plan.
- The road land width shall be clearly demarcated on the ground.

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

### 8. Cut and Fill and Embankment construction

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

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

### 9. Establishment of Construction Camp, Temporary office and Storage Area

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

107. 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.

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

- Construction campsites shall be located away from any local human settlements (minimum 500m away) and preferably located on lands, which are not productive barren/waste lands presently. Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m).
- The construction camps, office and storage areas shall have adequate water supply, sanitation and all requisite infrastructure facilities. This would minimize dependence of construction personnel on outside resources, presently being used by local populace and minimize undesirable social friction thereof.

- The construction camps shall be located at a minimum 5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 1 km from forest land/areas.
- The construction camps, office and storage areas shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.
- All construction camps shall have rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.
- The construction camps, office and storage areas shall have health care facilities for adults, pregnant women and children.
- All construction personnel shall be subjected to routine vaccinations and other preventive/healthcare measures.
- Contractor shall arrange all personal protective equipment (PPEs) like helmet, boots, and earplugs for workers, first-aid and fire fighting equipment at construction sites. An emergency plan shall be prepared to fight with any emergency like fire.
- Garbage bins must be provided in the camp and regularly emptied and disposed off in a hygienic manner. Domestic solid waste shall be disposed of in a control manner. The recyclable waste shall be sold off and non saleable and biodegradable waste shall be disposed through secured land filling.
- All fuel oil/lubricant unloading and storage shall be made on the paved areas away from storm water drainage.
- After completion of construction work, the camp /temporary office/storage areas sites shall be restored to its original condition.

#### 10. Traffic Movement

109. **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.

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

### B. Associated Impacts due to Construction Activities

#### 1. Loss of productive soil, erosion and land-use

111. **Impact**: No land use will change due to the project, since required ROW is available throughout the alignment. Land use though will change temporarily of construction camp, temporary office storage areas for the period of construction. This will also result in loss of soil productivity. Soil erosion may take place along steep and un-compacted embankment slope,

and wherever vegetation is cleared. Soil erosion may have cumulative effect viz. siltation, embankment damage, drainage clogging etc. The siltation, due to soil erosion may occur only in the ponds located close to the roads. Loss of soil due to run off from earth stockpiles may also lead to siltation. Land use may also change due to borrowing the earth.

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

### 2. Borrow Areas and Quarries

113. **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.

114. **Mitigation Measures**: Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. The borrow earth shall be sourced from identified locations and with prior permission of landowner and with clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and quantity that can be borrowed. The borrow area shall be located/ rehabilitated as per the guidelines given at Appendix 4. 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.

### 3. Hydrology and Drainage

115. **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.

116. None of the sample roads is crossing any natural stream. Certain subproject roads are cross local and seasonal drains. Village ponds are also located close to few roads. As such impact on Hydrology and Drainage Pattern is expected to be minimal.

117. **Mitigation Measures:** The provision of adequate cross drainage structures shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. The construction work shall be planned in dry season so that water quality of the water channel is not affected due to siltation. Elaborate drainage system shall be provided to drain the storm water from the

roadway and embankment and to ensure minimum disturbance to natural drainage of surface and subsurface water of the area. Provision of additional cross drainage structures shall be made in the areas where nearby land is sloping towards road alignment in both the both sides.

118. 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.

### 4. Compaction and Contamination of Soil

119. **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.

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

### 5. Construction Debris and Wastes

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

122. **Mitigation Measures**: All excavated materials from roadway, shoulders, verges, drains, cross drainage shall be used for embankments formation if feasible, filling pits, and landscaping. Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. MOSRTH guidelines shall be followed for debris, wastes removal and disposal at unproductive/wastelands which shall be selected with the consent of villagers and Panchayat. The dumping site should be of adequate capacity and to be located away from residential areas (at least 1,000 m away). It should also be located away from water bodies to prevent any contamination of these bodies.

### 6. Air Quality

123. **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 (SO2), particulate matters (PM), and nitrogen oxides (NOx) emissions.
- Localized increased traffic congestion in construction areas. Most of the emissions will be in the form of coarse particulate matter, which will settle down in close vicinity of construction site. This may affect the air quality of nearby areas, especially, due to emission discharge from low height of the stack.

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

- Vehicles delivering loose and fine materials like sand and aggregates shall be covered.
- Dust suppression measures like water sprinkling15, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing plant areas.
- Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements.
- Material storage areas shall also be located downwind of the habitation area.
- Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by state pollution control board (SPCB) to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions.
- Diesel Generating (DG) sets shall also be fitted with stack of adequate height. Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained.
- The requisite PPE (helmet, mask, boot, hand gloves) shall be provided to the construction workers.

### 7. Noise Quality

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

126. **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.

### 8. Groundwater and Surface Water Quality and Availability

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

127. **Impact:** Water will be required for compaction of road formation and domestic purposes in the workers camp. These requirements will be mainly sourced from groundwater due to availability and quality. Any uncontrolled abstraction of ground water can deplete the ground water table. Contamination of groundwater is not envisaged since all construction camps will have septic tanks. 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 the risk of siltation due construction near rivers.

128. **Mitigation Measures**: Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority[16] 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. Water conservation across all activities will be observed.

### 9. Biological Environment

129. **Impact:** Since the sample roads are not passing through any protected areas or forest area, there is no diversion of forest land exept for 27 roads which are to be constructed on existing path**.** The major adverse impacts will be due to tree cutting, Siltation and contamination of water bodies may affect the aquatic life. Since the aquatic life is minimal and no significant impact is anticipated on aquatic life.

130. **Mitigation Measures:** All efforts shall be taken to avoid tree cutting wherever possible and maintain the baseline conditions of the modified habitat. 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.

### 10. Impact on Common Property Resources

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

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

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

## C. Common Impacts during Operation Phase

### 1. Air Quality

133. **Impact:** Decrease in air quality due to increase in traffic and idling at congestions.

134. **Mitigation Measures**: The unpaved road condition is the main cause of poor air quality at present along the sub-project roads. The proposed road paving will result in the improved ambient air quality.

### 2. Noise

135. **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.

136. **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

137. **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.

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

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

140. **Mitigation Measures** It shall be ensured that all construction camp/temporary office/material storage areas are restored to its original conditions. The borrow area rehabilitation will also be ensured as per the agreed plan with the landowner. Contractor and PIC will ensure the same and obtained clearance from PIU before handling over the site to SRRDA. The PIC will undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required.

### 4. Groundwater

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

### 5. Hydrology and Drainage

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

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

## D. Socioeconomic Impact

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

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

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

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

## E. Road Specific Impacts

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

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

## A. Environmental Management Plan

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

149. The EMP is prepared basd on the Environmental Code of Practice (ECOP) applicable to rural road defined by ADB at RRS I stage.

150. The identified impacts are mostly 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 and noise pollution due to construction activities and operation of construction equipment, tree cutting and shifting of utilities and physical community structure.

151. Appropriate mitigation measures are identified for all rural road construction and operation activities. The identified impacts associated with rural roads and mitigative measures are largely common to most of the roads. The EMP is detailed at Appendix 4. It provides action common to all roads at pre-construction, construction and operation stage. Since IEE is carried out, prior to preparation of DPR, the EMP will be updated specific to road as per DPR requirements by PIU and included with DPR, which shall be available to contractor at the time of bidding. The areas to be updated as per DPR provisions are highlighted under location column of EMP.

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

## B. Environmental Monitoring Plan

153. The environmental monitoring program aims to assess the the environmental performance of environmental management plan. The EMOP will:

- assess the effectiveness of mitigation measures,
- assess the change in environmental quality during construction and operation stages,
- assess compliance to regulatory requirements, and
- monitor the status of corrective action taken in case of deviation from the planned measures or regulatory requirements.

154. For rural roads, EMoP will rely more on visual observation during pre construction aspects[17], 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

### Institutional Arrangement

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

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

157. The institutional arrangement at national and state levels to implement PMGSY and RCIP is shown at Figure 16**.**

## D. Institutional Environmental Responsibilities

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

159. **MORD**[18] the executing agency has the responsibility for monitoring implementation of the EMP for all subprojects and undertaking necessary due diligence. MORD ensure this through its Nodal Agency NRRDA (National Rural Road Development Authority). MORD will also ensure that

a. ADB is given access to undertake environmental due diligence for all subprojects, if and when needed as per EARF requirements.
b. SRRDA meet all environmental assessment requirements in accordance with EARF
c. It undertakes random monitoring of the implementation of the EMP
d. Ensure compliance to legislative requirements such as forest clearance for diversion of forest land for non-forest purposes and Consent to Establish/Operate for hot mix plant, batching plant
e. Appoint Technical Support Consultant (TSC) to assist SRRDA for various environmental aspect and safeguard compliances

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

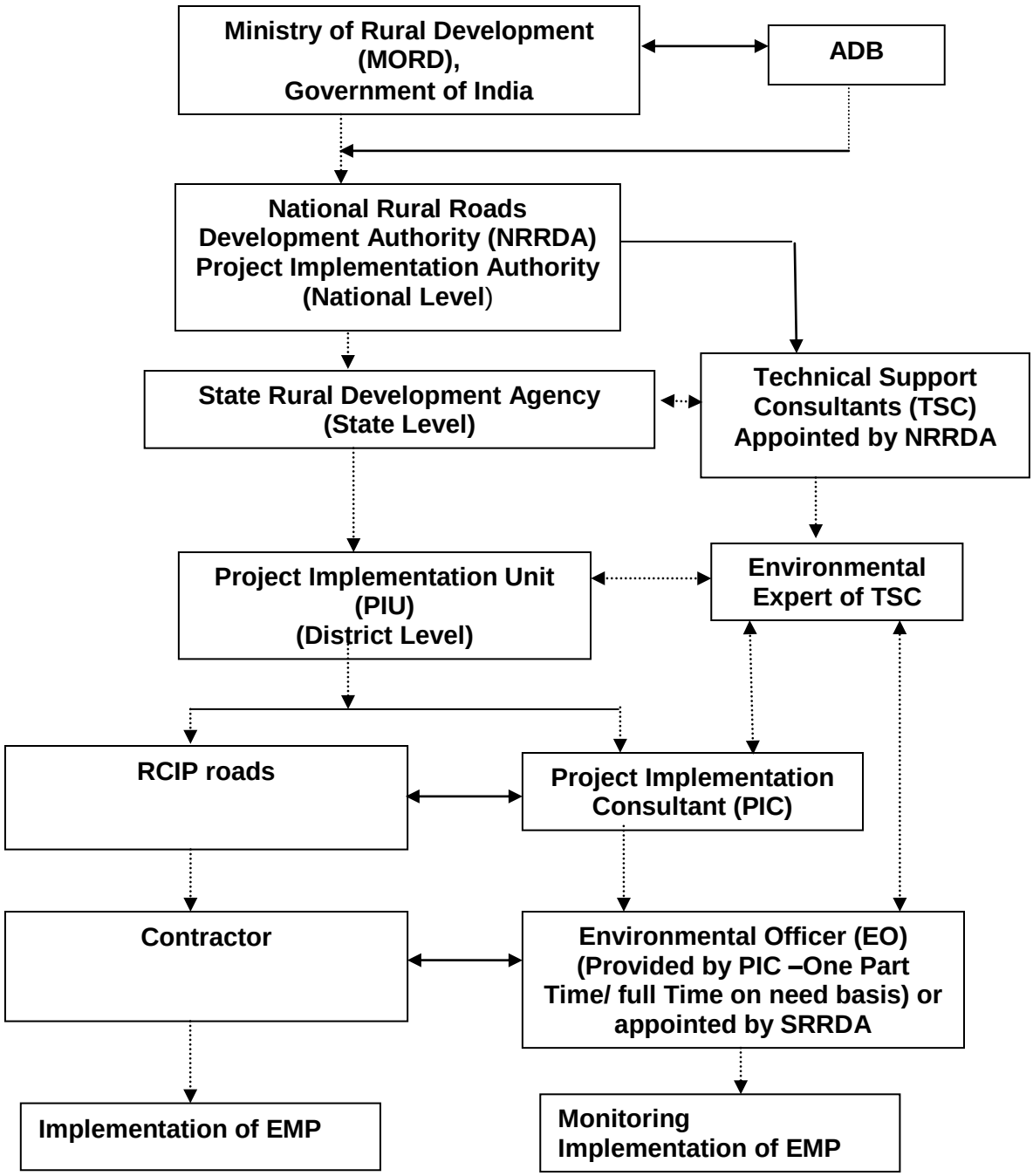



**Figure 16: Institutional Arrangement for EMP Implementation**

160. **SRRDA**[19]will ensure that :

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

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

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

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

a. Will provide technical assistance to SRRDA/PIU regarding environmental aspects, environmental permitting/clearances requirement,
b. Periodically review EMP implementation status including spot site inspections.
c. Conduct workshops/capacity building program at different level and functions.
d. Prepare environmental Due Diligence report for each trench before implementing next trench
e. Prepare state Level IEE reports and EMPs for non sample roads based on the ECOP checklist completed by the PIC

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

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

a. Review of project design and specifications to ensure their adequacy and suitability with respect to the implementation of EMP.
b. Collection and dissemination of relevant environmental documents including amendments to environmental protection acts issued by the various agencies, namely, ADB, Government of India / State and local bodies;
c. Interact with the counterpart of the Contractor(s), review work progress/plans and ensure implementation of the EMP;
d. 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;
e. Monitoring sensitive environmental attributes during construction and operation stages20 to ensure that the suggested mitigation measures in the EMP are implemented;
f. Facilitate PIU for preparation of annual monitoring report as per ADB defined format
g. Documentation of the environmental management/monitoring activities for the regular project implementation progress report, which will serve as the basis for the annual environmental monitoring reports.
h. Conducting environmental training/awareness programs for the contractors, the project implementation personnel and the communities.

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

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

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

165. ADB has prepared an Environmental Assessment and Review Framework (EARF) which identifies the broad scope of the MFF, outlines the policy, environmental screening and assessment, and institutional requirements for preparing the environmental assessments to be

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

followed for subsequent batches and tranches. This EARF also specifies criteria for eligibility for selection rural roads under RCIP. The sample roads are selected following these criteria. The EMP, monitoring requirement, institutional aspects, capacity building, grievance redress mechanism presented in this chapter are developed in line with above EARF. The eligibility criteria for selection of roads under RCIP, environmental assessment requirement for each trench and legal framework are given below:

**Selection Criteria and Environmental Assessment Requirement**

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

(i) No Category A (as per ADB's SPS) subproject will be included in the MFF.
(ii) Subprojects will be eligible for construction or upgrading in accordance with the PMGSY guidelines, and be included in the respective district core network.
(iii) The subprojects shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.
(iv) The subproject will not pass through any designated wildlife sanctuaries, national parks, other sanctuaries, notified ecological sensitive areas or area of internationally significance (e.g., protected wetland designated by the Wetland Convention).
(v) The projects shall only involve activities that follow Government of India laws and regulations, ADB's Safeguard Policy Statement (2009)

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

(i) ECOP checklists with annexes on trees, utility structures, community structures, strip plans and photographs will be completed for each and every road.
(ii) Based on the requirements of the PMGSY guidelines separate ECOP checklists will be prepared for bridges that are longer than 15 m.
(iii) Based on the completed ECOP checklists for roads and bridges, IEE reports will be prepared at a state level. These reports must contain a general EMP and a site specific EMP where there are site specific issues.
(iv) ADB's REA checklist for roads and highways will be completed based on the state level IEE reports prepared and submitted to ADB to confirm categorization

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

(i) Is the project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes
(ii) Could changes in precipitation patterns or evaporation rates over the lifespan of the project affect its sustainability and cost (i.e., increased landslides increase maintenance costs)?
(iii) Does the project use or depend on resources which could be affected by climate changes such as changes in temperature, precipitation, wind (increased soil moisture content in the sub-grade)?
(iv) Are there any demographic or socioeconomic aspects of the subproject and project area (e.g., population growth, settlement patterns) that increase the vulnerability of the project and surrounding area?

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

**Legal Framework**

169. As per Indian legislation, an environmental clearance is not required for rural roads. However, it may attract provisions of Forest Conservation Act, 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) Submission of a completed Rapid Environment Assessment (REA) checklist for Roads and Highways and a categorization form for each state level IEE that is prepared.
(ii) An Initial Environmental Examination[21] (IEE) report including the preparation of an Environmental Management Plan (EMP) and a Monitoring Plan.
(iii) Regular monitoring of implementation of the EMP and submission of monitoring reports and due diligence reports to ADB as necessary

## F. Capacity Building

170. Existing capacity of the State Rural Roads Development Agencies (SRRDAs) and Project Implementation Units (PIUs) for implementing environmental safeguard issues need substantial strengthening. Capacity building activities will mainly comprise training workshops for SRRDA and PIU environmental officers on (i) completion of environmental code of practice (ECOP) checklists; (ii) preparation of environmental management plan (EMP) and monitoring plans; (iii) monitoring of EMP implementation and completion of pre-, during and post-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

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

172. All environmental assessment documents are subject to ADB's Public Communication Policy (2005) and will be made available to the public, upon request. The SRRDAs are responsible for ensuring that all environmental checklist documentation, including the environmental due diligence and monitoring reports, are properly and systematically kept as part of the Investment Program specific records. MORD must disclose state specific sample road IEE reports on its website.

## H. Grievance Redress Mechanism

173. PRI administered village level committee is the first contact point for any aggrieved person. This committee will try to settle the concern by them self or in consultation with contractor or PIU. The unresolved concerned are forwarded to PIU for further action. PIU

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

resolves these concerns in consultation with PIC, SRRDA, and contractor as the situation demands. This is an established practice and is seen effective enough in RRS II. PIC will also collect concerns received by this committee in the intervening period and report the effectiveness of action taken.

174. Experience in earlier tranches of the progranIn shows that village level grievance redress committees comprising the sarpanch, panchayat secretary and other prominent citizens of the village were in place. However, as the site selection and project design process involved participation and full consultation with the community, there was hardly any grievance by the APs and no complaint was received by any of the village commitees.

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

# VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

## A. General

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

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

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

## B. Compliance with Relevant Regulatory Requirements

179. In India, public consultation is mandatory in case of Category A and B1 category Projects[22] in select conditions. Being a category B project as per ADB Environmental Guidelines 2003, consultation was carried out during the early stage of IEE report preparation. The requirement of public consultation during the implementation of the project has been proposed as part of the mitigation plan. This will involve regular communications between the PIU, PIC and the grievance redressal committee's and community leaders. Consultations carried out and grievances addressed will be recorded in the annual environmental monitoring report which will be submitted for disclosure on the ADB website.

## C. Beneficiaries' Comments

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

181. Some of the general issues raised during the different consultation sessions are summarized below :

- **Construction Camp** - The participants did not demonstare apprehension of any adverse impact due to the construction camp near to their villages. They

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

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** - those who had encroached on the proposed alignment raised this issue. However, they willoffered the encroached space for the proposed project, if demanded.
- **Road Safety** - Safety issues were not raised during cosultations but proposed countermeasures as required from PMGSY guidelines were discussed
- **Land Acquisition** - People were in full support of the project and were ready to donate their land for the same, if required.
- **Losses of Idols/Shrines** - Participants supported the project and were willing to shift the idols, burial grounds and other religious structures observed at certain locations if required.
- **Loss of Trees Due to Road Construction** - Respondents were of the opinion that trees cutting should be avoided or else minimized. For trees to be cut compensatory plantation should be done. Some villagers expected additional plantation should be carried out. They recommended to plant only local tree species.
- **Impacts on Health** – Villagers do not perceived any impact due to this road project. However, issues pertaining to sexually transmitted diseases (STDs), HIV- AIDS may be an issue during construction stage however, this aspects are analysed by Social Impact Assessment team separately.
- **Ambient Air & Noise Quality** – The respondents viewed that these are the problems of urban areas and their villages are still untouched from this aspect. They even do not anticipate any of these problems after the completion of the project. However, they do not want increased in pollution during construction phase.
- **Inconvenience during Construction** - The participants viewed that they will manage it, as it will be temporary in nature.
- **Employment during Construction** - The locals expected that they should be given preference in employment during project implementation.
- **Perceptions and Expectations** - The public and the PAPs appreciated need and supported the project fully. Community at large appreciated overall benefits to them resulting from project development;

## D. Addressal of Issues

182. The efforts made to address all the issues raised during consultations through design changes/adjustments and environmental best practices. Some of the provisions made under the project to address the issues and concerns of the community are given in Table 16.

**Table 16: Addressal of Issues and Concerns under the Project**

| Issue/Concern | Addressal under the project |
|---|---|
| Water Logging and Drainage | Adequate cross drainage structures have been planned |
| Road Safety | Adequate safely signage is planned all along the rural road. |
| Land acquisition and Mode of compensation | The proposed RoW is 12m along the rural road. No land acquisition is planned in project road. |
| Loss of roadside idols/shrines | Idols and shrines will be relocated to the other nearby |

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

# VII. CONCLUSIONS AND RECOMMENDATIONS

## A. Conclusions

183. 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.

184. 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

185. All sample roads included under RCIP were selected based on ecological and climate change consideration defined under EARF. Accordingly, none of the sample roads passes through protected areas or encroaches precious ecology (sensitive or protected areas) or any historical or archeologically protected areas. A total of 27 selected sample road passes through reserved forests but are all exixting path. Few trees cutting though may be involved.

186. Few rural road crosses natural stream and water logging problem in few roads exist. Adequate engineering measures are proposed slop stabilisation, erosion control and drainage of water.

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

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

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

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

191. 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.

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

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

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

## B. Key Recommendations

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

195. 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.

196. These IEE is prepared based on ECOP checklists and feasibility study. 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.

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

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## Appendix 1: Details of Roads Proposed under Tranche-3

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 1 | Ashoknagar | Chanderi | L088-L085 to Lidhorakalan | 3.50 |
| 2 | Ashoknagar | Chanderi | L045-T002 to Goraseharai | 2.10 |
| 3 | Ashoknagar | Ashoknagar | L123-T008 to Bawadikheda | 3.60 |
| 4 | Ashoknagar | Ashoknagar | L089-T006 to Jamakhedi | 2.00 |
| 5 | Ashoknagar | Ashoknagar | L125-T008 to Kudai | 4.10 |
| 6 | Ashoknagar | Ashoknagar | L065-T003 to Rajebamora | 2.60 |
| 7 | Ashoknagar | Ashoknagar | L084-T005 to Bamuriya Foot | 3.20 |
| 8 | Ashoknagar | Ashoknagar | L070-L067 to Sijawat | 1.60 |
| 9 | Ashoknagar | Ashoknagar | L077-T004 to Tarawali | 1.20 |
| 10 | Ashoknagar | Issagarh | L055-L054 to Manak Chock | 3.80 |
| 11 | Ashoknagar | Issagarh | L071-T003 to Imjhara | 4.00 |
| 12 | Ashoknagar | Issagarh | L105-T005 to Khemkhedi | 3.00 |
| 13 | Ashoknagar | Issagarh | L130-T005 to Hinotiya Foot | 5.50 |
| 14 | Ashoknagar | Issagarh | L106-L105 to Pipariya | 3.10 |
| 15 | Ashoknagar | Issagarh | L041-L040 to Piprol | 2.40 |
| 16 | Ashoknagar | Issagarh | L117-L116 to Cheerkheda | 4.50 |
| 17 | Ashoknagar | Mungaoli | L134-L 133 to Piparia | 2.70 |
| 18 | Ashoknagar | Mungaoli | L139-L 138 to Semri Piprai | 4.00 |
| 19 | Ashoknagar | Mungaoli | L070-T05 to Bhesonakala (Baibani) | 1.40 |
| 20 | Ashoknagar | Mungaoli | L053-T-03 to Ruhana | 1.40 |
| 21 | Ashoknagar | Mungaoli | L024-T-01 to Kenwara | 3.50 |
| 22 | Ashoknagar | Mungaoli | L021-T-01 to Pyasi (Piprai) | 5.40 |
| 23 | Ashoknagar | Mungaoli | L039-T-03 to Chiroli | 4.40 |
| 24 | Ashoknagar | Mungaoli | L052-T-03 to Bamman Khiria | 2.20 |
| 25 | Betul | Betul | Tahali to Devthan | 3.80 |
| 26 | Betul | Betul | Jogli Gondra Road to Ratamati Khurd | 2.15 |
| 27 | Betul | Betul | Lapajhiri to Gehuras | 2.85 |
| 28 | Betul | Ghodadongri | Ghuggi to Chopna | 2.25 |
| 29 | Betul | Ghodadongri | Vikrampur to Ghughari | 1.55 |
| 30 | Betul | Amla | Parsoda to Rambhakhedi | 1.50 |
| 31 | Betul | Amla | Amla Bordehi Road to Rateda Khurd | 1.45 |
| 32 | Betul | Amia | Tarodakala to Kacharboh | 2.85 |
| 33 | Betul | Amla | Barangwadi to Kothiya Raiyat | 4.20 |
| 34 | Betul | Amla | Somlapur to Pastlaimal | 4.25 |
| 35 | Betul | Multai | Multai Bordehi Road to Temjhira (B) | 2.50 |
| 36 | Betul | Multai | Barkhed - Jam Road to Siladehi | 1.50 |
| 37 | Betul | Multai | Mahatpur to Khadakwar | 2.20 |
| 38 | Betul | Multai | Jam to Buwalkhapa | 3.00 |
| 39 | Betul | Multai | Mulitai Chhmdwara Sn to Dunai | 1.85 |
| 40 | Betul | P. Pattan | Bisnoor Jogikheda (T-07) Road to Kunda | 2.80 |
| 41 | Betul | P. Pattan | Masod-Ghan Road to Khediramoshi | 1.00 |
| 42 | Bhind | Raun | Jaitpura Guda Road to Lidhora | 1.15 |
| 43 | Bhind | Raun | Ucha Road to Lachoora | 2.40 |
| 44 | Bhind | Lahar | Ajnar Road to Rohani Singh Ka Pura | 3.00 |
| 45 | Bhind | Lahar | Lahar Amayan Road to Dhohar | 2.00 |
| 46 | Bhind | Lahar | Lahar Seoda Road to Harpura | 0.90 |
| 47 | Bhind | Lahar | Kuthar Road to Khurd | 2.20 |
| 48 | Bhind | Lahar | Daboha Khajuri Road to Dharampura | 2.20 |
| 49 | Bhind | Lahar | Daboha Khajuri Road to Bagheri | 4.00 |
| 50 | Bhind | Lahar | Ratanpura Alampur Road to Chadraua | 5.00 |
| 51 | Bhind | Mehgaon | Jawasa Piphadi Road to Shayampura | 2.30 |
| 52 | Bhind | Mehgaon | Gawalior Etawa Road to Gishakpura | 1.20 |
| 53 | Bhind | Mahegaon | Gawalior Etawa Road to Vijaypura | 1.25 |
| 54 | Bhind | Mehgoan | Javasa Pipahadihed Road to Kheriya | 1.55 |
| 55 | Bhind | Mehgoan | Mehgaon Murena Road to Tejpura | 2.80 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 56 | Bhind | Gohad | Charenta (Karwas) Road to Madanpur | 3.25 |
| 57 | Bhind | Gohad | Gohad Mou Road to Silhona | 2.10 |
| 58 | Bhind | Gohad | Badagarh Road to Bankepura | 2.20 |
| 59 | Bhind | Gohad | Guhiser Road to Adupura | 1.50 |
| 60 | Bhind | Gohad | Ratva Road to Gumara | 3.80 |
| 61 | Chhatarpur | Bijawar | Ragoli to Auriya | 3.10 |
| 62 | Chhatarpur | Bijawar | T-10 to Dilari | 1.85 |
| 63 | Chhatarpur | Rajnagar | Ganj Jhamtulli to Rampura | 2.15 |
| 64 | Chhatarpur | Rajnagar | Rajnagar Chhatarpur to Kota | 4.50 |
| 65 | Chhatarpur | Rajnagar | Benigunj Road to Bamnora | 3.70 |
| 66 | Chhatarpur | Badamalhara | Awarmata Road to Sorai | 1.78 |
| 67 | Chhatarpur | Badamalhara | Tikamgarh Shahgarh Road to Amarwan | 2.88 |
| 68 | Chhatarpur | Badamalhara | Dharampura to Piprakala | 1.80 |
| 69 | Chhatarpur | Badamalhara | Badamalhara Ghuwara to Baraj | 1.70 |
| 70 | Chhatarpur | Badamalhara | Dhanguwan to Hardhota | 3.15 |
| 71 | Chhatarpur | Chhatarpur | T-10 to Sigon | 1.00 |
| 72 | Chhatarpur | Chhatarpur | T-06 to Gonchi | 2.20 |
| 73 | Chhatarpur | Chhatarpur | T-01 to Shaymra | 3.60 |
| 74 | Chhatarpur | Chhatarpur | T-02 to Palotha | 1.65 |
| 75 | Chhatarpur | Chhatarpur | T-09 to Piprokala | 2.40 |
| 76 | Chhatarpur | Chhatarpur | T-03 to Ataniya | 3.28 |
| 77 | Chhatarpur | Laundi | Laundi Mahoba to Itwa | 1.00 |
| 78 | Chhatarpur | Nowgong | T 10 (Joran) to Deotha | 4.93 |
| 79 | Chhatarpur | Nowgong | T 09 to Thathewra | 0.75 |
| 80 | Chhindwara | Parasia | Kachram To Damuamal | 2.13 |
| 81 | Chhindwara | Sousar | Satnur T01 T0 Malegaon | 6.70 |
| 82 | Chhindwara | Harrai | Tharwa To Chhata | 5.35 |
| 83 | Chhindwara | Harrai | L110 Kamthi Kareli Rd To Karaghat | 3.03 |
| 84 | Chhindwara | Chourai | Bamanwara To Mour | 2.08 |
| 85 | Chhindwara | Mohkhed | Hirawadi-Dhagdiyamal Road (L027) To Chourai | 1.30 |
| 86 | Chhindwara | Parasia | Chhabadi To Bijori Khurd | 2.60 |
| 87 | Chhindwara | Sousar | Borgaon To Jamlapani -2 | 2.45 |
| 88 | Chhindwara | Pandhurna | Pandhurna(T04) To Kamthikhurd | 2.00 |
| 89 | Chhindwara | Junnardeo | Bilawar Kala To Junapani | 4.00 |
| 90 | Chhindwara | Junnardeo | Bhamanwara To Ramnagri | 2.23 |
| 91 | Chhindwara | Junnardeo | Bilawarkhurd To Patniya | 1.80 |
| 92 | Chhindwara | Junnardeo | Dungariya Bhardagrah (Chunrichougan ) to Brajpura | 3.53 |
| 93 | Chhindwara | Junnardeo | Unchetemru (T13) To Dhannor | 2.83 |
| 94 | Chhindwara | Junnardeo | Barelipar To Dhamniya | 1.30 |
| 95 | Chhindwara | Junnardeo | T05 (Nimoti) To Mandla | 2.09 |
| 96 | Chhindwara | Junnardeo | Ghurrekhurremau To Harrapathar | 3.95 |
| 97 | Chhindwara | Chourai | Main Road Km 112 (Salkani) To Bilanda | 2.10 |
| 98 | Chhindwara | Chourai | T01 To Hathni | 2.10 |
| 99 | Chhindwara | Chourai | T01 Kunda To Bichhuwa | 1.30 |
| 100 | Chhindwara | Mohkhed | Jam To Umriyadalel | 0.90 |
| 101 | Chhindwara | Chhindwara | T10 To Chhabri | 3.00 |
| 102 | Datia | Bhander | I.P.S. Road To Charai (Tendot To Semaha) | 3.75 |
| 103 | Datia | Bhander | Bhander Sarsai Road (Khiriya Sahab) to Novai | 2.00 |
| 104 | Datia | Bhander | Bhander Rd. To Sahjoura (Berachh to Ajitpura) | 4.00 |
| 105 | Datia | Seondha | Kulaith Rd.To Jaswantpura (Indergarh Pichore Road | 4.95 |
| 106 | Datia | Seondha | Senthri (Parsodagujer) Road to Fatehpur | 2.25 |
| 107 | Datia | Seondha | Datia-Seondha Mau (Ikona) Road To Thaili | 2.25 |
| 108 | Datia | Seondha | Bhaguapura Alampur Road To Maliyapura (Datia | 3.20 |
| 109 | Datia | Seondha | Unchiya Tiraha To Jaura (Indergarh Kamad Road | 2.90 |
| 110 | Dewas | Dewas | Tolapura ( Siroliya) To Sutarkheda | 6.35 |
| 111 | Dewas | Dewas | Mirkhedi To Khatamba (Kankund) | 4.10 |
| 112 | Dewas | Dewas | Sumarkheda To Maxi Rd 18 Km | 1.02 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 113 | Dewas | Dewas | Nagora To Tigariya Road | 1.60 |
| 114 | Dewas | Sonkach | Nanadharakhedi To Nevari Road | 1.83 |
| 115 | Dewas | Sonkach | Kachnariya To Rajapur Road | 0.75 |
| 116 | Dewas | Sonkach | Baroli To Babai Road (Oad) | 2.10 |
| 117 | Dewas | Sonkach | Kharsi (Pardi Kheda) To Bhopal Road | 1.10 |
| 118 | Dewas | Tonkhurd | Vijaygarh Muriya To Chaubara Road | 2.87 |
| 119 | Dewas | Tonkhurd | Jasmiya To Ratankhedi | 2.38 |
| 120 | Dewas | Bagli | Udainagar To Patadiya (Seevanpani) | 3.50 |
| 121 | Dewas | Bagli | Premgarh (Bawadikheda) To Udaynagar Punjapura | 4.30 |
| 122 | Dewas | Bagli | Sadipura Road To Bavaliya | 3.80 |
| 123 | Dewas | Bagli | T-06 (Punjapura) To Kewtiapani | 1.40 |
| 124 | Dewas | Bagli | Badiamandu Road (Mana Pipaliya) To Dhekiya | 2.90 |
| 125 | Dewas | Bagli | Pandutalao To Bhadak (Sitapuri) | 4.00 |
| 126 | Dewas | Khategaon | Mola To Sannod (Sukardi) | 3.75 |
| 127 | Dewas | Khategaon | Kana Bujurg To MDR(T05) ( Rajor) | 2.40 |
| 128 | Dewas | Khategaon | Guradiya To NH-59 A | 1.88 |
| 129 | Dewas | Kannod | MDR To Chichhi ( Pangri) | 1.30 |
| 130 | Dewas | Kannod | Nanasa To Amoda (Surani) | 3.90 |
| 131 | Dewas | Kannod | Kusmaniya To Devsinghiya ( Kitiya) | 2.00 |
| 132 | Dewas | Kannod | MDR To Bamni Bujurg | 2.70 |
| 133 | Dewas | Kannod | MDR ( Dabri Bujurg) To Mehndul | 3.10 |
| 134 | Dewas | Kannod | Kataphod (Bhayli) To Chorwra | 1.90 |
| 135 | Dewas | Kannod | Kannod To Nagjhiri (Raipura) | 3.50 |
| 136 | Dewas | Kannod | MDR To Nayapura | 3.10 |
| 137 | Guna | Bamori | L085-T-04 Sen Board Hamirpur To Churela | 1.20 |
| 138 | Guna | Bamori | L089-T-04 Sen Board Hamirpur To Baniyani | 2.30 |
| 139 | Guna | Bamori | L095-T-05 Fatehgarh-Lakhnakhedi Rd To Bhilkheda | 5.20 |
| 140 | Guna | Chachoda | L111-T-09 Kumbraj-Badod Sanai Rd To Jhareda | 3.70 |
| 141 | Guna | Chachoda | L108-T-08 Kumbraj-Miragwas Rd To Amlya | 2.20 |
| 142 | Guna | Chachoda | L064-T-06 Chachoda Manohar Thana Rd To | 1.50 |
| 143 | Guna | Chachoda | L066-T-06 Chachoda Manohar Thana Rd To | 2.00 |
| 144 | Guna | Chachoda | L143-T-010-Barod-Chhabra Rd To Behdabeh | 1.20 |
| 145 | Guna | Chachoda | L031-T-01 Khatoli-A.B.Road To Sagar | 2.80 |
| 146 | Guna | Chachoda | L070-T-07 Chachoda-Miragwas To Kusmpura | 1.50 |
| 147 | Guna | Chachoda | L043-T-03 Binagnaj-Teligaon To Suthaliya To | 4.00 |
| 148 | Guna | Chachoda | L084-T-011 Kubmraj-Batawada Rd to Kanakhedi | 2.80 |
| 149 | Guna | Chachoda | L093-L-081 Dedla To Muhansakhurd | 3.80 |
| 150 | Guna | Guna | L139-T-01 A. B. Road To Agra | 8.40 |
| 151 | Guna | Guna | L031-L-030 Manpur To Punamkhedi | 3.60 |
| 152 | Guna | Raghogarh | L135-T-04 A.B. Raod-Janjali-Maksudangarh- | 4.50 |
| 153 | Guna | Raghogarh | L107-T-04 A.B. Raod-Janjali-Maksudangarh- | 2.00 |
| 154 | Guna | Raghogarh | L119-T-05 Ukawad-Naseerpur-Suthaliya Road To | 3.10 |
| 155 | Hoshangabad | Babai | Babai-Nasirabad Rd. (Ganera) to Gondalwada | 2.20 |
| 156 | Hoshangabad | Babai | SH-22 To Bamhori Kalan | 1.75 |
| 157 | Hoshangabad | Babai | SH-22(Guradiya) To Kanskheda | 3.10 |
| 158 | Hoshangabad | Babai | SH-22 To Meghli | 1.35 |
| 159 | Hoshangabad | Hoshangabad | Silari To Rupapur | 2.70 |
| 160 | Hoshangabad | Hoshangabad | Dolariya-Tigaria Road To Kharkhedi | 1.08 |
| 161 | Hoshangabad | Kesla | Itarsi-Dharamkundi Rd. To Nazarpur | 4.50 |
| 162 | Hoshangabad | Pipariya | SH-19 To Dabka | 4.25 |
| 163 | Hoshangabad | Pipariya | SH-22 (Hathwas-Kareli) Rd. To Tada | 3.50 |
| 164 | Hoshangabad | Pipariya | SH-19 (Seoni) To Sarra Kishore | 1.73 |
| 165 | Hoshangabad | Pipariya | SH-22 To Mahalwada | 1.90 |
| 166 | Hoshangabad | Pipariya | SH-22 To Rajola | 1.25 |
| 167 | Hoshangabad | Pipariya | SH-22 To Semri Randhir | 2.95 |
| 168 | Hoshangabad | Seoni Malwa | Dhamasa To Temla Kalan | 2.15 |
| 169 | Hoshangabad | Seoni Malwa | Seoni Malwa Rd. To Khal | 1.85 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 170 | Hoshangabad | Seoni Malwa | Seoni Malwa Rd. To Pathada | 3.40 |
| 171 | Hoshangabad | Sohagpur | SH-22 To Khapa Rd. To Singwada | 3.45 |
| 172 | Jabalpur | Kundam | T07 To Dadargawan | 2.00 |
| 173 | Jabalpur | Kundam | T03 To Sanjari | 2.00 |
| 174 | Jabalpur | Panagar | Beerner To Saraswahi | 0.95 |
| 175 | Jabalpur | Patan | MDR 1 To Khairi | 0.51 |
| 176 | Jabalpur | Shahpura | L-049 Gadapipariya(NH-12) To Katangi | 2.25 |
| 177 | Jabalpur | Jabalpur | Purwa To Junwani | 1.10 |
| 178 | Jabalpur | Kundam | T07 To Batai | 4.15 |
| 179 | Jabalpur | Kundam | T-02 To Khari | 0.85 |
| 180 | Jabalpur | Patan | Konikala To Itwa Imlia | 4.80 |
| 181 | Jabalpur | Patan | Sh-37 To Ganj Khamaria | 2.80 |
| 182 | Jabalpur | Patan | MDR To Timari | 0.65 |
| 183 | Jabalpur | Shahpura | Managawan (NH12) To Imaliya 18 | 3.40 |
| 184 | Jabalpur | Sihora | Kitola Panumariya To Padriakala | 3.20 |
| 185 | Jabalpur | Sihora | Sihora Silondi Road To Bahtuli | 2.65 |
| 186 | Katni | Badwara | PWD Rd To Bhadawar | 3.10 |
| 187 | Katni | Badwara | NH-78 To Chhaphani | 3.50 |
| 188 | Katni | Badwara | Pwd Rd To Gopalpur | 6.30 |
| 189 | Katni | Badwara | Harwah To Nipaniya | 1.60 |
| 190 | Katni | Badwara | SH-14 To Khirheni | 1.50 |
| 191 | Katni | Bahoribandh | Neemkheda To Bhatgawa | 1.60 |
| 192 | Katni | Bahoribandh | Patori To Magela | 1.20 |
| 193 | Katni | Deemar Kheda | Pakariya To Baroda | 1.90 |
| 194 | Katni | Deemar Kheda | Bamhani To Khandwara | 10.80 |
| 195 | Katni | Katni | NH-78 To Khirwa | 4.20 |
| 196 | Katni | V.Garh | Kanti To Padwai | 1.10 |
| 197 | Katni | V.Garh | Chora To Chori | 2.50 |
| 198 | Khandwa | Khandwa | Khandwa-Kalmukhi Rd To Baliyapura | 3.50 |
| 199 | Khandwa | Khandwa | Matpur To Jinwania Ala Road | 3.60 |
| 200 | Khandwa | Pandhana | Chickheda To Singot Road | 3.50 |
| 201 | Khandwa | Punasa | Badhani To Narmadanagar- Punasa Rd | 2.20 |
| 202 | Khandwa | Punasa | Awaliya (Fv) To Jalwa Bujurg Road | 2.83 |
| 203 | Khandwa | Punasa | Borani To Kenood Road | 4.82 |
| 204 | Khandwa | Punasa | Dait To Mundi Atootkhas Road | 2.30 |
| 205 | Khandwa | Punasa | Dhawadiya To Kothi Road | 2.46 |
| 206 | Khargone | Bhagwanpura | Kariyapura To Lalpura | 4.90 |
| 207 | Khargone | Barwah | Bhogawa Nipani To Sanghavi | 5.10 |
| 208 | Khargone | Barwah | Jethway - Berphad Bujurg To Jujakhedi | 1.90 |
| 209 | Khargone | Barwah | Badi Khargone Road To Bandhikhar | 1.50 |
| 210 | Khargone | Barwah | Sainik Nagar To Jamaniya | 1.25 |
| 211 | Khargone | Barwah | Bagod To Methawan | 3.80 |
| 212 | Khargone | Barwah | Padliya Bujurg To Lalpura Road | 2.40 |
| 213 | Khargone | Barwah | Bagod To Dolatpura | 1.70 |
| 214 | Khargone | Barwah | Methwan To Kakatti | 3.00 |
| 215 | Khargone | Barwah | Khedi To Ramkula | 3.00 |
| 216 | Khargone | Barwah | Barud To Nandgaon | 1.04 |
| 217 | Khargone | Barwah | Kundiya To Aroda | 2.20 |
| 218 | Khargone | Kasrawad | Mukandpura To Mathlay | 2.70 |
| 219 | Khargone | Kasrawad | Kasrawad Khurd To Ahilyapura | 3.20 |
| 220 | Narsinghpur | Narsinghpur | NH.26 Km. 352 To Agariya | 1.00 |
| 221 | Narsinghpur | Narsinghpur | Ghapindrai To Malhaua | 2.10 |
| 222 | Narsinghpur | Narsinghpur | Bhaiua To Pala | 1.10 |
| 223 | Narsinghpur | Narsinghpur | S.N. 22 Km 76 To Sahajpura | 1.00 |
| 224 | Narsinghpur | Narsinghpur | Ghatpindrai Road To Jhirikhurd | 1.60 |
| 225 | Narsinghpur | Narsinghpur | Nayagaon To Badguan | 3.35 |
| 226 | Narsinghpur | Narsinghpur | Dudwara To Lighari | 1.10 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 227 | Narsinghpur | Narsinghpur | Khapa (Dh) To Gheghra | 5.50 |
| 228 | Narsinghpur | Narsinghpur | Ranipipariya Rd To Nawalgaon | 2.00 |
| 229 | Narsinghpur | Narsinghpur | Chandpura To Gadariya Kheda | 2.80 |
| 230 | Narsinghpur | Narsinghpur | Kurpa To Jhar-Kurpa | 3.00 |
| 231 | Narsinghpur | Narsinghpur | Nawalgaon To Barurewa | 4.40 |
| 232 | Narsinghpur | Gotegaon | Nagwara To Katkuhi | 3.60 |
| 233 | Narsinghpur | Gotegaon | Simri Bandhi Road To Ankhiwara | 1.00 |
| 234 | Narsinghpur | Gotegaon | O.B. Road To Tikari | 1.70 |
| 235 | Narsinghpur | Gotegaon | Barheta Road To Gadarwara Khera | 2.75 |
| 236 | Narsinghpur | Gotegaon | Rohiya Road To Shedpipariya | 4.35 |
| 237 | Narsinghpur | Gotegaon | O.B. Road To Belkhedi | 2.77 |
| 238 | Narsinghpur | Gotegaon | Deonagar To Rajakacchar | 3.40 |
| 239 | Narsinghpur | Gotegaon | Barehta Rd To Andhyari | 2.50 |
| 240 | Narsinghpur | Gotegaon | Kunda Road To Gotegaon Kheda | 1.05 |
| 241 | Narsinghpur | Gotegaon | Jamuniya Road To Muwar | 2.40 |
| 242 | Narsinghpur | Gotegaon | Dhuwa Road To Koregaon | 2.90 |
| 243 | Narsinghpur | Gotegaon | Mehas Road To Umara | 1.70 |
| 244 | Narsinghpur | Gotegaon | O.B. Road To Deogaon | 2.80 |
| 245 | Narsinghpur | Gotegaon | Gourtala To Majni | 2.50 |
| 246 | Narsinghpur | Gotegaon | Chandankheda To Nandiya | 3.28 |
| 247 | Narsinghpur | Kareli | Rakai To Basedi | 4.40 |
| 248 | Narsinghpur | Kareli | Sas Bahu (Amheta) To Pipariya (A) | 3.75 |
| 249 | Narsinghpur | Kareli | Singhpur Road To Gwari Kala | 2.80 |
| 250 | Narsinghpur | Kareli | Kosam Kheda To Mehgawan | 2.70 |
| 251 | Narsinghpur | Saikheda | T08 To Sokalpur | 4.70 |
| 252 | Narsinghpur | Saikheda | Saikheda To Khairua | 5.50 |
| 253 | Narsinghpur | Saikheda | Saikheda To Pithras | 7.00 |
| 254 | Rajgarh | Narsinghgarh | Eklera Kurawar Road To Sehat Khedi | 4.60 |
| 255 | Rajgarh | Narsinghgarh | Sujalpur - Pachor Road To Karondi | 2.30 |
| 256 | Rajgarh | Narsinghgarh | Sukli To Guradiya | 3.00 |
| 257 | Rajgarh | Sarangpur | AB. Road To Bhura Khedi | 3.20 |
| 258 | Rajgarh | Sarangpur | Chatkiya To Mehrimoti | 1.30 |
| 259 | Rajgarh | Sarangpur | Sarangpur Sandawata Road To Digwad | 2.10 |
| 260 | Rajgarh | Sarangpur | Lima Chouhan To Pathari Jagir | 4.50 |
| 261 | Rajgarh | Sarangpur | Bhiyana To Dedla | 2.00 |
| 262 | Rajgarh | Sarangpur | Khujner (Sarangpur) - Gulawata Road To Echiwada | 1.90 |
| 263 | Rajgarh | Sarangpur | A B Road To Nipaniya Ruwala | 1.90 |
| 264 | Rajgarh | Sarangpur | Mau ( A.B. Road) To Dingalpur | 3.50 |
| 265 | Rajgarh | Sarangpur | Padliya - Mata To Bapchya | 4.18 |
| 266 | Rajgarh | Sarangpur | Pachor Machalpur Road To Bhilkheda | 2.65 |
| 267 | Ratlam | Piploda | Jaora Amba Road To Ajampurdodiya | 2.50 |
| 268 | Ratlam | Ratlam | Mangrol Road To Kaharakhedi | 1.32 |
| 269 | Ratlam | Jaora | Ringnod To Kamliya | 3.70 |
| 270 | Ratlam | Jaora | Netawali Rola Road To Sujanpura | 1.70 |
| 271 | Ratlam | Piploda | Sherpur To Ummedpura | 2.50 |
| 272 | Ratlam | Ratlam | Dosigaon To Borana | 1.28 |
| 273 | Ratlam | Ratlam | Pritam Nagar To Bhilkhedi | 3.20 |
| 274 | Ratlam | Ratlam | S.B. Road To Aiwariya | 1.67 |
| 275 | Ratlam | Ratlam | Sarwad To Surjapur | 2.63 |
| 276 | Rewa | Rewa | Rewa Tamara Road To Padiya | 2.80 |
| 277 | Rewa | Rewa | Teekar Road To Dhopkhari 299 | 4.20 |
| 278 | Rewa | Sirmour | L-083 (Badagawan) To Bela | 5.00 |
| 279 | Rewa | Sirmour | Tilkhan To Guhiya | 3.10 |
| 280 | Rewa | Teonther | Manika To Lokhawar | 1.00 |
| 281 | Rewa | Teonther | Khatkhari Khalan To Khatikhari Khurd | 1.00 |
| 282 | Rewa | Mauganj | Ratangawan To Matiyari | 4.00 |
| 283 | Rewa | Mauganj | Harraimudahan To Umarishripati | 4.60 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 284 | Rewa | Gengeo | Lalgaon To Devhata | 2.00 |
| 285 | Rewa | Gengeo | Anterila To Pondi | 2.55 |
| 286 | Rewa | Gengeo | Raghunathganj To Dhabaiya Fauji -255 | 2.50 |
| 287 | Rewa | Gengeo | Joraut To Hinauta | 2.70 |
| 288 | Rewa | Hanumana | Khatkhari To ( Ghogham) Uskakothar | 13.00 |
| 289 | Rewa | Hanumana | Majhagawan To Alhawa | 2.00 |
| 290 | Rewa | Hanumana | Domodar Garh ( Belha) To Koidar | 4.00 |
| 291 | Sagar | Malthone | Jhikni To Barodiya | 2.13 |
| 292 | Sagar | Khurai | Karaiya Pmgsy App Road To Bilaiya | 1.80 |
| 293 | Sagar | Khurai | Karaiya Pmgsy App Road To Jharai | 0.53 |
| 294 | Sagar | Khurai | MDR To Barkheri | 3.20 |
| 295 | Sagar | Khurai | MDR Dhanora To Karai | 2.00 |
| 296 | Sagar | Khurai | MDR Muriya To Semra Ghat | 2.18 |
| 297 | Sagar | Shahgarh | T 04 To Dhawara | 5.58 |
| 298 | Sagar | Shahgarh | T 05 To Simariya Kala | 0.96 |
| 299 | Sagar | Shahgarh | T 04 To Jalampur | 0.80 |
| 300 | Sagar | Shahgarh | Khatorakala To Lidhora | 2.35 |
| 301 | Sagar | Jaisinagar | Sh15 To Banjariya | 1.92 |
| 302 | Sagar | Jaisinagar | Jaisinagar To Jera | 6.20 |
| 303 | Sagar | Jaisinagar | T02 To Tekapar | 1.70 |
| 304 | Sagar | Jaisinagar | Kallai To Rampura | 1.30 |
| 305 | Sagar | Rehli | Patana To Patti Bargaon | 1.70 |
| 306 | Sagar | Rehli | Samal Khiriya To Pipargour | 1.50 |
| 307 | Seoni | Seoni | Lakhanwada Kedparpur (T20) To Simariya | 1.75 |
| 308 | Seoni | Seoni | Pindrai (T07) To Jorawari | 1.50 |
| 309 | Seoni | Seoni | Hinotiya To Narwakheda | 1.70 |
| 310 | Seoni | Seoni | T-18 Seoni Chhindwada To Chargaon | 2.90 |
| 311 | Seoni | Seoni | Binjhawada NH-7 By Pass (T10) To Patra | 3.65 |
| 312 | Seoni | Seoni | Chandouri Khurd To Nakotiya | 3.23 |
| 313 | Seoni | Seoni | T-21 (Sapapar) To Gadarwara | 4.90 |
| 314 | Seoni | Seoni | NH-7(T01) To Gorakhpur | 4.20 |
| 315 | Seoni | Seoni | Karirat To Gundrai | 4.24 |
| 316 | Seoni | Seoni | Seoni Amarwada (T21) To Panjra | 4.10 |
| 317 | Seoni | Seoni | Jamuniya To Bineki | 2.10 |
| 318 | Seoni | Seoni | NH-7 Chandanwadakhurd (T02) To Bisapur | 1.10 |
| 319 | Seoni | Seoni | Gopalganj To Datni | 1.85 |
| 320 | Seoni | Seoni | Marjhor To Sakarda | 2.10 |
| 321 | Seoni | Seoni | Bandol To Pipariya | 2.43 |
| 322 | Seoni | Seoni | Singori To Katarwara | 0.80 |
| 323 | Seoni | Seoni | NH-7 Chandanwada Khurd (T02) To Bandra | 0.70 |
| 324 | Seoni | Seoni | Thanwari (T02) To Radhai | 2.20 |
| 325 | Seoni | Seoni | Potalpani To Jatlapur | 3.63 |
| 326 | Seoni | Seoni | Lakhanwada (T18) To Pindrai | 3.20 |
| 327 | Seoni | Barghat | Lalpur (T04) To Ulat | 2.77 |
| 328 | Seoni | Dhanora | Khirkhiri(Amo) To Amoli | 3.90 |
| 329 | Seoni | Ghansore | Karithoon To Roto | 4.20 |
| 330 | Seoni | Ghansore | Kudwari To Chamarwah | 2.60 |
| 331 | Seoni | Keolari | Jhitara To Sindradehi | 1.20 |
| 332 | Seoni | Keolari | Jhola To Bhadutola | 1.05 |
| 333 | Seoni | Keolari | Sunwara To Khapa | 0.78 |
| 334 | Seoni | Lakhnadone | T-01 To Mohgaon Khurd | 3.40 |
| 335 | Shajapur | Shujalpur | Bankakhedi To Harrai Kalan Road | 3.80 |
| 336 | Shajapur | Shujalpur | Kamalia To Nandsura Road | 0.55 |
| 337 | Shajapur | Kalapipal | Sadan Khedi To Kalapipal Kurawar Road Km16 | 2.00 |
| 338 | Shajapur | Kalapipal | Kohara To Kalapipal Kurawar Road Km2 | 2.20 |
| 339 | Shajapur | Kalapipal | Bisamkhedi To Arandia | 4.50 |
| 340 | Shajapur | Agar | Malikhedi To Pat - Agar Road (Km. 119) | 2.50 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 341 | Shajapur | Agar | Badgon To Pat - Agar Road (Km, 111/8) | 3.10 |
| 342 | Shajapur | Agar | Kalmoi To Chandan Gaon | 2.42 |
| 343 | Shajapur | Agar | Agar - Sarangpur Road Km. 30 To Mathurakhedi | 2.22 |
| 344 | Shajapur | Susner | Dehriya Soyat To Diwankhedi | 1.75 |
| 345 | Shajapur | Susner | Indore - Kota Road (Km. 160/8) To Mangishpur | 2.55 |
| 346 | Shajapur | Susner | Mehatpur To Patpada | 2.35 |
| 347 | Shajapur | Susner | Maina To Kalriya | 1.73 |
| 348 | Shajapur | Susner | Indore - Kota (Km.146/4) To Kadia | 1.00 |
| 349 | Shajapur | Susner | Indore - Kota (Km. 155/4) To Nipaniya | 2.00 |
| 350 | Shajapur | Nalkheda | Gujarkhedi To Eklera | 2.20 |
| 351 | Shajapur | Nalkheda | Bagawad To Kakadiya To Nanakhedi Gurjar | 3.50 |
| 352 | Shajapur | Nalkheda | Kachanariya To Bisani | 2.30 |
| 353 | Shivpuri | Badarwas | L030 Sajai To Gagoni | 4.70 |
| 354 | Shivpuri | Badarwas | Amhara Dehrada Isagar Road (L038) To | 1.20 |
| 355 | Shivpuri | Badarwas | L051 (Deharda Isagar Road) To Bamorekhurd | 2.00 |
| 356 | Shivpuri | Badarwas | L060 Ab Road To Banskheda | 3.70 |
| 357 | Shivpuri | Badarwas | L061 Ab Road To Rijodi | 5.00 |
| 358 | Singrauli | Waidhan | Gadahra To Rajbandh | 1.75 |
| 359 | Singrauli | Waidhan | Pondi Path To Kamai | 5.50 |
| 360 | Singrauli | Waidhan | Gadahra To Chokara | 2.40 |
| 361 | Singrauli | Waidhan | Hardi Road To Dhatura Phokara | 6.04 |
| 362 | Singrauli | Waidhan | Khatkari To Barauha | 1.20 |
| 363 | Singrauli | Chitrangi | Geer To Badnai | 5.40 |
| 364 | Singrauli | Chitrangi | Khatai To Chikani | 4.40 |
| 365 | Singrauli | Chitrangi | Barmani To Lotan | 2.60 |
| 366 | Singrauli | Chitrangi | Dhani To Pipari | 5.80 |
| 367 | Singrauli | Chitrangi | Ghoghara To Agrahawa | 5.05 |
| 368 | Singrauli | Chitrangi | Bagaiya To Sirgudi | 10.05 |
| 369 | Singrauli | Chitrangi | Mohgadhi Road To Butwa | 5.73 |
| 370 | Singrauli | Chitrangi | Deora To Piparjhar | 4.41 |
| 371 | Singrauli | Chitrangi | Kulhiya To Akla | 3.40 |
| 372 | Singrauli | Chitrangi | Katarihar Road To Saketi | 7.00 |
| 373 | Singrauli | Chitrangi | Ghoghara To Patehara | 2.00 |
| 374 | Singrauli | Chitrangi | Mohariya Road To Gairuai | 3.62 |
| 375 | Singrauli | Chitrangi | Bagaiya Road To Gawardehi | 5.34 |
| 376 | Singrauli | Deosar | Main Road To Bamhani Alias | 3.45 |
| 377 | Singrauli | Deosar | Parsohar To Jaghat | 1.70 |
| 378 | Singrauli | Deosar | Nayatola To Madraich | 5.78 |
| 379 | Singrauli | Deosar | Saraundha To Daudol | 1.53 |
| 380 | Singrauli | Deosar | Parsohar To Chandreh | 3.50 |
| 381 | Singrauli | Deosar | Saraundha To Bhaisahun | 7.10 |
| 382 | Singrauli | Deosar | Gajaradai To Patharidah | 3.65 |
| 383 | Singrauli | Deosar | NH-75 (Atarwa) To Songarh | 4.63 |
| 384 | Singrauli | Deosar | Saraundha To Madwa | 1.03 |
| 385 | Singrauli | Deosar | Jhundihawa To Ghaghitola | 2.60 |
| 386 | Singrauli | Deosar | Kundwar To Sanda | 7.23 |
| 387 | Singrauli | Deosar | NH-75 To Langhadand | 2.50 |
| 388 | Ujjain | Badnagar | Badanagar Runija Road To Pitlawdiya | 1.60 |
| 389 | Ujjain | Badnagar | Badnagar Kesor Road To Birgodanadu | 1.63 |
| 390 | Ujjain | Badnagar | Badanagar Runija Road To Maswadiya Dhar | 5.75 |
| 391 | Ujjain | Badnagar | Amlawad Bhika To Jamalpura | 2.10 |
| 392 | Ujjain | Badnagar | Bhidawad To Rawadiya Kalan | 3.10 |
| 393 | Ujjain | Khachrod | Barthoon To Bramhankheda | 5.33 |
| 394 | Ujjain | Khachrod | Madawada To Barlai (Khachrod Road To Barlai) | 5.05 |
| 395 | Ujjain | Khachrod | Khachrod Ratlam Road To Nandwasla | 2.97 |
| 396 | Ujjain | Khachrod | Banjari Road To Kutlana (Batlawadi Ghudawan | 2.05 |
| 397 | Ujjain | Khachrod | Kadiyali To Sekdi Sultanpur (Part-Ii) | 1.25 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 398 | Ujjain | Ujjain | Kadacha To Kadchhali | 2.20 |
| 399 | Ujjain | Ujjain | Bolasa To Khokariya | 4.50 |
| 400 | Ujjain | Ujjain | Dewas Road To Bolasa | 2.45 |
| 401 | Ujjain | Ujjain | Ujjain To Kankariya - Chirakhan To Brijrajkhedi | 3.05 |
| 402 | Ujjain | Ujjain | Tajpur To Umriya - Jagir | 4.05 |
| 403 | Ujjain | Ujjain | Harnawada To Kasampur | 4.10 |
| 404 | Ujjain | Ujjain | Ring Road To Nahariya | 0.90 |
| 405 | Ujjain | Ujjain | Ujjain - Maxi To Khajuria - Kumawat | 1.95 |
| 406 | Ujjain | Ghattiya | Malikhedi To Kalesar | 1.05 |
| 407 | Ujjain | Ghattiya | T 05 ( Outer Ring Road) To Utesara | 1.85 |
| 408 | Ujjain | Mahidpur | Makla Borkheda Now Road To Khedliya Manpur | 0.90 |
| 409 | Ujjain | Mahidpur | Araniya Najik Mahidpur Marg To Bagala | 3.50 |
| 410 | Ujjain | Mahidpur | Bolkheda Now (C) to Mahudiya - Lasudiya Goyal | 7.80 |
| 411 | Ujjain | Mahidpur | Lasudiya Mansoor To Khajuriya Mansoor | 2.60 |
| 412 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Tilawdi | 1.40 |
| 413 | Ujjain | Tarana | Tarana-Ujjain-Road To Rajpura | 2.45 |
| 414 | Ujjain | Tarana | Kanthadi To Godadi | 1.50 |
| 415 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Mundli | 1.10 |
| 416 | Ujjain | Tarana | Kanasiya To Laxmipura Rupakhedi To Palduna | 0.50 |
| 417 | Ujjain | Tarana | Rawan Khedi To Tejla Khedi | 3.50 |
| 418 | Ujjain | Tarana | Tarana To Sala Khedi | 2.50 |
| 419 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Bijan Kheda | 1.50 |
| 420 | Ujjain | Tarana | Laxmipura To Rupakhedi To Pankhedi | 0.75 |
| 421 | Ujjain | Tarana | Kapeli To Umrajher | 3.20 |
| 422 | Ujjain | Tarana | Barkheda To Surajpura | 0.75 |
| 423 | Ujjain | Tarana | Tarana Berchhi Sunwa Goun | 3.65 |
| 424 | Ujjain | Tarana | Pat - Rupakhedi Road To Pipliya Bazaar | 2.20 |
| 425 | Umaria | Karkeli | Kgrk Road To Karaundi | 1.80 |
| 426 | Umaria | Karkeli | Bandhwatola To Baghwar | 2.40 |
| 427 | Umaria | Karkeli | Kaudiya To Bansa | 2.05 |
| 428 | Umaria | Karkeli | Karaundi To Birhuliya | 1.60 |
| 429 | Umaria | Karkeli | Tammannara To Urdani | 6.20 |
| 430 | Umaria | Karkeli | Amari-Mardari Road To Aaganhudi | 1.60 |
| 431 | Umaria | Karkeli | Pathari Kalan To Bajakund | 3.10 |
| 432 | Umaria | Karkeli | Kgrk Road To Raghopur | 1.10 |
| 433 | Umaria | Karkeli | Kgrk Road To Sahijana | 2.30 |
| 434 | Umaria | Karkeli | Kgrk Road (Singhpur) To Semariya | 2.45 |
| 435 | Umaria | Karkeli | Birsinghpur To Jhanpi | 1.00 |
| 436 | Umaria | Karkeli | Tammannara To Jamuniya | 7.70 |
| 437 | Umaria | Karkeli | Bilaspur To Manikpur | 2.40 |
| 438 | Umaria | Karkeli | Dhanwahi To Lagwari | 5.90 |
| 439 | Umaria | Karkeli | Karri-Bodli Road To Tikariya | 4.50 |
| 440 | Umaria | Karkeli | Kalda To Bichhiya | 3.30 |
| 441 | Umaria | Karkeli | Uphari To Ujaniya | 3.10 |
| 442 | Umaria | Karkeli | Pathari Kalan To Kataria | 1.95 |
| 443 | Umaria | Karkeli | Patrai To Atariya | 3.30 |
| 444 | Umaria | Karkeli | Tummadar To Amuwari | 1.80 |
| 445 | Umaria | Karkeli | Akhrar To Gura | 4.70 |
| 446 | Umaria | Karkeli | Khalekhatai To Tikurakhatai | 3.70 |
| 447 | Umaria | Karkeli | Baherwah To Barmani | 1.30 |
| 448 | Umaria | Karkeli | Nimha To Chhataini | 2.70 |
| 449 | Umaria | Karkeli | Akhrar Bilaspur Road To Kotalde | 2.70 |
| 450 | Umaria | Karkeli | Majmani Khurd To Ginjari | 2.50 |
| 451 | Umaria | Karkeli | Uchehra To Akmaniha | 5.45 |
| 452 | Umaria | Karkeli | Jhanpi To Tikurapathari | 10.70 |
| 453 | Umaria | Manpur | Dhamokhar Bijauri Road To Mardari | 5.45 |
| 454 | Umaria | Manpur | Semra To Semri | 2.20 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 455 | Umaria | Manpur | Karaundi Tola To Dongari Tola | 2.51 |
| 456 | Umaria | Manpur | Bagaiha To Salkhaniya | **3.63** |
| 457 | Umaria | Pali | Goira Road To Parsaura | 2.40 |
| 458 | Umaria | Pali | Chandpur To Baghannara | 3.50 |
| 459 | Umaria | Pali | NH 78 To Marwa Tola | 1.25 |
| 460 | Umaria | Pali | S.M.Road To Balbai | 1.60 |
| 461 | Umaria | Pali | Pali Sundar Dadar Road To Kunkuni | 0.90 |
| 462 | Vidisha | Nateran | Nateran To Khajuri Das | 3.10 |
| 463 | Vidisha | Nateran | Mahuta To Singrampur | 2.20 |
| 464 | Vidisha | Vidisha | Sunpura Road To Bais | 1.25 |
| 465 | Vidisha | Vidisha | Vidisha-Ahmadpur Rd. To Mungod | 4.00 |
| 466 | Vidisha | Vidisha | Sh-19 (Kagpur) To Kanari | 3.30 |
| 467 | Vidisha | Nateran | Nayagola Road To Narkheda Khadya | 2.60 |
| 468 | Vidisha | Vidisha | Khamkheda To Salaikhedi | 3.20 |
| 469 | Vidisha | Basoda | L165-Rojroo To Grahini | 1.70 |
| 470 | Vidisha | Basoda | L150-Karariya Jajgir To Pawai Kurwai | 5.00 |
| 471 | Vidisha | Basoda | L049-T01 To Kanjna | 1.40 |
| 472 | Vidisha | Basoda | L053-Behlot To Tabakkalpur | 4.75 |
| 473 | Vidisha | Basoda | L135-L134 To Chourawar | 4.55 |
| 474 | Vidisha | Kurwai | L139-T06 To Veerpur | 1.98 |
| 475 | Vidisha | Kurwai | L145-T06 To Pairakhedi | 1.28 |
| 476 | Vidisha | Kurwai | L104-Parsari To Sikandarpur | 1.73 |
| 477 | Vidisha | Kurwai | L026-Layara To Lachayara | 6.45 |
| 478 | Vidisha | Kurwai | L083-Bilakhedi To Simarghan | 2.85 |
| 479 | Vidisha | Kurwai | L101-T05 To Raimoodara | 2.05 |
| 480 | Vidisha | Kurwai | L042-T03 To Shyampur Gudawal | 2.15 |
| 481 | Vidisha | Kurwai | L153-T07 To Girwasa | 3.80 |
| 482 | Vidisha | Kurwai | L137-Mala To Karmedi | 5.20 |
| | **TOTAL** | | | **1381.36** |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 1 | Ashoknagar | Chanderi | L088-L085 to Lidhorakalan | 3.50 |
| 2 | Ashoknagar | Chanderi | L045-T002 to Goraseharai | 2.10 |
| 3 | Ashoknagar | Ashoknagar | L123-T008 to Bawadikheda | 3.60 |
| 4 | Ashoknagar | Ashoknagar | L089-T006 to Jamakhedi | 2.00 |
| 5 | Ashoknagar | Ashoknagar | L125-T008 to Kudai | 4.10 |
| 6 | Ashoknagar | Ashoknagar | L065-T003 to Rajebamora | 2.60 |
| 7 | Ashoknagar | Ashoknagar | L084-T005 to Bamuriya Foot | 3.20 |
| 8 | Ashoknagar | Ashoknagar | L070-L067 to Sijawat | 1.60 |
| 9 | Ashoknagar | Ashoknagar | L077-T004 to Tarawali | 1.20 |
| 10 | Ashoknagar | Issagarh | L055-L054 to Manak Chock | 3.80 |
| 11 | Ashoknagar | Issagarh | L071-T003 to Imjhara | 4.00 |
| 12 | Ashoknagar | Issagarh | L105-T005 to Khemkhedi | 3.00 |
| 13 | Ashoknagar | Issagarh | L130-T005 to Hinotiya Foot | 5.50 |
| 14 | Ashoknagar | Issagarh | L106-L105 to Pipariya | 3.10 |
| 15 | Ashoknagar | Issagarh | L041-L040 to Piprol | 2.40 |
| 16 | Ashoknagar | Issagarh | L117-L116 to Cheerkheda | 4.50 |
| 17 | Ashoknagar | Mungaoli | L134-L 133 to Piparia | 2.7 |
| 18 | Ashoknagar | Mungaoli | L139-L 138 to Semri Piprai | 4.00 |
| 19 | Ashoknagar | Mungaoli | L070-T05 to Bhesonakala (Baibani) | 1.40 |
| 20 | Ashoknagar | Mungaoli | L053-T-03 to Ruhana | 1.40 |
| 21 | Ashoknagar | Mungaoli | L024-T-01 to Kenwara | 3.50 |
| 22 | Ashoknagar | Mungaoli | L021-T-01 to Pyasi (Piprai) | 5.40 |
| 23 | Ashoknagar | Mungaoli | L039-T-03 to Chiroli | 4.40 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 24 | Ashoknagar | Mungaoli | L052-T-03 to Bamman Khiria | 2.20 |
| **24** | | | **Ashoknagar** | **75.2** |
| 1 | Betul | Betul | Tahali to Devthan | 3.80 |
| 2 | Betul | Betul | Neemjhiri to Bodna | 5.00 |
| 3 | Betul | Betul | Jogli Gondra Road to Ratamati Khurd | 2.15 |
| 4 | Betul | Betul | Lapajhiri to Gehuras | 2.85 |
| 5 | Betul | Betul | Sohagpur to Junawani | 3.40 |
| 6 | Betul | Ghodadongri | Ghuggi to Chopna | 2.25 |
| 7 | Betul | Ghodadongri | Vikrampur to Ghughari | 1.55 |
| 8 | Betul | Amla | Parsoda to Rambhakhedi | 1.50 |
| 9 | Betul | Amla | Amla Bordehi Road to Rateda Khurd | 1.45 |
| 10 | Betul | Amia | Tarodakala to Kacharboh | 2.85 |
| 11 | Betul | Amla | Barangwadi to Kothiya Raiyat | 4.20 |
| 12 | Betul | Amla | Somlapur to Pastlaimal | 4.25 |
| 13 | Betul | Multai | Khedicort to Lehida | 3.80 |
| 14 | Betul | Multai | Multai Bordehi Road to Temjhira (B) | 2.50 |
| 15 | Betul | Multai | Barkhed - Jam Road to Siladehi | 1.50 |
| 16 | Betul | Multai | Mahatpur to Khadakwar | 2.20 |
| 17 | Betul | Multai | Jam to Buwalkhapa | 3.00 |
| 18 | Betul | Multai | Mulitai Chhmdwara Sn to Dunai | 1.85 |
| 19 | Betul | P. Pattan | Bisnoor Jogikheda (T-07) Road to Kunda | 2.80 |
| 20 | Betul | P. Pattan | Masod-Ghan Road to Khediramoshi | 1.00 |
| **20** | | | **Betul** | **53.9** |
| 1 | Bhind | Ater | Pawai Road to Mahewa | 1.83 |
| 2 | Bhind | Bhind | Etawah Gwalior Road to Chasar | 1.30 |
| 3 | Bhind | Bhind | Umari Pandri Road to Puleh | 1.50 |
| 4 | Bhind | Bhind | Jakhmoli to Khodan | 0.90 |
| 5 | Bhind | Raun | Jaitpura Guda Road to Lidhora | 1.15 |
| 6 | Bhind | Raun | Ucha Road to Lachoora | 2.4 |
| 7 | Bhind | Lahar | Ajnar Road to Rohani Singh Ka Pura | 3.00 |
| 8 | Bhind | Lahar | Lahar Amayan Road to Dhohar | 2.00 |
| 9 | Bhind | Lahar | Lahar Seoda Road to Harpura | 0.90 |
| 10 | Bhind | Lahar | Kuthar Road to Khurd | 2.20 |
| 11 | Bhind | Lahar | Daboha Khajuri Road to Dharampura | 2.20 |
| 12 | Bhind | Lahar | Daboha Khajuri Road to Bagheri | 4.00 |
| 13 | Bhind | Lahar | Ratanpura Alampur Road to Chadraua | 5.00 |
| 14 | Bhind | Mehgaon | Jawasa Piphadi Road to Shayampura | 2.30 |
| 15 | Bhind | Mehgaon | Gawalior Etawa Road to Gishakpura | 1.20 |
| 16 | Bhind | Mahegaon | Gawalior Etawa Road to Vijaypura | 1.25 |
| 17 | Bhind | Mehgoan | Javasa Pipahadihed Road to Kheriya | 1.55 |
| 18 | Bhind | Mehgoan | Mehgaon Murena Road to Tejpura | 2.80 |
| 19 | Bhind | Gohad | Charenta (Karwas) Road to Madanpur | 3.25 |
| 20 | Bhind | Gohad | Gohad Mou Road to Silhona | 2.10 |
| 21 | Bhind | Gohad | Badagarh Road to Bankepura | 2.20 |
| 22 | Bhind | Gohad | Guhiser Road to Adupura | 1.50 |
| 23 | Bhind | Gohad | Ratva Road to Gumara | 3.80 |
| **23** | | | **Bhind** | **50.33** |
| 1 | Chhatarpur | Bijawar | Ragoli to Auriya | 3.10 |
| 2 | Chhatarpur | Bijawar | T-10 to Dilari | 1.85 |
| 3 | Chhatarpur | Rajnagar | Ganj Jhamtulli to Rampura | 2.15 |
| 4 | Chhatarpur | Rajnagar | Rajnagar Chhatarpur to Kota | 4.50 |
| 5 | Chhatarpur | Rajnagar | Benigunj Road to Bamnora | 3.70 |
| 6 | Chhatarpur | Badamalhara | Awarmata Road to Sorai | 1.78 |
| 7 | Chhatarpur | Badamalhara | Tikamgarh Shahgarh Road to Amarwan | 2.88 |
| 8 | Chhatarpur | Badamalhara | Dharampura to Piprakala | 1.80 |
| 9 | Chhatarpur | Badamalhara | Badamalhara Ghuwara to Baraj | 1.70 |
| 10 | Chhatarpur | Badamalhara | Dhanguwan to Hardhota | 3.15 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 11 | Chhatarpur | Chhatarpur | T-10 to Sigon | 1.00 |
| 12 | Chhatarpur | Chhatarpur | T-06 to Gonchi | 2.20 |
| 13 | Chhatarpur | Chhatarpur | T-01 to Shaymra | 3.60 |
| 14 | Chhatarpur | Chhatarpur | T-02 to Palotha | 1.65 |
| 15 | Chhatarpur | Chhatarpur | T-09 to Piprokala | 2.40 |
| 16 | Chhatarpur | Chhatarpur | T-03 to Ataniya | 3.28 |
| 17 | Chhatarpur | Laundi | Laundi Mahoba to Itwa | 1.00 |
| 18 | Chhatarpur | Nowgong | T 10 (Joran) to Deotha | 4.93 |
| 19 | Chhatarpur | Nowgong | T 09 to Thathewra | 0.75 |
| **19** | | | **Chhatarpur** | **47.4** |
| 1 | Chhindwara | Parasia | Kachram To Damuamal | 2.125 |
| 2 | Chhindwara | Sousar | Satnur T01 T0 Malegaon | 6.700 |
| 3 | Chhindwara | Harrai | Tharwa To Chhata | 5.35 |
| 4 | Chhindwara | Harrai | L110 Kamthi Kareli Rd To Karaghat | 3.025 |
| 5 | Chhindwara | Chourai | Bamanwara To Mour | 2.08 |
| 6 | Chhindwara | Mohkhed | Hirawadi-Dhagdiyamal Road (L027) To Chourai | 1.30 |
| 7 | Chhindwara | Parasia | Chhabadi To Bijori Khurd | 2.60 |
| 8 | Chhindwara | Sousar | Borgaon To Jamlapani -2 | 2.450 |
| 9 | Chhindwara | Pandhurna | Pandhurna(T04) To Kamthikhurd | 2.000 |
| 10 | Chhindwara | Amarwara | L043-Cwa-Narsingghpur Main Rd Km.30 To Tendni Mal(Verven) | 4.62 |
| 11 | Chhindwara | Amarwara | L058-Kolhiya(Kubdi) To Sariyapani | 4.40 |
| 12 | Chhindwara | Junnardeo | Bilawar Kala To Junapani | 4.00 |
| 13 | Chhindwara | Junnardeo | Bhamanwara To Ramnagri | 2.23 |
| 14 | Chhindwara | Junnardeo | Bilawarkhurd To Patniya | 1.80 |
| 15 | Chhindwara | Junnardeo | Dungariya Bhardagrah (Chunrichougan ) to Brajpura | 3.53 |
| 16 | Chhindwara | Junnardeo | Unchetemru (T13) To Dhannor | 2.83 |
| 17 | Chhindwara | Junnardeo | Barelipar To Dhamniya | 1.30 |
| 18 | Chhindwara | Junnardeo | T05 (Nimoti) To Mandla | 2.09 |
| 19 | Chhindwara | Junnardeo | Ghurrekhurremau To Harrapathar | 3.95 |
| 20 | Chhindwara | Chourai | Main Road Km 112 (Salkani) To Bilanda | 2.10 |
| 21 | Chhindwara | Chourai | T01 To Hathni | 2.10 |
| 22 | Chhindwara | Chourai | T01 Kunda To Bichhuwa | 1.30 |
| 23 | Chhindwara | Mohkhed | Jam To Umriyadalel | 0.90 |
| 24 | Chhindwara | Chhindwara | T10 To Chhabri | 3.00 |
| **24** | | | **Chhindwara** | **9.40** |
| 1 | Datia | Bhander | I.P.S. Road To Charai (Tendot To Semaha) | 3.75 |
| 2 | Datia | Bhander | Bhander Sarsai Road (Khiriya Sahab) to Novai (Bhander Sarsai Road to Novai) | 2.00 |
| 3 | Datia | Bhander | Bhander Rd. To Sahjoura (Berachh to Ajitpura) | 4.00 |
| 4 | Datia | Datia | Gwalior Jhansi (Gandhari) Road To Lamaycha | 1.30 |
| 5 | Datia | Seondha | Indergarh Goraghat Road To Pipra | 4.10 |
| 6 | Datia | Seondha | Indrgarh Goraghat Road To Ramgarh | 2.65 |
| 7 | Datia | Seondha | Kulaith Rd.To Jaswantpura (Indergarh Pichore Road | 4.95 |
| 8 | Datia | Seondha | Senthri (Parsodagujer) Road to Fatehpur | 2.25 |
| 9 | Datia | Seondha | Datia-Seondha Mau (Ikona) Road To Thaili | 2.25 |
| 10 | Datia | Seondha | Bhaguapura Alampur Road To Maliyapura (Datia Mau Road To Maliyapura) | 3.20 |
| 11 | Datia | Seondha | Unchiya Tiraha To Jaura (Indergarh Kamad Road (Bagpura) Road To Jaura) | 2.90 |
| **11** | | | **Datia** | **33.35** |
| 1 | Dewas | Dewas | Tolapura ( Siroliya) To Sutarkheda | 6.35 |
| 2 | Dewas | Dewas | Mirkhedi To Khatamba (Kankund) | 4.10 |
| 3 | Dewas | Dewas | Sumarkheda To Maxi Rd 18 Km | 1.02 |
| 4 | Dewas | Dewas | Nagora To Tigariya Road | 1.60 |
| 5 | Dewas | Sonkach | Nanadharakhedi To Nevari Road | 1.83 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 6 | Dewas | Sonkach | Kachnariya To Rajapur Road | 0.75 |
| 7 | Dewas | Sonkach | Baroli To Babai Road (Oad) | 2.10 |
| 8 | Dewas | Sonkach | Kharsi (Pardi Kheda) To Bhopal Road | 1.10 |
| 9 | Dewas | Tonkhurd | Vijaygarh Muriya To Chaubara Road | 2.87 |
| 10 | Dewas | Tonkhurd | Jasmiya To Ratankhedi | 2.38 |
| 11 | Dewas | Bagli | Udainagar To Patadiya (Seevanpani) | 3.50 |
| 12 | Dewas | Bagli | Premgarh (Bawadikheda) To Udaynagar Punjapura | 4.30 |
| 13 | Dewas | Bagli | Sadipura Road To Bavaliya | 3.80 |
| 14 | Dewas | Bagli | T-06 (Punjapura) To Kewtiapani | 1.40 |
| 15 | Dewas | Bagli | Badiamandu Road (Mana Pipaliya) To Dhekiya | 2.90 |
| 16 | Dewas | Bagli | Pandutalao To Bhadak (Sitapuri) | 4.00 |
| 17 | Dewas | Khategaon | Mola To Sannod (Sukardi) | 3.75 |
| 18 | Dewas | Khategaon | Kana Bujurg To MDR(T05) ( Rajor) | 2.40 |
| 19 | Dewas | Khategaon | Guradiya To NH-59 A | 1.88 |
| 20 | Dewas | Kannod | MDR To Chichhi ( Pangri) | 1.30 |
| 21 | Dewas | Kannod | Nanasa To Amoda (Surani) | 3.90 |
| 22 | Dewas | Kannod | Kusmaniya To Devsinghiya ( Kitiya) | 2.00 |
| 23 | Dewas | Kannod | MDR To Bamni Bujurg | 2.70 |
| 24 | Dewas | Kannod | MDR ( Dabri Bujurg) To Mehndul | 3.10 |
| 25 | Dewas | Kannod | Kataphod (Bhayli) To Chorwra | 1.90 |
| 26 | Dewas | Kannod | Kannod To Nagjhiri (Raipura) | 3.50 |
| 27 | Dewas | Kannod | MDR To Nayapura | 3.10 |
| **27** | **Dewas** | | | **73.525** |
| 1 | Guna | Aron | L052-T-04 Aron - Hapakhedi To Roriya | 2.900 |
| 2 | Guna | Aron | L039-T-04 Aron - Hapakhedi To Sarai | 3.300 |
| 3 | Guna | Aron | L033-L-032 To Rusalla To Budhakheda | 2.900 |
| 4 | Guna | Aron | L037-L-036 Mundra Khurd To Jakhoda | 3.600 |
| 5 | Guna | Bamori | L085-T-04 Sen Board Hamirpur To Churela | 1.200 |
| 6 | Guna | Bamori | L089-T-04 Sen Board Hamirpur To Baniyani | 2.300 |
| 7 | Guna | Bamori | L048-T-03 Meenapura-To Umri-Sirsi Rd. to | 5.200 |
| 8 | Guna | Bamori | L095-T-05 Fatehgarh-Lakhnakhedi Rd To Bhilkheda | 5.200 |
| 9 | Guna | Bamhori | L051-T-07-Rampur To Puraposar To Dudhai | 3.500 |
| 10 | Guna | Chachoda | L111-T-09 Kumbraj-Badod Sanai Rd To Jhareda | 3.700 |
| 11 | Guna | Chachoda | L108-T-08 Kumbraj-Miragwas Rd To Amlya | 2.200 |
| 12 | Guna | Chachoda | L064-T-06 Chachoda Manohar Thana Rd To | 1.500 |
| 13 | Guna | Chachoda | L066-T-06 Chachoda Manohar Thana Rd To | 2.000 |
| 14 | Guna | Chachoda | L143-T-010-Barod-Chhabra Rd To Behdabeh | 1.200 |
| 15 | Guna | Chachoda | L031-T-01 Khatoli-A.B.Road To Sagar | 2.800 |
| 16 | Guna | Chachoda | L070-T-07 Chachoda-Miragwas To Kusmpura | 1.500 |
| 17 | Guna | Chachoda | L043-T-03 Binagnaj-Teligaon To Suthaliya To | 4.000 |
| 18 | Guna | Chachoda | L084-T-011 Kubmraj-Batawada Rd to Kanakhedi | 2.800 |
| 19 | Guna | Chachoda | L093-L-081 Dedla To Muhansakhurd | 3.800 |
| 20 | Guna | Guna | L139-T-01 A. B. Road To Agra | 8.40 |
| 21 | Guna | Guna | L084-T-08 Guna-Fathegarh Rd To Mahugarh | 1.60 |
| 22 | Guna | Guna | L070-T-07 Jetadonger-Barkheda Rd To Kadhon | 1.00 |
| 23 | Guna | Guna | L088-T-01 A. B. Road To Bamori Bujurg | 1.00 |
| 24 | Guna | Guna | L096-T-09 Guna-Umri-Sirsi Rd To Ari | 2.60 |
| 25 | Guna | Guna | L031-L-030 Manpur To Punamkhedi | 3.60 |
| 26 | Guna | Guna | L097-T-09 Guna-Umri-Sirsi Rd To Bheraghati | 4.00 |
| 27 | Guna | Guna | L120-T-10 A.B. Road To Patai-Umri-Sirsi Rd To | 1.00 |
| 28 | Guna | Raghogarh | L135-T-04 A.B. Raod-Janjali-Maksudangarh- | 4.50 |
| 29 | Guna | Raghogarh | L107-T-04 A.B. Raod-Janjali-Maksudangarh- | 2.00 |
| 30 | Guna | Raghogarh | L119-T-05 Ukawad-Naseerpur-Suthaliya Road To | 3.10 |
| **30** | **Guna** | | | **88.4** |
| 1 | Hoshangabad | Babai | Babai-Nasirabad Rd. (Ganera) to Gondalwada | 2.200 |
| 2 | Hoshangabad | Babai | SH-22 To Bamhori Kalan | 1.750 |
| 3 | Hoshangabad | Babai | SH-22(Guradiya) To Kanskheda | 3.100 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 4 | Hoshangabad | Babai | SH-22 To Meghli | 1.350 |
| 5 | Hoshangabad | Hoshangabad | Silari To Rupapur | 2.700 |
| 6 | Hoshangabad | Hoshangabad | Dolariya-Tigaria Road To Kharkhedi | 1.075 |
| 7 | Hoshangabad | Kesla | Itarsi-Dharamkundi Rd. To Nazarpur | 4.500 |
| 8 | Hoshangabad | Pipariya | SH-19 To Dabka | 4.250 |
| 9 | Hoshangabad | Pipariya | SH-22 (Hathwas-Kareli) Rd. To Tada | 3.500 |
| 10 | Hoshangabad | Pipariya | SH-19 (Seoni) To Sarra Kishore | 1.725 |
| 11 | Hoshangabad | Pipariya | SH-22 To Mahalwada | 1.900 |
| 12 | Hoshangabad | Pipariya | SH-22 To Rajola | 1.250 |
| 13 | Hoshangabad | Pipariya | SH-22 To Semri Randhir | 2.950 |
| 14 | Hoshangabad | Seoni Malwa | Dhamasa To Temla Kalan | 2.150 |
| 15 | Hoshangabad | Seoni Malwa | Seoni Malwa Rd. To Khal | 1.850 |
| 16 | Hoshangabad | Seoni Malwa | Seoni Malwa Rd. To Pathada | 3.400 |
| 17 | Hoshangabad | Sohagpur | SH-22 To Khapa Rd. To Singwada | 3.450 |
| **17** | **Hoshangabad** | | | **43.1** |
| 1 | Jabalpur | Kundam | T07 To Dadargawan | 2.00 |
| 2 | Jabalpur | Kundam | T03 To Sanjari | 2.00 |
| 3 | Jabalpur | Panagar | Beerner To Saraswahi | 0.95 |
| 4 | Jabalpur | Patan | MDR 1 To Khairi | 0.51 |
| 5 | Jabalpur | Shahpura | L-049 Gadapipariya(NH-12) To Katangi | 2.25 |
| 6 | Jabalpur | Jabalpur | Purwa To Junwani | 1.10 |
| 7 | Jabalpur | Kundam | T07 To Batai | 4.15 |
| 8 | Jabalpur | Kundam | T-02 To Khari | 0.85 |
| 9 | Jabalpur | Patan | Konikala To Itwa Imlia | 4.80 |
| 10 | Jabalpur | Patan | Sh-37 To Ganj Khamaria | 2.80 |
| 11 | Jabalpur | Patan | MDR To Timari | 0.65 |
| 12 | Jabalpur | Shahpura | Sakri To Lalpur | 2.10 |
| 13 | Jabalpur | Shahpura | Managawan (NH12) To Imaliya 18 | 3.40 |
| 14 | Jabalpur | Shahpura | T02 MDR Tilwara Chargawa Rod To Nunpur | 0.80 |
| 15 | Jabalpur | Sihora | Kitola Panumariya To Padriakala | 3.20 |
| 16 | Jabalpur | Sihora | Sihora Silondi Road To Bahtuli | 2.65 |
| **16** | **Jabalpur** | | | **34.21** |
| 1 | Katni | Badwara | PWD Rd To Bhadawar | 3.1 |
| 2 | Katni | Badwara | NH-78 To Chhaphani | 3.5 |
| 3 | Katni | Badwara | Pwd Rd To Gopalpur | 6.3 |
| 4 | Katni | Badwara | Harwah To Nipaniya | 1.6 |
| 5 | Katni | Badwara | SH-14 To Khirheni | 1.5 |
| 6 | Katni | Bahoribandh | Neemkheda To Bhatgawa | 1.6 |
| 7 | Katni | Bahoribandh | Patori To Magela | 1.2 |
| 8 | Katni | Deemar Kheda | Pakariya To Baroda | 1.9 |
| 9 | Katni | Deemar Kheda | Bamhani To Khandwara | 10.8 |
| 10 | Katni | Katni | NH-78 To Khirwa | 4.2 |
| 11 | Katni | Rithi | Bilhari To Ghinochi | 5.45 |
| 12 | Katni | V.Garh | Kanti To Padwai | 1.1 |
| 13 | Katni | V.Garh | Chora To Chori | 2.5 |
| **13** | **Katni** | | | **44.75** |
| 1 | Khandwa | Harsud | Hoshangabad Khandwa Rd To Kadouli Ryt. | 1.20 |
| 2 | Khandwa | Harsud | Mandla To Karoli Road | 3.90 |
| 3 | Khandwa | Khandwa | Khandwa-Kalmukhi Rd To Baliyapura | 3.50 |
| 4 | Khandwa | Khandwa | Khandwa Aashapur Road To Badgaon Road | 4.90 |
| 5 | Khandwa | Khandwa | Matpur To Jinwania Ala Road | 3.60 |
| 6 | Khandwa | Pandhana | Itwa Mal To Singot-Bhilkhedi Rd | 3.50 |
| 7 | Khandwa | Pandhana | Kedar Khedi To Singot Bhil Khedi Road | 1.15 |
| 8 | Khandwa | Pandhana | Chickheda To Singot Road | 3.50 |
| 9 | Khandwa | Punasa | Badhani To Narmadanagar- Punasa Rd | 2.20 |
| 10 | Khandwa | Punasa | Awaliya (Fv) To Jalwa Bujurg Road | 2.83 |
| 11 | Khandwa | Punasa | Borani To Kenood Road | 4.82 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 12 | Khandwa | Punasa | Dait To Mundi Atootkhas Road | 2.30 |
| 13 | Khandwa | Punasa | Dhawadiya To Kothi Road | 2.46 |
| **13** | | | **Khandwa** | **39.86** |
| 1 | Khargone | Bhagwanpura | Kariyapura To Lalpura | 4.90 |
| 1 | Khargone | Barwah | Bhogawa Nipani To Sanghavi | 5.10 |
| 2 | Khargone | Barwah | Jethway - Berphad Bujurg To Jujakhedi | 1.90 |
| 3 | Khargone | Barwah | Badi Khargone Road To Bandhikhar | 1.50 |
| 4 | Khargone | Barwah | Khandwa Indore S.H.27 To Lohari | 4.90 |
| 5 | Khargone | Barwah | Sainik Nagar To Jamaniya | 1.25 |
| 6 | Khargone | Barwah | Bagod To Methawan | 3.80 |
| 7 | Khargone | Barwah | Padliya Bujurg To Lalpura Road | 2.40 |
| 8 | Khargone | Barwah | Bagod To Dolatpura | 1.70 |
| 9 | Khargone | Barwah | Methwan To Kakatti | 3.00 |
| 10 | Khargone | Barwah | Khedi To Ramkula | 3.00 |
| 11 | Khargone | Barwah | Barud To Nandgaon | 1.04 |
| 12 | Khargone | Barwah | Kundiya To Aroda | 2.20 |
| 13 | Khargone | Kasrawad | Bamandi To Titraniya | 5.70 |
| 14 | Khargone | Kasrawad | Mukandpura To Mathlay | 2.70 |
| 15 | Khargone | Kasrawad | Kasrawad Khurd To Ahilyapura | 3.20 |
| 16 | Khargone | Kasrawad | Approach Road To Bardevla | 3.40 |
| **16** | | | **Khargone** | **51.69** |
| 1 | Narsinghpur | Narsinghpur | NH.26 Km. 352 To Agariya | 1.00 |
| 2 | Narsinghpur | Narsinghpur | Ghapindrai To Malhaua | 2.10 |
| 3 | Narsinghpur | Narsinghpur | Bhaiua To Pala | 1.10 |
| 4 | Narsinghpur | Narsinghpur | Lalpul Gorakhpur Road Km. 2 To Barpani | 0.90 |
| 5 | Narsinghpur | Narsinghpur | S.N. 22 Km 76 To Sahajpura | 1.00 |
| 6 | Narsinghpur | Narsinghpur | Ghatpindrai Road To Jhirikhurd | 1.60 |
| 7 | Narsinghpur | Narsinghpur | Nayagaon To Badguan | 3.35 |
| 8 | Narsinghpur | Narsinghpur | Dudwara To Lighari | 1.10 |
| 9 | Narsinghpur | Narsinghpur | NH 26 K.M. 370 Gadariya | 2.25 |
| 10 | Narsinghpur | Narsinghpur | Kodras Kala To Mehgaon | 1.40 |
| 11 | Narsinghpur | Narsinghpur | Khapa (Dh) To Gheghra | 5.50 |
| 12 | Narsinghpur | Narsinghpur | Ranipipariya Rd To Nawalgaon | 2.00 |
| 13 | Narsinghpur | Narsinghpur | Chandpura To Gadariya Kheda | 2.80 |
| 14 | Narsinghpur | Narsinghpur | Kurpa To Jhar-Kurpa | 3.00 |
| 15 | Narsinghpur | Narsinghpur | Nawalgaon To Barurewa | 4.40 |
| 16 | Narsinghpur | Gotegaon | Nagwara To Katkuhi | 3.6 |
| 17 | Narsinghpur | Gotegaon | Simri Bandhi Road To Ankhiwara | 1 |
| 18 | Narsinghpur | Gotegaon | O.B. Road To Tikari | 1.7 |
| 19 | Narsinghpur | Gotegaon | Barheta Road To Gadarwara Khera | 2.75 |
| 20 | Narsinghpur | Gotegaon | Rohiya Road To Shedpipariya | 4.35 |
| 21 | Narsinghpur | Gotegaon | O.B. Road To Belkhedi | 2.77 |
| 22 | Narsinghpur | Gotegaon | Deonagar To Rajakacchar | 3.4 |
| 23 | Narsinghpur | Gotegaon | Barehta Rd To Andhyari | 2.5 |
| 24 | Narsinghpur | Gotegaon | Kunda Road To Gotegaon Kheda | 1.05 |
| 25 | Narsinghpur | Gotegaon | Jamuniya Road To Muwar | 2.4 |
| 26 | Narsinghpur | Gotegaon | Dhuwa Road To Koregaon | 2.9 |
| 27 | Narsinghpur | Gotegaon | Mehas Road To Umara | 1.7 |
| 28 | Narsinghpur | Gotegaon | O.B. Road To Deogaon | 2.8 |
| 29 | Narsinghpur | Gotegaon | Gourtala To Majni | 2.5 |
| 30 | Narsinghpur | Gotegaon | Chandankheda To Nandiya | 3.28 |
| 31 | Narsinghpur | Kareli | Manegaon To Bikor | 2.51 |
| 32 | Narsinghpur | Kareli | Rakai To Basedi | 4.4 |
| 33 | Narsinghpur | Kareli | Bikor Road To Kudi | 3.4 |
| 34 | Narsinghpur | Kareli | Sas Bahu (Amheta) To Pipariya (A) | 3.75 |
| 35 | Narsinghpur | Kareli | Singhpur Road To Gwari Kala | 2.8 |
| 36 | Narsinghpur | Kareli | Kosam Kheda To Mehgawan | 2.7 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 37 | Narsinghpur | Saikheda | T08 To Sokalpur | 4.70 |
| 38 | Narsinghpur | Saikheda | Saikheda To Khairua | 5.50 |
| 39 | Narsinghpur | Saikheda | Saikheda To Pithras | 7.00 |
| 40 | Narsinghpur | Saikheda | Bankhedi Tigadda To Bankhedi | 2.30 |
| **40** | | | **Narsinghpur** | **111.26** |
| 1 | Rajgarh | Biaora | NH-12 To Peepalbey | 1.500 |
| 2 | Rajgarh | Biaora | Nevali To Newaj | 2.000 |
| 3 | Rajgarh | Biaora | SH - 14 To Luhari | 3.200 |
| 4 | Rajgarh | Biaora | Suthaliya To Nalajhiri | 3.250 |
| 5 | Rajgarh | Narsinghgarh | Eklera Kurawar Road To Sehat Khedi | 4.600 |
| 6 | Rajgarh | Narsinghgarh | NH-12 To Padaliya Bana | 2.100 |
| 7 | Rajgarh | Narsinghgarh | Narsinghgarh - Bairasiya Road To Baraytha | 1.300 |
| 8 | Rajgarh | Narsinghgarh | Narsinghgarh To Vijaygarh | 3.100 |
| 9 | Rajgarh | Narsinghgarh | Sujalpur - Pachor Road To Karondi | 2.300 |
| 10 | Rajgarh | Narsinghgarh | Boda - Narsinghgarh Road To Chatha | 1.900 |
| 11 | Rajgarh | Narsinghgarh | Sukli To Guradiya | 3.000 |
| 12 | Rajgarh | Sarangpur | AB. Road To Bhura Khedi | 3.200 |
| 13 | Rajgarh | Sarangpur | Chatkiya To Mehrimoti | 1.300 |
| 14 | Rajgarh | Sarangpur | Sarangpur Sandawata Road To Digwad | 2.100 |
| 15 | Rajgarh | Sarangpur | Lima Chouhan To Pathari Jagir | 4.500 |
| 16 | Rajgarh | Sarangpur | Bhiyana To Dedla | 2.000 |
| 17 | Rajgarh | Sarangpur | Khujner (Sarangpur) - Gulawata Road To Echiwada | 1.900 |
| 18 | Rajgarh | Sarangpur | A B Road To Nipaniya Ruwala | 1.900 |
| 19 | Rajgarh | Sarangpur | Mau ( A.B. Road) To Dingalpur | 3.500 |
| 20 | Rajgarh | Sarangpur | Padliya - Mata To Bapchya | 4.175 |
| 21 | Rajgarh | Sarangpur | Pachor Machalpur Road To Bhilkheda | 2.650 |
| 22 | Rajgarh | Jirapur | Bhandawat To Laxman Pura | 2.200 |
| 23 | Rajgarh | Jirapur | Bhanpura To Goriyakheda | 5.400 |
| 24 | Rajgarh | Khilchipur | NH - 12 To Chibad Kalan | 2.500 |
| 25 | Rajgarh | Khilchipur | Khilchipur - Jirapur Road To Gujar Khedi | 1.000 |
| 26 | Rajgarh | Khilchipur | Khilchipur - Bhoomariya Road To Dalupura | 1.500 |
| 27 | Rajgarh | Khilchipur | Biaora Kala To Dundahedi | 4.100 |
| 28 | Rajgarh | Rajgarh | Rajgarh Khjner (Kalipeeth) Road To Tandikalan | 2.000 |
| 29 | Rajgarh | Rajgarh | NH-3 To Padampura | 3.200 |
| 30 | Rajgarh | Rajgarh | NH - 3 To Sameli | 2.500 |
| 31 | Rajgarh | Rajgarh | NH - 12 To Fool Khedi | 1.000 |
| 32 | Rajgarh | Rajgarh | Chatukheda Bamlabey Road To Baiheda | 2.400 |
| **32** | | | **Rajgarh** | **83.275** |
| 1 | Ratlam | Alote | Jaora Alote Road To Jhangaria | 2.100 |
| 2 | Ratlam | Alote | Alote Unhel Road To Palnagra | 1.880 |
| 3 | Ratlam | Piploda | Jaora Amba Road To Ajampurdodiya | 2.500 |
| 4 | Ratlam | Ratlam | Mangrol Road To Kaharakhedi | 1.320 |
| 5 | Ratlam | Alote | Jaora Alote Road To Bisalkheda | 1 |
| 6 | Ratlam | Alote | Rajala To Majanpura | 3.8 |
| 7 | Ratlam | Alote | Kothadi (Tal) To Nakatwada | 3.3 |
| 8 | Ratlam | Alote | Tugni To Akyakhurd | 3.6 |
| 9 | Ratlam | Alote | Alote Barkheda Road To Narani | 0.825 |
| 10 | Ratlam | Alote | Alote Barkheda Road To Devgarh | 2.6 |
| 11 | Ratlam | Alote | Alote Barod Road To Kabria Khedi | 1.75 |
| 12 | Ratlam | Alote | Alote Barkheda Road To Jalodiya | 2.5 |
| 13 | Ratlam | Jaora | Jaora Alote Road To Batwadia | 3.6 |
| 14 | Ratlam | Jaora | Batwadia To Roopdi | 2.1 |
| 15 | Ratlam | Jaora | Ringnod To Kamliya | 3.7 |
| 16 | Ratlam | Jaora | Bandwa To Borwana | 1.9 |
| 17 | Ratlam | Jaora | Netawali Rola Road To Sujanpura | 1.7 |
| 18 | Ratlam | Jaora | Lasudiya Jungli To Chayyan | 3.05 |
| 19 | Ratlam | Piploda | Sherpur To Ummedpura | 2.5 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 20 | Ratlam | Ratlam | Dosigaon To Borana | 1.28 |
| 21 | Ratlam | Ratlam | Pritam Nagar To Bhilkhedi | 3.2 |
| 22 | Ratlam | Ratlam | S.B. Road To Aiwariya | 1.67 |
| 23 | Ratlam | Ratlam | Sarwad To Surjapur | 2.63 |
| **23** | **Ratlam** | | | **54.505** |
| 1 | Rewa | Rewa | Rewa Tamara Road To Padiya | 2.80 |
| 2 | Rewa | Rewa | Teekar Road To Dhopkhari 299 | 4.20 |
| 3 | Rewa | Sirmour | L-083 (Badagawan) To Bela | 5.00 |
| 4 | Rewa | Sirmour | Tilkhan To Guhiya | 3.10 |
| 5 | Rewa | Teonther | Manika To Lokhawar | 1.00 |
| 6 | Rewa | Teonther | Khatkhari Khalan To Khatikhari Khurd | 1.00 |
| 7 | Rewa | Mauganj | Ratangawan To Matiyari | 4.00 |
| 8 | Rewa | Mauganj | Harraimudahan To Umarishripati | 4.60 |
| 9 | Rewa | Gengeo | Lalgaon To Devhata | 2.00 |
| 10 | Rewa | Gengeo | Anterila To Pondi | 2.55 |
| 11 | Rewa | Gengeo | Raghunathganj To Dhabaiya Fauji -255 | 2.50 |
| 12 | Rewa | Gengeo | Joraut To Hinauta | 2.70 |
| 13 | Rewa | Hanumana | Khatkhari To ( Ghogham) Uskakothar | 13.00 |
| 14 | Rewa | Hanumana | Majhagawan To Alhawa | 2.00 |
| 15 | Rewa | Hanumana | Domodar Garh ( Belha) To Koidar | 4.00 |
| **15** | **Rewa** | | | **54.45** |
| 1 | Sagar | Banda | T01 /B07 To Tentwara | 2.30 |
| 2 | Sagar | Banda | B 07 To Hinoti | 1.25 |
| 3 | Sagar | Banda | B 07 To Kalraho | 2.00 |
| 4 | Sagar | Bina | T 09 To Lahrawda | 1.05 |
| 5 | Sagar | Malthone | Jhikni To Barodiya | 2.128 |
| 6 | Sagar | Khurai | Karaiya Pmgsy App Road To Bilaiya | 1.80 |
| 7 | Sagar | Khurai | Karaiya Pmgsy App Road To Jharai | 0.525 |
| 8 | Sagar | Khurai | MDR To Barkheri | 3.20 |
| 9 | Sagar | Khurai | MDR Dhanora To Karai | 2.00 |
| 10 | Sagar | Khurai | MDR Muriya To Semra Ghat | 2.18 |
| 11 | Sagar | Shahgarh | T 04 To Dhawara | 5.58 |
| 12 | Sagar | Shahgarh | T 05 To Simariya Kala | 0.96 |
| 13 | Sagar | Shahgarh | T 04 To Jalampur | 0.80 |
| 14 | Sagar | Shahgarh | Khatorakala To Lidhora | 2.35 |
| 15 | Sagar | Deori | T-09 To Ghosi Patti | 0.700 |
| 16 | Sagar | Jaisinagar | Sh15 To Banjariya | 1.920 |
| 17 | Sagar | Jaisinagar | Jaisinagar To Jera | 6.200 |
| 18 | Sagar | Jaisinagar | T02 To Tekapar | 1.700 |
| 19 | Sagar | Jaisinagar | Kallai To Rampura | 1.300 |
| 20 | Sagar | Kesli | Narayan Pur To Indalpur | 1.500 |
| 21 | Sagar | Kesli | Keolari To Bagdari Khurd | 5.300 |
| 22 | Sagar | Rahatgarh | Khajra Maphy To Bhabuka Wari | 3.000 |
| 23 | Sagar | Rahatgarh | Chauki To Shikarpur | 4.200 |
| 24 | Sagar | Rahatgarh | Khajra Maphy To Nandan Wada | 3.300 |
| 25 | Sagar | Rahatgarh | Eran NH86 To Khari Gumariya | 2.680 |
| 26 | Sagar | Rahatgarh | Batyawada To Basoda | 3.600 |
| 27 | Sagar | Rahatgarh | Mahuna Gujar To Pekhlon | 3.000 |
| 28 | Sagar | Rahatgarh | L119 To Pachoha | 0.700 |
| 29 | Sagar | Rahatgarh | Samos To Dhana-Naryawali | 2.600 |
| 30 | Sagar | Rahatgarh | Khiriya Nikhara To Kodni | 1.550 |
| 31 | Sagar | Rehli | Patana To Patti Bargaon | 1.700 |
| 32 | Sagar | Rehli | Samal Khiriya To Pipargour | 1.500 |
| 33 | Sagar | Sagar | NH26 To Jasraj | 1.800 |
| 34 | Sagar | Sagar | Bamhori To Chawra | 3.65 |
| **34** | **Sagar** | | | **80.02** |
| 1 | Seoni | Seoni | T-23 To Gangerua | 2.70 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 2 | Seoni | Seoni | Lakhanwada Kedparpur (T20) To Simariya | 1.75 |
| 3 | Seoni | Seoni | Pindrai (T07) To Jorawari | 1.50 |
| 4 | Seoni | Seoni | Hinotiya To Narwakheda | 1.70 |
| 5 | Seoni | Seoni | T-18 Seoni Chhindwada To Chargaon | 2.90 |
| 6 | Seoni | Seoni | Binjhawada NH-7 By Pass (T10) To Patra | 3.65 |
| 7 | Seoni | Seoni | Chandouri Khurd To Nakotiya | 3.23 |
| 8 | Seoni | Seoni | T-21 (Sapapar) To Gadarwara | 4.90 |
| 9 | Seoni | Seoni | NH-7(T01) To Gorakhpur | 4.20 |
| 10 | Seoni | Seoni | Karirat To Gundrai | 4.24 |
| 11 | Seoni | Seoni | Seoni Amarwada (T21) To Panjra | 4.10 |
| 12 | Seoni | Seoni | Jamuniya To Bineki | 2.10 |
| 13 | Seoni | Seoni | NH-7 Chandanwadakhurd (T02) To Bisapur | 1.10 |
| 14 | Seoni | Seoni | Gopalganj To Datni | 1.85 |
| 15 | Seoni | Seoni | Marjhor To Sakarda | 2.10 |
| 16 | Seoni | Seoni | Bandol To Pipariya | 2.43 |
| 17 | Seoni | Seoni | Singori To Katarwara | 0.80 |
| 18 | Seoni | Seoni | NH-7 Chandanwada Khurd (T02) To Bandra | 0.70 |
| 19 | Seoni | Seoni | Thanwari (T02) To Radhai | 2.20 |
| 20 | Seoni | Seoni | Potalpani To Jatlapur | 3.63 |
| 21 | Seoni | Seoni | Lakhanwada (T18) To Pindrai | 3.20 |
| 22 | Seoni | Barghat | Lalpur (T04) To Ulat | 2.77 |
| 23 | Seoni | Dhanora | Khirkhiri(Amo) To Amoli | 3.90 |
| 24 | Seoni | Ghansore | Karithoon To Roto | 4.20 |
| 25 | Seoni | Ghansore | Kudwari To Chamarwah | 2.60 |
| 26 | Seoni | Keolari | Jhitara To Sindradehi | 1.20 |
| 27 | Seoni | Keolari | Jhola To Bhadutola | 1.05 |
| 28 | Seoni | Keolari | Sunwara To Khapa | 0.775 |
| 29 | Seoni | Lakhnadone | T-01 To Mohgaon Khurd | 3.40 |
| **29** | **Seoni** | | | **74.875** |
| 1 | Shajapur | Shajapur | Muli Khedi To Magriya Rd. | 1.20 |
| 2 | Shajapur | Moman Barodiya | Ukawata - Rasulpur | 0.80 |
| 3 | Shajapur | Moman Barodiya | Kharsoda To Salsalai | 1.70 |
| 4 | Shajapur | Moman Barodiya | Koriya To Gulana | 4.80 |
| 5 | Shajapur | Moman Barodiya | Bhatahedi To Dhandeda Rd. | 2.80 |
| 6 | Shajapur | Moman Barodiya | Dankani To Sarsi | 2.40 |
| 7 | Shajapur | Moman Barodiya | Malikhedi To Shujalpur Road 17. 5 Km | 2.00 |
| 8 | Shajapur | Shujalpur | Choki Nasirabad To Akhtiar Pur | 5.50 |
| 9 | Shajapur | Shujalpur | Bankakhedi To Harrai Kalan Road | 3.80 |
| 10 | Shajapur | Shujalpur | Lasidiya Hazam to Shujalpur Khardon Rd Km 5 | 2.18 |
| 11 | Shajapur | Shujalpur | Kamalia To Nandsura Road | 0.55 |
| 12 | Shajapur | Kalapipal | Sadan Khedi To Kalapipal Kurawar Road Km16 | 2.00 |
| 13 | Shajapur | Kalapipal | Kohara To Kalapipal Kurawar Road Km2 | 2.20 |
| 14 | Shajapur | Kalapipal | Bisamkhedi To Arandia | 4.50 |
| 15 | Shajapur | Agar | Malikhedi To Pat - Agar Road (Km. 119) | 2.5 |
| 16 | Shajapur | Agar | Badgon To Pat - Agar Road (Km, 111/8) | 3.1 |
| 17 | Shajapur | Agar | Kalmoi To Chandan Gaon | 2.42 |
| 18 | Shajapur | Agar | Agar - Sarangpur Road Km. 30 To Mathurakhedi | 2.22 |
| 19 | Shajapur | Susner | Dehriya Soyat To Diwankhedi | 1.75 |
| 20 | Shajapur | Susner | Indore - Kota Road (Km. 160/8) To Mangishpur | 2.55 |
| 21 | Shajapur | Susner | Mehatpur To Patpada | 2.35 |
| 22 | Shajapur | Susner | Maina To Kalriya | 1.73 |
| 23 | Shajapur | Susner | Indore - Kota (Km.146/4) To Kadia | 1 |
| 24 | Shajapur | Susner | Indore - Kota (Km. 155/4) To Nipaniya | 2 |
| 25 | Shajapur | Barod | Tanodiya Madkota Road To Fatehgarh | 1.7 |
| 26 | Shajapur | Barod | Ratankhedi To Narwal - Gangapur In Km. 8 | 3.8 |
| 27 | Shajapur | Nalkheda | Gujarkhedi To Eklera | 2.2 |
| 28 | Shajapur | Nalkheda | Bagawad To Kakadiya To Nanakhedi Gurjar | 3.5 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 29 | Shajapur | Nalkheda | Kachanariya To Bisani | 2.3 |
| **29** | | | **Shajapur** | **71.55** |
| 1 | Shivpuri | Kolaras | T04 Rannod Road To Pachawala | 1.00 |
| 2 | Shivpuri | Kolaras | T03 Bhadota Road To Berasiya | 4.90 |
| 3 | Shivpuri | Kolaras | Ab Road To Ukawal | 2.55 |
| 4 | Shivpuri | Khaniyadhana | L046 Cp Road To Vishanpura | 1.10 |
| 5 | Shivpuri | Khaniyadhana | L044 Cp Road To Khiriya Bamore | 2.30 |
| 6 | Shivpuri | Khaniyadhana | B07 (Bhagari) To Loharcho | 2.40 |
| 7 | Shivpuri | Badarwas | L030 Sajai To Gagoni | 4.70 |
| 8 | Shivpuri | Badarwas | Amhara Dehrada Isagar Road (L038) To Bhagoriya | 1.20 |
| 9 | Shivpuri | Badarwas | L051 (Deharda Isagar Road) To Bamorekhurd | 2.00 |
| 10 | Shivpuri | Badarwas | L060 Ab Road To Banskheda | 3.70 |
| 11 | Shivpuri | Badarwas | L081 Badarwas Rampuri To Kirola Nainagir | 11.70 |
| 12 | Shivpuri | Badarwas | L061 Ab Road To Rijodi | 5.00 |
| 13 | Shivpuri | Karera | Shivpuri Jhansi Road (NH25) To Ambari | 4.00 |
| 14 | Shivpuri | Narwar | Badgor Road To Sahidakhurd | 1.10 |
| 15 | Shivpuri | Pichhore | T07 To Umrikhurd | 4.70 |
| 16 | Shivpuri | Pichhore | T03 To Baxanpur | 1.00 |
| 17 | Shivpuri | Pichhore | T02 To Khargwaha | 4.15 |
| 18 | Shivpuri | Pichhore | T06 To Piproniya | 4.65 |
| 19 | Shivpuri | Pohri | Shivpuri-Seopur Road (T04) To Chhinari | 2.50 |
| 20 | Shivpuri | Pohri | L095 To Beharda | 1.80 |
| 21 | Shivpuri | Pohri | Shivpuri-Seopur Road (T04) To Ganesh Kheda | 2.25 |
| 22 | Shivpuri | Shivpuri | Boudi Broud To Khearouna | 6.00 |
| **22** | | | **Shivpuri** | **74.70** |
| 1 | Singrauli | Waidhan | Gadahra To Rajbandh | 1.750 |
| 2 | Singrauli | Waidhan | Pondi Path To Kamai | 5.50 |
| 3 | Singrauli | Waidhan | Gadahra To Chokara | 2.40 |
| 4 | Singrauli | Waidhan | Hardi Road To Dhatura Phokara | 6.04 |
| 5 | Singrauli | Waidhan | Khatkari To Barauha | 1.20 |
| 6 | Singrauli | Chitrangi | Geer To Badnai | 5.40 |
| 7 | Singrauli | Chitrangi | Khatai To Chikani | 4.40 |
| 8 | Singrauli | Chitrangi | Barmani To Lotan | 2.60 |
| 9 | Singrauli | Chitrangi | Dhani To Pipari | 5.80 |
| 10 | Singrauli | Chitrangi | Ghoghara To Agrahawa | 5.05 |
| 11 | Singrauli | Chitrangi | Bagaiya To Sirgudi | 10.05 |
| 12 | Singrauli | Chitrangi | Mohgadhi Road To Butwa | 5.725 |
| 13 | Singrauli | Chitrangi | Deora To Piparjhar | 4.41 |
| 14 | Singrauli | Chitrangi | Kulhiya To Akla | 3.40 |
| 15 | Singrauli | Chitrangi | Katarihar Road To Saketi | 7.00 |
| 16 | Singrauli | Chitrangi | Ghoghara To Patehara | 2.00 |
| 17 | Singrauli | Chitrangi | Mohariya Road To Gairuai | 3.62 |
| 18 | Singrauli | Chitrangi | Bagaiya Road To Gawardehi | 5.34 |
| 19 | Singrauli | Deosar | Main Road To Bamhani Alias | 3.45 |
| 20 | Singrauli | Deosar | Parsohar To Jaghat | 1.70 |
| 21 | Singrauli | Deosar | Nayatola To Madraich | 5.775 |
| 22 | Singrauli | Deosar | Saraundha To Daudol | 1.525 |
| 23 | Singrauli | Deosar | Parsohar To Chandreh | 3.50 |
| 24 | Singrauli | Deosar | Saraundha To Bhaisahun | 7.10 |
| 25 | Singrauli | Deosar | Gajaradai To Patharidah | 3.65 |
| 26 | Singrauli | Deosar | NH-75 (Atarwa) To Songarh | 4.625 |
| 27 | Singrauli | Deosar | Saraundha To Madwa | 1.025 |
| 28 | Singrauli | Deosar | Jhundihawa To Ghaghitola | 2.600 |
| 29 | Singrauli | Deosar | Kundwar To Sanda | 7.230 |
| 30 | Singrauli | Deosar | NH-75 To Langhadand | 2.500 |
| **30** | | | **Singrauli** | **126.365** |
| 1 | Ujjain | Badnagar | Badanagar Runija Road To Pitlawdiya | 1.60 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 2 | Ujjain | Badnagar | Badnagar Kesor Road To Birgodanadu | 1.63 |
| 3 | Ujjain | Badnagar | Badanagar Runija Road To Maswadiya Dhar | 5.75 |
| 4 | Ujjain | Badnagar | Amlawad Bhika To Jamalpura | 2.10 |
| 5 | Ujjain | Badnagar | Bhidawad To Rawadiya Kalan | 3.10 |
| 6 | Ujjain | Khachrod | Barthoon To Bramhankheda | 5.33 |
| 7 | Ujjain | Khachrod | Madawada To Barlai (Khachrod Road To Barlai) | 5.05 |
| 8 | Ujjain | Khachrod | Khachrod Ratlam Road To Nandwasla | 2.97 |
| 9 | Ujjain | Khachrod | Banjari Road To Kutlana (Batlawadi Ghudawan Road To Kutlana) | 2.05 |
| 10 | Ujjain | Khachrod | Kadiyali To Sekdi Sultanpur (Part-Ii) | 1.25 |
| 11 | Ujjain | Ujjain | Kadacha To Kadchhali | 2.20 |
| 12 | Ujjain | Ujjain | Bolasa To Khokariya | 4.50 |
| 13 | Ujjain | Ujjain | Dewas Road To Bolasa | 2.45 |
| 14 | Ujjain | Ujjain | Ujjain To Kankariya - Chirakhan To Brijrajkhedi | 3.05 |
| 15 | Ujjain | Ujjain | Tajpur To Umriya - Jagir | 4.05 |
| 16 | Ujjain | Ujjain | Harnawada To Kasampur | 4.10 |
| 17 | Ujjain | Ujjain | Ring Road To Nahariya | 0.90 |
| 18 | Ujjain | Ujjain | Ujjain - Maxi To Khajuria - Kumawat | 1.95 |
| 19 | Ujjain | Ghattiya | Malikhedi To Kalesar | 1.05 |
| 20 | Ujjain | Ghattiya | T 05 ( Outer Ring Road) To Utesara | 1.85 |
| 21 | Ujjain | Mahidpur | Ghosala Mahidpur Road To Kala Pipal | 2.00 |
| 22 | Ujjain | Mahidpur | Zarda To Sakariya | 3.30 |
| 23 | Ujjain | Mahidpur | Ghosla Mahidpur Road (Lambi Kheda) To Lasudiya Devsi | 4.60 |
| 24 | Ujjain | Mahidpur | Makla Borkheda Now Road To Khedliya Manpur | 0.90 |
| 25 | Ujjain | Mahidpur | Jagoti (Mahudi) To Hingoniya | 3.60 |
| 26 | Ujjain | Mahidpur | Araniya Najik Mahidpur Marg To Bagala | 3.50 |
| 27 | Ujjain | Mahidpur | Bolkheda Now (C) to Mahudiya - Lasudiya Goyal (C) | 7.80 |
| 28 | Ujjain | Mahidpur | Lasudiya Mansoor To Khajuriya Mansoor | 2.60 |
| 29 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Tilawdi | 1.40 |
| 30 | Ujjain | Tarana | Tarana-Ujjain-Road To Rajpura | 2.45 |
| 31 | Ujjain | Tarana | Kanthadi To Godadi | 1.50 |
| 32 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Mundli | 1.10 |
| 33 | Ujjain | Tarana | Kanasiya To Laxmipura Rupakhedi To Palduna | 0.50 |
| 34 | Ujjain | Tarana | Rawan Khedi To Tejla Khedi | 3.50 |
| 35 | Ujjain | Tarana | Tarana To Sala Khedi | 2.50 |
| 36 | Ujjain | Tarana | Rupakhedi Laxmipura Road To Bijan Kheda | 1.50 |
| 37 | Ujjain | Tarana | Laxmipura To Rupakhedi To Pankhedi | 0.75 |
| 38 | Ujjain | Tarana | Kapeli To Umrajher | 3.20 |
| 39 | Ujjain | Tarana | Barkheda To Surajpura | 0.75 |
| 40 | Ujjain | Tarana | Tarana Berchhi Sunwa Goun | 3.65 |
| 41 | Ujjain | Tarana | Pat - Rupakhedi Road To Pipliya Bazaar (Dhabala Hardu To Khaka-Nisultan) | 2.20 |
| **41** | **Ujjain** | | | **110.23** |
| 1 | Umaria | Karkeli | Kgrk Road To Karaundi | 1.80 |
| 2 | Umaria | Karkeli | Bandhwatola To Baghwar | 2.40 |
| 3 | Umaria | Karkeli | Kaudiya To Bansa | 2.05 |
| 4 | Umaria | Karkeli | Karaundi To Birhuliya | 1.60 |
| 5 | Umaria | Karkeli | Tammannara To Urdani | 6.20 |
| 6 | Umaria | Karkeli | Amari-Mardari Road To Aaganhudi | 1.60 |
| 7 | Umaria | Karkeli | Pathari Kalan To Bajakund | 3.10 |
| 8 | Umaria | Karkeli | Kgrk Road To Raghopur | 1.10 |
| 9 | Umaria | Karkeli | Kgrk Road To Sahijana | 2.30 |
| 10 | Umaria | Karkeli | Kgrk Road (Singhpur) To Semariya | 2.45 |
| 11 | Umaria | Karkeli | Birsinghpur To Jhanpi | 1.00 |
| 12 | Umaria | Karkeli | Tammannara To Jamuniya | 7.70 |

| S. No. | Name of District | Name of Block | Name of The Road | Length (Kms) |
|---|---|---|---|---|
| 13 | Umaria | Karkeli | Bilaspur To Manikpur | 2.40 |
| 14 | Umaria | Karkeli | Dhanwahi To Lagwari | 5.90 |
| 15 | Umaria | Karkeli | Karri-Bodli Road To Tikariya | 4.50 |
| 16 | Umaria | Karkeli | Kalda To Bichhiya | 3.30 |
| 17 | Umaria | Karkeli | Uphari To Ujaniya | 3.10 |
| 18 | Umaria | Karkeli | Pathari Kalan To Kataria | 1.95 |
| 19 | Umaria | Karkeli | Patrai To Atariya | 3.30 |
| 20 | Umaria | Karkeli | Tummadar To Amuwari | 1.80 |
| 21 | Umaria | Karkeli | Akhrar To Gura | 4.70 |
| 22 | Umaria | Karkeli | Khalekhatai To Tikurakhatai | 3.70 |
| 23 | Umaria | Karkeli | Baherwah To Barmani | 1.30 |
| 24 | Umaria | Karkeli | Nimha To Chhataini | 2.70 |
| 25 | Umaria | Karkeli | Akhrar Bilaspur Road To Kotalde | 2.70 |
| 26 | Umaria | Karkeli | Majmani Khurd To Ginjari | 2.50 |
| 27 | Umaria | Karkeli | Uchehra To Akmaniha | 5.45 |
| 28 | Umaria | Karkeli | Jhanpi To Tikurapathari | 10.70 |
| 29 | Umaria | Manpur | Dhamokhar Bijauri Road To Mardari | 5.45 |
| 30 | Umaria | Manpur | Semra To Semri | 2.20 |
| 31 | Umaria | Manpur | Karaundi Tola To Dongari Tola | 2.51 |
| 32 | Umaria | Manpur | Bagaiha To Salkhaniya | **3.63** |
| 33 | Umaria | Pali | Goira Road To Parsaura | 2.40 |
| 34 | Umaria | Pali | Chandpur To Baghannara | 3.50 |
| 35 | Umaria | Pali | NH 78 To Marwa Tola | 1.25 |
| 36 | Umaria | Pali | S.M.Road To Balbai | 1.60 |
| 37 | Umaria | Pali | Pali Sundar Dadar Road To Kunkuni | 0.90 |
| **37** | **Umaria** | | | **116.74** |
| 1 | Vidisha | Lateri | Unarsi Kalan Rd. To Mundara Ratansi | 3.20 |
| 2 | Vidisha | Lateri | Motipur To Daurala | 1.50 |
| 3 | Vidisha | Lateri | Lateri-Shamshabad Rd. To Semri Ahir | 2.10 |
| 1 | Vidisha | Nateran | Nateran To Khajuri Das | 3.10 |
| 2 | Vidisha | Nateran | Mahuta To Singrampur | 2.20 |
| 1 | Vidisha | Sironj | Kurwai-Sironj Rd. (T02) To Sona | 1.30 |
| 2 | Vidisha | Sironj | Sironj-Lateri Rd. To Jhukar Hauj | 2.00 |
| 3 | Vidisha | Sironj | Sironj-Imlani Rd. To Lidhoda | 0.60 |
| 9 | Vidisha | Vidisha | Sunpura Road To Bais | 1.25 |
| 10 | Vidisha | Vidisha | Vidisha-Ahmadpur Rd. To Mungod | 4.00 |
| 11 | Vidisha | Vidisha | Sh-19 (Kagpur) To Kanari | 3.30 |
| 12 | Vidisha | Nateran | Nayagola Road To Narkheda Khadya | 2.60 |
| 13 | Vidisha | Vidisha | Khamkheda To Salaikhedi | 3.20 |
| 14 | Vidisha | Basoda | L165-Rojroo To Grahini | 1.70 |
| 15 | Vidisha | Basoda | L150-Karariya Jajgir To Pawai Kurwai | 5.00 |
| 16 | Vidisha | Basoda | L049-T01 To Kanjna | 1.40 |
| 17 | Vidisha | Basoda | L053-Behlot To Tabakkalpur | 4.75 |
| 18 | Vidisha | Basoda | L135-L134 To Chourawar | 4.55 |
| 19 | Vidisha | Kurwai | L139-T06 To Veerpur | 1.98 |
| 20 | Vidisha | Kurwai | L145-T06 To Pairakhedi | 1.28 |
| 21 | Vidisha | Kurwai | L104-Parsari To Sikandarpur | 1.73 |
| 22 | Vidisha | Kurwai | L026-Layara To Lachayara | 6.45 |
| 23 | Vidisha | Kurwai | L083-Bilakhedi To Simarghan | 2.85 |
| 24 | Vidisha | Kurwai | L101-T05 To Raimoodara | 2.05 |
| 25 | Vidisha | Kurwai | L042-T03 To Shyampur Gudawal | 2.15 |
| 26 | Vidisha | Kurwai | L153-T07 To Girwasa | 3.80 |
| 27 | Vidisha | Kurwai | L137-Mala To Karmedi | 5.20 |
| **27** | **Vidisha** | | | **75.24** |
| **613** | **GRAND TOTAL** | | | **1736.38** |

## Appendix 2: Rural Roads: Environmental Checklist

### RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: NH-12 To Peepalbey

Block Name: Biaora

District Name: Rajgarh-I

Total Length of the Road: 1.50 km

Package No. MP-30-501

### A. Climatic Conditions

| | |
|---|---|
| Temperature | High: 42.4 **(May)** Low: 11.3 **°C (Jan)** |
| Humidity | High: 81 % **(Aug)** Low: 38 **%** |
| Rainfall<br>Rainy Season | 838 mm/year<br>**June** to **September** |

### B. Location of the Road and Generic description of Environment

| No. | Type of Ecosystem | Yes | No | Explanation |
|---|---|---|---|---|
| 1. | Coastal area Mangrove (along roadside) | | √ | Distance from Coastline: km<br>( ) more than 50%( ) less than 20% |
| 2. | Type of Terrain–(Plain/Hilly/ Mountainous etc.)<br>*(Explain the topography of the area and how many km of the road are located in the hilly area)* | | √ | Altitude: |
| 3. | Forest Area<br>*(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:<br>Legal Status of the Forest Area: Unclassified<br>*(Reserved, National Park, Sanctuaries, Unclassified, etc.)*<br>No part of the project road passes through any forest area. |
| 4. | Wildlife<br>(*Explain whether there are any wildlife species in the project area*) | | √ | Name of animals: **NA**<br>Endangered species (if any): **None** |
| 5. | Inhabited Area | √ | | Inhabited area lies between Ch-600m to Ch-1300m both side connecting village Peepalbey. |
| 6. | Agricultural Land | √ | | The agriculture land lies between Ch-100m to Ch-200m LHS along the proposed alignment. |
| 7. | Grazing grounds | √ | | Grazing ground was found between Ch-00m to Ch-200m RHS and Ch-200m to Ch-600m both side along the proposed alignment. |
| 8. | Barren Land | | √ | Barren land was not found along the project road. |

## C. Specific description of the Road Environment

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

| No. | Parameter/ Component | Yes | No | Explanation |
|---|---|---|---|---|
| 1. | Are there any areas with landslide or erosion problems along the road?<br>***(If yes, indicate the location (right or left side) and the chainage)*** | | √ | No part of the project road is passing through hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion.<br>( ) No Secondary Information is available and Local Community is not aware of this matter |
| 2. | Are there any lakes/swamps beside the road?<br>***(If yes, list them indicating the location (right or left side) and the chainage)*** | √ | | There is a pond between Ch-200m to Ch-300m, RHS and Ch-400m to Ch-600m on RHS along the proposed alignment and it is approximately 6m from the C/L of alignment. |
| 3. | Are there any nallas/streams/rivers etc. along/crossing the road?<br>***(If yes, list them indicating the location (right, left or crossing) and the chainage*** | √ | | Few water bodies are crossing the proposed alignment and cross drainage structures are provided at these locations.<br>**Existing CD**: No existing CD<br>**Proposed CD:** Between Ch-100m to Ch-200m, Ch-400m to Ch-500m, Ch-900m to Ch-1000m<br>**Proposed FC:** Between Ch-1100m to Ch-1200m |
| 4. | Are there problems of water stagnation and other drainage issues on or near the road?<br>(***If yes, mention chainage)*** | √ | | There are some points of water stagnation and other drainage issues on or near the road which is discussed above S. No.3 along the proposed alignment.<br>( ) 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?<br>***(If yes, mention flood level and frequency)*** | √ | | No flood prone area is observed along the proposed alignment except as discussed in S.No.3.<br>( ) 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?<br>***(If yes attach list of trees indicating the location (right or left side)and the chainage***) | √ | | There are 14 trees of 30 cm dbh or more within 10m from C/L on both sides along the proposed alignment. Tree locations and distance from C/l is given in **Attachment I.**<br>There is no tree loss identified at the alignment. |
| 7. | Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?<br>***(If yes, specify details of habitat with chainage)*** | | √ | No Faunal Habitat Area, Faunal breeding ground and bird migration areas exist within 100 m of the road shoulder on both sides along the proposed alignment.<br>( ) No Secondary Information is available and local Community is not aware of this matter |
| 8. | Along the road and within 100m of the road shoulder is there any evidence of floral and faunal species that are classified as endangered species? | | √ | No evidence of rare, endangered or threatened species are noticed or informed within 100 m of the road shoulder on both sides along the proposed alignment.<br>( ) No Secondary Information Available and Local Community is not aware of this matter |

| No. | Parameter/ Component | Yes | No | Explanation |
|---|---|---|---|---|
| 9. | Are there any utility structures[23] within 10 m on either side from the center line of the road alignment?<br><br>***(If yes, attach list with chainage)*** | √ | | There are few utility structures observed during the transect walk. The location and type of utility structure along with their approximate distance from C/L is given in **Attachment II** |
| 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?<br><br>***(If yes attach list with chainage)*** | √ | | Few religious cultural or community structures/buildings observed during the transect walk. The location and type of utility structure along with their approximate distance from C/L of proposed alignment is listed in **Attachment III.** |

## D. Public Consultation

| S.No. | Consultation Activities | Yes | No | Remarks |
|---|---|---|---|---|
| 1. | Consultation with local community was conducted before finalizing the alignment.<br><br>***(Attach list of people met and dates)*** | √ | | Yes, consultation with the community was held on 27/7/14. Participants list is attached with CPF document |
| 2. | Any suggestion received in finalizing the alignment | √ | | Suggestion received regarding FC locations between Ch-1100m to Ch-1200m |
| 3. | If suggestions received, were they incorporated into the design. | √ | | PIU will incorporate their suggestion. |

## E. Please attach the following:

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

[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.

**Attachment I :List of Trees**

| Chainage (m) | | | Left | Right |
|---|---|---|---|---|
| 0 | - | 100 | 6 | 4 |
| 700 | - | 800 | - | 1 |
| 1000 | - | 1100 | - | 3 |
| **Total** | | | **6** | **8** |

**Attachment II: List of Utilities**

| Chainage (m) | | | Left | Right |
|---|---|---|---|---|
| 1000 | - | 1100 | - | 4 EP |
| 1100 | - | 1200 | - | 4 EP |
| 1200 | - | 1300 | - | 2 EP, HP |
| 1300 | - | 1400 | 1 EP | - |

**Attachment III: List of Community Structures**

| Chainage (m) | | | Left | Right |
|---|---|---|---|---|
| 0 | - | 100 | temple | - |
| 100 | - | 200 | water tank | - |
| 600 | - | 700 | - | well, school |
| 700 | - | 800 | Temple | - |
| 1200 | - | 1300 | - | School |

**Attachment-IV**

| Left | | | | | Chainage (m) | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **8 to 10m** | **6 to 8m** | **4 to 6m** | **2 to 4m** | **0 to 2m** | | | | **0 to 2m** | **2 to 4m** | **4 to 6m** | **6 to 8m** | **8 to 10m** |
| - | Temple | 6 trees | - | - | 0 | - | 100 | - | - | 4 trees | - | - |
| Water tank | - | - | - | - | 100 | - | 200 | - | - | - | - | - |
| - | - | - | - | - | 600 | - | 700 | - | - | Well | - | School (100m) |
| Temple | - | - | - | - | 700 | - | 800 | - | 1 tree | - | - | - |
| - | - | - | 4 EP | - | 1000 | - | 1100 | - | 3 trees | - | - | - |
| - | - | - | 4 EP | - | 1100 | - | 1200 | - | - | - | - | - |
| - | - | - | - | - | 1200 | - | 1300 | - | School | 2 EP | HP | - |
| - | - | - | 1 EP | - | 1300 | - | 1400 | - | - | - | - | - |

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

## Photo Plates

Ch-00m Start point

Ch-300m Pond-RHS


Ch-600m school-RHS


Ch-900m CD proposed


Ch-1100m EP


Ch-1200m School-RHS

## Chainage wise Transect Walk Findings

| Chainage (M) | | | Existing Land Width (m) | Additional Land Required | | Losses | | Type of loss | | Village | Remarks /Suggestion |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LHS | RHS | LHS | RHS | LHS | RHS | | |
| 0 | - | 100 | 8 | - | - | - | - | - | - | Peepalway | Temple-LHS |
| 100 | - | 200 | 8 | - | - | - | - | - | - | " | Water tank-LHS, CD proposed |
| 200 | - | 300 | 8 | - | - | - | - | - | - | " | Pond-RHS |
| 300 | - | 400 | 8 | - | - | - | - | - | - | " | - |
| 400 | - | 500 | 8 | - | - | - | - | - | - | " | CD proposed, Pond-RHS |
| 500 | - | 600 | 8 | - | - | - | - | - | - | " | - |
| 600 | - | 700 | 8 | - | - | - | - | - | - | " | School-RHS, well, habitation area |
| 700 | - | 800 | 8 | - | - | - | - | - | - | " | Temple-LHS |
| 800 | - | 900 | 8 | - | - | - | - | - | - | " | - |
| 900 | - | 1000 | 8 | - | - | - | - | - | - | " | CD proposed |
| 1000 | - | 1100 | 5 | - | - | - | - | - | - | " | Habitation area, CC road proposed, Junction, 4 EP |
| 1100 | - | 1200 | 5 | - | - | - | - | - | - | " | FC, Junction-RHS, 4 EP |
| 1200 | - | 1300 | 5 | - | - | - | - | - | - | " | School-RHS, HP, 2 EP |
| 1300 | - | 1400 | 5 | - | - | - | - | - | - | " | Junction-LHS, EP |
| 1400 | - | 1500 | 5 | - | - | - | - | - | - | " | - |

**Photographs representing Road safety session at the road during transect walk**






## RURAL ROADS: ENVIRONMENTAL CHECKLIST

Road Name: Jaisinagar to Jera

Block Name: Jaisinaga

District Name: Sagar

Total Length of the Road: 6.20 km

Package no: 33511

### A. Climatic Conditions

| | |
|---|---|
| Temperature | High: 40 **°C (Apr)** Low: 11 **°C (Dec)** |
| Humidity | High: 87% **(Aug)** Low: 35 **%** |
| Rainfall<br>Rainy Season | 1168 mm/year<br>**June** to **September** |

### B. Location of the Road and Generic description of Environment

| No. | Type of Ecosystem | Yes | No | Explanation |
|---|---|---|---|---|
| 1. | Coastal area Mangrove (along roadside) | | √ | Distance from Coastline: km<br>( ) more than 50%<br>( ) less than 20% |
| 2. | Type of Terrain–(Plain/Hilly/ Mountainous etc.)<br>*(Explain the topography of the area and how many km of the road are located in the hilly area)* | | √ | Altitude:<br><br>The topography of the project road is flat at almost all locations. |
| 4. | Forest Area<br>*(Explain whether the road passes through forest areas or located along the forest areas and distance from shoulder to the forest area)?* | √ | | There is a forest area located between Ch-00m to Ch-1400m, Ch-2400m to Ch-3400m, Ch-3800m to Ch-6000m on both side along the proposed alignment.<br><br>Type of Vegetation: Teak, Palash<br><br>Legal Status of the Forest Area: *Unclassified* |
| 5. | Wildlife<br>(*Explain whether there are any wildlife species in the project area*) | | √ | Name of animals: **NA**<br><br>Endangered species (if any): **None** |
| 6. | Inhabited Area | √ | | Inhabited area lies between Ch-6000m to Ch-6200m on both side with connecting villages Jera, along the proposed alignment. |
| 7. | Agricultural Land | √ | | The agriculture land lies between Ch-1400m to Ch-2400m and Ch-3400m to Ch-3800m on both side along the proposed alignment. |
| 8. | Grazing grounds | | √ | Grazing ground was not found along the proposed alignment. |
| 9. | Barren Land | | √ | No Barren land along the project road. |

## C. Specific description of the Road Environment

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

| No. | Parameter/ Component | Yes | No | Explanation |
|---|---|---|---|---|
| 1. | Are there any areas with landslide or erosion problems along the road?<br><br>***(If yes, indicate the location (right or left side) and the chainage)*** | | √ | No part of the project road passes through hilly terrain prone to landslide or erosion. However, sufficient cross drainage structures will be constructed to avoid any erosion.<br>( ) No Secondary Information is available and Local Community is not aware of this matter |
| 2. | Are there any lakes/swamps beside the road?<br><br>***(If yes, list them indicating the location (right or left side) and the chainage)*** | | √ | Lakes/swamps were not found beside the road |
| 3. | Are there any nallas/streams/rivers etc. along/crossing the road?<br><br>***(If yes, list them indicating the location (right, left or crossing) and the chainage*** | √ | | Few water bodies are crossings the proposed alignment and cross drainage structures are proposed at these locations:<br>**Proposed CD –** Between Ch-00m to Ch-200m, Ch-600m to Ch-800m, Ch-800m to Ch-1000m, Ch-1600m to Ch-1800m, Ch-2000m to Ch-2200m, Ch-2600m to Ch-2800m, Ch-3400mt o Ch-3600m, Ch-4000m to Ch-4200m, Ch-4400m to Ch-4600m<br>**Existing CD – No existing CD**<br>**Community suggested FC –** No FC suggested community |
| 4. | Are there problems of water stagnation and other drainage issues on or near the road?<br><br>(***If yes, mention chainage)*** | √ | | There would be water stagnation point between Ch-4000m to Ch-4200m |
| 5. | Is the area along the project road prone to flooding?<br>***(If yes, mention flood level and frequency)*** | | √ | No flood prone area except as discussed in S.No.3.<br>( ) 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?<br>***(If yes attach list of trees indicating the location (right or left side)and the chainage***) | √ | | There are 54 trees of 30 cm dbh or more witjin 10m from C/L on both sides along the proposed alignment. Tree locations and distance from C/L is given in **Attachment I.**<br><br>No tree loss observed along the alignment |
| 7. | Along the road and within 100m of the road shoulder, are there any faunal habitat areas, faunal breeding ground, bird migration area, or other similar areas?<br>***(If yes, specify details of habitat with chainage)*** | | √ | No Faunal Habitat Area, Faunal breeding ground and bird migration areas exist within 100 m of the road shoulder on both sides along the proposed alignment.<br>( ) No Secondary Information is available and local Community is not aware of this matter |
| 8. | Along the road and within 100m of the road shoulder is there any evidence of floral and | | | No evidence of rare, endangered or threatened species are noticed or informed within 100 m of the road shoulder on both sides along the |

| No. | Parameter/ Component | Yes | No | Explanation |
|---|---|---|---|---|
| | faunal species that are classified as endangered species? | | √ | proposed alignment.<br>( ) 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?<br>***(If yes, attach list with chainage)*** | | √ | There are no utility structures observed during the transect walk. The location and type of utility structure along with their approximate distance from C/L of proposed alignment is listed in **Attachment II.** |
| 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?<br>***(If yes attach list with chainage)*** | | √ | Few religious cultural or community structures/buildings observed during the transect walk. The location and type of utility structure along with their approximate distance from C/L of proposed alignment is listed in **Attachment III.** |

## D. Public Consultation

| S.No. | Consultation Activities | Yes | No | Remarks |
|---|---|---|---|---|
| 1. | Consultation with local community was conducted before finalizing the alignment.<br>***(Attach list of people met and dates)*** | √ | | Yes, consultation with the community was held on 19/08/14. Participants list is attached with CPF document |
| 2. | Any suggestion received in finalizing the alignment | | √ | |
| 3. | If suggestions received, were they incorporated into the design. | | √ | |

## E. Please attach the following:

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

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

**Attachment I: List of Trees**

| Chainage (m) | | | Left | Right |
|---|---|---|---|---|
| 200 | - | 400 | 1 | 1 |
| 400 | - | 600 | 1 | 2 |
| 600 | - | 800 | - | 2 |
| 800 | - | 1000 | 2 | - |
| 1000 | - | 1200 | - | 1 |
| 1200 | - | 1400 | 1 | - |
| 1400 | - | 1600 | - | 2 |
| 1600 | - | 1800 | 2 | 2 |
| 1800 | - | 2000 | - | 1 |
| 2000 | - | 2200 | 2 | - |
| 2200 | - | 2400 | 1 | 2 |
| 2400 | - | 2600 | 1 | - |
| 2800 | - | 3000 | 1 | 2 |
| 3200 | - | 3400 | - | 3 |
| 3600 | - | 3800 | - | 4 |
| 3800 | - | 4000 | 2 | - |
| 4000 | - | 4200 | - | 2 |
| 4200 | - | 4400 | 2 | 1 |
| 4400 | - | 4600 | - | 2 |
| 4600 | - | 4800 | 2 | - |
| 4800 | - | 5000 | - | 3 |
| 5000 | - | 5200 | 2 | - |
| 5400 | - | 5600 | 4 | - |
| **Total** | | | **24** | **30** |

**Attachment II: List of Utilities**

| Chainage (m) | Left | Right |
|---|---|---|
| No Utility structure | | |

**Attachment III: List of Community Structures**

| Chainage (m) | | | Left | Right |
|---|---|---|---|---|
| 0 | - | 200 | - | Hostel |
| 6000 | - | 6200 | School | - |

**Attachment-IV**

| Left | | | | | Chainage (m) | | | Right | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **8 to 10m** | **6 to 8m** | **4 to 6m** | **2 to 4m** | **0 to 2m** | | | | **0 to 2m** | **2 to 4m** | **4 to 6m** | **6 to 8m** | **8 to 10m** |
| **-** | **-** | **-** | **-** | **-** | 0 | - | 200 | **-** | **-** | **-** | **-** | Hostel (20m) |
| - | - | 1 tree | - | - | 200 | - | 400 | - | - | 1 tree | - | - |
| - | - | 1 tree | - | - | 400 | - | 600 | - | - | 1 tree | - | - |
| - | - | - | - | - | 600 | - | 800 | - | - | 2 trees | - | - |
| - | - | 2 trees | - | - | 800 | - | 1000 | - | - | - | - | - |
| - | - | - | - | - | 1000 | - | 1200 | - | - | 1 tree | - | - |
| - | - | 1 tree | - | - | 1200 | - | 1400 | - | - | - | - | - |
| - | - | - | - | - | 1400 | - | 1600 | - | - | 2 trees | - | - |
| - | - | 2 trees | - | - | 1600 | - | 1800 | - | - | 2 trees | - | - |
| - | - | - | - | - | 1800 | - | 2000 | - | - | 1 tree | - | - |
| - | - | 2 trees | - | - | 2000 | - | 2200 | - | - | - | - | - |
| - | - | 1 tree | - | - | 2200 | - | 2400 | - | - | 2 trees | - | - |
| - | - | 1 tree | - | - | 2400 | - | 2600 | - | - | - | - | - |
| - | - | 1 tree | - | - | 2800 | - | 3000 | - | - | 2 tree | - | - |
| - | - | - | - | - | 3200 | - | 3400 | - | - | 3 trees | - | - |
| - | - | - | - | - | 3600 | - | 3800 | - | - | 4 trees | - | - |
| - | - | 2 trees | - | - | 3800 | - | 4000 | - | - | - | - | - |
| - | - | - | - | - | 4000 | - | 4200 | - | - | 2 trees | - | - |
| - | - | 2 trees | - | - | 4200 | - | 4400 | - | - | 1 tree | - | - |
| - | - | - | - | - | 4400 | - | 4600 | - | - | 2 trees | - | - |
| - | - | 2 trees | - | - | 4600 | - | 4800 | - | - | - | - | - |
| - | - | - | - | - | 4800 | - | 5000 | - | - | 3 trees | - | - |
| - | - | 2 trees | - | - | 5000 | - | 5200 | - | - | - | - | - |
| - | - | 4 trees | - | - | 5400 | - | 5600 | - | - | - | - | - |
| - | - | School | - | - | 6000 | - | 6200 | - | - | - | - | - |

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

**Attachment V**

**Photo Plates**


Start point & forest land start Ch-00m


Ch-500m Forest land

Ch-1000m Forest land

Ch-6200m School

**Chainage wise Transect Walk Findings**

| Chainage (M) | | | Existing Land Width (m) | Additional Land Required | | Losses | | Type of loss | | Village | Remarks /Suggestion |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LHS | RHS | LHS | RHS | LHS | RHS | | |
| 0 | - | 200 | 8 | - | - | - | - | - | - | - | CD proposed, Forest land |
| 200 | - | 400 | 8 | - | - | - | - | - | - | - | Forest land |
| 400 | - | 600 | 8 | - | - | - | - | - | - | - | Forest land |
| 600 | - | 800 | 8 | - | - | - | - | - | - | - | CD proposed, Forest land |
| 800 | - | 1000 | 8 | - | - | - | - | - | - | - | CD proposed, Forest land, Junction |
| 1000 | - | 1200 | 8 | - | - | - | - | - | - | - | Forest land |
| 1200 | - | 1400 | 8 | - | - | - | - | - | - | - | Forest land |
| 1400 | - | 1600 | 8 | - | - | - | - | - | - | - | - |
| 1600 | - | 1800 | 8 | - | - | - | - | - | - | - | CD proposed |
| 1800 | - | 2000 | 8 | - | - | - | - | - | - | - | - |
| 2000 | - | 2200 | 8 | - | - | - | - | - | - | - | CD proposed |
| 2200 | - | 2400 | 8 | - | - | - | - | - | - | - | - |
| 2400 | - | 2600 | 8 | - | - | - | - | - | - | - | Forest land |
| 2600 | - | 2800 | 8 | - | - | - | - | - | - | - | CD proposed, Forest land |
| 2800 | - | 3000 | 8 | - | - | - | - | - | - | - | Forest land |
| 3000 | - | 3200 | 8 | - | - | - | - | - | - | - | Forest land |
| 3200 | - | 3400 | 8 | - | - | - | - | - | - | - | Forest land |
| 3400 | - | 3600 | 8 | - | - | - | - | - | - | - | CD proposed |
| 3600 | - | 3800 | 8 | - | - | - | - | - | - | - | - |
| 3800 | - | 4000 | 8 | - | - | - | - | - | - | - | Forest land |
| 4000 | - | 4200 | 8 | - | - | - | - | - | - | - | CD & CC road proposed, forest land |
| 4200 | - | 4400 | 8 | - | - | - | - | - | - | - | Forest land |
| 4400 | - | 4600 | 8 | - | - | - | - | - | - | - | CD proposed, Forest land |
| 4600 | - | 4800 | 8 | - | - | - | - | - | - | - | Forest land |
| 4800 | - | 5000 | 8 | - | - | - | - | - | - | - | Forest land |
| 5000 | - | 5200 | 8 | - | - | - | - | - | - | - | Forest land |
| 5200 | - | 5400 | 8 | - | - | - | - | - | - | - | Forest land |
| 5400 | - | 5600 | 8 | - | - | - | - | - | - | - | Forest land |
| 5600 | - | 5800 | 8 | - | - | - | - | - | - | - | Forest land |
| 5800 | - | 6000 | 5 | - | - | - | - | - | - | - | - |
| 6000 | - | 6200 | 5 | - | - | - | - | - | - | - | Habitation area, cc road proposed, school |

**Road safety photographs showing shoeing Road safety session on the alignment during transect walk**






## Appendix 3: Environmental features of roads within 10 m corridor

| Sr. No. | District | Road Name | Length (KM) | No. of Affected persons | | Whether forest clearance required | No. of trees affected | EP Shifting | TP Shifting | TW Shifting | SS Shifting | CS Shifting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | No. of APs | No. of VAPs | | | | | | | |
| 1 | Ashoknagar | L088-L085 to Lidhorakalan | 3.5 | 0 | 0 | No | Nil | No | No | No | No | No |
| 2 | Ashoknagar | L125-T008 to Kudai | 4.1 | 0 | 0 | No | Nil | No | No | No | No | No |
| 3 | Betul | Neemjhiri to Bodna | 5 | 0 | 0 | Y | Nil | 3 | No | No | No | No |
| 4 | Betul | Sohagpur to Junawani | 3.4 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 5 | Bhind | Etawah Gwalior Road To Chasar | 1.3 | 0 | 0 | No | Nil | No | No | No | No | No |
| 6 | Bhind | Jakhmoli To Khodan | 0.9 | 0 | 0 | No | Nil | 3 | No | No | No | No |
| 7 | Chhatarpur | Ganj Jhamtulli to Rampura | 2.15 | 15 | 0 | No | Nil | No | No | No | No | No |
| 8 | Chhatarpur | Benigunj road to Bamnora | 3.7 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 9 | Chhindwara | Kachram To Damuamal | 2.125 | 0 | 0 | Y | 3 | No | No | No | No | No |
| 10 | Chhindwara | Satnur T01 T0 Malegaon | 6.7 | 0 | 0 | No | 3 | 2 | NIL | NIL | NIL | |
| 11 | Datia | Indergarh Goraghat Road to Pipra | 4.1 | 2 | 0 | No | Nil | No | No | No | No | No |
| 12 | Dewas | Vijaygarh Muriya to Chaubara Road | 2.87 | 22 | 6 | No | Nil | No | No | No | No | No |
| 13 | Dewas | Kachnariya to Rajapur Road | 0.75 | 0 | 0 | No | Nil | No | No | No | No | No |
| 14 | Dewas | Nanadharakhedi to Nevari Road | 1.825 | 9 | 0 | No | Nil | No | No | No | No | No |
| 15 | Guna | L096-T-09 Guna-Umri-sirsi rd to Ari | 2.6 | 9 | 0 | No | 3 | No | 1 | No | No | No |
| 16 | Guna | L031-T-01 Khatoli-A.B.Road to Sagar | 2.8 | 0 | 0 | No | Nil | 1 | No | No | No | No |
| 17 | Guna | L070-T-07 Chachoda-Miragwas to Kusmpura | 1.5 | 0 | 0 | Y | Nil | N | No | No | No | No |
| 18 | Hoshangabad | SH-22 to Khapa Rd. To Singwada | 3.45 | 0 | 0 | No | Nil | N | No | No | No | No |
| 19 | Hoshangabad | SH-19 To Dabka | 4.25 | 0 | 0 | No | Nil | N | No | No | No | No |
| 20 | Jabalpur | Sakri to Lalpur | 2.1 | 0 | 0 | No | Nil | 1 | No | No | No | No |
| 21 | Jabalpur | Konikala to Itwa Imlia | 4.8 | 0 | 0 | Y | Nil | N | No | No | No | No |
| 22 | Katni | PWD Rd to Gopalpur | 6.3 | 0 | 0 | Y | Nil | N | No | No | No | No |
| 23 | Khandwa | Khandwa Aashapur Road To Badgaon Road | 4.9 | 0 | 0 | No | 4 | N | No | No | No | No |
| 24 | Khargone | Khandwa Indore S.H.27 to Lohari | 4.9 | 0 | 0 | Y | Nil | N | No | No | No | No |
| 25 | Khargone | Bagod to Methawan | 3.8 | 0 | 0 | No | Nil | 1 | No | No | No | No |
| 26 | Narsinghpur 1 | Kodras kala to Mehgaon | 1.40 | 1.4 | 3 | No | Nil | Nil | No | No | No | No |
| 27 | Narsinghpur 1 | NH.26 km. 352 to Agariya | 1.00 | 1 | 0 | No | Y | Nil | No | No | No | No |
| 28 | Narsinghpur 1 | Ghapindrai to Malhaua | 2.100 | 2.1 | 0 | No | Nil | Nil | No | No | No | No |
| 29 | Narsinghpur 1 | Rakai to Basedi | 4.400 | 4.4 | 0 | No | Nil | 4 | No | No | No | No |
| 30 | Rajgarh | Narsinghgarh To Vijaygarh | 3.100 | 3.1 | 2 | 2 | Nil | Nil | 2 | No | No | No |
| 31 | Rajgarh | NH-12 To Peepalbey | 1.500 | 1.5 | 0 | No | Nil | Nil | No | No | No | No |
| 32 | Rajgarh | Bhandawat To Laxman Pura | 2.200 | 2.2 | 0 | No | Nil | Nil | No | No | No | No |
| 33 | Ratlam | Jaora Alote Road to Bisalkheda | 1.00 | 1 | 17 | 13 | Nil | Nil | No | No | No | No |
| 34 | Ratlam | Batwadia to Roopdi | 2.100 | 2.1 | 0 | No | Nil | Nil | No | No | No | No |

| Sr. No. | District | Road Name | Length (KM) | No. of Affected persons | | Whether forest clearance required | No. of trees affected | EP Shifting | TP Shifting | TW Shifting | SS Shifting | CS Shifting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | No. of APs | No. of VAPs | | | | | | | |
| 35 | Rewa | L-083 (Badagawan) To Bela | 5 | 0 | 0 | No | Nil | No | No | No | No | No |
| 36 | Rewa | Tilkhan To Guhiya | 3.1 | 0 | 0 | No | 1 | No | No | No | No | No |
| 37 | Sagar | Chauki to Shikarpur | 4.2 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 38 | Sagar | Jaisinagar to Jera | 6.2 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 39 | Sagar | B 07 to Hinoti | 1.25 | 0 | 0 | No | Nil | No | No | No | No | No |
| 40 | Sagar | MDR Dhanora to Karai | 2 | 0 | 0 | No | Nil | No | No | No | No | No |
| 41 | Seoni | T-23 to Gangerua | 2.7 | 0 | 0 | No | Nil | No | No | No | No | No |
| 42 | Seoni | T-18 Seoni Chhindwada to Chargaon | 2.9 | 0 | 0 | No | Nil | No | No | No | No | No |
| 43 | Seoni | Lakhanwada (T18) to Pindrai | 3.2 | 13 | 13 | No | Nil | 2 | No | No | No | No |
| 44 | Shajapur | Kharsoda to Salsalai | 1.7 | 4 | 4 | No | Nil | 1 | No | No | No | No |
| 45 | Shajapur | Koriya to Gulana | 4.8 | 0 | 0 | No | Nil | No | No | No | No | No |
| 46 | Shajapur | Choki Nasirabad to Akhtiar Pur | 5.5 | 0 | 0 | No | 1 | No | No | No | No | No |
| 47 | Shivpuri | T03 Bhadota Road To Berasiya | 4.9 | 2 | 0 | No | Nil | 3 | No | No | No | No |
| 48 | Shivpuri | Shivpuri-Seopur Road (T04) to Chhinari | 2.5 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 49 | Singrauli | Pondi Path to Kamai | 5.5 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 50 | Singrauli | Khatai to Chikani | 4.4 | 0 | 0 | No | Nil | No | No | No | No | No |
| 51 | Singrauli | Ghoghara to Patehara | 2 | 0 | 0 | No | Nil | No | No | No | No | No |
| 52 | Ujjain | Jagoti (Mahudi) to Hingoniya | 3.6 | 8 | 2 | No | Nil | No | No | No | No | No |
| 53 | Ujjain | Badnagar Kesor Road to Birgodanadu | 1.63 | 0 | 0 | No | Nil | No | No | No | No | No |
| 54 | Ujjain | Bolasa to Khokariya | 4.5 | 0 | 0 | No | Nil | 1 | No | No | No | No |
| 55 | Ujjain | Ujjain - Maxi to Khajuria - Kumawat | 1.95 | 0 | 0 | No | Nil | No | No | No | No | No |
| 56 | Umaria | Tammannara to Urdani | 6.2 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 57 | Umaria | Bandhwatola to Baghwar | 2.4 | 0 | 0 | No | Nil | No | No | No | No | No |
| 58 | Umaria | Uphari to Ujaniya | 3.1 | 0 | 0 | No | Nil | No | No | No | No | No |
| 59 | Umaria | Bagaiha To Salkhaniya | 3.63 | 0 | 0 | Y | 1 | No | No | No | No | No |
| 60 | Vidisha | Sironj-Lateri Rd. To Jhukar Hauj | 2 | 0 | 0 | Y | Nil | No | No | No | No | No |
| 61 | Vidisha | Sunpura Road To Bais | 1.25 | 0 | 0 | No | Nil | No | No | No | No | No |
| 62 | Vidisha | SH-19 (Kagpur) To Kanari | 3.3 | 0 | 0 | No | Nil | N | No | No | No | No |
| **Grand total** | | | **198.03** | **106** | **40** | **Y-16** | **37** | **20** | **1** | | | |

# Appendix 4: Guidelines for Borrow Area Management

## I. SELECTION OF BORROW AREAS

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

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

- 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.

## II. CONTRACTOR'S RESPONSIBILITY

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

- 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 unacceptable 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.

## III. 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.

## IV. REHABILITATION OF BORROW AREAS

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

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

- Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original round surface.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post use restoration and Environment Expert of Supervision Consultant will certify the post use redevelopment.
- The Contractor will keep record of photographs of various stages i.e., before using materials from the location (pre-project), for the period borrowing activities (construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

## Appendix 5: Environmental Management Plan

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | **Measures common to all sample roads** | | | | | | |
| | **Design and Pre Construction Stage** | | | | | | |
| 1. | Climate Change Consideration and Vulnerability screening | • Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required<br>• Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI ( Panchyati Raj Institution) | All through the alignment of each rural road | Pre Construction Phase | Part of Project Cost | Project Preparation Consultant/ design consultant | PIU/ MPRRDA |
| 2. | Finalization of alignment | • The road will be part of district core network and will comply with PMGSY guidelines<br>• 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.<br>• 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..<br>• Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009.<br>• Alignment finalization considering availability of right of way and in consultation with local people.<br>• ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines.<br>• Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure.<br>• The road shall follow natural topography to avoid excessive cut and fill. | All through the alignment of each rural road | Pre Construction Phase | Part of Project Cost | Project Preparation Consultant/ design consultant | PIU/ MPRRDA |
| 3. | Land acquisition | • Avoid or minimize land acquisition.<br>• Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report. | o All through the alignment of each rural road | Pre Construction Phase | Land to be made available by the state Government | PIU, Govt. of Madhya Pradesh , and other | Environmental officer under the PIC will also coordinate and ensure implementation |

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

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | | | | | implementation Unit (PIU) of MPRRDA, | |
| 6. | Shifting on Common Properties Resources | • All efforts are made to minimize shifting of common utilities and community structures.<br>• The community structures/utilities which can not be saved will be shifted to adjacent area with the concurrence and in consultation with community. | As determined by contractor under approval of PIC /PIU *(Attach or Refer to specific sections of DPR for community structures to be shifted along with chainages for the location of such structures)* | Construction Phase | Borne by Contractor | Contractor is responsible for ensuring provision of facilities under approval by PIC / PIU | Environmental officer and other team members of PIC will monitor and ensure appropriate implementation<br><br>Environmental officer will regularly interact with the local people who are likely to be affected to ensure that their interests are protected and no social resentment sets in. |
| 7. | Cut and Fill and Embankmen t Construction design & planning | • The alignment design shall consider options to minimize excessive cuts and fills.<br>• The cut and fill quantities shall be used for embankment to minimize barrow earth requirement.<br>• The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.<br>• Adequate provision shall be made for cross drainage structure for maintaining natural drainage pattern in the subproject area and preventing soil erosion.<br>• Side drain for channelizing water to nearby natural drain in water stagnation /logging prone area.<br>• The top soil of the cut and fill area shall be used for embankment slope protection<br>• Embankment will be designed above High Flood Level (HFL) wherever, area is prone to flood. | All through the alignment of each rural road *(Highlight the high flood level, chainage for action and linkages to DPR section)* | Pre Construction Phase | Part of Project Cost | Project Preparation Consultant/ design consultant | PIU/ MPRRDA |
| 8 | Hydrology and Drainage | • Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and | Near all drainage | Pre Construction | Part of Project | Project Preparation | PIU/ MPRRDA |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly.<br>• Provision of adequate side drainage shall be made in water stagnant/logging areas.<br>• 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.<br>• Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment to ensure minimum disturbance to natural drainage of surface and subsurface water of the area.<br>• Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides.<br>• 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.<br>• Road level shall be fixed above HFL. Embankment slope stabilization measures shall be planned. Stabilization measures may include vegetative treatment, stone pitching, retaining wall where feasible, low cost options such as bamboo / eucalyptus tree pilling . | crossing , nalas and river crossings etc. *(indicate HFL Level and Highlight the chainage for action and linkages to DPR section)* | Phase | Cost | Consultant/ design consultant | |
| 9 | Establishment of Construction Camp, temporary | • Construction camp sites shall be located away from any local human settlements (minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently.<br>• Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m).<br>• The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities.<br>• The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas. | As determined by contractor under approval of PIC/PIU/ (ref- Labelled: WASTE OIL; and hazardous sign be displayed at oil handling areas and | Pre-constructi on and constructi on stage | To be included in contractor' s cost | All facilities arto be planned and implemented by contractor under approva by PIU / PIC | PIU |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | • 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.<br>• All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.<br>• The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children.<br>• 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.<br>• Provision shall be made for domestic solid waste disposal in a control manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling.<br>• Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage. | sold off to SPCB/ MoEF authorized re-refiners). *(Contractor to specify the cost provision made for PPE and other environmental sanitation measures required per construction camp /* temporary office / storage area) | | | | |
| 10 | Traffic Movement | • The contractor will identify the areas were temporary traffic diversion may be required. He would prepare appropriate traffic movement plan for ensuring continued flow of traffic during construction phase. This may include movement of the traffic from the site of the construction area. This kind of a temporary diversion shall be finalized with the concurrence of respective PIU.<br>• 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.<br>• The diversion plan should ensure smooth flow of traffic, minimize accidents to road users during construction works.<br>• 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 | As proposed under DPR and determined by contractor and approved by PIC/PIU/ *(Highlight the chainages which may require traffic diversions)* | Pre-construction and construction stage | To be included in contractor' s cost | All facilities are to be planned and implemented by contractor under approval by PIU / PIC | PIU |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | visibility in day and night both. | | | | | |
| 11 | Occupational Health and Safety | • Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain and rolling terrain.<br>• Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m)<br>• The speed breakers shall be provided and directional sign boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required.<br>• Provision shall be made for Hazard markers at each end of all box culverts, river crossing causeways and similar CD structures<br>• Shoulder side slopes shall not be steeper than 2h:1V unless stone pitching of the slopes is provided.<br>• Cement concrete pavement and V-shaped drain shall be constructed to the full width of the available roadway within densely populated habitation and as per feasibility.<br>• Provision shall be made for Directional sight board shall be installed on all sharp curves and bends<br>• At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road.<br>• It is proposed to approach railways for adequate safety at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both side of the railway crossing | Throughout the project section at the location determined by contractor and approved by PIU<br><br>(Highlight the location with chainage for such requirements ) | Pre-construction and construction stage | To be included in contractor’ s cost | All facilities are to be planned and implemented by contractor under approval by PIU / PIC | PIU |
| | **Construction Stage** | | | | | | |
| 12. | Sourcing and transportation of construction material (aggregates , earth) | **Borrow Earth:**<br>• The borrow earth shall be obtained from identified locations and with prior permission for landowner and clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed.<br>• Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying implementation of | As Borrow sites and quarries (if required) location.<br><br>(List the probable locations for borrow | During Design and constructi on Stage | Engineeri ng cost | The selection of quarries and material selection will be the responsibility of contractor under approval | PIC /PIU/TSC Environmental officer and other team members of PIC will monitor |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | mitigation actions.<br>• 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).<br>• Borrowing of earth will not be done continuously through out the stretch.<br>• Ridges of not less than 8m widths will be left at intervals not exceeding 300m.<br>• Small drains will be cut through the ridges, if necessary, to facilitate drainage.<br>• The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal).<br>• The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.<br>• Fly ash will also be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment.<br>• The borrow area shall be rehabilitated as per the understanding arrived with the land- owner. The re-habilitation plan may include the following:<br>▪ 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.<br>▪ Borrow areas might be used for aquaculture in case landowner wants such development.<br>**Aggregate :**<br>▪ The stone aggregate shall be sourced from existing licensed quarries<br>▪ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU.<br>▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage<br>**Transportation of Construction Material**<br>▪ Existing tracks / roads are to be used for hauling of materials to the extent possible.<br>▪ Prior to construction of roads, topsoil shall be preserved or at least shall be used for any other | areas. (Highlight the identified quarries, if already identified. Contractors should also indicate the quarry they are likely to use if not already identified at DPR stag) | | | of PIC/PIU/TSC Environmental officer and other team members of PIC will ensure appropriate implementation of mitigation actions. | |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | useful purposes like using in turfing of embankment rather than allowing its loss by construction activities.<br>▪ The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation links are to be inspected at least twice daily to clear accidental spillage, if any. | | | | | |
| 13 | Loss of Productive Soil, erosion and land use change | • 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.<br>• The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes.<br>• It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion.<br>• Cut and fill shall be planned as per IRC provisions and rural road manual.<br>• All steep cuts shall be flattened and benched.<br>• Shrubs shall be planted in loose soil area.<br>• IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration<br>• Soil erosion shall be visually checked on slopes and embankment areas. In case soil erosion is found, suitable measures shall be taken to control the soil erosion | Thought out the road section (The contractor shall include the cost for the measures as part of the construction cost) | During the Construction stage | Included in project cost | Design Consultant and Contractor | PIU / MPRRDA |
| 14 | Compaction and Contamination of Soil | • To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route.<br>• The productive land shall be reclaimed after construction activity.<br>• Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas.<br>• Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste.<br>• The non-biodegradable and recyclable waste shall be | Throughout the project section of the road s<br><br>(The contractor shall include the cost for the measures as part of the construction | Design and construction stage | Project preparation cost and construction cost | Design consultant and Contractor, | PIU |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | sold off.<br>• Fuel and lubricants shall be stored at the predefined storage location.<br>• The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils.<br>• All efforts shall be made to minimize the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal.<br>• To avoid soil contamination at the wash-down and re-fuelling areas, “oil interceptors” shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners. | cost) | | | | |
| 15 | Construction Debris and waste | • All excavated materials from roadway,shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping.<br>• Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority.<br>• The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner.<br>• 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.<br>• Dumping sites should be away from water bodies to prevent any contamination of these bodies. | Throughout the project section of the road | Design and construction stage | Project preparation cost and construction cost | Design consultant and Contractor, | PIU |
| 16 | Air and Noise Quality | • Vehicles delivering loose and fine materials like sand and aggregates shall be covered.<br>• 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<br>• Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. | Near all drainage crossing , nalas and river crossings etc. | During Construction stage | Included in engineering cost | Contractor | PIU /MPRRDA |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | • Material storage areas shall also be located downwind of the habitation area.<br>• 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.<br>• Diesel Generating (DG) sets shall also be fitted with stack of adequate height ( as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the Dg set). . Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained.<br>• The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers.<br>• Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly. | | | | | |
| 17 | Biological environment - Tree planting | • Compensatory Afforestation shall be made on 1:3.ratio basis as per the plannings.<br>• Additional trees shall be planted wherever feasible | Throughout the project section of the road (Highlight Tree cutting locations & proposed likely plantation location) | during the design and Construction stage | Part of engineering work cost included | DFO and MPRRDA | PIU and MPRRDA |
| 18 | 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.<br>• The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected.<br>• Water intensive activities shall not be undertaken during summer period to the extent feasible.<br>• Provision shall be made to link side drains with the | Throughout the project section of the road (The contractor shall include the cost for the measures | construction stage | construction cost | Contractor, | PIC/PIU |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | nearby ponds for facilitating water harvesting if feasible<br>• Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity.<br>• Preventive measures like slop stabilisation, etc shall be taken for prevention of siltation in water bodies. | as part of the construction cost) | | | | |
| 19. | Occupational Health and Safety | • Verification of implementation of provision made at planning stage.<br>• Each worker is provided with requisite PPE<br>• Directional sight board shall be installed on all sharp curves and bends<br>• At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road. | Throughout the project construction section | Construction stages | construction cost | Contractor, PIU | PIU |
| | **Operation Stage** | | | | | | |
| 20. | Air and Noise Quality | • Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due vehicle movement.. Speed limitation and honking restrictions may be enforced near sensitive locations. | Throughout the project section at the location determined by contractor and approved by PIU | Operation stage | construction cost | Contractor, | PIC/PIU |
| 21 | Site restoration | • All construction camp/temporary office/material storage areas are to be restored to its original conditions.<br>• The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner.<br>• Obtained clearance from PIU before handling over the site to SRRDA.<br>• PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required | Throughout the project section at the location determined by contractor and approved by PIU | Operation stage | construction cost | Contractor, | PIC/PIU |
| 22. | Hydrology and Drainage | • Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season.<br>• Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted | Throughout the project section at the location determined by contractor and approved | Operation stage | construction cost | Contractor, | PIC/PIU |

| SL. No. | Attributes | Mitigation Measures | Location | Time Frame | Cost | Responsible for Implementing | Responsible for Monitoring |
|---|---|---|---|---|---|---|---|
| | | | by PIU | | | | |
| 23 | Occupational Health and Safety | • Directional sight board shall be installed on all sharp curves and bends<br>• At a main road, intersection or crossing “STOP” sign and ‘T-intersection’ warning sign shall be installed on the village road | Throughout the project section at the location determined by contractor and approved by PIU | Operation stage | construction cost | Contractor, | PIC/PIU |

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

## Appendix 6: 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.: XXX.

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance Status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| 198. | 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<br>• Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI ( Panchyati Raj Institution) | All through the alignment | No. of Additional Tree plantation Proposed | | |
| 199. | Finalization of alignment | • The road will be part of district core network and will comply with PMGSY guidelines<br>• 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.<br>• Subproject will not pass through any designated wildlife sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area..<br>• Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009.<br>• Alignment finalization considering availability of right of way and in consultation with local people.<br>• ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines.<br>• Adjust alignment to the extent feasible to of utilities or community structure.<br>• The road shall follow natural topography to avoid excessive cut and shifting | All through the alignment of each rural road | Compliance to Conditions of Forest Clearance if applicable | | |
| 200. | Land acquisition | • Avoid or minimize land acquisition.<br>• Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and | All through the alignment of each rural road | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance Status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report. | | | | |
| 201. | Biological environment - Tree planting | • All efforts shall be taken to avoid tree cutting wherever possible.<br>• Requisite permission from forest department shall be obtained for cutting of roadside trees.<br>• Provision of Compensatory Afforestation shall be made on 1:3.ratio basis.<br>• Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation. | Throughout the project section of the road | | | |
| 202. | Planning for land clearing | • The road land width shall be clearly demarcated on the ground.<br>• The utility and community structure shifting shall be planned in consultations and concurrence of the community.<br>• Tree felling shall be limited to those, which could not be saved even by design measures. The tree shall be cut with a prior permission of Forest department.<br>• The vegetable cover shall be removed and disposed in consultation with community.<br>• All public utilities shifting shall be planned with prior concurrence of respective agencies/authority and to the adjacent location approved<br>• Side drain for channelizing water to nearby natural drain in water stagnation /logging prone area.<br>• The top soil of the cut and fill area shall be used for embankment slope protection<br>• Embankment will be designed above High Flood Level wherever, area is prone to flood. | All through the Rural roads excepting in stretches of habitations | Tree cutting permission from Forests or Revenue department as applicable Permission of concerned utility Authorities No and proposed location of compensatory trees plantation, Concurrence from community for utility, community structure, and vegetation cover removal | | |
| 203. | Shifting on Common Properties Resources | • All efforts are made to minimize shifting of common utilities and community structures.<br>• The community structures/utilities which can not be saved will be shifted to adjacent area with the concurrence and in consultation fill. by them with community. | As determined by contractor under approval of PIC /PIU | | | |
| 204. | Cut and Fill and Embankment Construction design and planning | • The alignment design shall consider options to minimize excessive cuts and fills.<br>• The cut and fill quantities shall be used for embankment to minimize barrow earth requirement.<br>• The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.<br>• Adequate provision shall be made for cross drainage structure for | All through the alignment of each rural road | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance Status | Corrective action proposed in case of delay |
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| | | sign be maintaining natural drainage pattern in the subproject area and preventing soil erosion. | | | | |
| 205. | 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.<br>• Provision of adequate side drainage shall be made in water stagnant/logging areas.<br>• 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.<br>• Elaborate drainage system shall be provided to drain the storm water from the roadway and embankment to ensure minimum disturbance to natural drainage of surface and subsurface water of the area<br>• Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides.<br>• 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.<br>• Road level shall be fixed above HFL. Embankment slope stabilization measures shall be planned. Stabilization measures may include vegetative treatment, stone pitching, retaining wall where feasible, low cost options such as bamboo / eucalyptus tree | Near all drainage crossing , nalas and river crossings etc. | | | |
| 206. | Establishment of Construction Camp, temporary office and storage area | • Construction camp sites shall be located away from any local human settlements (minimum 0.5 km away) and preferably located on lands, which are not productive barren/waste lands presently.<br>• Similarly temporary office and storage areas shall be located away from human settlement areas (minimum 500 m).<br>• The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite pilling . control board for setting up the camp. infrastructure facilities.<br>• The construction camps shall be located at a minimum 0.5 km from forest land/areas to deter the construction labor in trespassing. Similarly, temporary office and storage areas shall be located at a minimum 0.5 km from forest land/areas.<br>• The construction camps, office and storage areas shall have | As determined by contractor under approval of PIC/PIU/ (ref-Labelled: WASTE OIL;<br>and hazardous | Location of Construction camp with planning of requisite facilities and making provision of such facilities prior to start of construction.<br>Availability of consent to establish from pollution | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance Status | Corrective action proposed in case of delay |
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| | | provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.<br>• All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided completely to the extent possible.<br>• The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children.<br>• 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.<br>• Provision shall be made for domestic solid waste disposal in a control manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling.<br>• Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage. | | | | |
| 207.0 | Traffic Movement | • The contractor will prepare appropriate traffic diversion scheme approved by respective PIU. This shall be implemented prior to start of construction to avoid any inconvenience to the present road users. This shall be implemented in other stretches of the road as per the progress of the construction work.<br>• The diversion plan should ensure smooth flow of traffic, minimize accidents to road users during construction works.<br>• Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility in day and night both. | As proposed under DPR and determined by contractor and approved by PIC/PIU/ | Each Sample road once. | | |
| 208.1 | Occupational Health and Safety | • Speed breakers (Rumble strips) as per IRC: 99-1988 shall be provided at sharp corves design and bends where the curve design speed is less than 40 km per hour in plain and rolling terrain.<br>• Speed breakers shall also be provided at a threshold of habitation (as per NRRDA guidelines) at regular intervals (150-200 m) through habitation.<br>• The speed breakers shall be provided and directional sign boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required.<br>• Provision shall be made for Hazard markers at each end of all box culverts, river crossing causeways and similar CD structures | Throughout the project section at the location determined by contractor and approved by PIU | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance Status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | • Shoulder side slopes shall not be steeper than 2h:1V unless stone pitching of the slopes is provided.<br>• Cement concrete pavement and V-shaped drain shall be constructed to the full width of the available roadway within densely populated habitation and as per feasibility.<br>• Provision shall be made for Directional sight board shall be installed on all sharp curves and bends<br>• At a main road, intersection or crossing "STOP" sign and 'Tintersection' warning sign shall be installed on the village road.<br>• It is proposed to approach railways for adequate safety at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both side of the railway crossing | | | | |
| 209.2 | Grievance Redress | • Obtaining information from Village level Grievance redress committee, PIU as applicable | | | | |

## II. ENVIRONMENTAL MONITORING DURING CONSTRUCTION STAGE

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

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| 1 | Sourcing and transportation of construction material ( aggregates , earth) | **Borrow Earth:**<br>• The borrow earth shall be obtained from identified locations and with prior permission for landowner and clear understanding for its rehabilitation. The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed.<br>• Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas.<br>• 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).<br>• Borrowing of earth will not be done continuously through out the stretch.<br>• Ridges of not less than 8m widths will be left at intervals not exceeding 300m.<br>• Small drains will be cut through the ridges, if necessary, to facilitate drainage.<br>• The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal).<br>• The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.<br>• Fly ash will also be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment.<br>• The borrow area shall be rehabilitated as per the understanding construction). Thought out the road section arrived with the land-owner. The re-habilitation plan may include the following:<br>▪ Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative | At Borrow sites and quarries (if required) location. | Compliance to IRC guidelines and stated criteria, Permission from land owners, Rehabilitation of borrow areas<br><br>Availability of valid consent of quarries | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
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| | | 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.<br>▪ Borrow areas might be used for aquaculture in case landowner wants such development.<br>**Aggregate :**<br>• The stone aggregate shall be sourced from existing licensed quarries<br>• Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU.<br>• Topsoil to be stockpiled and protected for use at the rehabilitation stage<br>**Transportation of Construction Material**<br>• Existing tracks / roads are to be used for hauling of materials to the extent possible.<br>• Prior to construction of roads, topsoil shall be preserved or at least shall be used for any other useful purposes like using in turfing of embankment rather than allowing its loss by construction activities.<br>• 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 | | • 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.<br>• The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes.<br>• It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion.<br>• Cut and fill shall be planned as per IRC provisions and rural any. Loss of Productive Soil,erosion and land use change | Throughout the project section of the road s . | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | • All steep cuts shall be flattened and benched.<br>• Shrubs shall be planted in loose soil area.<br>• IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration.<br>• Soil erosion shall be visually checked on slopes and embankment areas. In case soil erosion is found, suitable measures shall be taken to control the soil erosion | | | | |
| 3 | Compaction and Contamination of Soil | • 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.<br>• The productive land shall be reclaimed after construction activity.<br>• Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas.<br>• Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste.<br>• The non-biodegradable and recyclable waste shall be sold off.<br>• Fuel and lubricants shall be stored at the predefined storage location.<br>• The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils.<br>• All efforts shall be made to minimize the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal.<br>• 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 rerefiners. | Throughout the project section of the road road manual | | | |
| 4. | Construction Debris and waste | • All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. | | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | • Unusable debris material should be suitably disposed off at predesignated disposal locations, with approval of the concerned authority.<br>• The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner.<br>• For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies. | | | | |
| 5. | Air and Noise Quality | • Vehicles delivering loose and fine materials like sand and aggregates shall be covered.<br>• 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.<br>• Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements.<br>• Material storage areas shall also be located downwind of the habitation area.<br>• 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.<br>• Diesel Generating (DG) sets shall also be fitted with stack of adequate height ( as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the DG set). . Low sulphur diesel shall be used in DG sets and other construction machineries. Construction vehicles and machineries shall be periodically maintained.<br>• The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. | □ Near all drainage crossing , nalas and river crossings etc. | | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | • Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly. | | | | |
| 6. | Biological environment<br>- Tree planting | • Compensatory Afforestation shall be made on 1:3.ratio basis as per the plannings.<br>• Additional trees shall be planted wherever feasible. | Throughout the project road | | | |
| 7. | Ground Water and Surface Water Quality and Availability | • Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable.<br>• The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected.<br>• Water intensive activities shall not be undertaken during summer period to the extent feasible.<br>• Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible<br>• Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity.<br>• Preventive measures like slop stabilisation, etc shall be taken for prevention of siltation in water bodies. | Throughout the project road | | | |
| 8. | Occupational Health and Safety | • Verification of implementation of provision made at planning stage.<br>• Each worker is provided with requisite PPE<br>• Directional sight board shall be installed on all sharp curves and bends<br>• At a main road, intersection or crossing "STOP" sign and 'Tintersection'warning sign shall be installed on the village road. | Throughout the project section at the location determined by contractor and approved by PIU | | | |
| 9. | Grievance Redress | • Obtaining information from Village level Grievance redress committee, PIU as applicable | Each Sample road once. | | | |

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

## III. ENVIRONMENTAL MONITORING DURING OPERATION STAGE

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

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| 1. | Air and Noise Quality | • Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due vehicle movement.. Speed limitation and honking restrictions may be enforced near sensitive locations. | Throughout the project section at the location determined by contractor and approved by PIU | | | |
| 2. | Site restoration | • All construction camp/temporary office/material storage areas are to be restored to its original conditions.<br>• The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner.<br>• Obtained clearance from PIU before handling over the site to SRRDA.<br>• PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required | Throughout the road stretch | Survivability report, land owner concurrence of land reversal | | |
| | Hydrology and Drainage | • Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season.<br>• Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted | Throughout the project section at the location determined by contractor and approved by PIU | | | |
| 3. | Road Safety | • Directional sight board shall be installed on all sharp curves and bends<br>• 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 | Monitor road crashes and compile. Estimate no. crashes vs number of vehicles | | |

| SL. No. | Environmental Attributes | Mitigation Measures | Location | Additional Monitoring Indicator if applicable | Compliance status | Corrective action proposed in case of delay |
|---|---|---|---|---|---|---|
| | | | | passing section and compare with applicable national standards for blackspots | | |
| 4. | Grievance Redress | • Obtaining information from Village level Grievance redress committee, PIU as applicable | Each Sample road once. | | | |

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