# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ</td>
<td>Ambient Air Quality</td>
</tr>
<tr>
<td>ASI</td>
<td>Archaeological Survey of India</td>
</tr>
<tr>
<td>BPL</td>
<td>Below Poverty Line (families)</td>
</tr>
<tr>
<td>CBR</td>
<td>California Bearing Ratio</td>
</tr>
<tr>
<td>CI</td>
<td>Corridor of Impact</td>
</tr>
<tr>
<td>CRRO</td>
<td>Contract Rehabilitation and Resettlement Officer (a Manager in each PIU to implement the respective RAP)</td>
</tr>
<tr>
<td>DLC</td>
<td>District Level Committee</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
</tr>
<tr>
<td>ESMU</td>
<td>Environmental and Social Management Unit (at Corporate NHAI)</td>
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<td>GoI</td>
<td>The Government of India</td>
</tr>
<tr>
<td>GQ</td>
<td>The Golden Quadrilateral (Highways connecting the four largest metropolises, Delhi, Kolkata, Mumbai, and Chennai, total length about 6,500km)</td>
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<tr>
<td>GRC</td>
<td>Grievance Redressal Cell</td>
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<tr>
<td>MoST</td>
<td>The Ministry of Surface Transport, Government of India</td>
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<tr>
<td>MoRTH</td>
<td>The Ministry of Road Transport and Highways, Government of India (was part of MoST earlier)</td>
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<tr>
<td>NH-28</td>
<td>National Highway number 28</td>
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<tr>
<td>NHAI</td>
<td>National Highways Authority of India</td>
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<tr>
<td>NHDP</td>
<td>The National Highways Development Project (consists of the GQ and the North-South East-West Highways Projects, for capacity augmentation of about 14,000km of existing highways)</td>
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<tr>
<td>OD</td>
<td>Operational Directives (of the World Bank)</td>
</tr>
<tr>
<td>PAF</td>
<td>Project Affected Family</td>
</tr>
<tr>
<td>PAP</td>
<td>Project Affected Person</td>
</tr>
<tr>
<td>PDF</td>
<td>Project Displaced Family</td>
</tr>
<tr>
<td>PDP</td>
<td>Project Displaced Person</td>
</tr>
<tr>
<td>PIU</td>
<td>Project Implementation Unit (of NHAI for implementation of GTRIP)</td>
</tr>
</tbody>
</table>
PCU  Passenger Car Unit
RAP  Resettlement Action Plan
R&R  Resettlement and Rehabilitation
SC   Scheduled Caste (families)
ST   Scheduled Tribe (families)
WB   The World Bank
WHH  Woman-headed Household
Executive Summary

The chapter describes in brief, salient features of the project, the regulatory requirements for environmental assessment, the baseline environmental scenario with the environmental impacts and the proposed mitigation and enhancement measures along with the proposed institutional arrangements for implementation of recommendations. The chapter briefly summarizes the approach and findings of the EIA study that are discussed in detailed in later chapters. The chapter also provides a summary of the Environmental Management Plan and the resettlement Action Plan for the project.

Overview

India has embarked on a 10-year highway transportation improvement program as a part of the national policy to globalize its economy. National Highways comprise about 2% of total road length in the country and carry over 40% of total traffic across the length and breadth of the country.

The National Highways Authority of India was constituted by an act of Parliament, the National Highways Authority of India Act, 1988. It is responsible for the development, maintenance and management of National Highways. The Authority was operationalised in February 1995. National Highways Authority of India (NHAI) is mandated to implement National Highways Development Project (NHDP), which is India's Largest ever highways project formulated to equip India with world-class roads with uninterrupted traffic flow. The NHDP is a major initiative for capacity enhancement of National Highways and includes four/six laning of around 13,146 Km with a total cost of approximately Rs. 54,000 crores.

The National Highway Development Project

National Highways Authority of India (NHAI) has been assigned the task of executing National Highway Development Project (NHDP) by Govt. of India. The improvement of National Highways under NHDP marks the beginning of a new era. The NHDP includes the Golden Quadrilateral (GQ) under which four metropolitan cities of Delhi, Kolkata, Mumbai and Chennai, which are the hub of the economy for the Country, are being linked by four / six lane state of art modern roads; and the North – South and East – West Corridors linking Srinagar to Kanya Kumari and Silchar to Porbandar. The total length of this project is about 13,252 Km. In addition, NHAI is also taking up port connectivity of about 1000 Km.

Lucknow Muzaffarpur National Highway Project (LMNHP)

The project under consideration relates to rehabilitation and strengthening of existing 2-lane road and widening to 4-lane dual carriageway configuration of NH-28 from the important centre of Ayodhya, Uttar Pradesh to the city of Muzaffarpur in the State of Bihar from km 135.00 to km 586.00.

The National Highway-28 originates at Lucknow, the capital city of Uttar Pradesh and passes through important towns and places viz. Ayodhya, Gorakhpur, Kushi Nagar, Gopalganj, Muzaffarpur and ends...
at Barauni, an Industrial town in Bihar. Total length of NH-28 is around 628 km. The originating point of NH-28 at Lucknow is connected with NH-25 (Jhansi-Kanpur-Lucknow Link), NH-24 (Lucknow-Bareilly-New Delhi Highway) & NH-56 (Lucknow-Varanasi Highway linking NH-2 at Varanasi). National Highway No-86 (Chapra-Swan-Gopalganj) meets NH28 AT km 387 at Gopalganj just prior to the start of the project stretch. The project stretch under consideration has a total length of 349.05 kms including the existing Bypass at Basti.

The various consultancy packages and the contract packages under the LMNHP are given in the table below:

### TABLE-1.2: NATIONAL HIGHWAYS WORLD BANK PROJECTS LMNHP UNDER PHASE-III PROGRAM OF EAST - WEST CORRIDORS UNDER NHAI: CONSULTANCY PACKAGES UNDER THE PROJECT SCOPE

<table>
<thead>
<tr>
<th>Packages (Consultancy)</th>
<th>Contract Packages No.</th>
<th>Total Length in Km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-III/1 (Muzaffarpur –Gopalganj Section) Km. 386.000 to 520.000 of NH-28</td>
<td>IX, X, XI, XII</td>
<td>134.00</td>
</tr>
<tr>
<td>C-III/2 (Ayodhya – Gorakhpur Section) Km. 135.000 to 251.700 (Design Chainage 253.363) of NH-28</td>
<td>I, II, III</td>
<td>116.913</td>
</tr>
<tr>
<td>C-III/5 (Gorakhpur -Gopalganj Section) Km. 279.800 to 386.000 of NH-28</td>
<td>VII, VIII, IX *</td>
<td>106.20</td>
</tr>
</tbody>
</table>

* - Partly in both the Sections C-III/1 and C-III/5

The current report deals with three consultancy packages C-III/1, C-III/2 and C-III/5 with a total of nine contract packages. The contract packages with their start and end points with their total length are given in the table below:

### TABLE-1.3: DISTRIBUTION OF CONTRACT PACKAGE FORMING PART OF THE CONSULTANCY PACKAGES

<table>
<thead>
<tr>
<th>Packages (Consultancy)</th>
<th>Contract Package No.</th>
<th>Chainage</th>
<th>Total Length in Km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-III/2 (Ayodhya – Gorakhpur Section) Km. 135.000 to 251.700 of NH-28</td>
<td>I</td>
<td>Ayodhya bypass* and Km. 142.550 to Km. 164.000</td>
<td>27.550</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Km. 164.000 to Km. 208.00</td>
<td>33.000</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Km. 208.00 to Km. 251.700 (Design Chainage 253.363)</td>
<td>45.363</td>
</tr>
<tr>
<td>C-III/5 (Gorakhpur -Gopalganj Section) Km. 279.800 to 386.000 of NH-28</td>
<td>VII</td>
<td>Km. 279.800 to Km. 319.800</td>
<td>40.000</td>
</tr>
<tr>
<td></td>
<td>VIII</td>
<td>Km. 319.800 to Km. 360.915</td>
<td>41.115</td>
</tr>
<tr>
<td></td>
<td>IX</td>
<td>Part Length: Km. 360.915 to Km. 386.000</td>
<td>41.085</td>
</tr>
<tr>
<td>C-III/1 (Muzaffarpur –Gopalganj Section) Km. 386.000 to 520.000 of NH-28</td>
<td>IX</td>
<td>Part Length: Km. 386.000 to Km. 402.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Km. 402.000 to Km. 440.000</td>
<td>38.000</td>
</tr>
</tbody>
</table>
Traffic Scenario

This section of NH – 28 carries on an average 19000 to 22000 passenger car units (PCU) daily, based on the traffic survey conducted in the year 2002, with a substantial part of traffic belonging to the goods category, amounting to about 52 to 55% of the total traffic volume. The traffic volume on most part of the section is expected to grow up to 150,000 to 159,000 PCUs at the end of design period of 30 years. To cater to such volume of traffic, the upgrading and four laning is required urgently. Besides improving the traffic scenario, the increased Road Capacity and improved pavements can reduce travel time and lower the cost of vehicle use, while increasing access to market, jobs, education, and health services; and reduce transport costs for both freight and passengers.

Benefits of the Project

The LMNHP is expected to bring forward positive impacts (while causing some negative social impacts, which are proposed to be mitigated to the maximum extent possible) for the road-users and communities along the whole stretch of the project corridor.

Macro-Economic benefits

The project is seen as a major generator of economic momentum, and shall benefit the economically backward states of Uttar Pradesh and Bihar in a very significant way. The project is expected to remove industrial development bottlenecks, reduce transportation cost, and thereby benefit all sections of the society.

The project will further open up the vast hinterlands of UP and Bihar. The investment in rigid pavement is expected to boost the cement industry and further trickle down to other sectors of economy.

Local Level Benefits

The foremost benefit for the local communities would be the increased level of road safety. Most of the accidents now involve single vehicles, and the fatality among the pedestrians and the slow-moving traffic is significantly more than the automobile-users. Due to the project, a 5m wide median will segregate the vehicles travelling in the opposite direction, and chances of collision would be reduced. Also, the through traffic will be segregated from the local traffic and the pedestrian traffic, and the propensity of fatal accidents involving pedestrians and slow-moving traffic would be reduced.
Accident Reduction Benefits

The existing NH-28 stretches selected for LMNHP are known to have high rates of accidents. The traffic levels are high for the existing 2-lane carriageways. The traffic is a composition of heavy goods traffic (dominant, around 55%), passenger vehicular traffic, and slow moving vehicles. The slow moving vehicles are mainly animal-driven. There is no segregation between the fast and slow moving traffic.

A very substantial amount of local traffic occurs at each of the built-up stretches. Except for a few cities, the roads through the built-up areas have no median-divided carriageway, no space for the local traffic and for on-street parking. The provision for pedestrian traffic is also inadequate.

The heterogeneity of the traffic, smaller carriageway, geometric deficiencies, absence of adequate sight distance (in many places), hazardous exposure of the pedestrians to the heavy highway traffic – all these contribute to the occurrence of accidents. Absence of any median divider and the small carriageway width are the most important factors. Other inadequacies contributing to the accident risks include, railway crossings (unmanned), further reduction of carriageway due to unorganised on-street (on-pavement) parking, high (pavement) edge-drops, and unrestricted access of the stray animals on the highway.

The LMNHP solves all these accident-hastening issues. Divided, 4-lane carriageways are being provided, reducing the risks of head-on collision between vehicular traffic moving in the opposite directions. Separate service lanes are being provided at built-up areas. Geometric deficiencies will be corrected in the LMNHP. Pedestrian facilities, organised bus stops, footpaths, and adequate signages are being provided. New rail-over bridges will be constructed over the existing railway crossings. Parking lay-byes for trucks, and other heavy vehicles will all be provided. Access control (for both men and animals), even if not a total system to start with, shall also reduce the current number of accidents.

Due to LMNHP, provisions will be made for the local traffic, especially the non-motorised ones such as the bullock-carts, the handcarts, cycle rickshaws, etc. Passenger friendly amenities like bus stops, passenger sheds, underpasses for safe movement of local people from one side of the highway to the other, organised parking lots and lay-byes will be added. Common property resources, and community assets will be conserved and enhanced (detailed plans and designs for community property enhancements have been prepared as part of the Environmental Enhancement by the project).

Employment opportunities for local community

Proportionate to the investment in the project, large employment opportunities will be generated as a result of the project implementation. The employment opportunities will be created for skilled, semi-skilled and unskilled labourers. While most of the skilled labourers may come from other parts of the country, the opportunities for semi-skilled and unskilled sections of the workforce will be mainly available to the local communities. There are two reasons, why such employment opportunities will mainly accrue to the local communities: first, that bringing semi-skilled or unskilled labourers from outside is an uneconomical proposition; and, second, that in construction projects all over the country, semi-skilled workforce come mainly from Bihar and UP.
Improved access to amenities

By and large, for communities in the project influence area, indirect social benefits of the project are likely to include: (i) speedy access to employment, better health and education opportunities in urban centres along NH-28; (ii) increased opportunity for intensified informal economic activities linked to services/facilities for road users; and (iii) reduction in transportation costs and improved market access for agricultural produce of the area.

Equitable distribution of benefits

Given the wide variations in socio-economic characteristics and social development levels of various sections of the population, the magnitude of accrued benefits is likely to vary across social classes.

Environmental Benefits

The project will have some positive impacts on the environment as well as negative impacts. The environmental benefits from the project will be of two kinds (a) benefits associated and (b) benefits created. Benefits associated to the project will include,

- The project will result in Reduction of air pollution due to better riding quality, lessened congestion, improved speeds (therefore better fuel utilisation);
- Direct and significant reduction of overall fuel consumption;

Benefits created (planned, designed and budgeted) by the project will include,

- Increased overall safety levels and mitigation of existing accident black-spots;
- Reduction of air and noise pollution through better traffic management schemes, by providing adequate designs for traffic separation, parking, ensuring smooth flow of traffic, etc.;
- Creation of low-noise zones and noise shadows (particularly at education and health facilities near the project corridor);
- Reuse of pond ash in filling and embankments;
- Better visual environment, by means of cleaning of the project site and the immediate vicinity of the existing heap of indiscriminate dumping of wastes and dirt;
- Enhancement of important sites and common property resources;
- Landscaping of the entire project corridor,
- Improved local and roadside drainage; improving and augmenting waterways for several cross-drains, rivulets and rivers, preservation of water bodies and water sources;
- Introduction of low-pollution construction techniques, scheduling, plants and machinery, etc.

Compensation and mitigation of the negative impacts

There would, nonetheless, potential for certain negative environmental and social impacts due to, or in consequence of the project. The EIA/SIA carried out during preparation of the project identifies all such potential impacts. The EMPs and the RAPs prepared (for each of the contract packages) take care of all such potential impacts (which could not be avoided during the design/preparation). The NHAI will fully implement the EMPs and the RAPs, and the residual negative impacts will not be noticeable.
The negative impacts of the project, mostly environmental and social impacts will be mitigated adequately. In addition to the provision of replacement value of the property lost due to or in the consequence of the project, the project-affected persons (PAPs) will receive additional supports and assistance from the project to improve their livelihood and the quality of life. The project provides for skill development and vocational training to all socially vulnerable sections of the PAPs.

**Project Cost**

The package wise distribution of total cost of the project along with the Environmental Management and R&R cost is given in the table below:

<table>
<thead>
<tr>
<th>Package</th>
<th>Project Cost (Rs. Million)</th>
<th>Environmental Management Cost (Rs. Million)</th>
<th>R&amp;R Cost (Rs. Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2511.44</td>
<td>9.11</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>2689.46</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2677.10</td>
<td>14.04</td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>4529.48</td>
<td>13.01</td>
<td></td>
</tr>
<tr>
<td>VIII</td>
<td>3404.19</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td>3674.57</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>2911.38</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>2907.83</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>XII</td>
<td>3271.33</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28576.78</td>
<td>109.06</td>
<td>1143.519</td>
</tr>
</tbody>
</table>

**Summary of Environmental Clearances Required**

The project would need the following environmental clearances from GoI:

- Forest Clearance for the State of Uttar Pradesh is required from MoEF Regional Office.

The project would need the following environmental clearances from UP and Bihar:

- No Objection Certificate (NOC) from the Uttar Pradesh State Pollution Control Board and Bihar Pollution Control Board.
- Clearance from the State Pollution Control Boards (of Uttar Pradesh and Bihar) under the Air Act, the Water Act and the Cess Act, if stipulated by the State Pollution Control Boards while giving the NOC.
- Consent from State Pollution Control Boards for setting up of hot mix plants, batching plants, construction workers’ camps etc.
- Permission from state forest department for private tree cutting
- Clearance from river authorities for sand mining.
- Clearance from Ground Water Board for withdrawal of ground water for construction.

**Scope of Consultancy Services**

The current project is the Independent Review and Consolidation of the Social and Environmental Assessment Process for the Ayodhya-Muzaffarpur section on the NH-28 under the LMNHP. The scope of consultancy services under the project included review of the complete Environmental and Social Assessment process including the review of various study reports (Environmental and Social Screening reports, Environmental Impact Assessments, Environmental Management Plans and the Resettlement Action Plans for each of the consultancy package) submitted by the DPR consultants. The Executive Summary is being submitted as part of the consolidated Environmental Impact Assessment Report.

The scope of work for the DPR consultants included the detailed technical and environmental assessment for the entire consultancy packages that has been subjected to further review by the independent consultants. The Project assignment comprised of Survey/Investigation and Preparation of Feasibility Study and Detailed Project Report confirming to requirement of Rehabilitation and Upgrading of the Existing Two Lane Road to Four Lane Divided Carriageway. As an important component of the feasibility study, detailed Environmental and Social screening of the project has been conducted that has formed the basis for the present Environmental Impact Assessment. The Environmental and Social screening has provided vital inputs for the finalisation of the project design.

**Environmental Considerations**

The project design has taken into consideration the environmental and social impacts of the project and aims to minimise them. The environmental impacts of the project and corresponding mitigation measures have been addressed by additional studies undertaken by the Consultants in parallel and in conjunction with the engineering and economic studies. Recommendations of the environmental studies have been taken into account in developing project designs and Environmental Impact Assessment Report.

**Studies and Reports**

The project, as per the relevant legislation of the GoI, is subject to a clearance from MoEF, State Pollution Control Boards and the State Forest Departments on account of the possible adverse environmental impacts (includes tree cutting, land use changes and resettlement impacts also).

A number of inter-linked studies were carried out as part of the project preparation activities. Notable among those are the environmental and social assessment, which included assessment of the impacts
of the project on natural habitats and forests, cultural properties and indigenous population. Community consultation was built in the EIA/SA. For each of the contract packages EMPs and RAPs have been prepared, including plans for mitigation of impacts on forests, natural habitats, cultural properties, and indigenous population. The emphasis in the project was in integration of the mitigation measures into the project design and mainstreaming environmental and social concerns in all stages of planning, implementation and operation.

The EIAs (prepared for different consultancy packages) and the EMPs (for different contract packages) have been subjected to a review by independent consultants as per the World Bank guidelines for Environmental Assessment. The review study evaluated the comprehensiveness and adequacy of the Social and Environmental Assessment process conducted for the current section of LMNHP under consideration. The review study also identified the data gaps and the recommendations for further consideration. Further, independent consultants consolidated the EIAs, the EMPs, and the RAPs for all the consultancy packages into common packages for the entire project stretch. During consolidation, homogeneity was brought in the approaches and application among said reports of the different contract packages. Modifications arising out of the consolidation and review were incorporated in the reports for the individual packages.

Environmental Assessment

Methodology for EIA

The environmental impact assessment employed a reiterative methodology in which potential environmental issues were examined in successive levels of detail and specificity at each step in the process. The incorporation of feedback and assessments of those likely to be directly affected by the proposed project is an essential feature of the methodology and becomes increasingly important as the reiterative process proceeds. Major steps in the process were as follows.

- Interim Scoping
- Reconnaissance Surveys
- Assembly and Analysis of Data
- Assessment of Alternatives
- Preparation of Environmental Screening Study (ESS)
- Documentation of Baseline Conditions
- Assessment of Potential Impacts
- Continuous Consultations
- Identification of Mitigation & Environmental Enhancement Measures
Preparation of the Environmental Management Plan (EMP) and Resettlement Action Plan (RAP)

Independent Review

As discussed in the previous sections, the individual consultants have carried out the Environmental and Social Assessments. The Environmental Assessments have been carried out in accordance to the World Bank Operational Directive 4.01. Now, under the revised World Bank Operational Policy (OP) 4.01, the project requires an independent review of the Environmental Assessments to be carried out. The review study has employed a three-step approach:

Step 1: Review of individual EIA, EMP and RAP

The first step in the independent review process included a review of the individual EIA, EMP and RAP reports for the various project/contract packages prepared by the consultants to identify the gaps and deficiencies that need to be addressed in the consolidated report. A preliminary reconnaissance survey was conducted to facilitate the review process.

Step 2: Gaps and Recommendations

This step focussed on the shortcomings found in the individual EIA, EMP and RAP reports. The crucial deficiencies, which may directly impede decision-making were separated from less important ones.

Step 3: Consolidation of Reports

Based on the Gaps and Recommendations, the process of consolidation of individual reports was conducted. As part of the consolidation process various steps like detailed field visit/ground truthing, environmental monitoring, assessment of impacts etc. were undertaken.

Field Survey for Verification/ Ground Truthing

A detailed ground survey was conducted after the review of individual EIA reports. The field survey was conducted as part of the on-site validation exercise of the environmental issues within the Direct Impact Zone of the project. This involved the site verification of the various environmental and social issues (say water bodies, tree plantations, cultural properties, community property resources, environmental & social hotspots road safety, borrow areas, quarries etc), their locational context, nature and significance to the project and project influence area. Besides ground truthing, the site visit also served the purpose of missing data collection that included both primary and secondary data to consolidate the Environmental and Social Assessment process.
Summary of EIA

The following section gives the summary of the consolidated Environmental Impact Assessment for the entire stretch of the current project from Ayodhaya to Muzaffarpur.

Baseline Environmental Conditions, Predicted Impacts and Mitigation Measures

This section gives a brief summary of the baseline environmental conditions, predicted impacts on the environment and the mitigation measures.

Impact Identification and Prediction

For the purpose of impact identification, the project has been divided into three stages, viz., pre-construction, construction and operation stage. The different project stages, the activities and their potential for generating an impact on each of the environmental components (VEC) were considered. Seven categories of impacts with their impact description have been taken into consideration. The description of the various categories of impacts and corresponding magnitude of impact assigned is outlined below.

- High Adverse (Category HA)
- Moderate Adverse (Category MA)
- Low Adverse (Category LA)
- Non-Significant Impact (Category NS)
- High Beneficial (Category HB)
- Moderate Beneficial (Category MB)
- Low Beneficial (Category LB)

Project Location

The project stretch on NH-28, falls under the states of Uttar Pradesh and Bihar from Ayodhaya to Muzaffarpur and is divided into three consultancy packages: C-III/1, 2 and 5 that have been further divided into 9 sub-packages (I, II, III, VII, VIII, IX, X, XI and XII) for the construction purpose.

The project passes through 8 districts that will be directly impacted areas. The districts directly impacted by the project include Faizabad, Gonda, Basti, Sant Kabir Nagar, Gorakhpur, Gopalganj, Purbi Champaran and Muzaffarpur.
Ecologically sensitive areas include any road project passing through such environmentally sensitive areas is expected to have some impacts on the area and is thus required to get clearances from the concerned Governmental agency.

The secondary data collected from various agencies reveal that the project does not pass through any Environmentally Sensitive Area, as notified/declared by the Government. Environmentally sensitive areas include areas as national parks, sanctuaries, tiger reserves or reserve forests, etc. Some part of the project in the stretches C-III/1 and C-III/5 in Bihar belongs to flooded area category but by and large there are no environmentally sensitive areas in the project region.

The existing Highway (NH-28) passes through Ramgarh Reserved Forests starting at Km. 272 and ending at Km. 275.5 near Gorakhpur. The Gorakhpur Bypass was proposed in the project pre-feasibility to avoid any significant environmental impacts on the Ramgarh Reserved Forests. The current scope of project that includes widening and improvement of the highway does not include the stretch between km. 272 and km.275.5. The Ramgarh Reserved Forests ends at a distance of 2.3 km before the start of stretch C-III/5.

**Physical Environment**

**Meteorology**

**Baseline Status**

The Project corridor (NH – 28) is located in Humid Sub-tropical region with marked monsoon effects. The climate is distinguished by three district seasons.

- **Hot Summer** (From April to June)
- **Warm Humid Rainy Season** (July to Sep.)
- **Cold Winter** (Nov. to Feb)

The summer season is usually dry with high temperature ranging between 40 to 44 °C and the annual average temperature lies in the range of 25°C to 27.5°C. In all the stretches, the predominant wind direction is easterly & westerly throughout from October to June and shifts easterly or south-easterly from July to Sep and the average wind velocity is 5 Km/hr.

The overall rainfall (annual) in the project region varies between 1200 mm to 1300 mm and it receives most of its rainfall from the Bay of Bengal current of the south-western monsoon. Around 94 to 97 percent of the total rainfall is received during the monsoon season during mid of June to end of September during which it receives about 100 cm of rain.

**Impacts on Meteorology**

The project is likely to have a slight impact on the microclimate of the project area due to the cutting of trees, addition of pavement surface and use of heavy machinery in the area. The project is not likely to have any changes in macro-meteorological conditions of the area (including rain, temperature, wind etc.). These impacts can be minimized by taking mitigation measures and have been categorized as Low Adverse.
Avoidance, Mitigation and Enhancement Measures

It is expected that there will be a small change in the microclimate of the area due to felling of the trees necessitated by the project and the addition of increased pavement surface, though there is no impact likely on the macroclimate of the area due to the project. Avoidance measures for minimisation of felling of trees were undertaken during the design stage itself and the Environmental Screening Study but substantial tree felling has been found unavoidable. As a compensatory measure, for every tree felled as part of the project, two trees will be transplanted and nurtured for two years to ensure tree survival. The Landscaping plan shall ensure beautification of and enhancement of the highway aesthetics and environment.

Land Resources

Soils

Baseline Status

The soils in the region belong to three major classes Younger Alluvial Soils (Udifluvents under the class Entisols), Older Alluvial Soils (Paleustalfs and Haplaquents under the class Alfisols) and the Calcareous Alluvial Soils (Ustochrepts and Haplaquepts under the class Inceptisols). Small isolated portions of Tarai Soils (Haplaquolls) and Saline & Saline Alkali Soils (Natargids, Salargids & Salorthids) are also found in the project stretch. The soils occurring in the entire project have wide variations in drainage and texture. Dominantly, the soils are very deep, imperfectly to poorly drained, fine-loamy to fine in texture. The soils are neutral to slightly alkaline. As the soils are of alluvial nature with medium to low plasticity, as such, soil erosion is not considered to be an major issue as the highway runs in the Indo-Gangetic plains with practically very low cross slope. However, erosion of soil in high embankment zone can be seen which may be due to inadequate design slope/compaction. Under proposed widening scheme, such high embankment zones shall be designed with flat slope duly protected by pitching and turfing to avoid any erosion.

Impacts

Loss of Productive Soil

Pre-construction stage activities of the project including labour camps, stockyards, storage godowns etc might lead to a loss of productive soils if these activities are located on fertile/productive soils used for agriculture.

Highly productive soils in the project region are liable to be lost during the construction stage of the project due to excavation from quarries and borrow pits for earth required for road construction. Other impacts on soil productivity during construction includes the loss of the fertile plough layer at campsites and asphalt plants, and a drop in the elevation of borrow areas that will decrease land productivity. No impacts are considered to be significant during the operation stage.

Soil Erosion

The project activities during the pre-construction stage of the project that are likely to have an impact on the soil erosion includes clearing of roadside vegetation and felling of trees. As the construction activities would be started very soon after the clearing of vegetation, the loss in stability of the embankments is not considered a significant impact. As the soils are of alluvial nature with medium to
low plasticity, as such, soil erosion is not considered to be an major issue as the highway runs in the Indo-Gangetic plains with practically very low cross slope.

During the construction stage of the project, soil erosion may also occur in workshop areas as a result of unmanaged runoff from equipment washing-yards. Soil erosion would be especially prominent in the elevated sections of the highway including high embankments along the bridges, ROBs and the bridge approaches. Also the excavation of riverbeds and banks during the construction of bridges may result in an increase in the sediment load downstream of the bridge site if the residual soil is not properly disposed off.

The project would improve the drainage characteristics of the area by its improved design and additional capacity imparted to the drainage control elements like cross-drainage structures, which may lead to soil erosion and siltation downstream of such changes in drainage pattern. These effects would be more pronounced in the areas, which are characterised by embankments and slopes like embankment slopes, over-steep banks and bridge end fills. High embankments will also be subjected to erosion due to wind apart from water. Increase soil erosion will be prominent till the time compensatory planting has not been fully established and shall not be a factor afterwards.

Contamination of Soils
During the pre-construction stage setting up of construction camps, stockyards and hot-mix plants may cause contamination of soils by solid waste they generate and oil-spills etc. generated by the hot-mix plants at the areas exposed to such activities.

Soil contamination can also occur during the construction stage of the project due to improper disposal of scarified/scraped asphalt and concrete materials; contamination of soil by oils and chemicals at asphalt plant sites, workshop areas, and equipment washing-yards; solid wastes generated by the construction camps set up for the road construction; improper disposal of spoils and debris arising out of the construction process. The contamination of soils is a long-term impact that can also affect the quality of water resources, as the contaminants are likely to be carried over to the water bodies with runoff. The impacts on soil contamination can be mitigated to some extent by taking appropriate mitigation measures during construction through implementation of the Environmental Management Plan.

The impacts of the highway operation on the contamination of soils are envisaged to be negligible.

Compaction of Soils
Compaction of soils exposed to heavy machinery is likely during the pre-construction activities like site clearance, movement of heavy machinery and setting up of construction camps and stockyards and during the construction stage due to the movement of heavy machinery and other factors. The compaction of fertile soil may hinder growth of vegetation, crops and infiltration of soil. Compaction of soils is a short duration impact and can be minimised by taking measure as part of the Environmental Management Plan. This impact is considered non-significant.

Changes in Land-use Pattern
The project will entail acquisition of privately owned land for various purposes. The land acquisition will lead to a change in the land-use pattern for these acquired areas as land will be for construction camps and facilities, i.e., storage, equipment parking and washing areas; sources of borrow material/earth-fill; aggregate quarries; asphalt plants; access roads for haulage; disposal sites and procedures for the safe disposal of surplus construction and waste material.
The changes in land-use patterns is a temporary impact of the project and has been categorized as low adverse, given that adequate mitigation measures are taken to rehabilitate these areas and minimise pollution impacts during the pre-construction as well as construction stage.

**Borrowing of Earth and Stone Crushing Operations**

*Impacts during Pre-construction Stage*
Existing quarries that are already in operation with the required environmental clearances have been recommended for this project, and no new quarries have been proposed. The bulk of the materials needed for the construction of the embankments will be procured from the existing quarries. As these quarries are already in operation with the requisite environmental clearances and redevelopment plans, no major impacts, which arise in making new quarries operational, are likely. The impacts have been considered Non-Significant.

*Impacts during Construction Stage*
Quarrying operation for stones and aggregates involve use of stone crushers and the vibrating screen that are source of generation of dust. This dust can reduce the visibility and can be harmful for the workers. Also, dust is generated in the transit of borrow materials over long distances as no new quarries are being opened near the project site.

The haulage of soil from the borrow pits using dumper trucks and excavation of soil using heavy machinery causes compaction and generation of dust that is a temporary negative impact. However, all the approach roads being permanent in nature, no impact on the approach-road pavement, other than spillage and dust pollution due to transportation, is envisaged.

A huge quantity of sand would be required for the cement concrete rigid pavement and/or cross-drainage structures proposed. Sufficient quantity of suitable sand is available at a number of locations. These are already operational and would not experience any additional adverse impact, except those resulting from transportation.

**Avoidance, Mitigation and Enhancement Measures**

**Loss of Productive Soil**
The project design has been formulated so as to:

- Minimise the acquiring of productive agricultural land for uses such as locating construction camps, stockyards and storage godowns.
- Select land not fit for agriculture for construction yards, equipments and storage of construction material before the start of construction.
- The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped to a specified depth of 150mm and stored in stockpiles. At least 10% of the temporarily acquired area shall be earmarked for storing top soil.

Other measures for reduction in loss of productive soils have been provided in general and specific EMPs.

**Soil Erosion**
The measures envisioned in the EMP to minimise the impacts on soil erosion include provision of slope protection on embankments abutting water bodies & embankments of ponds, lakes or river bodies and steep slopes by providing brick pitching, stone pitching or by providing Gabion structures, as applicable. Retaining wall shall be provided for retaining land or water so as to minimize area acquisition or area reduction (community ponds, private property etc. very near to the road), which prove difficult to reduce with providing slope embankments with slope of 1:2 (V:H). Slope protection is normally required only for slopes steeper than 1V:2H. The side slopes gentler than this will be turfed with shrubs and grasses as per recommendations for the treatment of embankment slopes for erosion control, IRC: 56-1974.

Contamination of Soils
The measures identified in the Environmental Management Plan to minimise soil contamination include providing oil-intercepting chamber to treat surface runoff from vehicle parking areas; providing impervious floor-beds under the parking areas, ensuring proper disposal of spoils generated during construction activities in low-lying areas or soil quarries; maximising reuse and recycle of constructional wastes and proper disposal of unusable and hazardous wastes.

Compaction of Soils
Compaction is an essential component of the road construction but it should be ensured that the compaction is limited to the RoW of the highway and shall not be transmitted to the adjoining agricultural area. The EMP stipulates that the contractor shall ensure that plans for access roads and vehicle movement areas shall be located on non-productive soils and the RoW; all the vehicles will as far as possible, follow per-designated routes. Also, heavy, wide and slow moving vehicles should be kept away from the sensitive routes and use of heavy machinery on productive land to be minimized to prevent compaction of fertile soil and there would be limitation on the axle load such that topsoil is protected from compaction

Borrowing of Earth
During the selection of the borrow areas, care was taken during the design stage itself to ensure that the loss of fertile and productive agricultural soil as well as loss of vegetation is minimum. The identification of borrowing areas was done so that the selected area shall conform to the requirements of the criteria formulated for borrowing sites.

To ensure compliance during construction it is stipulated that no borrow areas will be opened without permission of the Supervision Consultant. Borrow pits shall not be dug continuously in a stretch. The location, shape and size of the designated borrow areas shall be as approved by the Engineer and in accordance to the IRC-10-1961 recommended practice for borrow pits for road embankments.

Precautionary measures as the covering of vehicles will be taken to avoid spillage during transport of borrow materials. To ensure that the spills, which might result from the transport of borrow and quarry materials do not impact the settlements, it will be ensured that the excavation and carrying of earth will be done during day-time only. The unpaved surfaces used for the haulage of borrow materials will be maintained properly.

Redevelopment of Borrow Areas
Recommendations have been made for redevelopment of borrow areas. The recommended actions for the redevelopment of borrow areas is dependent on the ownership of the land. The actual measure to be taken will depend on the owner of the land, as in the case of private lands. The contractor shall not
owe the responsibility of redevelopment of borrow areas. The same shall lie with the owner of the land, private or panchayat, who will be adequately compensated for the borrowed earth. However, the Supervision Consultant shall inform and educate the owner about the recommended actions, with the final decision to rest on the owner.

The recommended actions for redevelopment of borrow areas include: conversion into garbage-dumping site; redevelopment as a fishpond for use as commercial fishery by the local community Panchayat (in case of Govt. land) or by the owner (in case of private ands); and redevelopment into constructed wetlands as community based wastewater treatment facilities.

Quarrying and Stone Crushing Operations
It is recommended that the material shall be obtained only from licensed quarries and after getting approval from the SC.

Measures have been proposed for mitigating the impacts due to transportation of earth and stone/rock aggregates etc. during the construction stage of the project. Covering of haulage vehicles with tarpaulin or any other good quality covering material during transport of the soil/earth or stone/rock aggregates shall be ensured; excavation and transport of earth shall be limited during the daytime only to minimize risks of the spills etc. from the earthwork on the community; and frequent washing of roads being used during transport of soil shall be done through sprinklers. Also redevelopment plan for the borrow areas shall be prepared and followed by the Contractor and care shall be taken by the contractor to ensure that the working conditions for the workers in stone quarries is up to the required standards.

Ambient Air Quality

Baseline Status

Ambient Air Quality was monitored for parameters viz: Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂) caused due to sulphur content in diesel fuel, Nitrogen Dioxide (NO₂) resulting from the burning of petrol, Carbon Monoxide (CO) resulting from the burning of petrol & diesel, Respirable Suspended Particulate Matter (RSPM).

The project stretch as a whole is characterized by large stretches of pristine areas interrupted by built-up locations and traffic bottlenecks like Tamkuhi Checkpost and some other major intersections. The AAQ at pristine locations has been assessed to be very good as compared to the built-up locations, traffic intersections and bottlenecks. The results of the monitoring indicate that most of the parameters are within the NAAQS at these built-up locations & junctions except for RSPM and SPM that can be attributed to traffic bottlenecks along with many other factors apart from vehicular traffic.

Impact on Air Quality

Ambient Air quality of the area will be affected by project activities during construction and post construction including site clearing and grubbing, ground leveling, cutting and clearing of trees, construction of highway embankment, laying of different pavement layers including bituminous layer, construction of bridges, excavation operations at borrow area, mobile crushing units, Hot-mix & Batch mix plant emissions and emissions of heavy vehicles used in construction and operation of vehicles after commissioning of the highway.
Generation of Dust
Dust is likely to be generated during pre-construction stage activities including site clearance, use of heavy vehicles and machinery, and procurement & transport of raw material like soils, rocks and fly-ash from quarries to the project site. The impact would be most prominent in the RoW and the areas downwind of such activities.

During the construction process, large amount of earthwork is likely to result in dust generation from site activities including handling of soil, rock aggregates & fly-ash; stone crushing operations; handling and storage of aggregates in the asphalt plants; operation of concrete plants; mixing of bitumen and aggregates in asphalt mix plants etc. Traffic-diversion routes marked along dirt tracks would also generate fugitive dust when in use by vehicular traffic and would create short-term localised impacts due to dust generation. The effect of dust generation as part of project activities is most likely to be felt by the workers operating at the project site and shall be provided with pollution masks during the entire construction period.

Generation of Exhaust Gases
The movement of heavy vehicles and machinery for activities such as site clearances is likely to generate impacts due to emission of exhaust gases during the pre-construction stage.

During construction phase Hot Mix and Batch Mix Plant, emissions of heavy vehicles used in construction, generation of odour from construction activities as well as from construction camps will contribute substantially to the short-term deterioration of air quality due to emission of oxides of sulphur, hydrocarbons and particulate matter. Also traffic-diversions will contribute to the generation of excess exhaust gases during the construction stage.

The operation of the highway would entail increase in traffic volumes and speeds, with consequent increase in vehicular emissions. The effect of the increased vehicular movement has been predicted for the purpose of assessment of impacts using the CALINE-4 air dispersion model developed by the California Transportation Department. The prediction exercise has been carried out for the year 2013, 2023 and 2033 (10, 20 and 30 years respectively).

Most of the project stretch is characterised by rural and pristine locations with very good AAQ levels and the impact of vehicular transport on these areas will be limited. The AAQ is expected to be a problem in built-up locations and crossings that are characterised by heavy traffic and bottlenecks. The project will reduce these traffic bottlenecks and increase vehicular speeds. Therefore, it is concluded that the air quality will not be significantly affected by the project as in the without project scenario, traffic bottlenecks and reduced speeds will contribute heavily to air pollution. The air quality levels for CO will be within the stipulated levels at most of the places for the entire design life of the project and the condition may improve at many places with respect to current conditions due to project intervention.

Overall, the impact of project on the air quality can be considered as non-significant overall and beneficial with respect to the ‘without project’ scenario.

Avoidance and Mitigation Measures
The major mitigation measures envisioned by the EMP include frequent dust suppression by water sprinkling; transport of raw material (earth, stones & aggregates, fly-ash) to be carried out in covered vehicles; all crushers identified to be used in construction to conform to relevant dust emission control legislation of the SPCB; all the construction plants to be sited at least 1 km in the downwind direction from the nearest human settlement; all Hot mix plants shall be fitted with dust extraction systems; dust screening vegetation to be planted on the edge of the RoW for all existing roadside crushers; traffic
detours and diversions shall be designed such as to minimize bottlenecks and ensure smooth traffic as far as possible, construction work to be carried out at night to reduce traffic bottlenecks; air pollution monitoring to be carried out at least once a month to verify that air pollution norms are being followed by the contractor & the air quality at the construction site does not exceed the prescribed limits; and planting of trees along the highway as part of compensatory planting and also at locations sensitive to air pollution like schools, hospitals etc. which are very near to the highway boundary.

Impact on Water Resources

Baseline Status

The major flowing surface water bodies intersecting the project highway include rivers the Saryu at Km 135, the Tehri at Km 138, the Kwano at Km 194, the Katnaiya at Km 213.20, Ami at Km 204.4, the Gandak at Km. 423 and Tributary of Burhi Gandak River at Km. 489, the Little Gandak at Km. 310, Gaghi River at Km. 328, Jarahi Nalla at Km. 346 and Daha river at Km. 374 respectively. Besides these, a large number of irrigation channels of Gandak Project intersect the highway stretch.

The NH-28 is flanked by numerous natural depressions on either sides, which accumulate water seasonally as well as perennially.

The static water bodies located along the corridor constitute perennial ponds along the road. There are 30 ponds in the entire project stretch. The details of ponds existing within the direct Impact Zone are presented as Annexure III at the end of this Report.

Some of these water bodies/tanks are being used by the local community for washing/bathing purpose and have been lined to enhance use and storage capacity. Many of these ponds and water logged areas are used for religious purposes especially after monsoons. The religious event is known as ‘Chhat Puja’ and is observed mostly in the states of U.P and Bihar.

The project highway, which traverses through the flood plains is prone to water logging and local flooding along certain stretches. While many of these water bodies are natural depressions, quite a few of them were initially low-lying areas created as a result of borrowing operations. On both sides of the road, there exist irregular and discontinuous ditches without any outfall. Rainwater stagnates there during the end of monsoon. In the urban areas, surface run off along the road often inundate the road leading to ditches on the road surface. Certain areas get water logged due to inadequate slope of the terrain. These water-logged areas are especially prominent in the stretches C-III/1 and C-III/5.

The quality of ground water from recharge areas down to the upper alluvial zone is within suitable limits for irrigation. The ground water in central alluvial zone & below is within suitable limits for Domestic use and drinking.

Tapping of Water Resources for project activities

The project will entail tapping of groundwater and surface water resources to meet campsite and construction requirements, bringing its use into competition with local use. Since the project stretch passes through flood-affected zone, the ground water table is high, no significant adverse/depleting impact on the ground water are expected. The impact is non-significant and the impact is a temporary one likely to be present only during the pre-construction and construction stage of the project.
Contamination of Water Resources

Impacts
Pre-construction stage activities that are likely to contaminate water resources include setting up of construction camps near water sources and transportation of construction material like soil, rocks and fly-ash without adequate handling precautions. Surface and subsurface water resources in the selected sections may be contaminated by fuel and chemical spills, or by solid waste and effluents generated by the kitchens and toilets at construction campsites, thereby contaminating the water resources in the project area.

Also, removal of trees and vegetation during the pre-construction stage could result in the washing away of sediments into the water resources thereby increasing the sediment load in the receiving bodies.

Natural streams and irrigation channels may become silted by borrow material earth in the runoff from the construction area, workshops and equipment washing-yards resulting in decreased water availability. This is the major impact likely as a result of the construction activities. The spoil heaps placed along the construction area are also likely to contribute sediment load to the water resources due to erosion of soil.

Overall the impacts are expected to be low, given the adequate implementation of mitigation measures during construction activity.

Avoidance and Mitigation Measures
The avoidance and mitigation measures envisioned by the EMP for minimising impacts on the quality of water resources include siting of the construction camps away from any sensitive water resources; proper handling of the raw material during transport; preparing temporary drains to dispose off the eroded sediments and to prevent them from entering the surface water bodies; construction work near wells and groundwater sources to be carried only out after properly covering them; provision of Sedimentation/Septic Tanks, water-incepting ditches and drains to prevent contamination of water resources from surface runoff from construction camps; provision of oil-interceptors shall be made along with impervious bed underneath the parking area draining the runoff into the oil interceptors to prevent contaminated discharges from entering into any water body without adequate treatment and provision of riparian buffers provided along the edges of the pond to prevent contamination of these surface water bodies.

Community and Private Water Resources

Impacts
Pre-construction stage of the project entails acquiring of land for the ROW. Construction activities require dismantling of wells and hand-pumps that are located in the Corridor of Impact of the project. Some water bodies like community ponds will also be affected by the project. In all there are a total of 30 ponds located within the ROW between Gorakhpur and Muzaffarpur. These are likely to be impacted during the construction. Since these provide safe drinking water source to the adjoining habitats, proper plans shall be prepared for enhancement of them.
A total of 2676 hand pumps and wells are likely to be impacted in the entire project stretch. Relocation of these water resources have been worked out in consultation with the community, and all community resources impacted due to the project will be relocated at suitable locations.

Avoidance, Mitigation and Enhancement Measures
During the design stage of the project, maximum efforts were made to reduce the number of community and private water sources to be affected by project by varying the alignment of highway. It will be ensured that before dismantling of any hand-pumps or wells, relocation/opening of new water sources shall be carried as per the consultations held with the village communities. As an enhancement measure and beautification measure, the community ponds in the vicinity of the project can be modified to provide wastewater treatment capability using treatment wetland technology. A part of these ponds can be converted to Treatment Wetland with other part to be used as fresh water pond to store the treated water. Due to highway operation, it is likely that there will be growth of population in adjoining villages that shall result in increased pressure on these ponds, as most of these ponds are used disposal of wastewater from the concerned village. These treatment facilities can also be landscaped to provide recreational facilities to the tourists and local people and can also generate monetary benefit through fish culture and handicrafts.

Flood Hazard
The project area falls under the flood prone zone of the Indo-Gangetic Plain and has been known for its frequent flooding. The implementation of project would result in better drainage characteristics as they are considered adequately in the Engineering design of the project.

The project stretch from Km. 386 to Km. 422 runs roughly parallel to the River Gandak having old flood protective embankment at around 2 to 5 Km. on up-stream side of existing highway alignment. Breaches occurs during high flood this bund since last four consecutive years, which results in overtopping of existing NH-28 from KM. 389.800 to Km. 402.000 with depth of flow varying from 0.50 m. to 1.50 m.

To avoid such overtopping, it is proposed to raise the existing highway embankment at least 1 m above the maximum flood water level from Km. 389.750 to Km. 402 by of at-least 1.50 to 2.50 m. with provision of extra waterways in terms of Balancing Bridges (around 18 nos. total waterway 400 m.) & culverts wherever required. It has also been proposed to protect the highway embankment by boulder pitching & boulder apron at toe location.

Noise Environment
Baseline
Noise level survey was conducted by the DPR consultants to establish the baseline conditions. The results of the monitoring indicate that the noise existing levels at the commercial locations, junctions and built-up areas mostly exceed the day-time noise standards. Whereas, the night time standards are mostly met at all the locations. The high noise levels during the day time can be attributed to the traffic bottlenecks created by inadequate carriageway width of the existing highway. A variation of as much as 15 dB (A) and more was observed at the monitoring locations between the day and nighttime noise levels.
Impacts

During the pre-construction stage, increased noise levels are expected in activities such as site clearance, setting of construction camps, transportation of raw materials and setting up of stockyards etc. The pre-construction stage is expected to last for a short duration. Also, care has been taken to locate these sites away from the settlement locations.

The effect of noise depends upon its intensity, frequency and duration. During construction there would be intermittent and temporary increase in sound levels along the project corridor due to:

- Use of heavy equipment & the hauling of construction material
- Use of heavy Plants, generators & compressors etc
- Traffic congestion during construction
- Cutting of trees will reduce the buffering of noise of vehicle

The noise levels drop sharply with increasing distance from the source of noise generation. The impacts of construction on noise environment are temporary and lasts as long as the duration of construction activity and hence are considered Moderate Adverse. Also, the construction activity near the settlements will be restricted to daytime only and proper noise mitigation measures will be employed as given in the EMP.

The most significant phase of impacts on the noise environment is the operation phase of highway i.e. due to high-speeding vehicles. Reduction of vehicular engine noise (as a result of reduced congestion, smoother flow of traffic), vehicular body noise (as a result of reduced development roughness) and reduction of blowing of horns would tend to bring the noise levels down whereas, increase in traffic would contribute to a general raising of the noise levels.

To predict the effect of highway operation on the neighbouring environment, noise prediction modelling was carried out as part of the impact assessment exercise. Highway Noise Model developed on the guidelines suggested by Federal Highway Administration (FHWA), USA was used for noise prediction modelling. The model results show that change in noise level for the year 2020 as compared with the year 2003 and 2005 exceed the permissible limits but the increase is not of much significance keeping in view the manifold increase in the distance upto 100m and 150m from the center line of the road at the selected locations. The decrease in Noise Levels with distance varies between 20-25 dBA, which is significant as the noise levels get reduced below the standard limit prescribed for Ambient Air Quality Standards.

Also, it is recommended that sensitive locations that are very near to the carriageway and are predicted to be sensitive shall be designed/upgraded for noise mitigation measures using techniques given in the Environmental Mitigation Plan. Also, the impact of noise at distances of 100 m to 150 m are not very significant.

Avoidance and Mitigation Measures

The mitigation measures for reducing noise impacts include: monitoring and regular maintenance of vehicles, equipment and construction machinery to maintain noise levels to minimum; all plants and equipments to be used for construction shall strictly confirm to Central Pollution Control Board (CPCB) noise standards; blasting operations to be undertaken so as to produce minimum vibrations in sensitive areas and shall be restricted to daytime hours; no construction activity to be permitted between 10PM to 6AM where the villages and residences are located within 150m from construction sites; effective
traffic management to be ensured during construction activities especially in built up areas; workers in the vicinity of high noise levels to be provided ear plugs, helmets and should be engaged in diversified activities to prevent prolonged exposure to noise levels of more than 90 dB (A); and no batching and hot mix plants to be located within 500m of sensitive land uses like schools, hospitals etc.

Mitigation of the noise effects during operation of the project will be effected by the following options that include noise attenuation barriers such as earthen berms between source and receptor, concrete barriers, wood, metal or double – glazing of windows for façade insulation to be used at sensitive receptors like hospitals and schools; planting of noise absorbing trees like Ashoka (Polyalthia Longifolia), Putranjiva Roxburghii and Alstonia Scholaris to be carried out along the highway corridor to maximize noise attenuation.

Details of the types of noise barriers specified for the project have been presented in the EMP and the locations of all specific noise mitigation measures are provided in the specific EMPs for all the contract packages.

**Biological Environment**

**Flora**

**Baseline Status**

The existing National Highway-28 passes through Ramgarh Forests. The Ramgarh forest area starts at Km. 272 and ends at Km. 275.50. The project design has ensured that the forest is not impacted and the Gorakhpur Bypass has been proposed to avoid the impact. The widening of the highway will not be undertaken in the project along the forest. Though Ramgarh Reserve Forests falls under the boundary of Project Influence Zone of 7 km radius of Section C-III/5, which starts at Km 279.80, it does not lie in the Direct Impact Zone of the project.

However, a significant amount of roadside vegetation is likely to be impacted due to road widening. The road stretch has multiple rows of various species on either side such as Eucalyptus, Sheesham, Neem, Ashok, Peepal, Mango, Arjun, Cassia, Bargad, Gulmohar, Mahua. A total number of 1,01,915 trees exists within right of way of the entire project stretch, out of which 53,147 trees are expected to be impacted and removed.

State Government Forest Departments have planted a variety of trees under the social forestry and the plantation forestry projects since 1983/84 all along the road on both the sides. Social forestry plantations in Uttar Pradesh are mainly comprised of Dalbergia sissoo (Shisham), Eucalyptus hybrid (Safeda), Cassia siamea (Kala siris) and Delonix regia (Gulmohar). Plantation in Bihar mainly comprises of Acacia arabica (Kateri Babul), Prosopis juliflora (Vilayati Babul), Albizzia lebbeck (Siris), Cassia siamea (Kalasiris), Dalbergia sisssoo (Shisham) Parkinsonia aculeta (Kikar), Tectona grandis (Saguan) and Eucalyptus hybrid (Safeda).

**Impacts**

The highway does not pass through any sensitive area or any reserved forests and the construction activities are not expected to significantly affect the vegetation in the region. The main impact on flora
involves the removal of the roadside plantations including trees and grubbing of vegetative cover for construction and a clear zone within the Right of Way (RoW). The types of impacts on flora would comprise of loss of trees; loss canopies; loss of green tunnels; compaction of vegetation and pollution & dust accumulation on vegetation.

Around 53, 147 trees within the ROW are likely to be affected due to the project. The most significant impact of the proposed project will be the removal of some old trees of Bargad, Neem, Peepal, Imli, Shisham and Arjun. However, some of these trees have already lived their life and are showing signs of decay. Further, some of the trees are situated at the edge of the carriageway and are hazardous to the traffic.

Marginal impact may arise with respect to air quality and ambient noise, as trees attenuate air pollutants and noise at varying degrees. The project highway does not pass through forest area and no endangered or threatened species of flora has been recorded on the roadside and therefore none of these would be impacted.

The indirect impacts of tree felling can be manifold like increased penetration of sunlight onto the highway pavement; loss of fuel and other products that and loss of ecosystem supported by the roadside vegetation and avifauna habitat.

**Avoidance, Mitigation and Enhancement Measures**

Various options for highway alignment were considered so as to reduce/minimize the loss of trees due to project implementation during design stage. A landscaping plan was developed as part of project design that will be implemented during construction stage for impact mitigation and environmental enhancement.

Compensatory planting has been proposed as per the NHAI’s strategy for compensatory planting. It has been proposed to plant two trees for every tree felled as part of the project. The responsibility of planting these trees will lie with the State Forest Department as per the adopted strategy. The NHAI will compensate the Forest Department for such activities as per the rate. Adequate provisions have been kept in the Environmental Management budget for compensatory planting. It will be the duty of the State Forest Department to maintain the tree plantation for three years and ensure a survival rate of at least 75-80% of trees. The provisions for tree maintenance have also been made into the environmental management budget.

The project stretch National Highway NH-28 is proposed to be strengthened and reinforced using various techniques of soft landscapes, principally through planting of various types. The details of the landscaping plan are provided in the EMP.

**Fauna**

**Baseline Status**

There is no protected wild - life area within the project influence zone. The fauna in the highway stretch is mostly restricted to domesticated animals and birds. The aquatic fauna in the rivers in the project stretch comprises of fresh water species. The details of the species found in the region can be found in the main EIA report.
Impacts

The fauna found in the project area is dominated by domesticated animals including cattle, goat, dogs etc. that are found in villages. There are no wildlife sanctuaries or reserved forests that can be found in the projects stretches and also, there are no reports of any endangered species present in the project-affected area. As the area around the project road does not support wild life, the loss of wild life due to collision with vehicles is only a remote possibility.

Movement of heavy vehicles may impact the domesticated animals, as they may become liable to accidents. Also, there will be migration of Avifauna due to cutting of trees and construction activity. There are a number of bridges that will be constructed/ upgraded in the entire project stretch leading to constriction of water flow and increased sediment load. Increased load of fine sediment through runoff will make the water more turbid. If the concentrations are exceptionally high, smaller fish can be harmed. Heavier sediment may smother the algae growing in the lower strata and would completely alter the substratum of the watercourse. Excessive sediment loads may also mean disruption to areas where fish lay their eggs. The water quality of surface drainage channels is likely to be impaired due to leakages and oil spills as long as the construction period continues. However, measures to divert the passage of pollutants into the river such as silt fencing can be adopted to minimize the impact.

Avoidance, Mitigation and Enhancement Measures

The avoidance and mitigation measures for minimising impacts on fauna primarily include proper planning and precautionary measures during construction to minimise any damage or disruption to the fauna. In case any rare/endangered animal species are found during construction, the Contractor shall be responsible to intimate the wildlife protection authorities in the area.

Social Environment

Acquisition of Land

Impacts

One of the most significant impacts on the social environment is the acquisition of land for the purpose of the project. As the width of ROW required for a standard National Highway is 60 m, which can be optimised to approx. 45 m, the required width exceeds the available ROW at many places, thus necessitating land acquisition. As has often been seen along the National Highways in India, encroachment of land in the ROW is very common; these properties will also be affected by the project implementation. Land acquisition shall mean loss of productive land, loss of community space along the existing road, loss of private and public properties along the road. A total of 233.952 ha of land will need to be acquired for the purpose of the project. Land acquisition is a sensitive issue and has been dealt exhaustively in the Social Assessment study. Adequate plans have been developed for relocation of PAPs in the Resettlement Action Plan developed for such purpose.

Avoidance, Mitigation and Enhancement Measures
Proper avoidance measures will be taken during the design and environmental screening study of the project to minimize the acquisition of land for the purpose of the project. All the displaced property shall be relocated as per the measures and entitlements as described in the RAP before the start of construction.

**Cultural Properties**

**Baseline Status**

Under the Project Influence Zone, one of the principal centres of Buddhist pilgrimage, at Kushinagar, is situated at a distance of 400 m at Km. 317. The Site is protected under the Archaeological Survey of India and the State Archaeological Department. This is the place where Lord Buddha left his corporeal self and attained Nirvana. Lots of tourists visit this place from different parts of the country as well as from abroad, throughout the year.

Other sites in the project stretch protected under the Archaeological Survey of India and the State Archaeological Department is shown (schematic diagram) on next page. As such all these sites are situated at more than 100 m. from existing highway, the ASI clearance is not required. The same has also been confirmed by Mr. A.C. Tripathi, Conservator, Archaeological Survey Department, Kushinagar.

There are a total of 200 temples, 59 Hindu shrines and 19 Mazar/Mosques built up in the entire stretch of the project highway located within 30 m of central line of the existing road on either side. Mitigation measures for such properties have been adequately discussed in the RAP report.

**Avoidance, Mitigation and Enhancement Measures**

Efforts were made during the project design to protect the sensitive cultural properties by shifting the highway alignment on other side as far as technically feasible. Most of these cultural properties have been proposed for shifting and relocation. Detailed mitigation measures are described in the RAP report for the project.

The measures for mitigation of impact on cultural properties have been dealt in the social impact assessment study carried out for the project.

**Public Utilities Services**

**Telephone Poles**

There are a large number (details provided in the Annexure of the EIA report) of telephone poles erected on the entire stretch of the project Highway. These telephone poles are required to be shifted beyond the ROW and steps for the shifting have already been taken up.

**Electric Poles and Transformers**

There are a large number (details provided in the Annexure of the EIA report) of electric poles (with or without wire) and transformers located within 30 m on either side of the centre of the existing road.
These electric poles are likely to be impacted during the construction. These Electric poles and transformers are required to be shifted beyond the ROW and steps for the shifting have already been taken up.

**Land Prices**

Increased connectivity of the areas affected by the project with the commercial areas nearby would result in significant inflation of land prices. Improvement in access facilities would also result in more encroachment of land along the highway, which is very difficult to control and requires proactive measures for capacity building on the part of NHAI and local Government. New business opportunities related to services for highway commuters would come up with enhancement of highway facilities leading to encroachment of land along the highway. Encroachment will mean that the future expansion/widening of the road scheme will be problematic and the issues related with easement and eviction will become a real challenge for the NHAI that is already stretched to the limit. Increase in land prices would result in betterment of economic conditions of the landholders, which is a positive impact.

**Opening of Industries**

With better connectivity provided by the highways for transport of raw material and increased access to markets for finished goods may result in burgeoning of industrial facilities near the highway. This would result in the change in land-use pattern of the area, which is mostly restricted to agriculture in the present scenario. Cheap labour availability due to better connectivity would also contribute to the opening of industrial units along the highway.

Setting up industries is likely to be accompanied with increase in waste generation in the area, which will have a negative impact on the environment and shall be controlled by at the time of planning and implementation stage for such industrial estates/parks. Opening of industries would also provide income generation opportunities for the local community and can be considered as a positive impact. Proper planning and proactive control measures for prevention of environmental pollution would change the impact from adverse to beneficial due to setting up of new industries.

**Agriculture**

Increase in prices of land due to the better connectivity provided by the project would result in selling of land by the farmers. This would result in change of land-use from agriculture to commercial or industrial and is likely to decrease the production of crops. However, better connectivity would also result in opening of access to new markets with consequent improvement in compensation for their product. This is a positive impact and has been categorized as Low Beneficial.

**Exploitation of Resources**

Though improvement in access is likely to induce economic growth in the area; opening of industries, development of new businesses and increase in population along the highway would result in an increase in exploitation of natural resources. Over exploitation of groundwater, disposal of solid wastes and wastewater from these developmental activities is a negative impact of the project and is a long-term effect that would be visible only after a few years of development. Proper planning and mitigation can, however, result in sustainable development of these areas, thereby, resulting in general prosperity of the area.
Human Health and Safety

Impacts

Pre-construction stage activities including site clearances and movement of heavy vehicles & machinery along with transport of earth in trucks is likely to have negative impacts on the health of the people coming in contact with dust and exhausts generated by such activities.

The human health & safety in surrounding communities will be affected during the construction phase as general mobility of both local residents and their livestock in and around the construction area is likely to be hindered; unmonitored construction activities like dismantling of structures, cutting of trees, haulage material obstructing vision, spillages of lubricants on road making it slippery may create an accident risk for local residents, particularly the children and traffic detours may also have an impact on the safety of the vehicular traffic as improper signage during night time that could result in accidents, especially for fast moving vehicles.

High speed vehicles during operation stage are a cause for concern. Increase in air pollution and noise pollution from the operation of highways is another area of concern for the human health due to the project implementation.

Avoidance, Mitigation and Enhancement Measures

Avoidance measures were identified in the planning stage of the project for mitigating the threats on road safety liable to occur due to the project operation. The Environmental Management Plan envisions that proper signage and speed restrictions have been put in place during the highway implementation to avoid/mitigate these negative impacts.

The EMP also seeks to provide adequate measures for mitigation of air pollution through compensatory tree planting along with mitigation for noise pollution.

The details of measures to minimise and mitigate impacts on human health and safety are given in the EMP and the Mitigation Measures section of the EIA report.

Ribbon Induced Development

Development of highways invariably brings with them the induced development along the highways, known as ‘ribbon induced development’. This often means extension of urban areas especially at the ends of cities along the highway. Development of these fringe areas is facilitated by movement of people from congested areas of the city and the migration of people from rural areas in search of work. This induced development would be liable to result in stress on basic amenities like water supply, wastewater disposal, solid waste disposal etc, which are not expected to satisfy the demands in the absence of proper planning resulting in degradation of environment and living conditions.

Local Employment Generation

The project due to its nature is liable to create income generation opportunities for the local community as part of the project implementation activities. The demand for unskilled and semi-skilled labour is expected to be satisfied by the population of these two states only as most of the workers in this category belong to these states in all of the country especially the northern states.
Development of highways usually accompanies growth and mushrooming of services from local entrepreneurs along the highway. Services such as ‘Dhabas’, petrol pumps, vehicle-repair shops, hotels and other travel related services are expected to generate significant employment opportunities for the local community. This impact is categorised as ‘MB’.

**Interaction between Local Communities**

The presence of migrant construction workers inevitably causes some degree of social unease and even active disputes with the local community as a result of cultural differences. The widening of the existing road will cause disruptions to affected people, who have based their livelihood on the ROW legally or illegally, will be the most affected ones. One of the impacts of relocation of people is the psychological impact, which makes them vulnerable to disputes with other people and Government agencies even though they may be able to lead a better life after being adequately compensated and rehabilitated by the project initiatives. This is a sensitive matter and would be dealt in the social interactions and community involvement exercises. This is termed as ‘Low Adverse’ negative impact that can be effectively mitigated by taking mitigation measures through RAP and SIA exercise.

**Summary of the EMP**

The EMP is a construction period phase-wise plan of action for mitigation/ management/ avoidance of the negative impacts of the project and enhancement of the project corridor. For each measure to be taken, its location, timeframe, implementation and overseeing/supervision responsibilities have been specified.

A General Environmental Management Plan giving standard guidelines to be followed for the entire construction work has been prepared along with the specific EMPs. Separate Environmental Management Plans have been prepared for each of the nine project contract packages giving location-specific details of the Environmental management measures and also gives the cost estimates for each of the environmental mitigation and capacity building measures. As per the Terms of Reference for the project, the environmental elements have been incorporated in the design and bid documents.

The environmental mitigation measures have been discussed in the previous section, details of which are provided in the general and specific EMPs. The following section gives the summary of institutional and capacity building measures proposed for the current project.

**Implementation capacity**

**Institutional Arrangements**

The NHAI is responsible for 13000 km of National Highways in India, which includes developing the National Highways and their maintenance & management. The responsibility of NHAI for this project is to ensure that the East-West Corridor project (LMNHP) under the National Highway Development Program (NHDP) is completed within the stipulated time and with such workmanship that the
subsequent maintenance and management can be carried out as per design and without any additional expenditure as envisaged during the design.

To maintain the desired standards of workmanship and quality, NHAI employs reputed and international consultants for the preparation of project feasibility and design. NHAI is responsible for supervising the work quality of these consultants. For the purpose of incorporating the complete environmental considerations into the project design, NHAI also employs independent review consultants to review and consolidate the Environmental and Social Assessment process for the all the stretches under one project.

NHAI is also responsible to ensure that project has minimum environmental impacts and the contractor besides actual construction activity diligently follows the avoidance/mitigation/enhancement measures envisaged by the EMP and RAP during the implementation of the project. For the purpose of the project, the contractors will be selected by International Competitive Bidding (ICB) procedure and a Supervision Consultant (SC) will also be hired through ICB to ensure the implementation of environmental measures by the contractor along with various provisions for construction as per the contract document. The Supervision Consultant will report the extent of compliance with the conditions laid down to the NHAI. In addition, the SC will be responsible for drawing up environmental management plan for unforeseen environmental impacts that are encountered during construction.

**Proposed Institutional Capacity Augmentation**

**Proposal for inducting three DGM (Environment) at the NHAI headquarters**

To enhance the institutional capacity for environmental management, it is proposed that four officers be appointed at the NHAI headquarters, at the rank of DGM.

**Responsibilities**

Each of the DGM (Environment) will be responsible for coordinating all projects of NHAI to ensure timely conduction of Environmental Assessments and incorporation of Environmental concerns into the project design during the DPR stage. The DGM (Environment) will also take care of all the reporting requirements as per the Environmental Management Plans for different projects in their zones. S/he would also interact with the state authorities, if required. The DGM (Environment) will report to the GM (Environment) regularly as in the case of current DGM (Environment) and update the progress of implementation of Environmental Management measures. The DGM (Environment) will primarily focus on the issue of Environmental Management during pre-design stage, design & DPR stage and the project implementation stage of the project.

The DGMs will also be responsible for periodic monitoring, contingency/improved design, providing inputs into the draft budget plans of the Environmental Cell, checking progress and setting targets for line agency works.

**Proposal for a Technical Committee at the NHAI headquarters**

It is proposed to create a Technical Review Committee at the Corporate HQ of NHAI. The purpose of the technical committee will be to induct technical managers for incorporation of various specialised technical skills required for better implementation of environmental management. The technical committee will report to the GM (Environment). The Technical Committee comprising of five Managers (Technical) for the following environmentally specialised areas that include:
• Air Pollution Control
• Noise Pollution Control
• Ecology
• Public Health Engineering
• GIS
• Environmental Policies

The responsibilities to be fulfilled by the Technical Committee at various stages of a highway project include:

• Technical Review of environmental issues during the project screening stage to ensure the identification of best alternatives and due incorporation of environmental issues in project design.
• Review and incorporation of specific environmental issues by respective specialists into the Environmental Assessment of all NHAI projects.
• Supervision of progress/extent of implementation of the Environmental Management measures during the construction stage of the projects.
• Formulation of policies regarding the incorporation/handling of technical issues in engineering design and environmental management on NHAI projects.

The technical committee will also oversee the functions of the documentation engineers (detailed out below) who are expected to help ensure that environmental concerns are integrated into the proposed Corridor Maintenance and Management Unit’s functioning at the Corporate NHAI level. In addition,

**Project Implementation Units (PIU)**

At the project implementation level, each PIU is recommended to be strengthened by more staff by addition of Civil Engineers/Public Health Engineer for work of supervision of environmental management measures during the project implementation. It is proposed to have one such engineer at one PIU. The present provision for part-time (in-charge along with Technical aspects) responsibilities is likely to be inadequate since the implementation phase will entail looking after each and every environmentally sensitive location where any project activity is going on. The Manager (Environment) within each PIU must have BE (Civil) or MSc (Environmental Science). The desirable qualifications include ME (Environmental). Prior experience on construction site would be a definite advantage. The main responsibilities of the incumbent would be:

• Compile quarterly environmental reports and send the same to the Corporate HQ, NHAI
• Verify compliance monitoring carried out by consultants
• Routine check on the site every 15 days.
• Take on spot decisions rectify minor problems on site
• Oversee supervision consultants
• Ensure co-ordination among government departments/agencies

S/he could be deputed from other government departments, sourced from consultants other than those entrusted with Construction Supervision or even on contract. In case of contractual appointments, there
could be a provision for annual review of the performance for extension up to a maximum of 3 years. The assistance from the Construction Supervision Consultants’ Environmental Engineer (Officer) will be of great value especially with the preparation of compliance reports as per the EMP. The Supervision consultant should ensure that there is one environmental engineer assigned full time to each construction package, thus three environmental engineers reporting to one Manager (Environment) and six Environmental Engineers reporting to the other Manager (Environment).

It is also proposed to have periodic audits by the Environmental Technical Committee to oversee the work of the Manager (Environment) at the PIU. The purpose of the periodic field monitoring by Technical Committee will be to:

- Verify contractual obligations of the contractor and the Supervision Consultant.
- To verify design intent of the mitigation measures and make at-site changes to improve/modify design based on site conditions.

Training

The training for Environmental Management Capacity Building under LMNHP has been devised taking into account the training already imparted under previous projects undertaken by NHAI for National Highway development and the budgetary allocations. The proposed training for environmental management capacity building stresses on environmental considerations into the environmental assessment, project execution and project management. The detailed training program and costing can be seen in the EIA and the EMP reports.

Reporting System

As part of the institutional capacity building requirements, an electronic reporting system has been proposed under the project to facilitate and smoothen the reporting process for better environmental management on the part of NHAI. The proposed GIS based environmental management software (Highway Information Management System) will help in speedier reporting to the top management of NHAI and consequently quicker decision-making.

The proposed reporting system will also help in technical management of the project. Specific reporting formats and user-friendly interfaces have been proposed for the HIMS. The details of the proposed reporting system can be obtained from the Consolidated Environmental Impact Assessment report and the General Environmental Management Plan for the project.
Summary of RAP

Introduction

The overall objective of the RAP is to ensure that all PAPs of LMNHP at least regain their status of living they had prior to the project implementation or improve upon that. The specific objectives of this RAP are to:

- Identify the PAPs by the type of loss and extent of damage
- Categorise entitled persons (EPs) according to the eligibility criteria of the R&R policy of LMNHP.
- Work out entitlements for each EP based on the criteria as laid down in the R&R policy of the project.
- Ensure that all PAPs are aware of their entitlements under the policy and participate actively in the project.
- Identify land for resettlement and the preferences of the PAPs for their relocation
- Develop institutional support for implementation of the R&R process.
- Evolve a suitable mechanism for monitoring and evaluation of the R&R process and indicate the parameters for monitoring.
- Phase the implementation of RAP through NGO, which is described in the subsequent sections.

The RAP components are:

- Introduction and methodology
- Poverty Assessment
- Legal Framework and Resettlement Policy
- Census Results
- Public Consultations
- Land Acquisition
- Resettlement Sites
- Income Restoration
- Institutional Arrangements
- Grievance Redress Mechanism
- Impact Evaluation
Implementation Schedule

Estimated Budget for implementation

Cultural Properties

Highway Related Diseases

While the policy document describes what need to be done, why and how, the action plan describes in more detail how, when by whom the activities will be carried out.

Methodology

The document has been prepared based on information collected during December 2002 to September 2003. The survey methodology used were:

- Census verification and socio-economic survey using pre-tested structured questionnaire
- Group Discussion with potentially affected population at village level
- Information dissemination at district level
- Group Discussion with Truckers and concerned officials for Highway related diseases.

Expected Social Benefits

Poverty alleviation is one of the objectives of World Bank aided projects. On the similar lines, LMNHP on its implementation is expected to bring in rural prosperity in the area. The following benefits are expected from the project:

- As a result of the improved road system, industrialisation and other economic activities will be able to spread more evenly throughout the state and more entrepreneurs may prefer to establish their business or production in areas with lower prices of land and with access to an available workforce. This in turn will bring in prosperity to rural areas.

- Development will emerge along the roads in terms of vehicle repair workshops, restaurants, hotels, etc. These businesses are known to give spin off in terms of petty trade gradually developing into larger businesses. The project through PD and CRRO will establish contacts with government departments in charge with planning and development activities where safe drinking water and sanitation will be provided as a collective benefit to the population. Selected ponds and temples along the roads will be enhanced in consultation with the local population. Provision for the same has already been made in the RAP and EMP budget. The funds in required instalments will be provided to the concerned departments. A responsible official of the department in close coordination with CRRO will carry out the implementation

- The improved roads would reduce Vehicle Operating Cost (VOC), as the vehicles will be able to travel at a faster speed, which in turn would reduce time, transport cost and the wear and tear of the vehicles. Timely and effective delivery of both goods and passengers will increase effectiveness of agriculture, trade, etc.
Increase in employment opportunities (direct and indirect, permanent and temporary, as well as for short and long term), access to various amenities, increase in business opportunities, improved traffic safety, increase in availability of passenger transport services are some of the other expected benefits.

**Negative Social Impacts**

Certain negative social impacts are inherent with any developmental project. Therefore, under LMNHP as well some of the negative social impacts were unavoidable, though such impacts have been minimized because of close co-ordination between social, environment and engineering aspect of the project. The negative impacts are as follows:

- Loss of private immovable properties in part or full (including agriculture land, residences, homestead, shops, trees, wells, etc)
- Loss of source of income
- Loss of civic amenities

**Land Requirement and Acquisition Process**

A total of 233.952 hectare of land will be acquired, out of which 3.6 hectares of land will be required for bypasses, 219.315 hectares for improvement of roads and another 11.037 hectares will be transferred from other government departments. Due to land acquisition 6307 households will be affected. Only one bypass has been proposed in the entire corridor at Ayodhaya. The land will be acquired through NH Act, 1956, details of which have been presented in chapter 4.

**TABLE: EXTENT OF LAND ACQUISITION**

<table>
<thead>
<tr>
<th>Route Name</th>
<th>Land required for widening</th>
<th>Land required for bypass</th>
<th>Land to be transferred</th>
<th>Total Area Required (hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucknow – Ayodhaya</td>
<td>101.35</td>
<td>3.600</td>
<td>0</td>
<td>101.35</td>
</tr>
<tr>
<td>Ayodhaya – Gorakhpur</td>
<td>105.82</td>
<td>0</td>
<td>5.957</td>
<td>111.777</td>
</tr>
<tr>
<td>Gorakhpur - Gopalganj</td>
<td>15.745</td>
<td>0</td>
<td>5.080</td>
<td>20.825</td>
</tr>
<tr>
<td>Gopalganj - Muzaffarpur</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>222.915</strong></td>
<td><strong>3.6</strong></td>
<td><strong>11.037</strong></td>
<td><strong>233.952</strong></td>
</tr>
</tbody>
</table>

**Project Affected Persons (PAPs)**

The overall affect of the proposed road upgrading has been on agriculture land and commercial establishments. A total of 17357 families will be affected, which in turn will affect 75434 persons. Over three fifths of the affected population is male.
TABLE: EXTENT OF IMPACT

<table>
<thead>
<tr>
<th>PACKAGE</th>
<th>Number of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAPs</td>
</tr>
<tr>
<td>Lucknow – Ayodhaya</td>
<td></td>
</tr>
<tr>
<td>Ayodhaya – Gorakhpur</td>
<td>26360</td>
</tr>
<tr>
<td>Gorakhpur – Gopalganj</td>
<td>40221</td>
</tr>
<tr>
<td>Gopalganj - Muzaffarpur</td>
<td>8853</td>
</tr>
<tr>
<td>TOTAL</td>
<td>75434</td>
</tr>
</tbody>
</table>

Majority of the PAPs are OBC. Though a total of 940 scheduled castes households were found, only 13 tribal households were reported during fieldwork. The reported ST households are widely scattered and are very much a part of mainstream. Special provisions for vulnerable groups have been made in the R&R Policy of the project. Little over two fifths of the total PAPs are illiterate.

TABLE: DEMOGRAPHIC AND SOCIAL CHARACTERISTICS IN CORRIDOR OF IMPACT

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Packs</th>
<th>Lucknow - Ayodhaya</th>
<th>Ayodhaya - Gorakhpur</th>
<th>Gorakhpur - Gopalganj</th>
<th>Gopalganj - Muzaffarpur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic/Social</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution of PAPs by type of sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>14788</td>
<td>22635</td>
<td>5552</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>11572</td>
<td>17586</td>
<td>3301</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>26360</td>
<td>40221</td>
<td>8853</td>
<td></td>
</tr>
<tr>
<td>Distribution of Families by Family Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
<td>859</td>
<td>2789</td>
<td>1001</td>
<td></td>
</tr>
<tr>
<td>Joint</td>
<td></td>
<td>3262</td>
<td>4159</td>
<td>422</td>
<td></td>
</tr>
<tr>
<td>Extended</td>
<td></td>
<td>11</td>
<td>408</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Others/ Not Responded</td>
<td></td>
<td>12</td>
<td>35</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4144</td>
<td>7391</td>
<td>1680</td>
<td></td>
</tr>
<tr>
<td>Distribution of Families by Religious Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td></td>
<td>3712</td>
<td>6547</td>
<td>1508</td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td></td>
<td>417</td>
<td>798</td>
<td>161</td>
<td></td>
</tr>
<tr>
<td>Buddhism</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Sikh</td>
<td></td>
<td>1</td>
<td>0</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td></td>
<td>1</td>
<td>11</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Jainism</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>13</td>
<td>35</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4144</td>
<td>7391</td>
<td>1680</td>
<td></td>
</tr>
</tbody>
</table>
In Ayodhaya – Gorakhpur and Gorakhpur – Gopalganj joint families were more dominating than any other family system. However, in Gopalganj – Muzaffarpur section, nuclear families dominates the family system. In project corridors only two faiths are primarily professed in the study area viz., Hinduism and Islam. However, little less than 90% of the PAPs following Hinduism make it a dominating religion. In order to identify vulnerable groups, it is important to record the social group

<table>
<thead>
<tr>
<th>Distribution of PAPs by social stratification</th>
<th>SC</th>
<th>505</th>
<th>232</th>
<th>203</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>OBC</td>
<td>1983</td>
<td>4103</td>
<td>915</td>
<td></td>
</tr>
<tr>
<td>General Caste</td>
<td>1223</td>
<td>2160</td>
<td>390</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>39</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3712</td>
<td>6547</td>
<td>1508</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution of PAPs by Marital Status</th>
<th>Married</th>
<th>Unmarried</th>
<th>Divorced</th>
<th>Widower</th>
<th>Widow</th>
<th>Separated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12653</td>
<td>20281</td>
<td>4564</td>
<td>0</td>
<td>632</td>
<td>135</td>
<td>26360</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution of PAPs by age group</th>
<th>0 to 6 years</th>
<th>7 to 14 years</th>
<th>15-59</th>
<th>60 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3954</td>
<td>5931</td>
<td>947</td>
<td>5951</td>
<td>26360</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution of PAPs by Literacy Level</th>
<th>Illiterate</th>
<th>Literate</th>
<th>Middle</th>
<th>Secondary</th>
<th>Graduate</th>
<th>Post Graduate</th>
<th>Professionals</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6873</td>
<td>5575</td>
<td>3053</td>
<td>3424</td>
<td>636</td>
<td>108</td>
<td>944</td>
<td>2737</td>
<td>22406</td>
</tr>
</tbody>
</table>

| Operations Research Group in association with Spatial Decisions | 38 |
affiliation of the PAP. The caste configuration across all the packages shows that Other Backward Castes (OBC) is the dominating force followed by upper caste. As is true for both the states, presence of tribes is almost negligible in the project area. Total tribal strength is 13 households in entire corridor. To identify affected families as per the R&R policy of LMNHP, it is imperative to record marital status of PAPs, and more specifically of women PAPs. According to survey results, number of married and unmarried PAPs is more or less same. Data for divorced, separated, widow and deserted was specifically analysed as they all form separate family as per R&R policy and are eligible for R&R assistance. Number of widows was found to be quite high in Gorakhpur – Gopalganj package, though presence of widows was recorded in all the three packages.

As per R&R policy, all males above the age of 18 years, irrespective of marital status will be considered as separate family and all women PAPs, above the age of 18 but unmarried will be considered as separate family. Age group classification also helps in assessing dependent and economically independent population.

In light of the above, PAPs were distributed in 4 age group categories as shown in the table above. As the table shows, majority of the PAPs in all the packages fall under the age category of 15 - 59 years (Children). This shows that large number of PAPs is economically independent. Percentage of old and retired PAPs (60 or more than 60 years) is less than 10% across all the Packages. This clearly indicates that average life span of the PAPs in the study area is quite low.

Literacy level is a quantifiable indicator to assess the development status of any area/region. Higher the literacy rate, more developed the area would be. Secondly, in displacement induced development project, data on literacy level of PAPs helps in formulating alternative income restoration schemes. Keeping this in mind, literacy level of PAPs was recorded during the Census Survey.

In project corridors, over one fourth of the total PAPs are illiterate. Even among the literate PAPs, nearly 15% have attained some level of literacy through non-formal education or just attended school without attaining education even upto primary level. Such PAPs can only put their signature or can read simple lines in local language.

Trade and Business (primarily petty shops) is the most common occupation found among the non – titleholder PAPs settled along the road, where as agriculture has emerged as a pre-dominant occupation among titleholders.

**Table: Distribution of Households by Type of Loss**

<table>
<thead>
<tr>
<th>Packages</th>
<th>Type of Impact</th>
<th>Type of Loss</th>
<th>Residential</th>
<th>Commercial</th>
<th>R+C</th>
<th>Agri.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucknow – Ayodhaya</td>
<td>Displaced</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ayodhaya – Gorakhpur</td>
<td>Displaced</td>
<td></td>
<td>201</td>
<td>335</td>
<td>0</td>
<td>0</td>
<td>537</td>
</tr>
<tr>
<td></td>
<td>Affected*</td>
<td></td>
<td>1039</td>
<td>2322</td>
<td>636</td>
<td>1391</td>
<td>5388</td>
</tr>
<tr>
<td>Gorakhpur – Gopalganj</td>
<td>Displaced</td>
<td></td>
<td>122</td>
<td>885</td>
<td>107</td>
<td>0</td>
<td>1113</td>
</tr>
<tr>
<td></td>
<td>Affected*</td>
<td></td>
<td>952</td>
<td>1289</td>
<td>971</td>
<td>6280</td>
<td>9492</td>
</tr>
<tr>
<td>Gopalganj – Muzaffarpur</td>
<td>Displaced</td>
<td></td>
<td>945</td>
<td>888</td>
<td>208</td>
<td>0</td>
<td>2041</td>
</tr>
<tr>
<td></td>
<td>Affected*</td>
<td></td>
<td>991</td>
<td>1013</td>
<td>246</td>
<td>227</td>
<td>2477</td>
</tr>
</tbody>
</table>

*: affected also includes displaced.
The average annual household income varies from approximately Rs. 25,214 to Rs. 33,600. The average annual expenditure is little more than the income and this is one reason why PAPs are always under debt.

The survey result shows that BPL households vary from 1153 in Gopalganj – Muzaffarpur to 2910 in Gorakhpur – Gopalganj package.

### TABLE: Resource Base of the Households

<table>
<thead>
<tr>
<th>Resource Base</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LA</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>1838</td>
</tr>
<tr>
<td>Labour</td>
<td>936</td>
</tr>
<tr>
<td>Service</td>
<td>1052</td>
</tr>
<tr>
<td>Trade &amp; business</td>
<td>6877</td>
</tr>
<tr>
<td>Professional</td>
<td>152</td>
</tr>
<tr>
<td>Others</td>
<td>4926</td>
</tr>
<tr>
<td>Total</td>
<td>15781</td>
</tr>
<tr>
<td>Average HH Income</td>
<td>29358</td>
</tr>
<tr>
<td>Average HH Expenditure</td>
<td>30997</td>
</tr>
<tr>
<td>No. of BPL Households</td>
<td>1390</td>
</tr>
</tbody>
</table>

### TYPE OF STRUCTURE

<table>
<thead>
<tr>
<th></th>
<th>Permanent</th>
<th>Semi-Permanent</th>
<th>Temporary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1298</td>
<td>527</td>
<td>1230</td>
<td>3055</td>
</tr>
<tr>
<td></td>
<td>1840</td>
<td>494</td>
<td>651</td>
<td>2985</td>
</tr>
<tr>
<td></td>
<td>746</td>
<td>53</td>
<td>266</td>
<td>1065</td>
</tr>
</tbody>
</table>

As per the survey result a total of 8989 households falls under vulnerable category, of which majority are households, which are below poverty line, followed by schedule caste households.

### TABLE: Distribution of Vulnerable Households

<table>
<thead>
<tr>
<th>Packages</th>
<th>SC</th>
<th>ST</th>
<th>WHH</th>
<th>BPL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucknow – Ayodhaya</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ayodhaya - Gorakhpur</td>
<td>656</td>
<td>0</td>
<td>40</td>
<td>1807</td>
<td>2503</td>
</tr>
<tr>
<td>Gorakhpur – Gopalganj</td>
<td>298</td>
<td>17</td>
<td>332</td>
<td>3737</td>
<td>4384</td>
</tr>
<tr>
<td>Gopalganj - Muzaffarpur</td>
<td>299</td>
<td>0</td>
<td>103</td>
<td>1700</td>
<td>2102</td>
</tr>
<tr>
<td>Total</td>
<td>1253</td>
<td>17</td>
<td>475</td>
<td>7244</td>
<td>8989</td>
</tr>
</tbody>
</table>
Impact on Cultural properties

Among the cultural properties 259 temples and shrines, 19 mosques & majors, 2 graveyards and 1 cremation ground will be affected which falls within the corridor of impact. Such shrines and graveyards will be shifted in consultation with the people of the area.

<table>
<thead>
<tr>
<th>Community Properties</th>
<th>Lucknow-Ayodhaya</th>
<th>Ayodhaya-Gorakhpur</th>
<th>Gorakhpur-Gopalganj</th>
<th>Gopalganj-Muzaffarpur</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand pump</td>
<td>1180</td>
<td>1053</td>
<td>407</td>
<td>2640</td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>13</td>
<td>14</td>
<td>9</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Tubewell</td>
<td>52</td>
<td>21</td>
<td>6</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Pond</td>
<td>3</td>
<td>16</td>
<td>0</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>63</td>
<td>30</td>
<td>11</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Health Facilities</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Graveyard</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cremation ground</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CPR and Govt. Buildings</td>
<td>42</td>
<td>53</td>
<td>71</td>
<td>166</td>
<td></td>
</tr>
<tr>
<td>Temple</td>
<td>79</td>
<td>51</td>
<td>70</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Hindu Shrine</td>
<td>10</td>
<td>21</td>
<td>28</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>Mazar/Mosque</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1462</td>
<td>1266</td>
<td>613</td>
<td>3341</td>
<td></td>
</tr>
</tbody>
</table>

Entitlement framework

The Resettlement and Rehabilitation (R&R) policy is based on World Bank's OP/BP 4.12 and Operational Directives (OD) 4.20 for resettlement of involuntarily displaced persons and indigenous people. The action plan has been prepared based on the broad outlines laid down in the policy. The principle of the R&R policy is the guiding philosophy to provide a development approach to resettle and rehabilitate the people affected by project. In particular:

- Wherever possible, displacement will be reduced on or avoided altogether by sensitive design of civil works (e.g. alternative designs or modification to the design).

- Where displacement is unavoidable, those displaced will have their living standard improved. They will be located as a single unit among the peer groups or will be assisted to integrate into their new community. Particular attention will be paid to the needs of the most vulnerable groups to be resettled.

- PAPs will be compensated, at replacement cost, for assets lost.

- Adequate social and physical infrastructure will be provided.
• PAPs and lost community would be encouraged to participate in the design and the implementation of RAP.

**Entitlement Categories**

Three primary categories have been identified for entitlement of compensation and assistance under R&R package of Government of Uttar Pradesh, viz.

- **Project Affected Families (PAFs)**
- **Project Affected individual Adults (PAAs)**
- **Project Affected Groups (PAGs)**

**Project Affected Families**

- The families getting affected due to the project are entitled for compensation for the loss of land, structure and other such immovable assets including crops. They will have the right to salvage building materials and counselling on alternative site. The compensation will be given to the owner of the property. The PAF is eligible for following entitlement:

  • Consultation, counselling regarding alternatives, and assistance in identifying new sites and opportunities. PAFs apart from counselling on various entitlement packages will also receive help in identifying suitable relocation site, identification of alternative economic rehabilitation schemes and training for skill upgradation.

  Compensation for land at replacement cost, allowances for fees or other charges.

  • Advance notice to harvest non-perennial crops or compensation for lost standing crops. In case due to shortage of time, advance notice could not be served compensation will be paid. The compensation will be twice the amount of market price of the crop lost.

  • Compensation for perennial crops and trees will be calculated as annual produce value times remaining produce years

  • Replacement or compensation for structures or other non-land assets.

  • Right to salvage materials from existing demolished structures.

  • PAFs belonging to the vulnerable groups are eligible for existing government-housing schemes for the weaker section of the society. The vulnerable groups may be defined as Scheduled Tribes, Scheduled Castes, women headed households, land-less and below poverty line families (annual income below Rs 24,000).

  • Shifting Assistance to move their belongings to the new relocation site.

  • Option of moving to resettlement sites or clusters; incorporating needs for shelter and livelihood.

**Project Affected Persons**
All majors in a household (i.e. above the age of 18 years) are eligible for assistance for loss of livelihoods. Thus, there may be more than one person eligible in each household. The project will provide rehabilitation and assistance for loss of livelihood for any individual impacted by the project. Additional support mechanisms will be made available to re-establish or enhance their livelihood through existing government poverty alleviation programmes. If available, employment associated with the project would be provided. The entitlement package includes:

- Rehabilitation and Assistance for lost or diminished livelihood. All PAPs eligible under this package will be provided help to improve or at least regain the former income level. Special attention will be paid to the vulnerable groups.

- Additional support mechanisms for vulnerable groups in re-establishing or enhancing livelihood. Vulnerable group will receive counselling on alternatives, guidance on appropriate training programmes and advice on marketing new products.

- Employment opportunities connected with the project to the extent possible. It is expected that number of job opportunities will be created by the project. In such opportunities, preference will be given to the PAPs. These job opportunities will be over and above the assistance provided to restore their lost income level. These opportunities are not necessarily limited to the vulnerable group, but to every PAP. The majority of the jobs created will be in unskilled and semi-skilled nature therefore can always be given to the PAPs.

**Project Affected Group**

The project-affected groups are entitled for following compensation/assistance:

- Restoration and improvement of common property resource

- Social forestry programmes envisaged under the project and relocation of drinking water sources shall be done taking women need in consideration.

- Provision of safe space and access for business purposes, local transport and public use.

- Safety measures for pedestrians, particularly children and other non-motorised transport.

- Landscaping of community common areas in urban environment.

- Provision of medical aid in case of accident on the highway

**Entitlement Matrix**

The summary entitlement matrix is produced below which shows the eligible PAP and associated entitlement/support. Specific elements of the entitlements provided in the package of compensation and assistance that will be delivered by the project RAP are detailed in Chapter 4. Any impact not falling within any of the categories mentioned will be addressed within the general spirit of the entitlement framework.
TABLE: BROAD ENTITLEMENT FRAMEWORK FOR RESETTLEMENT AND REHABILITATION

<table>
<thead>
<tr>
<th>Impacts and assistance criteria</th>
<th>Land Acquisition</th>
<th>Inside Right of Way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Squatters</td>
<td>Encroachers</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>NV</td>
</tr>
</tbody>
</table>

A. Corridor of Impact: Loss of land and other assets

Support given to families and households

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Land Acquisition</th>
<th>Inside Right of Way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Squatters</td>
<td>Encroachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V</td>
<td>NV</td>
</tr>
<tr>
<td>1</td>
<td>Consultation, counseling regarding alternatives, and assistance in identifying new sites and opportunities.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>Compensation for land at replacement cost, plus allowances for fees or other charges</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Advance notice to harvest non-perennial crops, or compensation for lost standing crops.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Compensation/ R&amp;R assistance for perennial crops and trees, calculated as annual produce value for three years</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Compensation or R&amp;R assistance for structures or other non-land assets</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>6</td>
<td>Right to salvage material from demolished Structures</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>7</td>
<td>Shifting assistance, transitional allowance, rent</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>8</td>
<td>Option of moving to resettlement sites (in a group of minimum 25 families) incorporating needs for civic amenities</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

B. Corridor of Impact: Lost or diminished livelihood

Support given to adult individuals

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Land Acquisition</th>
<th>Inside Right of Way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Squatters</td>
<td>Encroachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V</td>
<td>NV</td>
</tr>
<tr>
<td>1</td>
<td>Rehabilitation and assistance for lost or diminished livelihood</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>Additional support mechanisms for vulnerable groups in re-establishing or enhancing livelihood</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td>Employment opportunities in connection with project to the extent possible and training</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Any other impacts not yet identified, whether loss of assets or livelihood</td>
<td>Unforeseen impacts shall be documented and mitigated based on the principles agreed upon in this policy framework.</td>
<td></td>
</tr>
</tbody>
</table>

C. Indirect, group oriented impacts in the vicinity of the road corridor

Group oriented support will be given to mitigate negative impacts on the community, and to enhance development opportunities. Addressing traffic safety needs of pedestrians will target particular support at more vulnerable groups.

The entitlements will exclude the affected non-vulnerable encroachers but include non-vulnerable squatter.
Public consultations

Public participation was undertaken to make explicit the social factors that will affect the development impacts of planned highway improvements and mediate project results. Through public participation, stakeholders and key social issues were identified and strategy was formulated. It included socio-cultural analysis and design of social strategy, institutional analysis and specifically addressed the issue of how poor and vulnerable groups may benefit from the project.

Consultations were held at local (community) level and district level. Apart from this, separate survey was carried out among truckers to identify prevalence HIV/AIDS among them and presence of commercial sex workers on the project routes. The main objectives of the consultation program were to minimize negative impact in the project corridors and to make people aware of the road rehabilitation project. During the process efforts were made to ascertain the views and preferences of the people.

The aims of community consultation were:

- To understand views of the people affected w.r.t to the impacts of the road
- To identify and assess all major economic and sociological characteristics of the village to enable effective planning and implementation and,
- To resolve the issues relating to affect on community property

The district level consultations were intended to prepare for district committees that will be established to support RAP implementation. Participants in District level consultations included District Magistrate, representatives of district level officials of line departments, NGOs, and representative of Zilla Parishad.

Key findings of the local level consultations:

- Though participants were aware of the fact that road will be widened, but the people did not know details of the project.
- Local population, though reluctant agreed for relocation of temples and other religious properties. It was agreed upon that site and process of relocation would be finalised by the local population. They were however; assured that all efforts will be made to avoid relocation of religious properties.
- PAPs were of the view that community should be consulted before the drawings of the roads are finalised. They were informed that team would come back to the village to disseminate information regarding finalisation of road design.
- Majority of PAPs agreed that given the road condition and traffic volume, widening and strengthening is necessary.
- Compensation was the major issue in every discussion. Most of the PAPs feared of low compensation because of past experience. However, consultants informed them about the procedure of calculating compensation and were also informed about R &R assistances to meet the replacement value. Cash compensation is more preferred by the PAPs.
- Safety was major concern among the local population. Regarding safety issues, rumble strips or speed breakers was demanded at every major habitation and especially before a school
or hospital. Consultants informed PAPs that service lanes will be provided particularly along the urban areas.

- As regard to employment in the project, permanent job in NHAI or with the contractor was preferred over temporary job during the project implementation.
- While finalizing the design, views of the PAPs and outcome of state and district level workshop were considered which helped in reducing the number of PAPs.

Efforts for Minimizing Resettlement

Road design has been based on co-ordination between the design and the R&R team. Numerous discussions were held between Social and Highway design team to avoid or minimise the negative impacts and specially the displacement wherever possible. In the design phase, mitigation measures incorporated include:

- Bypass at dense urban area viz., Ayodhaya. Social team has finalised alignment of the bypass in such a way that agriculture fields are not bifurcated from the middle and making it agriculturally and economically unviable. Care has been taken to ensure that only a side strip of the agriculture land is acquired.
- Eccentric widening.
- Upgradation of existing bypasses thus minimising land acquisition and negative social impact.
- Reducing design speed in built up areas –
- Reducing impacts on existing shrines and religious structures - In many cases the design cross section has been reduced or redesigned to protect shrines.
- Provision of service lanes, underpasses, flyovers and junction improvements
- Provision of culverts and drains to improve sanitary conditions

The purpose and nature of the resettlement activities

The basic outputs expected from the R&R activities are that the PAPs will be better off or equal to the pre-project situation in terms of:

- Land
- Housing
- Business opportunities
- Access to amenities
- Access to Common Property Resources (CPRs)
- Access to other services
The resettlement activities comprise:

<table>
<thead>
<tr>
<th>Key R&amp;R Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment of the baseline situation before project through Census and socio-economic surveys and consultations</td>
</tr>
<tr>
<td>2. Set-up Social Development and Resettlement Cell:</td>
</tr>
<tr>
<td>- Appointment of NGOs for implementation</td>
</tr>
<tr>
<td>- Establish Co-ordination and Grievance Redress committee</td>
</tr>
<tr>
<td>3. Involvement and participation of PAPs:</td>
</tr>
<tr>
<td>- Group discussion</td>
</tr>
<tr>
<td>- Core rapid appraisal</td>
</tr>
<tr>
<td>4. Collaboration with line departments for dovetailing existing poverty alleviation schemes</td>
</tr>
<tr>
<td>5. Training of R&amp;R implementing agencies and departments</td>
</tr>
<tr>
<td>6. Appointment of NGO for implementation</td>
</tr>
<tr>
<td>7. Awareness regarding R&amp;R policy</td>
</tr>
<tr>
<td>8. Updation of baseline information</td>
</tr>
<tr>
<td>9. Preparation of micro-plans</td>
</tr>
<tr>
<td>10. Land Acquisition</td>
</tr>
<tr>
<td>11. Disbursement of compensation and other R&amp;R assistance</td>
</tr>
<tr>
<td>12. Calculation and disbursement of replacement cost</td>
</tr>
<tr>
<td>13. Economic Rehabilitation</td>
</tr>
<tr>
<td>14. Awareness programme on highway related diseases</td>
</tr>
<tr>
<td>15. Identification of relocation sites for residential displaced persons</td>
</tr>
<tr>
<td>16. Identification of business sites</td>
</tr>
<tr>
<td>17. Infrastructure development at new resettlement sites</td>
</tr>
<tr>
<td>18. Implementation of R&amp;R package</td>
</tr>
<tr>
<td>19. Monitoring and evaluation</td>
</tr>
</tbody>
</table>

Critical Assumptions behind this R&R Policy are that:

- There will be sufficient acceptance, will and motivation among the implementing agencies to handle legal and other constraints.
- Government Poverty Alleviation Programmes for Vulnerable Sections in the society are ready to be mobilised
- Competent NGO can be found to implement the action plan
- Land for relocation will be identified and allocated before eviction of PAPs
- Customer base for business owners will remain
Implementation schedule and institutional Arrangement

Implementation plan has been spread over a period of two years. A year wise activity chart has been provided in chapter on Implementation Schedule of the Resettlement Action Plan. However, a simplified summary of the operational aspects of the implementation plan will be prepared when the project starts. It will be given to PIU, who along with the NGOs will have to put the plan into action.

RAP has the provision for the following mechanism/committees for proper implementation of action plan:

Grievance redress mechanism: Participatory planning has been the basis for finalizing the R&R work and therefore while implementing the R&R plan, the PAPs should have a feeling that they are being consulted & their grievances if any are being attended properly by the PIU. This requires a grievance redress cell in order to regulate the process at all levels. Therefore in order to satisfy the aggrieved PAPs, step-by-step process for registering and addressing grievances has been planned for this project.

Grievance redress involves registering complaints, response time, communication mode, & mechanism for appeal or approaching civil courts. If other provisions fail, then the district level grievance redress committee or Lokadalat will be an effective mechanism.

District Level Committee

The committee would include District Magistrate or his representative, district land acquisition officer, pradhans of panchayat samities, representative of affected villages including women, representative of revenue department, line departments, PIU, people’s representatives, NGO and representatives of affected population. The formation of DLCs would be facilitated by NGOs. The functions of the DLC will be as follows:

- To meet regularly to review the progress of land acquisition/ R&R;
- Facilitate the implementation of the RAP programs in the project-affected area.
- Meet regularly at pre-decided dated specifically for grievance redressing purpose;
- Help in amicable settlement of disputes at community level;
- Carry forward the ones which are not reconciled to the Grievance Redress Committee
- Coordination with local govt. authorities & field offices.

Need for NGO/CBO

The relocation disturbs the present activities of PAPs and therefore there is a need to establish and stabilise their economic living. While all tasks relating to Land Acquisition is taken care by the Competent Authority, the implementation of RAP is the responsibility of the PIU. The NGO will help in implementing various components of the RAP, particularly the use of compensation and rehabilitation assistance for more productive purposes like purchase of land, self-employment, etc. Its involvement is all the more important since there are no social community organisations among the PAPs which otherwise could have taken lead in this regard.
Being new to the area of working with PAPs, the selected NGO will have to work directly under the CRRO who will be in charge for implementation of RAP. Thus implementation becomes joint responsibility of PIU and NGO.

**Role of NGO**

Resettlement relates to human aspects and economic rehabilitation requires human resources development consisting of education, training, awareness generation, etc. NGO will be involved to assist PIU in implementation of RAP. The NGO will help educating PAPs on the proper utilisation of compensation and rehabilitation grant and help them in getting financial assistance, if required, under various subsidy related development programmes. It will also organise training programmes to impart required skill for such PAPs who would prefer to go for self-employment schemes. Specifically, the tasks of the NGO will be to:

- Develop rapport with PAPs and between PAPs and PIU
- Assess the level of skills and efficiency in pursuing economic activities, identify needs for training and organise programmes either to improve the efficiency and/or to impart new skills.
- Assist PAP in receiving rehabilitation entitlement due to them
- Motivate and guide PAP for proper utilisation of benefits under R&R policy provisions;
- Facilitate purchase of agriculture land in negotiating price and settling at a reasonable price or expedite the same through Land Purchase Committee.
- Assist PAPs in obtaining benefits from the appropriate development programmes.
- Help PAPs in increasing their farm income through provision of irrigation facility or improving farm practices, and
- Ensure marketing of produce particularly those under self-employment activities.
- Complete the consultation at the community level and provide support by describing the entitlements to the EPs and assisting them in their choices
- Accompany and represent the EPs at the Grievance Committee meeting.
- Assist the EPs to take advantage of the existing government housing schemes and employment and training schemes that are selected for use during the project, and
- Carry out other responsibilities as required and identified.

In the context of implementing of RAP, it is important that NGO, which is genuine and committed to the task entrusted, is selected. An NGO with local presence is, however, more suitable hence would be preferred. The NGO may be contracted on specified terms and conditions with proper fixation of financial accountability. The payment to NGO will be linked to the performance of the task assigned and the time period. The payment will be arranged on quarterly basis to be released on certification of completing the previous task. The monitoring of R&R programme will also include the performance of NGO. The NGO services will be required for two years for which provisions have been provided in the plan.
Training and Capacity Building

Establishing sufficient implementation capacity to launch and carry out those components of project resettlement that must be completed before civil works. To enhance capabilities, PIU staff can be sent on exposure visits to other projects with good resettlement programmes as well as sponsored for training courses in Resettlement and Rehabilitation (R&R). The Administrative Staff College of India (ASCI) in Hyderabad conducts a two weeks course in R&R. The training would also cover techniques in conducting participatory rural appraisal for micro planning, conducting census and socio-economic surveys, dissemination of information, community consultation and progress monitoring and evaluation. One week training through specialist of the field will be arranged at PIU level both for its own staff and NGO staff engaged for the job.

Implementation Schedule

A period of 36 months will be required to implement the Resettlement Action Plan. Date wise activities have been presented in table below:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparatory Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Mobilization</td>
<td>01/04/2004</td>
<td>05/04/2004</td>
<td>5 days</td>
</tr>
<tr>
<td>Training of CRRO and project staff for familiarization with RAP report</td>
<td>06/04/2004</td>
<td>08/04/2004</td>
<td>3 days</td>
</tr>
<tr>
<td>Orientation training of project staff (Supervisors/ VLWs) on the RAP</td>
<td>06/04/2004</td>
<td>08/04/2004</td>
<td>3 days – parallel exercise</td>
</tr>
<tr>
<td>Initial consultations with NHAI team for firming up the activity plan</td>
<td>06/04/2004</td>
<td>08/04/2004</td>
<td>3 days – parallel exercise</td>
</tr>
<tr>
<td>Collection and review of RAP Report &amp; other relevant documents</td>
<td>09/04/2004</td>
<td>30/04/2004</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Reconnaissance survey and rapport building with community &amp; district</td>
<td>09/04/2004</td>
<td>30/04/2004</td>
<td>3 weeks – parallel exercise</td>
</tr>
<tr>
<td>Preparation and submission of inception report to the NHAI</td>
<td>15/04/2004</td>
<td>30/04/2004</td>
<td>2 weeks – parallel exercise</td>
</tr>
<tr>
<td><strong>Land Acquisition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appointment of Competent Authority</td>
<td>01/03/2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue of section 3A</td>
<td>01/04/2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publication in Newspaper</td>
<td>15/04/2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 3C: Hearing of objection</td>
<td>01/04/2004</td>
<td>22/04/2004</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Section 3D: Declaration of Acquisition</td>
<td>16/06/2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 3G: Determination of compensation &amp; issue of award by CA</td>
<td>16/09/2004</td>
<td>16/11/2004</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Section 3H: Deposit of payment amount</td>
<td>01/10/2004</td>
<td>28/02/2005</td>
<td>20 weeks</td>
</tr>
<tr>
<td>Disbursement of compensation</td>
<td>10/10/2004</td>
<td>30/09/2005</td>
<td>50 weeks</td>
</tr>
<tr>
<td><strong>Verification Survey</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalization of verification survey questionnaire</td>
<td>01/05/2004</td>
<td>07/05/2004</td>
<td>1 week</td>
</tr>
<tr>
<td>Activities</td>
<td>Start Date</td>
<td>End Date</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------------</td>
<td>-------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Rapport building visit by VLWs/ Supervisors</td>
<td>01/05/2004</td>
<td>07/05/2004</td>
<td>1 week– parallel exercise</td>
</tr>
<tr>
<td>Training of supervisors/VLWS for social impact census survey</td>
<td>07/05/2004</td>
<td>14/05/2004</td>
<td>1 week</td>
</tr>
<tr>
<td>Digital photography of Pre-project status of structures/assets in ROW</td>
<td>15/05/2004</td>
<td>30/05/2004</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Preparation of inventory of asset loss (private/common property etc)</td>
<td>01/06/2004</td>
<td>30/06/2004</td>
<td>4 weeks– parallel exercise</td>
</tr>
<tr>
<td>Conducting Verification survey – NTH</td>
<td>01/05/2004</td>
<td>30/09/2004</td>
<td>20 weeks</td>
</tr>
<tr>
<td></td>
<td>01/10/2004</td>
<td>31/03/2005</td>
<td>24 weeks</td>
</tr>
<tr>
<td>Preparation of list of PAPs/ PAFs/ PDPs with socio-economic details</td>
<td>01/06/2004</td>
<td>31/12/2004</td>
<td>28 weeks-will run parallel to verification survey</td>
</tr>
<tr>
<td>Submission of Identification and Verification Report for NTH</td>
<td></td>
<td>31/10/2004</td>
<td></td>
</tr>
<tr>
<td>Submission of Identification and Verification Report for Titleholders</td>
<td></td>
<td>31/05/2005</td>
<td></td>
</tr>
</tbody>
</table>

**IEC and Awareness Campaign**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation and distribution of R&amp;R policy document to the PAPs</td>
<td>01/05/2004</td>
<td>30/06/2004</td>
<td>8 weeks days</td>
</tr>
<tr>
<td>Organize awareness campaigns for sharing information on RAP</td>
<td>01/05/2004</td>
<td>31/07/2004</td>
<td>12 weeks- partially parallel</td>
</tr>
<tr>
<td>Confidence building measures through participatory process</td>
<td>01/05/2004</td>
<td>30/09/2004</td>
<td>20 weeks– On going exercise</td>
</tr>
<tr>
<td>Consultation meetings with project staff, contractors and labours</td>
<td>01/09/2004</td>
<td>30/09/2004</td>
<td>4 weeks – parallel exercise</td>
</tr>
<tr>
<td>Organize awareness campaigns for construction labours on HIV/ AIDS</td>
<td>01/10/2004</td>
<td>30/09/2006</td>
<td>On going activity- as and when required</td>
</tr>
<tr>
<td><strong>Establishment of DLC/GRC</strong></td>
<td>31/03/2004</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Land and Building Valuation**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolving land and building valuation methods</td>
<td>01/05/2004</td>
<td>31/05/2004</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Measurement &amp; valuation of land and structures (private/community etc.)</td>
<td>01/06/2004</td>
<td>30/09/2004</td>
<td>16 weeks– parallel to verification survey</td>
</tr>
<tr>
<td>Preparation of entitlement/ assistance compensation for the TH and NTH</td>
<td>01/08/2004</td>
<td>31/01/2005</td>
<td>24 weeks</td>
</tr>
<tr>
<td>Photography of EPs for distribution of entitlement-cum- Identity Cards</td>
<td>01/06/2004</td>
<td>31/10/2004</td>
<td>20 weeks – partially parallel to verification survey</td>
</tr>
</tbody>
</table>

**Micro Plans & Disbursement**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of Micro Plans (Non-title holders)</td>
<td>01/08/2004</td>
<td>30/11/2004</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Preparation of Micro Plans (Title holders)</td>
<td>01/09/2004</td>
<td>31/07/2005</td>
<td>44 weeks</td>
</tr>
<tr>
<td>Opening of bank account in joint names for disbursement</td>
<td>15/02/2005</td>
<td>31/05/2005</td>
<td>14 weeks</td>
</tr>
<tr>
<td>Informing EPs about entitlement, DLC/ GRC, grievances application</td>
<td>01/01/2005</td>
<td>31/03/2005</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>
Activities | Start Date | End Date | Remarks
--- | --- | --- | ---
Disbursement of entitlement/ assistance | 01/03/2005 | 01/10/2005 | 28 weeks – intermittent exercise

Rehabilitation Process

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livelihood analysis/options for PAPs/ PDPs</td>
<td>01/12/2004</td>
<td>30/04/2005</td>
<td>20 weeks</td>
</tr>
<tr>
<td>Training Need Assessment</td>
<td>01/01/2005</td>
<td>30/04/2005</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Formation of Savings/ Self Help Groups (SHGs)</td>
<td>01/01/2005</td>
<td>30/11/2005</td>
<td>44 weeks</td>
</tr>
<tr>
<td>Vocational, skill up gradation trainings based on the micro plans</td>
<td>01/03/2005</td>
<td>30/01/2006</td>
<td>44 weeks – Groups of various trades will be trained over a period of 44 weeks</td>
</tr>
<tr>
<td>Disbursement of ERG to vulnerable</td>
<td>01/06/2005</td>
<td>28/02/2006</td>
<td>36 weeks – as and when training is completed</td>
</tr>
<tr>
<td>Initialization of new activity</td>
<td>01/07/2005</td>
<td>30/05/2006</td>
<td>44 weeks – as and when training of a particular group ends</td>
</tr>
<tr>
<td>Mid term checks</td>
<td>01/10/2005</td>
<td>01/06/2006</td>
<td>32 weeks – as and when individual / groups starts new activity</td>
</tr>
<tr>
<td>Repeat training if required</td>
<td>01/06/2006</td>
<td>01/08/2006</td>
<td>8 weeks - if required</td>
</tr>
</tbody>
</table>

Resettlement Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Start Date</th>
<th>End Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification and selection of sites for resettlement and site development</td>
<td>01/07/2004</td>
<td>30/04/2005</td>
<td>40 weeks-</td>
</tr>
<tr>
<td>Shifting of PDPs/ vendor market/ private/community structures etc.</td>
<td>01/01/2005</td>
<td>01/01/2006</td>
<td>48 weeks – will run parallel to site development</td>
</tr>
<tr>
<td>Rehabilitation at new sites/ locations identified</td>
<td>01/03/2005</td>
<td>01/01/2006</td>
<td>40 weeks</td>
</tr>
<tr>
<td>Submission of Completion Report</td>
<td></td>
<td>31/09/2006</td>
<td></td>
</tr>
</tbody>
</table>

Income Restoration

Basic information on IR activities of PAPs will be available from the census and socio-economic surveys. Information from base line surveys will be available on features of economic activities of PAPs under two categories, viz.,

- Land based economic activities
- Non-land economic activities
- Total income of PAPs from various sources

Project induced displacement may lead to loss or diminished income for Project Affected Person (PAPs). The main categories of impacts are as follows:

- Loss of agriculture land in part or full
- Loss of commercial establishments (permanent)
- Loss of temporary commercial structure or mobile vendor (Squatters)
• Loss of livelihood (Commercial tenants or helping hands, agriculture labours)

Projects like road development involve acquiring linear strips of land; as such the impacts are not expected to be significant. However, mitigation measures need to be planned and implemented however insignificant the impacts may be.

The entitlement framework has the following provisions for restoration of income:

**Assistance for Squatters and Encroachers**
- Vulnerable encroacher and squatters to get replacement value for the structure
- Training @ Rs. 1500 per EP
- Commercial vulnerable encroacher and squatter to get ERG
- Squatters to get shifting allowance of Rs.800 for temporary, Rs. 1500 for semi-permanent and Rs.2500 for permanent.
- Squatters to get lump sum Rs. 2000 as transitional allowance.

**Assistance for Kiosks**
- All Kiosk households to get Rs.800 as one time shifting allowance

**Titleholder – Agriculture land**
- Compensation at replacement cost
- Vulnerable to get ERG.
- Training @ Rs. 1500 per EP
- Vulnerable to get transitional allowance @ Rs. 2000 per month for 9 months and if non-vulnerable the period would be of 3 months
Titleholder – Residential and Commercial

- Compensation at replacement cost (both land and structure)
- Transitional assistance of Rs.2000 per month for 9 months
- Shifting allowance of Rs.800 for temporary, Rs. 1500 for semi-permanent and Rs.2500 for permanent
- Vulnerable to get ERG
- Training @ Rs. 1500 per EP

Non-Titleholder – Tenant (Residential and Commercial)

- A sum equal to nine months rental @ Rs. 2000 per month
- Lump sum shifting allowance of Rs. 800
- For commercial tenant; Vulnerable to get ERG and Training @ Rs. 1500 per EP

Highway related diseases

Vehicles carrying people or goods over long distance are the frequent users of highways (both national and state). Various studies conducted on Trucker’s behaviour shows that the drivers and helpers of such long distance vehicles like truck often spend many days at a stretch, outside their homes and away from their family members. The factors of financial insecurity, tensions at work, being away from home for long duration give rise to irregular habits among the truck drivers and their assistants. Taking to alcohol and commercial sex is one the means of entertainment and releasing tension and as result they become prey to HIV positive and other sexually transmitted diseases (STD).

Therefore, a survey was conducted among truckers and their assistants under UP-SRP study at different locations across all the five routes of Phase I. The survey result shows that, drivers and helpers or assistants take halts at different resting-places designated/naturally developed along the corridors to have sex, which are usually unsafe. Thus sexual diseases are often found to spread rapidly along the road and highway corridors. On the other hand, tuberculosis (TB) and other like diseases are also found to spread through physical contacts along with STD and AIDS. Seeing the gravity of the spread of all these diseases proper measures are required to be taken to create awareness about their severity and to control such spread of diseases. Among such measures, the most important is awareness campaign among the truckers and CSWs through IEC.

Trafficking of women and child and Child Labour is another aspect NGO shall have to take care of. Recommended measures have been provided in chapter on Social Concerns.

Construction camps

For large-scale construction like that of highways, construction camps should be planned to house the construction workers. Apart from local labour force the project will require highly skilled labour, which may not be available locally. Therefore, it is expected that there will be in-migration of some labour force from outside. Hence, to meet their housing demand and other basic necessities, certain provisions have been made in the camps. The provisions enlisted would be of use to all the residents of the construction camp with a special emphasis on women and children. Issues discussed in the
chapter are based on assumption that a substantial non-native labour force will come to work in the stretch where construction is in progress and move along as the work progresses.

The site for construction camp should be at least 500 m down wind from habitations. The sites for construction camps will be finalised in consultation with the local population and will need approval of the PIU. This provision has been made in the EMP as mandatory requirement for the contractor. The chapter provides typical lay out construction camp and hot mix plant and normally applicable laws addressing social and environmental issues. The chapter further details out contract obligations and additional specifications under LMNHP for contractor.

Need for detailing construction camp was all the more important as the impact of substantial migrant population in any area entails its own special concerns. This has a real potential to create strife in the host community as well as in the labour force itself. Therefore an attempt has been in this chapter to bring this issue into focus for implementation agencies as well as for the planners of future projects.

**Budgetary Estimate for RAP Implementation**

The total estimated budget for R&R program is Rs. 1143.519 million. The budget includes land acquisition cost, assistance to affected families, measures for HIV/AIDS prevention, community infrastructure development, cost for RAP implementation, monitoring and evaluation of RAP implementation, training for eligible PAPs and PIU field staff.

**TABLE: SUMMARY R&R BUDGET**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Head</th>
<th>NHAI</th>
<th>World Bank</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compensation</td>
<td>369.413</td>
<td>369.413</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Assistsances</td>
<td>12.002</td>
<td>613.299</td>
<td>625.301</td>
</tr>
<tr>
<td>3</td>
<td>Community Infrastructure</td>
<td>0</td>
<td>121.305</td>
<td>121.305</td>
</tr>
<tr>
<td>4</td>
<td>Support to RAP Implementation</td>
<td>0</td>
<td>27.50</td>
<td>27.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>381.415</td>
<td>762.104</td>
<td>1143.519</td>
</tr>
</tbody>
</table>

In association with Spatial Decisions