

Uttar Pradesh core Road Network Development Project (P147864)

Environment and Social Management Framework (ESMF); and Environmental Impact Assessment (EIAs)/ Environment Management Plans (EMPs), Social Impact Assessment (SIAs)/Resettlement Action Plans (RAPs) for Roads identified for implementation in Phase I

Executive Summary

1.0 Introduction

The state has a road network of 299,604 km, out of which 174,451 km is under Uttar Pradesh Public Works Department (PWD). The roads under PWD comprise 7,550 km of National Highways (NHs), 7,530 km of State Highways (SHs), 5,761 km of Major District Roads (MDRs), 3,254 km of Other District Roads (ODRs) and 138,702 km of Village Roads (VRs). Only about 60% of SHs are two-lane (7 m). In the entire state 62% of MDRs and 83% of ODRs have widths less than 7 m.

With a view to improve the transport network system, UP PWD has identified 24,095 km of Core Road Network (CRN) for the development. The Core road development works will consist of raising the formation level, widening to a full two lanes from the existing single and intermediate lane widths, and/or pavement rehabilitation/strengthening. Road sections with high volumes of non-motorized traffic will be widened to 10m with 1.5m full paved shoulders. Road stretches crossing urban areas may also require upgrading to a four lane cross section, and/or provision for drains, sidewalks and parking where required. In some cases, new alignments (by-passes and/or re-alignments may also be required. In view of the above, UP core road network development project (UPCRNDP) has been designed. The UPCRNDP will have three Components:

Component 1: Road Improvement

Though a total of 1000 km of road will be widened and upgraded, in phase I four road corridors are covered totaling about 264 km. The roads under phase I include:

- Hamirpur – Rath Road, Existing length 75.7 km
- Garautha – Chirgaon (Jhansi), 50.0 km
- Gola – Shahajahanpur – 59.4 Km
- Badayun – Bilsa- Bijnaur- 80 Km

Component 2: Road Safety Initiatives

A comprehensive and coordinated package of road safety sub-components to be delivered by the Transport, Home, Public Works and Health Departments

Component 3: Institutional Strengthening

This component is likely to include a program to strengthen PWD asset management of SHs, MDRs and ODRs, to support the application of IT systems for human resource management and works budgeting and management across the PWD organization

2.0 Objective of the study

The study has the following objectives:

- a baseline database containing the environmental and social features and issues in the immediate vicinity of proposed road corridor;
- structures likely to be affected by the widening/improvement proposal;
- highlight the social problems and suggests general and typical mitigation measures to alleviate social problems that the project-affected people may face less loss of livelihood, displacement and loss of access to community facilities etc;
- identify key environmental issues and mitigation measures for negative impacts, as well as enhancement activities for positive impacts
- understand the policy and regulatory framework to guide development of appropriate management plans to ensure compliance with the applicable national and state requirements as well as policies of the World Bank
- develop resettlement action plan to avoid, reduce or mitigate likely negative impacts of project and enhance positive impacts, sustainability and development benefits;

- carry out an environmental impact assessment to develop environmental management plan for each road describing mitigation measures and enhancement measures to be implemented as part of the project

3.0 Scope of the Study

The scope of the study includes:

Environment

- Collection of information about current environmental conditions in the study area from secondary sources
- Monitoring of pollution in sample representative locations to establish levels of air, noise and water quality as well as tree survey and other biodiversity related studies as appropriate
- Preparation of Environmental Impact Assessment including Environmental Management Plan

Social

- Carry out Structure Verification Survey of the structures likely to be affected and Census and Socio-Economic Survey of the Project Affected Persons (PAPs) to get the base line information about the level of impact and to get the base line socio economic status of the PAPs.
- Preparation of Strip Plan showing existing structures likely to be affected along the project road
- Conducting Social Impact Assessment including Rehabilitation and Resettlement (R&R) studies
- Preparation of Social Impact Assessment (SIA) report and Resettlement Action Plan (RAP)

4.0 Methodology

Environment

The preparation of the EIA and EMP for each road has been undertaken in line with guidance provided in the ESMF (please see Annexure I for the ESMF summary). It also used the EIA Manual for highway projects prepared by the MoEF and available good practice guidance from multilateral funding agencies like the ADB and World Bank. The steps in the process were:

- Identification of alignment specific environmental constraints using the checklist in the ESMF. The hot spots identified during the screening exercise were further assessed for their criticality and impacts jointly by teams of environmental specialist, social impact specialist, design engineers and surveyors.
- Review of the policies, legislation, and regulation governing road improvements with World Bank support in Uttar Pradesh
- Collection of data from secondary sources like published literature, government documents, etc. These included Survey of India top sheets, District Planning Maps, Forest Statistics, Wetland Atlas, Statistical Abstract of Uttar Pradesh for 2012 Collection of Primary data on environmental components. Field survey were carried out to collect information on the major environmental features such as settlement facilities, drainage pattern of the area, forest, trees within RoW of the alignment, water bodies, river crossing, sensitive receptors, air, water, noise and soil quality etc.
- Consultations with stakeholders, including public meetings and focused meetings with government officials in Forest and Revenue departments
- Analysis, including modeling for some impacts and selection between various options for avoidance, minimization, and mitigation. This included preliminary estimates using HDM4 for fuel consumption for estimating GHG emissions. It also covered options of using different construction material to minimize resource use.
- Finalization of the selected option and estimation of costs with roles and responsibilities of various stakeholders, including implementation, supervision, monitoring and reporting within GoUP, and to the World Bank.

Social

The resettlement action plan is based on the primary and secondary data sources. Secondary data source include Gazetteer of project districts and District Census Details, 2011. To assess the socio-economic

condition, a questionnaire has been developed and used to conduct census and socio-economic survey of the project affected persons within the identified corridor width. Following steps were followed during the Social impact assessment and preparation of RAPs:

Step 1: Reconnaissance Survey and Screening to take into account sections with social issues and identify stakeholders through discussions with project authorities and community members along the project corridors.

Step 2: Ascertaining right of way through collection of records from revenue department

Step 3: Conducting Census and Socio-economic Survey in 30 m corridor

Step 4: Identifying social hotspots

Step 5: Social Input to design

Step 6: Identifying Actual PAPs by superimposing design on social strip plans

Step 7: Preparing Resettlement Action Plan

5.0 Consultations

Considering the importance of people's participation in the project planning, public consultation and FGDs were also carried out at different levels at various stages of project preparation. The objectives of the consultation were to disseminate information about the project to the potentially affected population in order to incorporate their views and suggestion for preparing the RAP and the design and to assess the economic situation of the settlement. The consultation focuses on identification of issues raised by the PAPs and its integration in the Resettlement Action Plan.

6.0 Collection of Data from Secondary Sources

Throughout the Study, various types of secondary data were used along with the primary data collected through surveys. Secondary data sources included Uttar Pradesh at a Glance, published by Jagaran Publications (Social, Cultural, Demographic and Economic profile of Uttar Pradesh), District Census Handbooks of districts through which road is passing through, Tehasil Offices; and Census of India, 2011.

7.0 Right of Way

The established width of right of way on an average is 30m. However, ROW width varies from 8 m to 36 m. Moreover, the existing ROW is not free of encumbrances. Using available records with the PWD and the revenue department, R&R team have verified the boundaries of legal right of way as well as boundaries of private properties within and in the vicinity of the corridor of impact. The limit of displacement will be limited not to the legal right of way but only to the corridor of impact.

COVERAGE of this document provides an overview of the impacts of roads considered in phase I on the biophysical and socio-economic environment in the project area, including affected people. It also summarizes the measures taken to ensure that these are managed appropriately in line with requirements of the local laws as well as the applicable World Bank policies. It is pertinent to mention here that each road has been analyzed in detail and each EIA/EMP and the RAP include their own executive summaries. These individual summaries may be referred for details of current conditions and relevant regulatory requirements in the project area with reference to the bio-physical as well as socio-economic variables. These documents have been publicly disclosed in country and in the Infoshop. These documents can be accessed at the following links:

1. <http://uppwd.up.nic.in/wbprojects.html> (Hamirpur-Rath section of SH-42)
2. <http://uppwd.up.nic.in/wbprojects.html> (Gauratha-Chirgaon section of SH-42)
3. <http://uppwd.up.nic.in/wbprojects.html> (Gola-Shahjahanpur section of SH-93)
4. <http://uppwd.up.nic.in/wbprojects.html> (Badayun-Bilsa-Bijnaur section of SH-51)

8.0 Impacts

Environment

The project improvements will result in requirement of cutting of about 32,435 trees, which are classified as protected forests in Uttar Pradesh, along all Phase I roads put together. Out of these over 48% (15,667) are along Badaun - Bilsa road, while the least – slightly over 9% (3003)- are along the Garauntha - Chirgaon road. None of the Phase I roads pass close to any protected areas or other natural habitats. A total

of 12 roadside water bodies could be negatively impacted by the road works. While there are none along the Garuntha-Chirgaon road, 3 out of 20 are likely to be affected along Hamirpur-Rath road, 7 out of 25 along Gola-Shahjahanpur road, and 2 out of 6 water bodies along the Badaun-Bilsi road. If not properly designed, improved roads could have safety concerns during the operation phase, especially since design speed improvements are a key desired outcome of the project. Climate change related impacts have been identified and where possible suitable mitigation measures are included as part of the design. Greenhouse gas emission projections made using HDM 4 indicate slight increase in projected emissions over the no-project scenario for Gola-Shahjahanpur road (about 8.85%), and Badaun-Bilsi road (8.80) and reductions for the Hamirpur-Rath road (-3.90%) and Garuntha-Chirgaon road (-11.81%).

Other commonly identified impacts during construction phase of include the pollution increase from plants required for construction – Hot-mix, Cement batching, and from domestic waste of construction camps established for the project. In addition, safety of the workers and other road users, especially since these roads will be improved while being used by regular road users, are a key concern.

Social

The project will impact a total of 1197 families (729 households and 3020 persons) of which 619 families will be displaced. The displaced families are non-titleholders and largely small commercial structure and kiosk owners. Out of total 1197 affected families, 56 percent are losing commercial structures of which more than 50 percent are kiosk owners. These kiosks will move out of corridor of impact but will remain within the right of way. Little over 15 percent are losing part of their residential structure. Project activities though largely is restricted within the right of way, project will be acquiring 7.7 ha of private land for widening of bridge approaches. The families losing part of their agriculture land are 16 percent of the total project affected families and no titleholder is getting displaced. Project will also impact 218 common property resources and majority of them are hand pumps. The other CPRs include religious structures, stand posts, water tanks, bus stops and boundary walls.

Corridor wise comparison shows that out of total affected households, 67 percent are from Hamirpur Rath road; 13 percent are in Gola-Shahjanpur road; 12 percent are in Garautha Chirgaon road and 7 percent are from Badayun Bilsi road.

9.0 Cutoff Date

The date of completion of census survey will be considered as cut-off date for non-titleholders and therefore, people who are not surveyed during the census will not be considered as PAP. However, a person not enumerated during the census, but able to prove their stay in the project corridor, during the census survey will be considered for entitlement. Period of Census Survey varied from August 2014 to December 2014. The cutoff date for titleholders will be date of notification u/s 11 of RFCTLARR Act 2013.

10.0 Mitigation Measures

Environment

The key mitigation measure for the impacts on trees is the provision of compensatory afforestation of twice the number of trees cut, in compliance with the Forest (Conservation) Act, 1980, which is funded by the project and executed by the Forest Department. Other mitigation measures include the provision of toe wall protection for select ponds, and compensation of storage volume, where such protection is not possible. 7 ponds along Gola-Shahjahanpur road have provision of such toe walls. Water harvesting structures have been included in the project design for ensuring groundwater recharge along all 4 roads. Since the project also focuses on the safety of road users, design of the roads already include special provisions close to the settlements like traffic calming measures with signages and other interventions. In addition, safe road use orientation training for people, especially children, living in the project area is also envisaged. Additional enhancement measures are proposed for select locations identified along each road. There are 2 ponds and 1 school that will benefit along Hamirpur-Rath road, 2 public meeting places along

Garutha-Chirgaon road, 2 schools along Gola-Shahjahanpur, and 1 temple and 1 pond along Badaun-Bilsi road.

For impacts that can be directly undertaken by the Contractor, relevant portions of the Environmental Management Plan form a part of the bidding/Works Contract document. A stylized typical EMP with impacts mitigated through this arrangement, their supervision and monitoring as well as reporting requirements, is included as an **Annexure II** to the Summary.

Social

In order to minimize and / or mitigate adverse social impacts, Uttar Pradesh Public Works Department has developed a Project specific Resettlement & Rehabilitation (R & R) Policy, 2014 and an Environment and Social Management Framework (ESMF). This policy and the ESMF is based on the Right to Fair Compensation and transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013 subject to subsequent supplements by Government of Uttar Pradesh (GoUP) orders and World Bank Operational Policy 4.12 on involuntary resettlement. Based on project specific R&R policy, Resettlement Action Plans for all the four phase I corridors have been prepared and disclosed in country as well as on Bank's InfoShop. The mitigation measures include compensation for lost asset; R&R assistances; and livelihood restoration measures. The ESMF provides guidance in preparation of RAPs for phase II roads. The entitlement matrix as per different impact categories is given below.

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
A. Loss of Private Agricultural, Home-Stead & Commercial Land				
1	Land within the Corridor of Impact (COI)	Titleholder family. and families with traditional land Right	Compensation at Market value, Resettlement and Rehabilitation	<ul style="list-style-type: none"> • Land for land, if available. Or, Cash compensation for the land at Market value, which will be determined as provided under section 26 of RFCTLARR Act 2013. • The land if allotted will be in the name of both husband and wife. • If post acquisition, residual land is economically unviable, the land owner will have the choice of either retaining or sell off rest of the land. • Refund of stamp duty and registration charges incurred for replacement land to be paid by the project; replacement land must be bought within a year from the date of payment of compensation to project affected persons. • Subsistence allowance of Rs. 36000 as one time grant • One time grant of Rs. 500,000 or annuity • Compensation at market value for loss of crops if any
B. Loss of Private Structures (Residential/Commercial)				
2	Structure within the Corridor of Impact (Col)	Title Holder/ Owner	Compensation at Market value, Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> • Cash compensation for the structure at replacement value which would be determined as per as per section 29 of the RFCTLARR Act 2013. House under Indira Awas Yojna in rural area or Rs. 50000 in lieu off and house under Rajiv Awas Yojana in urban area or Rs 100,000 in lieu off. The house if allotted will be in the name of both husband and wife. • Right to salvage material from the demolished structures. • Three months' notice to vacate structures. • Refund of stamp duty and registration charges for purchase of new alternative houses/shops at prevailing rates on the market value as determined in (a) above. Alternative houses/shops must be bought within a year from the date of payment of compensation.

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
				<ul style="list-style-type: none"> In case of partially affected structures and the remaining structure remains viable, additional 10% to restore the structure. In case of partially affected structures and the remaining structure becomes unviable additional 25% of compensation amount as severance allowance. Subsistence allowance equivalent to Rs. 36000 as one time grant. Each affected family getting displaced shall get a one-time financial assistance of Rs. 50,000 as shifting allowance. Each affected family that is displaced and has cattle, shall get financial assistance of Rs 25,000/- for construction of cattle shed. One time grant of Rs. 50,000 as resettlement assistance Each affected person who is a rural artisan, small trader or self-employed person and who has been displaced (in this project owner of any residential-cum commercial structure) shall get a one-time financial assistance of Rs 25,000/-for construction of working shed or shop. One time grant of Rs. 500,000.
3	Structure within the Corridor of Impact (Col)	Tenants/ Lease Holders	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Registered lessees will be entitled to an apportionment of the compensation payable to structure owner as per applicable local laws. In case of tenants, three months written notice will be provided along with Rs. 50,000 towards shifting allowance.
C. Loss of Trees and Crops				
4	Standing Trees, Crops. within the Corridor of Impact (Col)	Owners and beneficiaries (Registered/ Un-registered tenants, contract cultivators, leaseholders & sharecroppers	Compensation at market value	<ul style="list-style-type: none"> Three months advance notice to project affected persons to harvest fruits, standing crops and removal of trees. Compensation to be paid at the rate estimated by: <ul style="list-style-type: none"> The Forest Department for timber trees The State Agriculture Extension Department for crops The Horticulture Department for fruit/flower bearing trees. Registered tenants, contract cultivators & leaseholders & sharecroppers will be eligible for compensation for trees and crops as per the agreement document between the owner and the beneficiaries. Un-registered tenants, contract cultivators, leaseholders & sharecroppers will be eligible for compensation for trees and crops as per mutual understanding between the owner and the beneficiaries.
D. Loss of Residential/ Commercial Structures to Non-Titled Holders				
5	Structures within the Corridor of Impact (Col) or Government land	Owners of Structures or Occupants of structures identified as per Project Census Survey	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Non vulnerable encroachers shall be given three months' notice to vacate occupied land Vulnerable encroachers will be provided cash assistance at replacement cost for loss of structures as described in section 29 of the RFCTLARR Act 2013. Any encroacher identified as non-vulnerable but losing more than 25% of structure used will be paid cash assistance at replacement cost for loss of structures. The amount will be determined as per section 29 of the

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
				<p>RFCTLARR Act 2013.</p> <ul style="list-style-type: none"> All squatters to be paid cash assistance for their structures at replacement costs which will be determined as mentioned in section 29 of the RFCTLARR Act 2013. All squatters (other than kiosks) will be eligible for one time grant of Rs 36000 as subsistence allowance. All squatters other than Kiosks will be given shifting allowance of Rs 50,000 per family as one time grant for a permanent structure and Rs. 30,000 for a semi-permanent structure and Rs. 10,000 for a temporary structure. Each affected person who is a rural artisan, small trader or self-employed person assistance of Rs 25,000/- for construction of working shed or shop. In case of Kiosks, only Rs. 5000 will be paid as one time grant.
E. Loss of Livelihood				
6	Families living within the Corridor of Impact (Col)	Title Holders/ Non-Title holders/ sharecroppers, agricultural labourers and employees	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Subsistence allowance of Rs. 36,000 as one time grant. (PAPs covered under 1(f), 2 (f) and 5 (e) above would not be eligible for this assistance). Training Assistance of Rs. 10,000/- for income generation per family. Temporary employment in the project construction work to project affected persons with particular attention to vulnerable groups by the project contractor during construction, to the extent possible.
F. Additional Support to Vulnerable Families				
7	Families within the Corridor of Impact (Col)	SC, ST, BPL, WHH families	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> One time additional financial assistance of Rs. 50,000. Squatters and encroachers already covered under clause 5 are not eligible for this assistance.
G. Loss of Community Infrastructure/Common Property Resources				
8	Structures & other resources (e.g. land, water, access to structures etc.) within the Corridor of Impact (Col)	Affected communities and groups	Reconstruction of community structure and common property resources	<ul style="list-style-type: none"> Reconstruction of community structure and Common property resources in consultation with the community.
H Temporary Impact During Construction				
9	Land & assets temporarily impacted during construction	Owners of land & Assets	Compensation for temporary impact during construction e.g. diversion of normal traffic, damage to adjacent parcel of land / assets due to movement of heavy	<ul style="list-style-type: none"> Compensation to be paid by the contractor for loss of assets, crops and any other damage as per prior agreement between the 'Contractor' and the 'Affected Party'.

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
			machinery and plant site.	
J. Resettlement Site				
10	Loss of residential structures	Displaced titleholders and non-titleholders	Provision of resettlement site/ vendor market	<ul style="list-style-type: none"> Resettlement sites will be developed as part of the project, if a minimum of 25 project displaced families opt for assisted resettlement. Vulnerable PAPs will be given preference in allotment of plots/flats at the resettlement site. Plot size will be equivalent to size lost subject to a maximum of provision given in RFCTLARR Act 2013. Basic facilities shall be provided by the project at resettlement site as per the provisions given in the Third Schedule of RFCTLARR Act 2013. Similarly, if at least 25 displaced commercial establishments (small business enterprises) opt for shopping units, the Project Authority will develop the vendor market at suitable location in the nearby area in consultation with displaced persons. Basic facilities such as approach road, electricity connection, water and sanitation facility, will be provided in the vendor market by the project. Vulnerable PAPs will be given preference in allotment of shops in vendor market. One displaced family will be eligible for only one land plot at resettlement site or shop in the vendor market.

11.0 Gender Action Plan

Mainstreaming gender equity and empowerment is already a focus area in the project. In the sub projects, activities related to livelihood restoration women's need has been addressed. A Gender Action Plan for all the four phase I corridor has been prepared. The primary data on gender was collected as part of social impact assessment survey. A budget of INR 4 million has been earmarked for implementation of GAP. The GAP budget is part of overall budget of Resettlement Action Plan implementation.

12.0 Minimizing Impacts

Environment

Integration of environmental concerns with the design has been a feature of the project design. It has had clear benefits, for instance, with respect to use of alternative material – such as ash from power plants for the construction of embankment wherever it was found to be appropriate. Approximately 24180 cu. m. of ash would be utilized for construction of embankment for the Gola-Shahjahanpur road, 19000 cu. m. would be used for Garutha-Chirgaon road, and another 12860 cu. m. of ash would be used for the same purpose for the Badaun-Bilsa road. In addition saving ponds adjacent to the roads, where these are in use has been also included as part of the design. Along Badaun-Bilsa road, impacts on two ponds have been avoided by the use of alignment modification and protection measures – stone pitching. A total of 957500 cu.m. of recycled material from roadway cutting and drain is being used in the project resulting in corresponding reduction in requirement of fresh material for embankment. This includes 268000 cu. m. for Hamirpur-Rath section of SH-42, 218000 cu.m. from Gauratha-Chirgaon section of SH-42, 201500 cu.m. for Gola-Shahjahanpur section SH-93 and 270000 cu.m. for Badayun-Bilsa-Bijnor section of SH-51.

A total of 91 additional culverts have been designed for the 4 roads put together to minimize erosion/flooding impacts. Of these almost a 1/3rd (35) are along Badaun-Bilsa road, while another 31 are along HamirpurRathroad. The least additional culvert requirements are along Gola-Shahjahanpur road.

Social

Due importance has been given to social issues while road designing. The coordination between social and design team helped in minimizing the number of PAPs and affected PAHs. Concentric widening has been proposed in 204 km out of total 265 km to avoid involuntary land taking and minimize the social impact.

Eccentric widening option has been proposed in rest 58 km (22% of the total 265 km) of the road corridors primarily for geometrical correction and improvement of existing road alignment. However, those within the right of way (ROW) but not within corridor of impact (COI) will not be displaced by the project. In view of safety requirements as well as segregation of the fast moving traffic from the local slow moving traffic, paved shoulder has been proposed in the entire project road. Provision of street lighting has been made in habitations as one of the road safety measures.

13.0 Timing of Resettlement

The resettlement process will be completed before the start of civil works on a particular milestone. The milestones for handing over the stretch to the contractor have been finalized through a joint survey of PWD and PMC consultants. The milestones are based on degree of hindrance. Stretches, which are free of encroachment and other encumbrances, will be handed over first to contractor. Project is in the process of hiring NGO to implement the RAP. PAPs within the corridor of impact in a particular milestone will be relocated before the civil work starts on any section of the project road.

14.0 Institutional Arrangement

The project has established Environment; Social Development and Resettlement Cell at headquarters level. ESDRC is headed by Project Director and will be assisted by one Environment and one Social Development Coordinator. The coordinators will be of the rank of Assistant Engineer of PWD. At the district level, project will establish project implementation unit. One Assistant Engineer will be designated as Environmental and Social Officer. ESO will be responsible for coordinating with line departments at the district level and will also facilitate land purchase wherever required. In addition, a Non-Governmental Organization (NGO) having relevant experience in implementation of R & R projects will be contracted to provide assistance to Implementing Authority as well as affected persons. The process of hiring NGO is has been initiated. The district level committees will be set up to facilitate the finalization of replacement value and all grievances of the people. During implementation, the social development specialist of PMC will be responsible for day to day monitoring of RAP implementation. Project will hire independent consultants for mid-term and end term evaluation of RAP implementation. The roles and responsibilities of each of these players have been detailed out in corridor specific RAP. The resettlement action plan for each corridor will be implemented in two years.

The implementation of the EMP, pertaining to Civil Works, will be undertaken by the contractor. The contractor team is required to have an environmental and safety officer for day-to-day supervision of the works. They will also undertake periodic environmental monitoring to confirm the levels of pollution in the project area, especially where there are ongoing civil works, both along the roads, and in the contractors' camps. The PMC will supervise the implementation and keep the ESDRC informed regarding the progress in implementation, as well as any challenges/bottlenecks. The ESDRC will also coordinate with other departments like Forests, Health, and Education for components that are beyond the Civil works. Individual EMPs contain the Terms of Reference for each stakeholder that the PWD will be responsible for.

15.0 Grievance Redress Mechanism

An Integrated Grievance Redress Mechanism (IGRM) will be established at the head quarter level that will register user complaints using combination of various mediums (e.g. a dedicated toll free phone line, web based complaints, written complaints in feedback register and open public days) and address them in a time bound system. The project will appoint a Grievance Redress or Public Relation officer solely responsible for handling phone and web based complaints. The person will be responsible for directing the aggrieved person to the concerned official through e-mail. On receiving any phone call or web based or email, a unique number will be generated which will be the reference number for the caller and he can trace the progress of his grievance / query through that number. Any complaint lodged will be addressed within 15 days of receiving the complaint. System will have escalation matrix i.e. if grievance / query remain unattended or there is no response from the concern officer for specified period of time than system will escalate the grievance / query to next level through email. The toll free line will be monitored between 10 AM to 5.30 PM on all working days. Any call made before or after the stipulated time, will get recoded and from the voice mail an e- mail will be generated addressed to the grievance officer. The grievance officer will then direct that mail to the concerned official and follow-up. The recorded message will be responded back the next day. The project will also commit itself for proactive disclosure and sharing of

information with the key stakeholders, including the communities/beneficiaries. The website of PWD will have the name and number of social development officer; the toll free number and also the website address.

16.0 Consultations

A total of 25 local level consultations were carried out across all the four phase I corridors with the local community including project affected persons. The issues discussed included widening options; removal of encroachment; employment opportunities; shifting religious structures and other common properties; safety of women and children; compensation and drainage. The suggestion given by the community has informed project preparation and has been incorporated in the design and Resettlement Action Plans and EIA/EMP as appropriate. Such consultations will continue during the implementation phase as well.

17.0 Budget

Environment

The total budget for the environmental management plans for all 4 Phase I roads is slightly over INR 422.41 million. Tree plantation, including compensation at the rate of the Net Present Value of protected forest, is the largest component of the estimate. In addition, budgetary provision has been made for the enhancement of select locations along each road. Monitoring of pollution in both construction and operation phases has been included in the estimate. In addition, training of the staff has also been budgeted.

Social

The cost for implementation of RAP has been estimated at INR 160.6 million for all the four phase I corridors. The estimated budget covers the cost towards acquisition of private land in two corridors; R&R assistances, relocation / reconstruction of common property resources; gender action plan; administrative expense, monitoring and evaluation and contingencies.

Environmental and Social Management Framework

Executive Summary

Project Background

Uttar Pradesh has a road network of 299,604 km, out of which 174,451 km is under Uttar Pradesh Public Works Department (PWD). The roads under PWD comprise 7,550 km of National Highways (NHs), 7,530 km of State Highways (SHs), 5,761 km of Major District Roads (MDRs), 3,254 km of Other District Roads (ODRs) and 138,702 km of Village Roads (VRs). Only about 60% of SHs are two-lane (7 m). In the entire state 62% of MDRs and 83% of ODRs have widths less than 7 m.

The Core road development works will consist of raising the formation level, widening to a full two lanes from the existing single and intermediate lane widths, and/or pavement rehabilitation/strengthening. Road sections with high volumes of non-motorized traffic will be widened to 2-lane black top carriageway of 7.0 m width with 1.5m full paved shoulders on either side covering a total carriageway width of 10 m. Road stretches crossing urban areas may also require upgrading to a four lane cross section, and/or provision for drains, sidewalks and parking where required. In some cases, new alignments (by-passes and/or re-alignments) may also be required.

Rationale and Objective of Environmental and Social Management Framework (ESMF)

Except for the Sharda Bridge, for which design process is getting underway, the other upgrading / reconstruction and widening activities are generally well-understood. Given that the sub-project roads can be from anywhere in the Core Road Network spanning the entire state, this guiding framework is prepared to ensure that subsequent project activities have a common understanding of the environmental and social issues involved, and a harmonized approach to handling these issues is followed. This Environmental and Social Management Framework (ESMF) will be used to identify the environmental and social impacts of each sub-project and help design commensurate mitigation/enhancement measures as well as to assign the responsibility for implementation of these measures.

The overall goal of the ESMF is to ensure that decision making in subsequent stages of the project is informed and influenced by environmental and social considerations for each of the sub-projects, many of which are still to be identified. It aims to integrate environmental and social concerns into the project's design and implementation. In order to achieve this, main objectives of the ESMF are

- To establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the Project;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- To establish the Project funding required to implement the ESMF requirements; and
- To provide practical information resources for implementing the ESMF.

Study Methods

The ESMF for UPCRNDP has been prepared based on (i) rapid assessment of 4 sample project corridors; (ii) review of secondary data on different environmental and social components including regulatory frameworks, (iii) review of previous reports on environmental and social issues of the state of Uttar Pradesh in road sector, and (iv) consultation with different stakeholders. The objective of the above exercise was:

- To establish baseline environmental and social condition in the state at broad level
- To understand type and distribution of environmentally and socially sensitive features in the state

- Preliminary identification of environmental and social impacts likely to be triggered due to the project activities
- To assess the applicable regulations and policies

Environmental and Social Baseline

Uttar Pradesh is a northern State and located between 23°52'N and 31°28'N latitudes and 77°3' and 84°39'E longitudes. Garlanded by the Ganga and Yamuna, the two auspicious rivers of Indian mythology, Uttar Pradesh is surrounded by Bihar in the East, Madhya Pradesh in the South, Rajasthan, Delhi, Himachal Pradesh and Haryana in the west and Uttaranchal in the north and Nepal touch the northern borders of Uttar Pradesh. The State of Uttar Pradesh comprises an area of about 243,290 km² equal to 6.88% of the total area of India, and is the fourth largest Indian state by area. With over 200 million inhabitants in 2011, it is the most populous state in the country.

Physiography

The state can be divided into two physiographic regions: the central plains of the Ganges (Ganga) River and its tributaries (part of the Indo-Gangetic Plain), and the southern uplands. The vast majority of Uttar Pradesh lies within the Gangetic Plain, which is composed of alluvial deposits brought down from the Himalayas by the Ganges network. Most of this area is a featureless, though fertile plain varying in elevation from about 300 meters in the northwest to about 60 meters in the extreme east. The southern uplands form part of the highly dissected and rugged Vindhya Range, which rises generally toward the southeast.

Geology

The geological formation of the state is characterized by rock formations ranging in age from the Archean (the Bundelkhand Granitic gneisses) to the Recent (the Ganga alluvium). The Ganga plain which dominates the landscape and nearly covers three fourth of the geographical area of the State, lies between the rocky Himalayan belt in the north and the southern hilly tract comprised of mainly Pre-Cambrian rocks. It is filled with recent alluvial sediments which are at places more than 1,000m. thick and an amalgam of sand, silt, clay in varying proportions the southern hilly tract is roughly parallel to the Ganga-Yamuna lineament. The tract is underlain by granitic complex in Bundelkhand region and in Sonbhadra. It is overlain by rocks Mahakoshal (Bijawar) and Vindhyan Supergroup. The younger rock comprise of coal bearing Gondwana in south Sonbhadra and basaltic rocks in southern part of Lalitpur.

Seismic Zone: According to GSHAP data, the state of Uttar Pradesh falls in a region of moderate to high seismic hazard.

Soils

The dominant soil landscapes, representing the northern plains, constitute gently to very gently sloping lands. In some area the soil is highly calcareous. The soils in general are neutral in reaction and have moderate clay and low organic carbon content. Traditionally rain fed and irrigated agriculture is common. The main crops grown are rice, maize, pigeon pea, sorghum, pearl millet, moong beans during kharif and wheat, bengal gram, green peas, rapeseed and mustard and lentil during rabi season. Sugarcane is the main cash crop. Rice–wheat cropping system is more predominant.

Climate

Uttar Pradesh has a humid subtropical climate and experiences four seasons. The winter in January and February is followed by summer between March and May and the monsoon season between June and September. Summer Temperatures shoot upto 43 degree celcius and in winter the weather temperature oscillates between 12.5 and 17.5 degree celcius. The mean annual rainfall ranges from 650 mm in the southwest corner of the state to 1000 mm in the eastern and southeastern parts of the state. About 90% of the rainfall occurs during the southwest Monsoon, lasting from about June to September.

Drainage

The state is well drained by a number of rivers originating in either the Himalayas to the north or the Vindhya Range to the south. The Ganges and its main tributaries—the Yamuna, the Ramganga, the Gomati, the Ghaghara, and the Gandak are fed by the perpetual snows of the Himalayas. The Chambal, the Betwa, and the Ken, originating from the Vindhya Range, drain the southwestern part of the state before joining the Yamuna. The Sone, also originating in the Vindhya Range, drains the southeastern part of the state and joins the Ganges beyond the state. The Gangetic plain stretches across the entire

length of the state from east to west. The other two regions, the central and the western are comparatively better with a well-developed irrigation system. The Gangetic plain is watered by the Yamuna, the Ganges and its major tributaries, the Ramganga, the Gomati, the Ghaghra and Gandak. The Betwa and Ken rivers join the Yamuna from the south-west in this region.

Hydrogeology

Hydro-geologically, the States can be divided into Five units namely (1) Bhabar (2) Tarai (3) Central Ganga plains (4) Marginal Alluvial plains and (5) Southern Peninsular zone. The first one is in the extreme north followed successively by the rest southwardly. The yield of tube wells tapping Bhabar and Tarai zones ranges between 100-300 m³/hr and 100-200 m³/hr, respectively. The water level is deep in Bhabar where as in Tarai auto flow conditions are noticed with piezometric head of 6-9 magl. The Central Ganga plain is characterized by low relief and numerous alluvial features. There are four major aquifers in the depth range of 700 mbgl. The yield of these tube wells ranges from 90 to 200 m³/hr. The thickness of sediments in Marginal alluvium is 50-300 m and yield of tube wells is between 35 to 70 m³/hr. The yield prospects of Vindhyan & Crystalline rocks in the southern peninsular region are limited.

Environmental Quality

Ambient Air Quality

In general the state suffers from high dust problem. The state pollution control board conducts regular monitoring of ambient air quality in major towns of the state. The annual average ambient air quality in 2012 suggests that in all the major towns/cities, the concentration of PM₁₀ was higher than the prescribed limit. Kanpur, Ghaziabad, Firozabad, Bareilly and Allahabad were among the most polluted cities as per the monitoring results of 2012. The concentrations of SO₂ and NO₂ in the air were found within the prescribed limit.

Water Quality

The monitoring of surface water quality for different surface water sources including major rivers and ponds are regularly conducted by the U.P. State Pollution Control Board. Almost all the surface water bodies, from where water samples were collected, show high biological contamination in terms of Total Coliforms.

Ecological Resources

Forests

The state has an abundance of natural resources. In 2013, the recorded forest area in the state was 14,349 km² which is about 5.96% of the state's geographical area. As per Indian State of Forest Report 2013, the total forest cover in Uttar Pradesh is 14,349 km². Out of this very dense forest is 1,623 km², moderately dense forest covers 4,550 km² and open forest covers 8,176 km². Out of the total forest cover, 70.31 percent of the forest cover is Reserve Forest, 8.75 percent area is Protected Forest and rest 21.12 percent is Unclassed Forests. The existing forests in Uttar Pradesh can be classified into three categories: (i) wet tropical deciduous forests (ii) dry tropical deciduous forests and (iii) tropical thorny forests.

Roadside Trees

The predominant tree species along roads are neem, teak, shisham, babul and eucalyptus. Apart from this mango, peepal, ornamental trees like gulmohar, amaltas, *Acacia auriculiformis*, etc are prominent species. In most of the roads forest department has planted trees. In Uttar Pradesh, linear plantation along National Highways, State Highways and Canals within right of way has been declared as Protected Forests. Hence, felling of trees within existing ROW will attract provisions of Forest Conservation Act, and case documentation for diversion of forest area for non- forest purpose will applicable required.

Fauna

Uttar Pradesh has vivid fauna and flora. The fauna of UP consists Tigers, Cats, Antelopes, Deer, Wild Boars, Elephants, Rhinos and other animals that are common in basin. Chinkara, Sambar and Chital, Neel Gai, Swamp Deer, Hispid Hare and Bengal Floricans, Black Buck are the other common wild animals found in different forests of Uttar Pradesh.

The avian population here comprises a mix of residents as well as migratory birds. Some of the major migratory birds during the season are greylag goose, pintail, cotton teal, red-crested pochard, gadwall, shoveler, coot and mallard. Some major local migratory and residential birds are spotwill, Sarus crane, painted stork, peacock, white ibis, dabchick, whistling teal, open-bill stork, white-necked stork, pheasant-tailed jacana, bronze winged jacana, purple moorhen, lapwing, tern vulture, pigeon, king crow, Indian roller and bee-eater. Uttar Pradesh has one National Park and 23 Wildlife Sanctuary covering a total

area of 5712 sq Km, which contributes 2.37 percent of the state's geographical area. The state is dotted with a number of natural wetlands. Some of them are having significant ecological importance and protected. Out of total wetlands of Uttar Pradesh, Brijghat to Narora Stretch of Upper Ganga River extended in Hapur and Bulandshahar districts is among the 26 Ramsar site Indian wetlands deemed to be of "international importance" under the Ramsar Convention.

Social Profile

Uttar Pradesh constitutes one of the largest states in India and the state itself represents one of the largest self-governing areas in the world in terms of population. The State of Uttar Pradesh, whilst fourth largest in India in geographical land area, has a population that is estimated to be of the order of 195 million people, a figure superseded by only six countries in the world. It covers 93,933 square miles (243,290 km²), equal to 6.88% of the total area of India. Hindi is the official and most widely spoken language in its 75 districts. Agriculture and service industries are the largest parts of the state's economy. According to the Uttar Pradesh Census 2011, the density of population in Uttar Pradesh is about 800 people per square kilometer which is way above the national average of about 380 and a major cause of concern. Hinduism is the dominant religion in Uttar Pradesh, followed by a majority of 80% people. Muslims forms the second largest community with a population of 18.4%. Rest of the population follows Sikhism, Buddhism, Christians and Jains. The scheduled castes are 17.5 % of the total population whereas scheduled tribes are less than 2 % of the total population. The literacy rate in the state has gone up in recent years and yet continues to linger at about 70% which is below the national average of 74%. The sex ratio is almost at par with the national average and stands at about 900. The land-use pattern in UP is predominantly agriculture based

Economic Profile

Uttar Pradesh is a major contributor to the national food grain stock. Partly this is due to the fertile regions of the Indo-Gangetic plain and partly owing to irrigation measures such as the Ganges Canal and tube-wells. Lakhimpur Kheri is a densely populated sugar producing district in the country. It is also home to 78% of national livestock population. Uttar Pradesh supports about 15% of India's total livestock population of its livestock in 1961, 15% were cattle, 21% buffaloes, 13% goats and 8% other livestock. Between 1951 and 1956 there was an overall increase of 14% in the livestock population. There are about 8,000 km² of water area, including lakes, tanks, rivers, canals and streams. The work participation rate for total workers is defined as the percentage of total workers to total population. In a similar way it is defined for main and the marginal workers. The main workers are distributed in nine industrial categories of economic activities as per 2011 census.

ENVIRONMENTAL AND SOCIAL REGULATIONS AND POLICY FRAMEWORK

India has developed a fairly comprehensive regulatory framework to address environmental and social concerns in relation to development projects. Its wide ranging enactments cover almost all major issues that need to be addressed in the course of development of infrastructure from a social and environmental perspective.

Key Environmental and Social Laws and Regulations

Table below presents Environmental and Social Regulations and Legislations relevant to this project, which are the responsibility of a number of government agencies. This is followed by salient features of important regulations and acts.

Summary of Relevant Environmental and Social Legislations

Acts/Rule/Policy	Year	Objective	Applicability to this Project	Responsible Agency
Environmental (Protection) Act	1986	To protect and improve the overall environment.	Yes, all environmental legislation is covered in this umbrella Act	MoEFCC GoI; CPCB; UP State Pollution Control Board
Environment	2006	To provide	Yes. Applicable Only for	State

Acts/Rule/Policy	Year	Objective	Applicability to this Project	Responsible Agency
Impact Assessment Notification		environmental clearance to new development activities following environmental impact assessment	State Highways located in Eco-sensitive Zone	Environmental Impact Assessment Authority(SEIAA)
Indian Forest Act The Forest (Conservation) Act The Forest (Conservation) Rules	1927 1980 1981	To check deforestation by restricting conversion of forested areas into non forested areas.	Yes, both in case of acquisition of Reserved Forest Area or Roadside Trees as Protected Forest	Forest Department, Govt. of UP (for land conversion below 5 hectare & 40% density), MoEF, Regional Office and MoEF.
Wild Life (Protection) Act	1972	To protect wildlife through certain of National Parks and Sanctuaries.	Yes. Only for the project either located inside the boundary of Wildlife Sanctuary or National Park/Tiger reserves. State Highways passing through Eco sensitive zone outside the boundary of Wildlife Sanctuary/ National Parks will also need recommendation of NBWL.	Chief Conservator. Wildlife, Wildlife Wing, Forest Department, Gov. of U.P. and National Board For Wildlife, Gol.
National Forest Policy National Forest Policy (Revised)	1952 1988	To maintain ecological stability through preservation and restoration of biological diversity.	Yes For clearing of forest/ felling of Trees	Forest Department, Gol and Govt. of U.P.
Water (Prevention and Control of Pollution) Act	1974	To control water pollution by controlling	Yes. Forest establishment and operation of Hot Mix/ Stone	UPPCB

Acts/Rule/Policy	Year	Objective	Applicability to this Project	Responsible Agency
		discharge of pollutants as per the prescribed standards.	crusher/WMM/Batching Plants during construction, etc	
Air (Prevention and Control of Pollution) Act	1981	To control air pollution by controlling emission of air pollutants as per the prescribed standards.	Yes. Forest establishment and operation of Hot Mix/ Stone crusher/WMM/Batching Plants during construction, etc	UPPCB & Transport Department.
Central Motor Vehicle Act Central Motor Vehicle Rules	1988 1989	To check vehicular air and noise pollution.	Yes. For construction vehicles	Motor Vehicle Department,
Ancient Monuments and Archaeological Sites and Remains Act	1958	Conservation of cultural and historical remains found in India.	Yes. For the project located within 300 m from such features	Archaeological Dept. GOI, Indian Heritage Society and Indian National Trust for Art and Culture Heritage (INTACH).

Acts/Rule/Policy	Year	Objective	Applicability to this Project	Responsible Agency
Right to fair compensation and transparency in land acquisition, rehabilitation and Resettlement Act	2013	Fair compensation for acquisition of immovable assets; Resettlement of displaced population due to LA and economic rehabilitation of all those who are affected due to land acquisition.	Yes. In case of acquisition of land	Revenue Department. Govt. of U.P.
Seventy Third Constitution Amendment Act,	1992	The Act enables participation of Panchayat level institutions in decision-making by broadening the village level functions, supporting implementation of development schemes. The Act provides for involvement of the PRIs especially, the Gram Sabha/ Panchayat during project preparation and implementation. The Panchayats at the village level will be involved for preparation and implementation of the project.	Yes, especially for any sub project located in panchayat area	Department of Panchayati Raj, Government of Uttar Pradesh
The Scheduled Tribes and other	2006	Grants legal recognition to	Yes, if project road passes through	Ministry of Tribal Affaires, GOI and

Acts/Rule/Policy	Year	Objective	Applicability to this Project	Responsible Agency
Traditional Forest Dwellers (Recognition of Forest Rights) Act		the rights of traditional forest dwelling communities, partially correcting the injustice caused by the forest laws. Makes a beginning towards giving communities and the public a voice in forest and wildlife conservation	customary forest land including reserved and protected forests; protected areas and also community forest.	Department of Tribal Welfare, GoUP

Summary of Statutory Clearance/Permits Requirement

The project requires a number of statutory clearances under different Acts and Rules at different stage of the project.

Summary of Statutory Clearance Requirement of the Project

S. No.	Type of Clearance/Permits	Applicability	Project Stage	Responsibility	Time Required
1.	Environmental Clearance	Prior Environmental Clearance for State Highways Located at 1000 m above mean sea level and/or located in eco-sensitive zone	Pre-Construction	PIU, UP PWD	11-12 months
2.	Forest Clearance for land diversion	For diversion of forest land including Reserved Forest and Protected Forest	Pre Construction	PIU, UP PWD	6-8 months
3.	Tree felling permission	For roadside tree cutting	Pre construction	PIU, UP PWD	1-2 months

S. No.	Type of Clearance/Permits	Applicability	Project Stage	Responsibility	Time Required
4.	NOC and consents under Air & Water Act from SPCB	For Project Alignment for the State Highway Expansion project requiring environmental clearance	Pre- Construction	PIU, UP PWD	2-3 months
5.	NOC (Consent to Establish and Consent to Operate) under Air and Water Act from SPCB	For siting and erection of stone crusher and Hot Max Plants, WMM and Batching plants etc.	Construction Stage (Prior to erection and operation of Plants)	Contractor	2-4 months
6.	Explosive License from Chief Controller of Explosives,	For storing fuel oil, lubricants, diesel etc.	Construction stage (Prior to storing fuel, lubricants and Diesel, etc.)	Contractor	2-3 months
7.	Permission for storage of hazardous chemical from CPCB	Manufacture storage and Import of Hazardous Chemical	Construction stage (Prior to initiation of any work)	Contractor	2-3 months
8.	Quarry Lease Deed and Quarry License from State Department of Mines and Geology	Quarry operation	Construction stage (Prior to initiation of Quarrying)	Contractor	2-3 months
9.	Environmental Clearance for stone quarry from State environmental Impact Assessment Authority, U.P.	Opening of new Quarry and Borrow area for earth material	Construction stage (Prior to initiation of Quarrying)	Contractor	5-6 months
10.	Permission for extraction of	Extraction of ground	Construction stage (Prior to initiation	Contractor	1-2 months

S. No.	Type of Clearance/Permits	Applicability	Project Stage	Responsibility	Time Required
	ground water for use in road construction activities from State Ground Water board	water	of installation of Bore wells and abstraction of water from such source)		
11.	Permission for use of water for construction purpose from irrigation department	Use of surface water for construction	Construction stage (Prior to initiation of abstraction of water from such source)	Contractor	1-2 months
12.	Labour license from Labour Commissioner Office	Engagement of Labour	Construction stage (Prior to initiation of any work)	Contractor	2-3 months

World Bank Safeguard Policies

Projects financed with World Bank assistance should comply with World Bank Operational Policies. The World Bank has Environmental and Social Safeguard Policies to reduce or eliminate the adverse effects of development projects.

Safeguard Policies of World Bank

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
OP 4.01 Environmental Assessment	The objective of this policy is to ensure that Bank financed projects are environmentally sound and sustainable	The environmental issues will be addressed adequately in advance. An integrated Environmental Screening and Environmental Assessment (EA) with Environmental Management Plan (EMP) will be developed to manage environmental risks and maximize environmental and social benefits wherever it is applicable.	EIA and/or EMP required.

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
<p>OP 4.04 Natural Habitats</p>	<p>The policy recognizes that the conservation of natural habitats is essential for long-term sustainable development. The Bank, therefore, supports the protection, maintenance and rehabilitation of natural habitats in its project financing, as well as policy dialogue and analytical work.</p> <p>The Bank supports and expects the Borrowers to apply a precautionary approach to natural resources management to ensure environmentally sustainable development</p>	<p>This policy may be triggered by the Project due to improvement activity of road requiring forest/ wildlife lands, locating close to the natural habitats with the potential to cause significant adverse impact or degradation of natural habitats whether directly (through construction) or indirectly (through human activities induced by the project).</p>	<p>EIA and EMP required</p>
<p>OP 4.36 Forests</p>	<p>This policy focuses on the management, conservation, and sustainable development of forest ecosystems and resources. It applies to project that may have impacts on</p> <p>(a) health and quality of forests;</p> <p>(b) affect the rights and welfare of people and their level of dependence upon forests and projects</p>	<p>Impact of widening /construction activities on Forest areas required to be taken care of. Generally diversion of reserve forest will be avoided, however the roadside trees along state highways being declared as protected forest, road side tree felling will attract the provision of Forest (Conservation) Act. The forest related issues, avoidance/ minimization of forest loss and its management should be integrated with EA study and</p>	<p>Forest land diversion Application has to be prepared and submitted to forest department. The issue of forest loss and its mitigation/compensatory measures is required to be integrated in EIA study and EMP.</p>

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
	that aim to bring about changes in the management, protection or utilization of natural forests or plantations, whether they are publicly, privately or community owned. The Bank does not support the significant conversion or degradation of critical forest areas or related critical natural habitats.	EMP.	
OP 4.09 Pest Management	The objective of this policy is to promote the use of biological or environmental control methods and to reduce reliance on chemical pesticides.	Pest / Vector management involvement in UPCRNDP is not likely.	Not Applicable
OP/BP 4.12 Involuntary Resettlement	The objective of this policy is to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs. Furthermore, it intends to assist displaced person in improving their former living standards; community participation in planning and implementing resettlement; and to provide assistance to affected people,	There will be need for limited land acquisition for certain project corridors resulting in: relocation or loss of shelter; loss of assets or access to assets; loss of income sources or means of livelihood.	Resettlement Action Plan in consultation with the community and project authorities

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
	regardless of the legality of title of land		
OP 4.10 Indigenous People	This policy aims to protect the dignity, right and cultural uniqueness of indigenous people; to ensure that they do not suffer due to development; that they receive social and economic benefits	This policy may be triggered if there are indigenous people in the project area; when potential adverse impacts on indigenous people are anticipated; and if indigenous people are among the intended beneficiaries.	Indigenous people development Plan
OP/BP 4.11 Physical Cultural Resources	This policy aims at assisting in the preservation of cultural property, historical, religious and unique natural value-this includes remains left by previous human inhabitants and unique environment features, as well as in the protection and enhancement of cultural properties encountered in Bank-financed project.	This policy may be triggered by sub-projects under UPCRNDP in those areas where cultural property, historical, religious and unique natural value-this includes remains left by previous human inhabitants and unique environment features may be affected during widening and strengthening work of the sub-projects.	Application has to be prepared and submitted to Archeological department in case any impact is envisaged due to widening of the project. The impact on such features should be integrated with EIA study and included in EMP

Relevant Provisions within Standard Specifications

The Ministry of Road Transport & Highways (MoRT&H) specifications that govern road and bridges construction in India also cover environmental aspects of the works. Specifically, Section 111 on Protecting the Environment, and Annexure A to Clause 501 which covers pollution aspects directly address environmental issues. Several other stipulations require works to be executed with care for environmental and social aspects. These include: stipulation of topsoil conservation (Clause 301 and 305), safety during construction (Clause 302 for blasting and 304 for excavation) and also safety for operation stage (Section 810), maintenance of existing amenities and facilities during clearing and grubbing (Clause 201), precautions during river training works (Clause 2501), location of borrow areas

(Clause 305), soil erosion and control measures (Clause 306 and provision of geotextiles under Clause 702), recycle and reuse of existing pavement (Section 517) and also provision of turfing (Clause 407).

ENVIRONMENT MANAGEMENT FRAMEWORK

Environmental and Social Management Framework (ESMF) is devised as a tool for use by UPPWD to identify and address the potential environmental and social concerns or impacts of a project right from the planning stage to its implementation and post-implementation operations. The objective the ESMF is to mainstream environmental and social considerations with other project documents in the planning, execution and post-execution stages in order to ensure that environmental and social concerns are adequately taken care of in all these stages.

Environmental Assessment Process

The project will use a structured approach to environmental management to allow the project development process, follow the hierarchy of avoidance, minimization, compensation/mitigation for negative impacts and enhancement of positive impacts where practically feasible and advantageous. Following sections describe what needs to be done at each stage of the overall project life – sub-project selection, design of the project supported interventions, implementation of the project activities, and reporting on progress.

Sub-project Selection/Screening

This step will involve review of the available environmental information about the project road and its surrounding areas. It would help identify issues to be verified during reconnaissance site visits and also provide a preliminary idea regarding the nature, extent, and timing of environmental issues that would need to be handled during the subsequent stages. It will also help identify opportunities for avoidance and/or minimization early in the project cycle so that the design process can be informed appropriately. The steps to be followed include the following:

- Confirm the presence of environmentally sensitive areas from secondary sources or site observations
- Verify the extent of applicability of GoUP, Gol, and World Bank policies in sub-project activities
- Identify potential negative and positive impacts and provide clarity on which issues need to be investigated more comprehensively during preparation of Environmental Impact Assessment that will be done during the Design stage.
- This should help with sequencing of sub-projects, and factoring in timelines like those associated with regulatory clearance processes into project implementation.

Environmental Impact Assessment (EIA)

The EIA is the most commonly used tool to ensure that environmental aspects are considered during decision making – by influencing design to avoid /minimize, and where unavoidable mitigating the residual adverse impacts and/or enhancing positive impacts. It also provides a platform for getting views from stakeholders including the directly affected population to improve the design so that the asset quality is improved. Detailed guidance regarding the EIA contents is available in the OP4.01 of World Bank and more sector specific guidance is provided by the MoEF's EIA Guidance Manual for Highways. EIA includes the following:

- Overview of the sub-project – its location, proposed improvements, along with a map, its benefits, costs and implementation schedule for all activities
- Characteristics of the existing environment (baseline) of the alignment, within the broader region through which it passes
- Description of potential impacts – both positive and negative, with quantified estimates where possible, otherwise qualitative judgments
- Analysis of alternatives available to minimize negative impacts and maximize positive ones, including changes to alignment, materials, technologies, etc.
- Consultations undertaken, including in project area with affected people, and with other line departments
- Management measures selected to reduce the adverse impacts and increase positive impacts, monitoring and reporting arrangements, and capacity building needs if any, along with costs of

each as a management plan including roles and responsibilities of various actors – UPPWD, consultants, and contractors, and other arms of GoUP, where appropriate

- Conclusion regarding the completeness of analysis and need for any follow-on study other beyond monitoring of predicted impacts

Preparation of Environmental Management Plan

The EMP should be sub-project specific, clearly and concisely describing adverse impacts, selected management measures to bring it to an acceptable level and timelines for implementing these measures. It should also clarify roles and responsibilities among the various stakeholders – UPPWD, PMC, Contractors, and other GoUP departments. It would be useful if contract specific EMPs are prepared as this would facilitate integration with the bidding documents. The building blocks of an EMP are:

- Potential Adverse Impacts Identified and Mitigation measures to be adopted, together with conditions within which one or other measure would apply and their integration with phases operations of road construction – Design, Pre-construction, Construction/ Implementation and Operation
- Enhancement plans for positive impacts
- Monitoring Plan with indicators, mechanisms, frequency, locations,
- Budgetary allocations for all the above activities
- Institutional arrangements for each activity and mitigation measures
- Implementation schedules for each activity and its integration with the sub-project implementation timelines
- Reporting procedures, including for redressing grievances related to environmental issues

Potential Environmental Impacts

Based on the information available about the 4 roads studied for the development of the ESMF, several important issues have been identified that would need to be evaluated in the context of each sub-project following screening and scoping exercises. A summary of the issues, and potential impacts is presented in the following paragraphs to guide preparation of upcoming EIA and EMPs as more roads get identified.

Impacts on Forests and Wildlife

Direct loss of Forest land is possible where sufficient RoW is not available in some stretches. This will result in removal of trees, increased dust in those areas, soil characteristics changes, etc. In such cases, minimization of forest land, which is quite scarce in UP is a chosen strategy. Clearance under the Forest (Conservation) Act, 1980 would be taken in each case and to that extent compensatory afforestation through Forest Department is expected. Once such roads are identified through screening, the EIA will pay special attention to analysis of alternatives that can reduce impacts on Forests and Wildlife.

Material Use

The use of stone, earth, sand, water can be stress on the natural resource base. This can be an important concern with respect to stone since this is a scarce material in the alluvial plains that form majority of the state. Unmitigated borrowing of earth and sand from rivers has the potential to have irreversible impacts. Use of other chemicals – bitumen, fuels, and hazardous substances has the potential of safety hazards, as well as pollution of the land and water in case of indiscriminate disposal or spillage due to negligence/accident.

Changes to water flow due to Road Level/Alignment Changes

Flooding or erosion due to the raising of levels of road in the flat areas of Uttar Pradesh is possible. Especially for sections that are frequently overtopped, raising can cause flooding and/or erosion and can make roadsides very unsafe, especially during monsoon. Debris management can be an issue in stretches where the entire pavement is to be removed since very few suitable disposal areas may be available. Consideration of climate change related aspects should also be integrated here since it may affect the final design of drainage structures, for example.

Impacts on Water Bodies

There could be loss of volume if the road expansion requires building embankments in waterbodies and would be a permanent loss like agricultural or forest land lost. Deterioration in water quality is also possible during earthworks, if proper care is not taken. Spills of material during construction can also impact water quality.

Contractors' Camp and Plant Sites

Improper siting of these elements could cause stress on the local infrastructure, may also cause social friction if the host communities feel that their resources are being used by 'outsiders'. Pollution for the duration of the project implementation from construction plants is also potential adverse impact that needs to be planned for in advance.

Air Pollution

Increase in noise level during construction has the potential to disturb many people. There may be schools or hospitals or other such locations like places of worship where permanent noise increase may follow road upgradation. Temporary or permanent increase in air pollution levels with regard to local pollutants like Particulate Matter and global pollutants like GHG emissions is also identified as one of the key negative impacts that would need to be suitably mitigated.

Demolition Waste

Where waterway crossings need realignments, demolition of structures is required. If dismantled structures are not disposed-off properly, they cause waterlogging/obstruction in waterways.

Safety

One of the project components aims to improve safe conditions along project roads. It will therefore strive to ensure that roadsides are safer and people and animals have safe passages across improved roads where speeds will increase. Access to road side resources would need to be protected for continued use. For workers, like those working high structures like bridge across the river Sharda, occupational safety concerns would also need to be addressed.

Other Project Benefits

The improved connectivity provided by upgraded roads is expected to benefit the road users. It is expected to provide economic opportunities to a large section of the rural population of UP. The overall long term benefits would likely outweigh the short term, mostly construction related negative impacts since majority of the improvements are likely to be within the Right of Way already with UPPWD. Better access to education facilities, as well as health facilities will improve the well-being of roadside dwellers. Local businesses will also benefit from the increased activities along the sub-project roads.

SOCIAL MANAGEMENT FRAMEWORK

This ESMF defines (a) the approach for identifying the social issues associated with the project, (b) the requirements for conducting social screening and social assessment studies, and (c) measures to prevent, mitigate and manage adverse impacts and enhance positive ones. This SMF includes a simplified screening checklist, which will be used to determine the degree of social assessment. Based on screening results, Social Impact Assessment (SIA) will be carried out and Resettlement Action Plan (RAP) and Indigenous Peoples Development Plan (IPD)) for specific initiatives will be prepared if required. This SMF includes a resettlement policy framework describing mechanisms for addressing the possible temporary disruption of services and income (e.g., temporary displacement of informal vendors), and temporary restrictions on access to facilities while the construction work is ongoing in the project area. The SMF includes guidance on preparing of indigenous peoples development plan, gender action plan; consultation mechanism; capacity building measures and a monitoring mechanism.

Social Issues

The social screening and initial impact assessment of the four (4) candidate roads identified following social impacts:

- Loss of agricultural land in case of private land acquisition;
- Loss of structures used for residential, commercial and other purposes and associated loss of livelihood i.e., loss of livelihood due to impacts on sources of earning;
- Loss of other properties and assets such as boundary walls, hand pumps, bore wells, dug wells, ponds etc.;
- Disruption of livelihood due to clearing of RoW particularly, petty shop owners, squatters and encroachers;
- Loss of common property resources such as religious places, Samadhi, graveyard, cremation places, water resources, village gates, passenger shelters, etc;
- Likelihood of increased accidents due to road widening;

- Traffic blocks disrupting lives of people due to the landslides after heavy monsoon. Cutting of slopes may trigger landslides causing loss of assets and access in hilly sections;
- Likelihood of spread of HIV/AIDS among construction workers and road side community.

Social Screening Process

Identification of Impacts

The purpose of screening is to get an overview of the nature, scale and magnitude of the issues in order to determine the need for conducting Social Impact Assessment (SIA) and preparing Resettlement Action Plan (RAP). After identifying issues, the applicability of the Bank's environment and social safeguard policies is established along with Government of India's and state government's regulatory requirements. Based on this, boundaries and focus areas for the SIA along with the use of specific instruments will be determined. The possibility of any adverse impact in the sub-project site will be identified during the screening process. The screening format has been designed to identify sub-project/s with potential social issues that may need to be addressed at the project planning stage.

Establishing Impacts

Having identified the potential impacts of the relevant sub-projects, the next step is to develop action plans to mitigate the impacts. This will require detailed social impact assessment. The Consultant along with Project authority will undertake a survey for identification of the persons and their families likely to be affected by the project.

Sub-Project Approval

In the event that a subproject involves land acquisition against compensation or loss of livelihood or shelter, UP PWD shall:

- not approve the subproject until a satisfactory RAP has been prepared and shared with the affected person and the local community; and
- not allow works to start until the compensation and assistance has been made available in accordance with the framework.

Resettlement Action Plan (RAP)

RAP provides a link between the impacts identified and proposed mitigation measures to realize the objectives of involuntary resettlement. The RAPs will take into account magnitude of impacts and accordingly prepare a resettlement plan that is consistent with this framework for Bank approval before the sub-project is accepted for Bank financing.

- Sub-projects that will affect more than 200 people due to land acquisition and/or physical relocation and where a full Resettlement Action Plan (RAP) must be produced.
- Sub-projects that will affect less than 200 people will require an abbreviated RP (Resettlement Plan).
- The above plans will be prepared as soon as subproject is finalized, prior to Bank's approval of corresponding civil works bid document.
- Projects that are not expected to have any land acquisition or any other significant adverse social impacts; on the contrary, significant positive social impact and improved livelihoods are exempted from such interventions.

Resettlement Policy and Land Acquisition Framework

The guidelines are prepared for addressing the issues limited to this project for resettlement and rehabilitation of the PAPs. This policy has been developed based on the Right to Fair Compensation and transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013 subject to subsequent supplements by GoUP orders and World Bank Operational Policy 4.12 on involuntary resettlement.

R & R Benefits for Project Affected Families

The resettlement and rehabilitation (R&R) benefits shall be extended to all the Project Affected Families (PAF) whether belonging to below poverty line (BPL) or non-BPL. The details are provided in the entitlement matrix (Table 5.1 below). For tribal households, following provisions will be adhered.

- Each Project Affected Family of ST category shall be given preference in allotment of land.
- Tribal PAFs will be re-settled close to their natural habitat in a compact block so that they can retain their ethnic/linguistic and cultural identity

- The Tribal Land Alienated in violation of the laws and regulations in force on the subject would be treated as null and void and the R&R benefits would be available only to the original tribal land owner.

Table 0.1: Entitlement Matrix

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
A. Loss of Private Agricultural, Home-Stead & Commercial Land				
1	Land within the Corridor of Impact (COI)	Titleholder family. and families with traditional land Right	Compensation at Market value, Resettlement and Rehabilitation	<ul style="list-style-type: none"> • Land for land, if available. Or, Cash compensation for the land at Market value, which will be determined as provided under section 26 of RFCTLARR Act 2013. • The land if allotted will be in the name of both husband and wife. • If post acquisition, residual land is economically unviable, the land owner will have the choice of either retaining or sell off rest of the land. • Refund of stamp duty and registration charges incurred for replacement land to be paid by the project; replacement land must be bought within a year from the date of payment of compensation to project affected persons. • Subsistence allowance of Rs. 36000 as one time grant • One time grant of Rs. 500,000 or annuity • Compensation at market value for loss of crops if any
B. Loss of Private Structures (Residential/Commercial)				
2	Structure within the Corridor of Impact (Col)	Title Holder/ Owner	Compensation at Market value, Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> • Cash compensation for the structure at replacement value which would be determined as per as per section 29 of the RFCTLARR Act 2013. House under Indira Awas Yojna in rural area or Rs. 50000 in lieu off and house under Rajiv Awas Yojana in urban area or Rs 100,000 in lieu off. The house if allotted will be in the name of both husband and wife. • Right to salvage material from the demolished structures. • Three months' notice to vacate structures. • Refund of stamp duty and registration charges for purchase of new alternative houses/shops at prevailing rates on the market value as determined in (a) above. Alternative houses/shops must be bought within a year from the date of payment of compensation. • In case of partially affected structures and the remaining structure remains viable, additional 10% to restore the structure. In case of partially affected structures and the remaining structure becomes unviable additional 25% of compensation amount as severance allowance. • Subsistence allowance equivalent to Rs. 36000 as one time grant. • Each affected family getting displaced shall get a one-time financial assistance of Rs 50,000 as shifting

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
				<p>allowance.</p> <ul style="list-style-type: none"> Each affected family that is displaced and has cattle, shall get financial assistance of Rs 25,000/- for construction of cattle shed. One time grant of Rs. 50,000 as resettlement assistance Each affected person who is a rural artisan, small trader or self-employed person and who has been displaced (in this project owner of any residential-cum commercial structure) shall get a one-time financial assistance of Rs 25,000/-for construction of working shed or shop. One time grant of Rs. 500,000.
3	Structure within the Corridor of Impact (Col)	Tenants/ Lease Holders	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Registered lessees will be entitled to an apportionment of the compensation payable to structure owner as per applicable local laws. In case of tenants, three months written notice will be provided along with Rs. 50,000 towards shifting allowance.
C. Loss of Trees and Crops				
4	Standing Trees, Crops . within the Corridor of Impact (Col)	Owners and beneficiaries (Registered/ Un-registered tenants, contract cultivators, leaseholders & sharecroppers	Compensation at market value	<ul style="list-style-type: none"> Three months advance notice to project affected persons to harvest fruits, standing crops and removal of trees. Compensation to be paid at the rate estimated by: <ul style="list-style-type: none"> The Forest Department for timber trees The State Agriculture Extension Department for crops The Horticulture Department for fruit/flower bearing trees. Registered tenants, contract cultivators & leaseholders & sharecroppers will be eligible for compensation for trees and crops as per the agreement document between the owner and the beneficiaries. Un-registered tenants, contract cultivators, leaseholders & sharecroppers will be eligible for compensation for trees and crops as per mutual understanding between the owner and the beneficiaries.
D. Loss of Residential/ Commercial Structures to Non-Titled Holders				
5	Structures within the Corridor of Impact (Col) or Government land	Owners of Structures or Occupants of structures identified as per Project Census Survey	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Non vulnerable encroachers shall be given three months' notice to vacate occupied land Vulnerable encroachers will be provided cash assistance at replacement cost for loss of structures as described in section 29 of the RFCTLARR Act 2013. Any encroacher identified as non-vulnerable but losing more than 25% of structure used will be paid cash assistance at replacement cost for loss of structures. The amount will be determined as per section 29 of the RFCTLARR Act 2013.

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
				<ul style="list-style-type: none"> All squatters to be paid cash assistance for their structures at replacement costs which will be determined as mentioned in section 29 of the RFCTLARR Act 2013. All squatters (other than kiosks) will be eligible for one time grant of Rs 36000 as subsistence allowance. All squatters other than Kiosks will be given shifting allowance of Rs 50,000 per family as one time grant for a permanent structure and Rs. 30,000 for a semi-permanent structure and Rs. 10,000 for a temporary structure. Each affected person who is a rural artisan, small trader or self-employed person assistance' of Rs 25,000/- for construction of working shed or shop. In case of Kiosks, only Rs. 5000 will be paid as one time grant.
E. Loss of Livelihood				
6	Families living within the Corridor of Impact (Col)	Title Holders/ Non-Title holders/ sharecroppers, agricultural labourers and employees	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> Subsistence allowance of Rs. 36,000 as one time grant. (PAPs covered under 1(f), 2 (f) and 5 (e) above would not be eligible for this assistance). Training Assistance of Rs 10,000/- for income generation per family. Temporary employment in the project construction work to project affected persons with particular attention to vulnerable groups by the project contractor during construction, to the extent possible.
F. Additional Support to Vulnerable Families				
7	Families within the Corridor of Impact (Col)	SC, ST, BPL, WHH families	Resettlement & Rehabilitation Assistance	<ul style="list-style-type: none"> One time additional financial assistance of Rs. 50,000. Squatters and encroachers already covered under clause 5 are not eligible for this assistance.
G. Loss of Community Infrastructure/Common Property Resources				
8	Structures & other resources (e.g. land, water, access to structures	Affected communities and groups	Reconstruction of community structure and • common property resources	<ul style="list-style-type: none"> Reconstruction of community structure and Common property resources in consultation with the community.

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
	etc.) within the Corridor of Impact (Col)			
H Temporary Impact During Construction				
9	Land & assets temporarily impacted during construction	Owners of land & Assets	Compensation for temporary impact during construction e.g. diversion of normal traffic, damage to adjacent parcel of land / assets due to movement of heavy machinery and plant site.	<ul style="list-style-type: none"> • Compensation to be paid by the contractor for loss of assets, crops and any other damage as per prior agreement between the 'Contractor' and the 'Affected Party'.
J. Resettlement Site				
10	Loss of residential structures	Displaced titleholders and non-titleholders	Provision of resettlement site/ vendor market	<ul style="list-style-type: none"> • Resettlement sites will be developed as part of the project, if a minimum of 25 project displaced families opt for assisted resettlement. Vulnerable PAPs will be given preference in allotment of plots/flats at the resettlement site. Plot size will be equivalent to size lost subject to a maximum of provision given in RFCTLARR Act 2013. Basic facilities shall be provided by the project at resettlement site as per the provisions given in the Third Schedule of RFCTLARR Act 2013. Similarly, if at least 25 displaced commercial establishments (small business enterprises) opt for shopping units, the Project Authority will develop the vendor market at suitable location in the nearby area in consultation with displaced persons. Basic facilities such as approach road, electricity connection, water and sanitation facility, will be provided in the vendor market by the project. Vulnerable PAPs will be given preference in allotment of shops in vendor market. One displaced family will be eligible for only one land plot at resettlement site or shop in the vendor market.

INDIGENOUS PEOPLES DEVELOPMENT FRAMEWORK (IPMF)

Objective

The objective is to design and implement projects in a way that fosters full respect for Indigenous Peoples' dignity, human rights, and cultural uniqueness and so that they: (a) receive culturally compatible, gender and inter-generationally inclusive social and economic benefits; and (b) avoid adverse effects during the development process, or if not feasible ensure that these are minimized, mitigated or compensated.

Generic Issues / Concerns of Tribal Communities

Though no tribal settlement was identified during rapid assessment, tribal issues were identified through review of secondary information. In order to have a more focused tribal development strategy, these issues have been grouped into (i) issues that are directly related to the project development for which measures will have to be taken up under the project to address them and (ii) issues which are outside the scope of the project but institutional collaboration could help the tribal in their development. These have been listed below:

Issues related directly to the development of the project

- Loss of agriculture income
- Loss of employment of daily wagers in shops and eating places along the road
- Loss of shelter
- Lack of effective consultation
- Loss of community facilities
- Poor access to project information and benefits
- Seek employment opportunities through project
- Physical displacement

Other Issues:

- Low level of agriculture productivity
- Lack of employment opportunities
- Low income levels
- Poor health
- Low level of education
- High levels of debt

Procedure for Preparing an Indigenous Peoples Development Plan (IPDP)

In order to prepare an IPDP the following steps will be taken:

- Social screening to establish the presence of tribes in the project area or have collective attachment to the project area
- based on a detailed social assessments establish baseline data on the tribal people (subsistence, employment, community networks) in the project area;
- review Acts / policy guidelines applicable in the respective states regarding tribal groups and also the central Acts / Policies;
- identify the impacts (both positive and negative) and prepare an IPDP;
- disclose the draft IPDP

Key Elements of IPDP and Participatory Approach

The key elements in an IPDP include:

- All development plans for indigenous people should be based on full consideration of the options and approaches that best meet the interests of the communities.
- Scope and impact be assessed and appropriate mitigation measures are identified
- Project should take into account the social and cultural context of affected peoples, and their skills and knowledge relating to local resource management

- During project preparation, formation and strengthening of indigenous peoples organization; communication to facilitate their participation in project identification, planning, execution and evaluation should be promoted.
- In case PWD is not capable of preparing and implementing IPDP, experienced community organizations / NGOs can be involved as intermediaries.

Implementation Issues and Strategy

It is envisaged that proper implementation of IPDP is possible only through community participation. The participatory approach will ensure:

- Promotion of community concern and involvement
- Proper organization and management of resources
- Setting up of criteria and fixing criteria and procedures for project execution are done at the grass root level
- Identification, selection and strengthening of implementing agency at the grass roots level

GENDER ASSESSMENT AND DEVELOPMENT FRAMEWORK

The project designs should be gender responsive based on the gender analysis, and should be included in the DPR. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation must be discussed thoroughly to determine the need for further action. Listed below are the key action points:

General Check list

- Identify key gender and women's participation issues.
- Identify the role of gender in the project objectives.
- Prepare terms of reference (TOR) for the gender specialist or social development specialist of the client
- Conduct gender analysis as part of overall Social Assessment.
- Draw up a socioeconomic profile of key stakeholder groups in the target population and disaggregate data by gender.
- Examine gender differences in knowledge, attitudes, practices, roles, status, wellbeing, constraints, needs, and priorities, and the factors that affect those differences.
- Assess men's and women's capacity to participate and the factors affecting that capacity.
- Assess the potential gender-differentiated impact of the project and options to maximize benefits and minimize adverse effects.
- Identify government agencies and nongovernmental organizations (NGOs), community-based organizations (CBOs), and women's groups that can be used during project implementation. Assess their capacity.
- Review the gender related policies and laws, as necessary.
- Identify information gaps related to the above issues.
- Involve men and women in project design.
- Incorporate gender findings in the project design.
- Ensure that gender concerns are addressed in the relevant sections (including project objectives, scope, poverty and social measures, cost estimates, institutional arrangements, social appendix, and consultant's TOR for implementation and M & E support).
- List out major gender actions.
- Develop gender-disaggregated indicators and monitoring plan.

Core Requirement for Mainstreaming Gender

- All data should be disaggregated by gender, caste, ethnicity, location and age
- Issues of division of labour, access to resources and decision making power (who is doing what, who has access to what, who makes the ultimate decision) have to be assessed for their gender differential impact on women and men of different social identity group.

- Assessment of policies, programs, institutional arrangements, human resources issues and M&E system has to be done from a gender perspective of project, project authorities and community groups.

Consultation Framework and Information Disclosure

Consultation Framework

The Consultation Framework envisages involvement of all the stakeholders' at each stage of project planning and implementation. The UP PWD through DPR consultants and partner NGO during implementation will be responsible for ensuring participation of the community at sub-project level. Involvement of the community is not limited to interactions with the community but also disclosing relevant information pertaining to the project tasks.

Information Disclosure

The mechanism of information dissemination should be simple and be accessible to all. Two of the important means that have been followed until now include briefing material and organization of community consultation sessions. The briefing material (all to be prepared in local language) can be in the form of (a) brochures (including project information, land requirements and details of entitlements including compensation and assistance to be given to the PAPs) that can be kept in the offices of local self-government (municipal office in case of urban area and gram panchayat office in case of rural area) and PWD; (b) posters to be displayed at prominent locations and (c) leaflets that can be distributed in the impacted zone of the sub project. Consultation meetings should also be organized at regular intervals by the PWD to acquaint the PAPs of the following:

- Timeline and progress of the project;
- Information on compensation and entitlements;
- Information on land acquisition and market valuations of property;
- Time line for acquisition.

Stakeholder Mapping

Through the formal and informal consultation, following stakeholder mapping has been done, identifying their interests concerned with the project activities.

Stakeholder Mapping

Stakeholder Category	Interests	Potential/Probable impacts
Primary stakeholders		
Project affected people	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Beneficiaries	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Secondary stakeholders		
UP PWD & PAPs	Project implementation, Contracting; Project management, Monitoring and evaluation	(+/-)
NGOs, CSOs, Local Administration	Development, Community participation, and Community welfare	(+/-)

Institutional Arrangement for Environmental and Social Management Plans Environment

The Government of Uttar Pradesh has setup Project Management Unit (PMU) for UPCRNDP to streamline decision-making and provide more autonomy for project execution and delivery. The PMU is headed by Chief Engineer, World Bank Projects (Roads) supported by Superintending Engineer (Planning) and Project Director, UPCRNDP at Head Office. The Project Director will have overall responsibility for implementation and procurement of projects. An Environmental and Social Development Cell (ESDC) has been set up at PMU. The cell is headed by an Executive Engineer. He is overall responsible for EIA preparation and EMP Implementation, coordinating and liaising with government organization as well as the World Bank with respect to different forest and environmental issues. He will also be responsible for progress monitoring of Environmental safeguards during project execution and submission of quarterly/ annual report on EMP compliance to the funding Agency. In the field, there is provision of World Bank Circles headed by Superintending Engineers. The Division offices will act as Project Implementation Units (PIUs). Executive Engineers in each World Bank Circle will be responsible to oversee the project progress at site in their respective area. It is proposed to have one Environmental Nodal Officer at Office of each Executive Engineer who will look into the compliance with the safeguards, liaising with local authorities in connection with different permits and licenses, redressing the public complaints on environmental issues, etc.

The PMU has appointed Project Management Consultant to assist with project preparation and support implementation as Engineer in-charge who will supervise the Contractors activities, compliances and monitor the overall progress of work. There is provision of Environmental Specialist in PMC. The Contractor team will also include Environment and Safety Officer. The Roles and responsibility of implementation and Supervision Agencies at different levels have been defined in table below.

Position	Roles & Responsibilities
PMU's Environmental and Social Nodal Officer (ESD Cell)	<ul style="list-style-type: none"> • Finalize the EIA and EMP for individual sub-project with inputs from PMC • Confirm integration of EMP provision related to works in the contract documents • Provide guidance on environmental issues to PIUs Environmental and Social officers as requested • Coordinate with regulatory agencies like Forest Departments, and at request of PMC and/or Contractor, UPPCB • Prepare regular reports on progress on EMP implementation across the project with inputs from the PMC's environmental specialist • Document experiences of developing and implementing environmental mitigation measures and convert it into training material for internal and external capacity building • Facilitate interaction between environmental teams of different sub-projects to allow cross-fertilization of ideas, successes and learnings
Environmental and Social Nodal Officer at PIU (Division Office)	<ul style="list-style-type: none"> • Coordinate with PMC's environmental specialist to monitor and report on progress on EMP implementation as part of works contracts • Participate in and facilitate consultations with stakeholders • Participate in project meetings and report on the issues related to environmental management to provide for any mid-course corrections that may be required based on situation on the ground • Coordinate on the training and capacity building initiatives
Environmental Specialist, PMC	<ul style="list-style-type: none"> • Lead the development of the sub-project specific EIA and EMP for the entire project • Review contract documents to ensure that EMP provisions related to works are included in the contract documents • Assist the Environmental Specialist in the PMU to follow-up with state government departments • Oversee and report to the PMU on implementation of EMP provisions included in the works contract for each sub-project • Act as a resource person in trainings based on experience on implementing this project and previous relevant work
Contractors' Environmental and	<ul style="list-style-type: none"> • Lead the implementation of EMP measures included in the Contract • Report on progress and shortcomings of the measures implemented to

Safety Officer

Environmental Specialist of PMC

Social

The PMU and the decentralized dedicated teams (PIUs) will be supported by also competitively recruited experts, as needed. A social specialist and an environment specialist will be hired by PMU and one official in PIU will be designated as Environmental and Social Officer. The project will take help of partner NGOs in implementation of RAP. The responsibilities of all role players in the project are given below.

Responsibilities of Social Specialists and NGO

Levels	Roles and Responsibilities
PMU Social Specialist	<ul style="list-style-type: none">☑ Finalize safeguard documents;☑ Provide policy guidance to the project level counterparts☑ Ensure dissemination of R&R Policy at state level☑ Monitoring R&R and Land acquisition activities. Make budgetary provisions for R&R activities☑ Liaison with state administration for land acquisition and implementation of RAP;☑ Participate in state level meetings☑ Finalize TOR of contracting NGO for implementation and external agency for monitoring and evaluation☑ Prepare training schedule for state and project level social development officials for capacity building to implement the RAP;☑ Prepare TOR for any studies required and qualitative dimensions to the implementation of RAP;☑ Facilitate appointment of consultants to carry out the studies and co-ordinate them.☑ Monitor physical and financial progress on implementation of RAP;
PIU Social Officer	<ul style="list-style-type: none">☑ Co-ordinate with district administration and NGO responsible for implementation of ESMF/ RAP and other safeguard documents;☑ Translation of R&R policy in local language and ensure dissemination at state; district and community level - prepare pamphlets on policy for information dissemination☑ Coordinate with the state and district level officials for acquisition of private land and implementation of ESMF/ RAP; Liaison with district administration for dovetailing of government schemes for Income Restoration Schemes☑ Monitor physical and financial progress of implementation of RAP,☑ Participate in the project level meetings☑ Report progress, highlighting social issues not addressed, to provide for mid-course correction,☑ Coordinate training of project level staff with agencies involved.☑ Organise by-monthly meetings with NGO to review the progress of R&R, and gender actions

Levels	Roles and Responsibilities
NGO	<ul style="list-style-type: none"> ☑ Conduct the verification for the affected families and update the census and socio-economic data ☑ Develop rapport with PAFs and between PAFs and project ☑ Design and carry out information campaign and consultations with the local community during the implementation of the RAP, ☑ Provide information to PAFs and local community and conduct awareness on R&R Policy and distribute the policy to the affected families ☑ Prepare and submit the micro plans for the PAFs ☑ Assist the PAFs in receiving the compensation and rehabilitation assistance ☑ Motivate and guide PAP for productive utilization of the compensation and assistance amount ☑ Assess the level of skills and efficiency in pursuing economic activities, identify needs for training and organize training program ☑ Assist PAFs in approaching the grievance redressal mechanism ☑ Assist the PAFs in getting benefits from the appropriate local development schemes ☑ Prepare monthly progress reports and participate in monthly review meetings ☑ Participate in the training program for capacity building ☑ Carry out other responsibilities as required from time to time

GRIEVANCE REDRESS MECHANISM (GRM)

An integrated system will be established with Grievance Redress Cells (GRCs), with necessary officers, officials and systems, at the state as well as sub project levels. Grievances if any, may be submitted through various mediums, including in person, in written form to a noted address, through a toll free phone line or through direct calls to concerned officials, and online. PWD will appoint a person to receive such calls and online messages. The person in-charge based on nature of complaint, will forward the same to the concerned official. A ticket or a unique number will be generated for all such call and messages. The complainant will follow up based that unique number. All calls and messages will be responded within two weeks. In response is not received within 15 days, the complaint will be escalated to next level. As part of IGRM (Integrated GRM), a Grievance Redress Cell (GRC) will be set up at the district level. The staffing of GRC will include Environmental and Social Nodal officer of PMU; Environmental and Social Nodal officers of PIU; and two representatives from community / beneficiary / affected persons. The head of the cell will be a person of repute but not continuing in the government service.

MONITORING AND REPORTING

The PMU through the respective PMUs will monitor all the sub projects to ensure conformity to the requirements of the ESMF. The monitoring will cover all stages of planning and implementation. The monitoring will be carried out through the environmental and social safeguard compliance reports that will form a part of Quarterly Progress Reports (QPR) for all sub projects and regular visits by the environmental and social specialists of the PMU and PIU.

An external evaluation of the RAP implementation prepared for sub projects will also be undertaken twice during the implementation of the project – midterm and at the end of the implementation as per the terms of reference. During implementation, meetings will be organized by PMU inviting all PIUs for providing information on the progress of the project work.

Project monitoring will be the responsibility of the PMU who will submit Quarterly Progress Reports. The reports will compare the progress of the project to targets set up at the commencement of the project.

The list of impact performance indicators will be used to monitor project objectives. The socio-economic survey conducted will provide the benchmarks for comparison.

CONSULTATION AND PUBLIC DISCLOSURE

Stakeholder Consultation

Stakeholder consultations are integral to development projects and need to be carried out all through the project life. These are an effective way to communicate about the priorities for both the UPPWD and the stakeholders should be used extensively as the project progresses. These consultations can provide insights that may elude designers and help unravel inexplicable responses to proposals effectively. Ensuring an open and transparent information exchange right from start is a key ingredient of successful project implementation. Recognizing this, UPPWD has begun consultations right from the start of the project.

Since this is a category A project, consultations with stakeholders across the spectrum are needed early and continuously in the project. The identified stakeholders include project affected people-with an emphasis on disadvantaged groups, youth, local NGOs, road users, private sectors, local leaders, officials from other GoUP Departments. Some roads may have special groups that may need to be sensitively handled like Scheduled Castes. UPPWD should be geared up to carry out consultations from the Identification stage, through project planning and design, as well as during implementation.

The state-level ESMF workshop was carried out on November 7, 2014. The objective of consultation was to receive feedback from various stakeholders and wider dissemination on draft ESMF document. The consultation was carried out in local language (Hindi). The executive summary of draft ESMF and project specific R&R policy in Hindi was circulated prior to the consultation. The issues discussed during the consultation included:

- Objective & approach of the Projects under UPCRNDP & ESMF
- Minimizing adverse environmental and social impacts such as minimize tree cuttings; provide safety measures near schools and health centres
- Procedure of Environmental and Social Safeguards in different sub-projects
- Safety of women and children during construction
- Safety measures for road users and public
- Bus stops and bus shelters at major habitations
- Drains in urban areas
- Land prices and prices of the properties affected to be finalized in consultation with the community
- Replacement of community properties
- Facilities for solid waste management in urban areas

Information Disclosure

For the benefit of the community in general and PAPs in particular, RAP and R&R policy will be translated in Hindi and kept at

- Public Libraries of the districts
- Office of Chief Development Officer, and
- Libraries of various colleges in the district.
- PWD offices in project districts
- Schools of the villages affected, and
- Any other public place along the highway

A copy of RAP and R&R policy will also be placed at the office of Chief Engineer, UP PWD, Lucknow and respective PWD circles and divisions.

Budget

Each sub-project will have its own budget to cover the EMP costs relating to mitigation measures, enhancements, wherever included in the plan, and monitoring costs. In addition, training and capacity building costs need to be added for specific issues that EIA and EMPs may bring out. For instance, there may be a need to have short courses on specific topics, experience exchanges on common issues, and so on.

ENVIRONMENT MANAGEMENT PLAN (EMP)

The EMP should be sub-project specific, clearly and concisely describing adverse impacts, selected management measures to bring it to an acceptable level and timelines for implementing these measures. It should also clarify roles and responsibilities among the various stakeholders – UPPWD, PMC, Contractors, other GoUP departments. It would be useful if contract specific EMPs are prepared as this would facilitate integration with the bidding documents. The building blocks of an EMP are:

- Potential Adverse Impacts Identified and Mitigation measures to be adopted, together with conditions within which one or other measure would apply and their integration with phases operations of road construction – Design, Pre-construction, Construction/ Implementation and Operation
- Enhancement plans for positive impacts
- Monitoring Plan with indicators, mechanisms, frequency, locations,
- Budgetary allocations for all the above activities
- Institutional arrangements for each activity and mitigation measures
- Implementation schedules for each activity and its integration with the sub-project implementation timelines
- Reporting procedures, including for redressing grievances related to environmental issues

The general Environmental Concerns during DPR stage and project implementation stage associated with road projects are presented in Table 1.0 and Table 2.0. These concerns are required to be addressed properly in preparation of Environmental Management Plan.

Table 1.0: Environmental Concerns in DPR Preparation

S. No.	Activity	Items to consider	Measures to address
A.	Road Construction		
1.0	Environmental Inventory	Trees	Inventorization of environmental features Avoidance, design modifications to minimize adverse environmental impacts Incorporating community concerns into finalizing alignment
		Forests	
		Wildlife sanctuary/National Park/Tiger reserves/ notified Eco-sensitive zones	
		Rivers / water crossings	
		Water bodies	
		Wetland	
		Grazing lands	
		Cultural properties	
		Utilities	
		Community facilities	
		Major junctions	
2.0	Detailed Surveys	Geological, geotechnical studies	Stability analysis and measures to address slope instability, bridge works, etc.
		Topographical surveys	Detailing of features

S. No.	Activity	Items to consider	Measures to address
		Hydrological surveys in flood prone areas	Identification of flood prone areas and measures to avoid afflux Identification of agricultural use of land
3.0	Identification of material sources	Borrow material	Utilizing alternative materials
			Minimize requirements through design modifications
			Location criteria
		Quarry material	Utilizing alternative materials
			Material extraction from existing quarries
		Water availability	Identification of perennial/community/private sources
			Scheduling construction to suit water availability
			Utilizing community water sources without conflict of uses
		Water bodies	Provision of silt fencing
			Rehabilitation of water bodies
		Stability of slopes	Measures for slope stabilization
		Soil erosion	Erosion control measures
		Land use changes	Land use control measures adjacent to the road
			Empowering Gram Sabha to regulate development
		Agriculture lands	Avoidance from setting up construction camps, borrow areas
			Conservation of top soil
			Site restoration after construction
		Cultural properties	Avoidance through design modifications
			Planning for Relocation & rehabilitation
		Common Property Resources	Avoidance through design modification
			Planning for Relocation of consultation with community
Drainage	Provision of adequate number of CD Structures		
Trees	Compensatory plantation & arrangements for roadside plantation		
Forest areas	Avoidance through design modifications		
	Environment Management measures during construction		

S. No.	Activity	Items to consider	Measures to address
		Natural Habitats	Avoidance through design modification or formulating additional measures for avoiding impacts
5.0	Precautionary measures during construction to avoid environmental impacts	Top soil	Stockpile topsoil and preservation
		Construction sites	Provision of pollution control measures
			All measures to ensure public & worker's health/safety
			Water Management
		Construction camps	Criteria for identification of sites and Infrastructure arrangements
			Safe disposal of all wastes
			Enforcement of pollution control measures
		Borrow areas	Arrangements with land owners to include redevelopment
		Quarry areas	Rehabilitation of quarry areas if new quarries are opened
		Public/workers health & safety	Personal Protective Equipment to be provided
Public safety at construction sites to be undertaken			
Measures for worker's health & hygiene at construction camps			
6.0	Consultations with community	Land for borrowing	Agreement to include borrow area rehabilitation
		Water for construction	Agreements with owners/community for utilizing water
		Site for construction camps	Rehabilitation of the land after construction
		Removal of trees	Compensation for the trees cut
			Relocation costs to be covered in the project
			Relocation costs to be covered in the project
		Traffic during construction	Provision of alternate routes or prior notice to the users
7.0	Finalization of alignment	Concerns of community	Community concerns to be incorporated
		Environmental impacts identified	Impacts identified are to be mitigated by incorporation of provisions as per guidelines
		Design aspects	Impacts that can be mitigated through design modifications should be incorporated
8.0	Preparation of detailed drawings	All concerns/impacts identified	Designs for enhancements and mitigation measures including cost provisions
9.0	Monitoring of	All environmental aspects	Monitoring implementation of Environmental

S. No.	Activity	Items to consider	Measures to address
	Progress	identified	measures

Table 2.0: Environmental Concerns During Project Implementation –Road Projects

S. No.	Activity and Sub Activity	Impact/s	Measure/s
PC	Pre – Construction Activities		
A1.0	Alignment marking	-Nil-	(i) Co-ordination with revenue department
A2.0	Relocation of utilities	Disruption of services of current use	(i) Identification of relocation site in advance
			(ii) Scheduling the activity in consonance with the community usage pattern
A3.0	Tree Felling	Compliance with Forest Act in case trees are on forest land (the Roadside Trees are notified Protected Forests along the State Highways in U.P.)	(i) Prior clearance from Forest Department
		Loss of canopy and warming effect	(iii) Compensatory plantations & landscape designs
A4.0	Clearance of land	Affect on livelihood	(i) Compensation as per project provisions
		Affect on standing crops	(ii) Scheduling of activity and coordination
		Affect on cultural properties	(iii) Relocation of the cultural properties
		Affect on natural habitats such as national park, forest, sanctuaries, notified wetlands, fisheries and aquatic habitats.	(iv) No clearance of vegetation beyond proposed RoW.
A5.0	Diversion of forest land	Compliance with Forest Act	(i) Activity scheduling to avoid delays, conformance to legal requirements
		Affect on vegetation	(ii) Precautionary measures during construction in forest areas
		Pollution from construction activities	(iii) Precautions while operating equipment/machinery
A6.0	Transfer of land ownership	Grievances from community	(i) Addressal through Grievance Redressal Mechanisms & Consultations
		Affect on livelihood	(ii) Provision of entitlements as per resettlement framework

S. No.	Activity and Sub Activity	Impact/s	Measure/s
A7.0	Location of Storage Yards, labour camps, and construction sites	Pollution from construction camps, storage yards & labour camps	(i) Location criteria to be adopted
			(ii) Obtain NOC from State PCB
		Pressure on local infrastructure	(iii) Infrastructure arrangements to be as per guidelines
A8.0	Procurement of equipments and machinery	Machinery likely to cause pollution at settlements and natural habitats	(i) Machinery to be procured shall be in conformance with emission standards of CPCB
		Safety concerns in machinery operation	(ii) Safety equipment for workers
A9.0	Identification and Selection of Material Sources	Conflict of uses in case of water	(i) Consultations and arrangements at contractor-individual levels, documentation of agreement
		Borrowing causes depressed lands	(ii) Consultations and arrangements at contractor-individual levels, documentation of agreement
		Pollution due to material extraction from borrow and quarry areas to surrounding environment	(iii) Precautionary measures during siting of borrow areas and quarry areas
		Disturbance to Natural Habitats	(iv) Avoidance of location of material sources in Natural Habitats
A10.0	Identification of designated locations of waste disposal	Pollution due to location close to settlements, water bodies & other sensitive areas	(i) Site selection in conformance to criteria provided
B	Construction Activities		
B1.0	Site Clearance		
B1.1	Clearing and Grubbing	Effect on roadside vegetation	(i) Restricting movement of machinery/equipment
		Debris generation creating unsightly conditions	(ii) Disposal / storage of grubbing waste and possible reuse
B1.2	Dismantling of existing culverts and structures, if any	Generation of Debris creating unsightly conditions	(i) Disposal of waste and likely reuse
		Flooding due to interception to drainage paths	(ii) Provision of diversion channels and/or scheduling construction of culverts in dry months

S. No.	Activity and Sub Activity	Impact/s	Measure/s
B2.0	Planning Traffic diversions and Detours	Trampling of vegetation along traffic diversions	(i) Activity scheduling, identification of alternative track
B3.0	Material Procurement	Loss of topsoil	(i) Stripping & Storing topsoil
		Formation of stagnant water pools due to borrowing/quarrying	(ii) Rehabilitation plan for borrow areas & quarry areas
		Illegal quarrying / sand mining	(iii) Conformance of quarries selected to the SPCB requirements, including quarry rehabilitation plans
		Uncontrolled blasting at quarries	(iv) Controlled blasting to the extent required. Conformance to blasting rules as per the Indian Explosives Act
B4.0	Transport of materials to site	Fugitive emissions from transport trucks	(i) Covering of material with tarpaulin or use of covered box trucks during transport
		Dust emissions from haul roads	(ii) Haul road management
B5.0	Materials handling at site		
B5.1	Storage of materials	Contamination to water sources, leaching into ground water	(i) Provision of impervious base to storage areas
B5.2	Handling of earth	Dust rising and increase in particulate concentration in ambient air	(ii) Use of dust suppressants
B5.3	Handling of fly ash	Increase of particulate concentration and contamination of nearby areas	(iii) Use of dust suppressants
B5.4	Handling of granular material	Risk of injury to workers	(iv) Use of Personal Protective Equipment
B5.5	Handling of bituminous materials	Leaching of materials, contamination of water sources	(v) Provision of impervious base at bitumen storage areas
		Air pollution	(vi) Control of emissions from mixing
B5.6	Handling of oil/diesel	Contamination from accidental spills	(vii) Prevention of accidental spills, affecting cleaning immediately after spill
		Pollution due to incomplete burning	(viii) Use of pollution control equipment

S. No.	Activity and Sub Activity	Impact/s	Measure/s
B5.7	Waste management	Littering of debris at construction site	(ix) Waste to be disposed at disposal locations only
		Contamination of surroundings due to runoff from construction site	(x) Prevention of runoff from entering water bodies
B5.8	Operation of construction equipments and machinery	Air & Noise pollution	(xi) Conformance to Emission standards and norms
		Operational safety of workers	(xii) Conformance to Safety concerns of the road users and workers in operation, first aid provision and mandatory provision of Personal Protective Equipment
B5.9	Movement of Machinery	Trampling of vegetation	(xiii) Restriction of movement within ROW
		Damage to flora & natural habitats	(xiv) Minimizing impact on vegetation
		Damage to road side properties	(xv) Minimizing impacts on private and common properties, including religious structures
B6.0	Earthworks		
B6.1	Cutting	Uncontrolled blasting in case of rock cutting	(i) Controlled blasting to be made mandatory
		Loss of topsoil	(ii) Preservation of topsoil for reuse
		Waste generation	(iii) Safe disposal of waste & possible reuse
B6.2	Embankment construction	Interruption to drainage	(i) Drainage channels to be provided with culverts in advance to embankment construction
		Dust Rising	(ii) Dust suppression with water
		Excess water/material usage	(iii) Minimising height of embankment
		Erosion causing impact on embankment/slope stability	(v) Slope stabilization measures as seeding, mulching & bio-engineering techniques
		Formation of rills / gullies	(vi) Construction of temporary erosion control structures as per requirements
		Contamination of water bodies/ water courses	(vii) Control measures as silt fencing, vegetative barriers etc
			(viii) Avoiding disposal of liquid wastes into natural water courses

S. No.	Activity and Sub Activity	Impact/s	Measure/s
B6.3	Maintenance at construction camp	Collection of rainwater in construction camps	(ix) Temporary drains during construction
		Waste water from labour camps	(x) Disposal of waste water into soak pits
		Contamination of soil	(xi) Removal of oil / other chemical spills & wastes
B6.4	Cutting embankments of surface water bodies	Impact on the drainage flows in and out of the water body	(xii) Restoration of drainage channels
		Embankment stability	(xiii) Design of slopes of the water bodies, slope protection etc
B7.0	Sub-Base & Base courses		
B7.1	Granular sub-base	Extensive extraction of quarry materials	(i) Use of locally available materials
B7.2	Wet mix macadam	Extensive water requirement	(ii) Scheduling the activity in wet months
			(iii) Avoiding conflict of uses due to water extraction from construction
B7.3	Shoulders treatment	Movement of Machinery for compaction	(iv) Restricting movement on adjacent lands
B8.0	Culverts and Minor Bridge Works	Interruption to water flow	(i) Provision of diversion channels
		Pollution of water channels during construction	(ii) Control of sediment runoff
		Safety of Workers	(iii) Mandatory use of Personal Protective Equipment
B9.0	Surfacing		
B9.1	Bituminous surface	Worker's safety during handling of hot mix	(i) Mandatory use of Personal Protective Equipment
		Damage to vegetation (burning/ cutting)	(ii) Avoiding use of wood as fuel for heating bitumen
			(iii) Hot mix plant location on waste lands
		Contamination due to bituminous wastes	(iv) Safe disposal of bituminous wastes
		Impacts on Air quality	(v) Ensuring compliance of hot mix plants with the CPCB emission standards
B9.2	Concrete surfacing for roads crossing built up areas	Contamination of surroundings due to concrete mixing	(vi) Mixing concrete at designated locations away from habitation and agriculture lands

S. No.	Activity and Sub Activity	Impact/s	Measure/s
B10.0	Road furniture/Signage	-Nil-	To be provided as per design
B11.0	Shoulder protection	Requires material extraction from quarries	(i) Use locally available material (ii) Ensure that all shoulders are clear of debris or construction materials
B12.0	Enhancements	-Nil-	(i) To be included in DPR
B13.0	Monitoring environmental conditions	-Nil-	(i) To be as per the codes of environmental practice
C	Post Construction Activities		
C1.0	Clearing of construction camps		
C1.1	Dismantling of campsite	Waste generation at the construction site	(i) Disposal of waste at designated locations (ii) Restoration of site to original or better condition
C1.2	Campsite rehabilitation	Change of land use due to setting up of construction camp	(ii) Campsite to be restored to its original condition as per the rehabilitation plan
			(iii) Restoration of top soil
C2.0	Clearing of Water Channels, side drains and culverts	Generation of debris & silt	(i) Removal of Debris and disposal
C3.0	Rehabilitation of borrow areas	-Nil-	(i) Top soil restoration, re-vegetation