KINGDOM OF CAMBODIA

Nation – Religion – King

MINISTRY OF PUBLIC WORKS AND TRANSPORT

Provincial and rural Infrastructure Project, CS1

STANDARD GUIDELINES

For

IMPLEMENTATION OF ENVIRONMENTAL AND SOCIAL SAFEGUARDS

January 15, 2010

KINGDOM OF CAMBODIA

Nation – Religion – King

Ministry of Public Works and Transport

No---------- **Phnom Penh----------2010**

PRAKAS

On

Promulgation of the Standard Guidelines for Implementation of Environmental and Social Safeguards Framework in Ministry Projects, particularly for Road Assets Creation and Maintenance

Minister of Public Works and Transport

- Having seen the Constitution of the Kingdom of Cambodia, particularly Articles 44 and 59
- Having seen the Royal Decree No NS/RKM/0704/124 dated July 15, 2004 on the Appointment of the Royal Government of Cambodia
- Having seen the Royal Decree No 02/NS/94 of July 20, 1994 on the Organization and Functioning of the Council of Ministers
- Having seen the Royal Decree No No 0196/03 NS/RKM of January 24, 1996 on the Establishment of the Ministry of Public Works and Transport
- Having seen the Royal Decree on the Establishment and Demarcation of Protected Areas dated November 01, 1993
- Having seen Royal Decree of May 23, 1995 concerning Teritorial Management, Urban Planning and Construction
- Having seen the Law on Environmental Protection and Natural Resource Management, Kram NS/KRM/1296/36 dated December 24, 1996
- Having seen the Forestry Law Kram NS/ RKM/0802/016 dated August 31, 2003
- Having seen the Land Law of August 2001
- Having seen the Expropriation Law----------
- Having seen the Sub-decree No 14ANK-BK/03/03/98 of March 03, 1998 on the organization and functioning of the Ministry of Public Works and Transport
- Having seen the Sub-decree on Community Forestry Management No 79/NK/BK of Dec 20, 2003
- Having seen Sub-decree on Environmental Impact Assessment Process No 72/ANRK/BK

- Having seen Sub-decree No 42/ANRK/BK dated July 10, 2000 on Air Pollution Control and Noise Disturbance
- Having seen Sub-decree on Water Pollution Control No 27/ANRK/BK of April 06, 1999
- Having seen Resettlement Policy Framework o RP 146 of June 2003 of the Ministry of Public Works and Transport
- Pursuant to the necessity of the Ministry and the Agreements with the World Bank and the Asian Development Bank

DECIDES

ARTICLE 1: To Promulgate the Standard Guidelines for implementation of Environmental and Social Safeguards, as attached to this Prakas.

ARTICLE 2: To make mandatory the use of these Guidelines for all projects of the Ministry of Public Works and Transport, however funded

ARTICLE 3: General Secretariat, Cabinet, all relevant General Directorates and Departments of the Ministry of Public Works and Transport and all relevant Executing Agencies shall comply with this Prakas, effective from the date of signature appended hereto.

Minister of Public Works and Transport

Signature and Seal

Tram Iv Tek

Recipients:

-Office of the Council of Ministers
-All related General Directorates and Departments
-All related line Ministries and institutions
-Archives

FOREWORD

The Ministry of Public Works and Transport [MPWT] has developed this unified set of Standard Guidelines for the implementation of Environmental and Social Safeguards. This document is also in the nature of a Manual, which Ministry personnel may use as guidance.

The need for this set of Standard Guidelines arises from the fact that there has so far not been any set of clear guidance that could be used by those who are in charge of implementing the Ministry's projects. The World Bank and the ADB have been insisting on compliance with the ESSF, and the Royal Government of Cambodia has also clearly indicated its focus on ensuring the safety and integrity of the environment. Simultaneously, concern for social issues, especially resettlement issues, has also been of a very high order.

The World Bank has stressed on the need to have a compilation of a clear set of Technical Environmental Guidelines. Efforts were therefore made by this Ministry to ensure, that all guidance and compliance requirements with regard to Environmental and Social Safeguards, are brought together in a format that is readily usable by the implementing/executing personnel. This volume is the final result of this effort.

There have been debates on whether the ESSF as applicable to advanced developing countries should be applicable in totality to countries less fortunate. This issue arises from the costs of compliance, which not every country is able to afford. In the case of Cambodia, environmental regeneration, especially for forest cover, has never really been an issue. Therefore, in many projects there has been laxity in the implementation of ESSF, and this set of Standard Procedures will help to combat such laxity to the maximum possible extent.

It is the intention of the MPWT to review the implementation of this set of Standard Guidelines at regular intervals. The Ministry will also consider the issues that arise during that processes and will endeavour to address those issues through appropriate modifications of the Procedures, or through addenda or explanatory/clarificatory statements as may be required from time to time.

Implementation of the Guidelines will necessitate capacity-building within the Ministry. It is hoped that there will be support from the multilateral donor agencies and development partners so that such capacity building can be carried on a sustainable basis.

Finally, I would like to express my sincere appreciation of the initiative of the World Bank in providing the funding required for the preparation of these Guidelines and for carrying out the initial training in Safeguards compliance.

Tram Iv Trek
Minister
Ministry of Public Works and Transport

Contents

List of Forms

Abbreviations

AADT	Average Annual Daily Traffic
BCPL	Banteay Chhmar Protected Landscape
CPR	Common Property Resource
COI	Corridor of Impact
CRE	Chief Resident Engineer
DFW	Department of Forestry and Wildlife; within MAFF
DOE	Department of the Environment; Provincial level of MOE
DOP	Department of Planning; within MPWT
DEMP	Detailed Environmental Management Plan
DMS	Detailed Measurement Survey
RWG	Resettlement Working Group
EMDP	Ethnic Minority Development Plan
ESO	Environmental and Social Office;
ES	Environmental Specialist
GMS	Greater Mekong Sub-region
GRC	Grievance Redress Committee
IA (EA)	Implementing (Executing) Agency
ID	Identity Card
IPDP	Indigenous Peoples Development Plan
IRS	Income Restoration Scheme
ISA	Initial Social Assessment
JICA	Japan International Co-operation Agency
MA	Monitoring Agency
M&E	Monitoring and Evaluation
MEF	Ministry of Economy & Finance
MAFF	Ministry of Agriculture Forestry and Fisheries
MOE	Ministry of the Environment
MPWT	Ministry of Public Works and Transport
MRC	Mekong River Commission
NR	National Road
OP	Operational Policy
PAP	Project Affected Persons
PIB	Public Information Booklet
PIU	Project Implementation Unit
RAP	Resettlement Action Plan
RE	Resident Engineer
ROW	Right of Way
RP	Resettlement Plan
R&R	Resettlement and Rehabilitation
SA	Social Assessment
SCCA	Ang Trapang Thmor Sarus Crane Conservation Area
SIA	Social Impact Assessment
TOR	Terms of Reference
TSBR	Tonle Sap Biosphere Reserve
VRC	Village Resettlement Committee
WB	World Bank

- Sustainable use of Cambodia's natural resources is a key factor to the country's development. Approximately three-quarters of the population are directly engaged in agriculture and depend upon the land for their daily subsistence. Agriculture and forestry contribute nearly 40 percent of the country's Gross Domestic Product (GDP). Tourism, which is based on the country's cultural and natural wonders, also contributes significantly to economic development. Reliance on these industries means that sustainable management of natural resources and other aspects of the environment are vital for improving rural livelihoods and for economic growth. Up-gradation and maintenance of roads and highways is a prerequisite for the development of a under developed countries like Cambodia.

- It is the Ministry of Public Works and Transport (MPWT) and MRD policy to ensure that road development, including maintenance works, do not cause negative impacts on the local physical, biological as well as natural environmental including local communities. To achieve this objective, it is the responsibility of MPWT's/MRD to ensure that appropriate action, including monitoring, are undertaken during the project planning, designing, pre-construction, construction and post construction phases. Safeguard compliances performance of contractors is considered important and will be monitored closely because EMP compliances is part Environmental Safeguard. Efforts will be made to incorporate measures to reduce, minimize or compensate the associated impact that may occur during various phases of the project. MPWT's/MRD staff will also ensure that information related to the environmental and social impacts of the project is made available for the local public for review and will promote/ maintain close consultation and cooperation with local communities and local authorities.

- Simultaneously with environmental safeguards, there is cause for being concerned about the social dimensions of projects. Involuntary resettlement is a complicated subject. To achieve resettlement objectives remains an inherently risky proposition and new projects bring to the fore new resettlement issues or challenges. The primary objectives of these Guidelines are to provide detailed guidance to the project proponents in addressing social issues in development projects specifically in planning and implementation of resettlement plans, ethnic minority development plans, where necessary. The Guidelines also provide guidance for conducting social assessment in projects with indirect impacts on population within or beyond the project boundaries. The Guidelines explain in detail the processes and procedures necessary for collection of data, surveys and preparation of various documents in accordance with the provisions of the National Policy on Resettlement and Compensation, Herein after called the 'Policy'. The guidelines cover all phases of project process from project identification to implementation and post-implementation evaluation of resettlement activities on development projects.

- These Technical Guidelines (TEG) should be applied to all the civil works subprojects to be implemented under RAMP/PRIP and also other Government sponsored projects. All the concerned divisions/officers/units responsible for planning, implementation, and supervision and monitoring of the subproject and or activity will be responsible for proper application of the guidelines. When appropriate, the safeguard requirements will be incorporated into the normal operation of the division/ officers/ units. The Environmental and Social Office (ESO) of the Department of Planning in MPWT/ MRD will responsible for ensuring the compliances, including provide technical assistance and training to the concerned staff, but they itself need training and supporting guidelines to implement the project on sustainable basis. There is no existing environmental guideline

in related to preparation of EIA/EMP report of road / highway projects. They are depending on the guidelines of funding agencies.

- These Guidelines also provide resettlement practitioners with guidance on the implementation of resettlement principles, the procedural requirements for projects, the technical aspects of resettlement planning, and the actual implementation of resettlement. This guidance is intended to increase the likelihood that the projects will achieve the objectives of (a) avoiding or minimizing adverse impacts and to conceive and execute resettlement activities as sustainable development programs, (b) giving displaced persons opportunities to participate in the design and implementation of resettlement programs, and (c) assisting displaced persons in their efforts to improve their livelihoods and standards of living, or at least to restore these to pre-project levels.

- In Cambodia, both practices related to environmental safeguard compliance as well as resettlement procedures and practices are evolving over time and are constantly refined and strengthened as more experience is gained from development projects. In this context, every effort will be made in future to update these Guidelines periodically and issue updated versions as and when necessary.

Explanations of Key Terms

- **Explanations of some of the Key terms normally used in environmental management and social safeguards planning and compliance are given below:**
  i. **Afforestation:** Planting trees where there were none before.
  ii. **Agroforestry:** The integration of tree growing with crop and livestock production. Agroforestry offers a way of tackling the combined problems of wood storages, poor agricultural production and environmental degradation.
  iii. **Acid rain:** When strong acids fall from the atmosphere in the form of rain, snow, fog or dry particles. The acid is the result of pollution caused mostly by sulphur oxides and nitrogen oxides that are discharged into the atmosphere by industry. It also is created by burning coal and oil, from the operation of smelting industries and from transportation. In the atmosphere, these gases combine with water vapour to form acids, which then fall back to Earth. The result often kills forests and sterilizes lakes.
  iv. **Aquifer:** A porous, water-saturated layer of sediment and bedrock under the Earth's surface; also described as artesian (confined) or water table (unconfined)
  v. **Atmosphere:** The envelope of air surrounding the Earth. Most of the total mass of the atmosphere lies within the troposphere and the stratosphere. Most weather events are confined to the troposphere, the lower eight to 12 km of the atmosphere. The ozone layer is found in the stratosphere which typically extends from 10 to 40 km above the Earth.
  vi. **Biodegradable:** Capable of being broken down by living organisms into inorganic compounds. Ideally all waste should be biodegradable
  vii. **Biological diversity (biodiversity):** The variety of different living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the variety of different ecosystems that they form. This includes diversity within species, between species and of ecosystems, and the genetic variability of each species.
  viii. **Biological resources:** Includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.
  ix. **Biomass:** The total amount of living organisms in a given area.

x. **Biosphere:** The global ecosystem; that part of the earth and atmosphere capable of supporting living organisms.
xi. **Carbon tetrachloride:** A solvent which is considered toxic and can cause cancer in humans. It is used primarily as a feedstock material for the production of other chemicals, including CFCs.
xii. **Compensation.** Compensation means payment in cash or in kind for an asset to be acquired or affected by a project at replacement cost.
xiii. **Cut-off Date. '**Cut-off date' is the date prior to which the occupation or use of the project area makes residents/users of the project area eligible to be categorized as affected persons. In many projects, the cut-off date coincides with the commencement of the census of affected persons within the project area boundaries. Persons not covered in the census are not eligible for compensation and other entitlements.
xiv. **CFCs (chlorofluorocarbons):** Any of the various compounds consisting of chlorine, hydrogen, fluorine, and carbon. They were first invented by DuPont Corporation in 1928 and have been widely used as refrigerants, as aerosol propellants, as cleaning solvents and in the manufacture of plastic foam. In 1972, scientists discovered that gaseous CFCs can deplete the ozone layer when they slowly rise into the stratosphere and their chlorine atoms react with ozone molecules. Efforts are now underway through the Montreal Protocol to reduce and then eliminate production of this substance worldwide.
xv. **Carbon dioxide:** A colourless, odourless, non-poisonous gas, which results from fossil fuel combustion and is normally a part of the air.
xvi. **Climate change:** The slow variations of climatic characteristics over time at a given place. Usually refers to the change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable periods.
xvii. **Climate system:** The totality of the atmosphere, hydrosphere, biosphere, and geosphere and their interactions that characterize the average and extreme conditions of the atmosphere over a long period of time at any one place or region of the earth's surface.
xviii. **Climate:** The long term average condition of the weather in a given area.
xix. **Composting:** The natural biological decomposition of organic material in the presence of aerobic bacteria to form a rich, dark soil fertilizer.
xx. **Conservation:** The long-term protection and sustainable management of natural resources in accordance with principles that ensure long-term economic and social benefits.
xxi. **Contaminant:** Any biological, chemical, physical or radiological substance that has an negative effect on air, soil or water.
xxii. **Deforestation:** The felling of trees, usually for commercial purposes.
xxiii. **Desertification:** Land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.
xxiv. **Ecosphere:** Refers to the entire global ecosystem that comprises atmosphere, lithosphere, hydrosphere, and biosphere as inseparable components.
xxv. **Ecosystem:** A dynamic and complex system of plant, animal and microorganism communities and their non-living environment all interacting as a functional unit within a defined physical location. The term may be applied to a unit as large as the entire ecosphere, but usually refers to a division thereof.
xxvi. **Effluent:** The discharge of industrial or urban waste material into the environment; the outflow from a lake or river.
xxvii. **Emissions:** The release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.
xxviii. **Entitlement.** Range of measures comprising compensation, income rehabilitation assistance, transfer assistance, income substitution, and relocation

which are due to affected people, depending on the type and degree of their losses, to restore their economic and social base.

xxix. **Environmental Impact Assessment (EIA):** The critical appraisal, both positive and negative, of the likely effects of a proposed project, ,development, activity or policy on the environment.

xxx. **Environmentally Sound:** That which does not harm the environment in any way.

xxxi. **Erosion:** The wearing away of land surface by wind, water, glaciers, chemicals, and exposure to the atmosphere. Erosion occurs naturally but can be intensified by land-clearing practices related to farming, residential or industrial development, road building.

xxxii. **External Monitoring Agency** is the independent entity designated by the Project Proponent to monitor resettlement implementation activities in a project.

xxxiii. **Habitat:** The geographical location(s) and the associated set(s) of environmental conditions that are necessary for the flourishing of a particular type of plant or animal. In other words, their home.

xxxiv. **Hazardous waste:** Refuse that could present dangers through the contamination and pollution of the environment. It requires special disposal techniques to make it harmless or less dangerous

xxxv. **Implementing Agency** (aka Project Proponent/Project Authority/Executing Agency) is the agency, public or private, that is responsible for planning, design and implementation of a development project.

xxxvi. **Integrated resource planning:** The management of two or more resources in the same general area, such as water, soil, timber, grazing land, fish, wildlife and recreation.

xxxvii. **Land Acquisition** means the process whereby a person is compelled by a public agency to alienate all or part of the land a person owns or possesses, to the ownership and possession of that agency, for a public purpose in return for compensation

xxxviii. **Land degradation:** The reduction or loss of the biological or economic productivity from rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands. Land degradation usually results from unsustainable land use.

xxxix. **Project Affected Person (PAP)** includes any person or persons, household (sometimes referred to as project affected family), a firm, or a private or public institution who, in the context of acquisition, or repossession, of assets or change in land use, as of the cut-off date, on account of the execution of a development project, or any of its subcomponents or part, would have their (a) Standard of living adversely affected, (b) Right, title or interest in all or any part of a house, land (including residential, commercial, agricultural, plantations, forest and grazing land) or any other moveable or fixed assets acquired or possessed, in full or in part, permanently or temporarily adversely affected: or (c) Business, occupation, place of work, residence, habitat or access to forest or community resources adversely affected, with or without displacement. PAP means persons or affected household and consists of all members of a household residing under one roof and operating as a single economic unit, who are adversely affected by a project or any of its components. For resettlement purposes, affected persons will be considered as members of affected households.

xl. **Recyclable:** Refers to such products as paper, glass, plastic, oil and metals that can be reprocessed into products again instead of being disposed of as waste.

xli. **Reforestation:** The process of reestablishing a forest on previously cleared land.

xlii. **Rehabilitation** means assistance provided to PAPs seriously affected due to the loss of productive assets, incomes, employment or sources of living, to supplement payment of compensation for acquired assets in order to improve, or at least achieve full restoration of living standards and quality of life to pre-project level.

xliii. **Relocation** means the physical shifting of an PAP from his/her pre-project place of residence, place of work or business premises.

xliv. **Renewable resources:** Natural resources that have the capacity to be naturally replenished despite being harvested (e.g., forests, fish). The supply of natural resources can, in theory, never be exhausted, usually because it is continuously produced

xlv. **Replacement Cost** is the amount needed to replace an affected asset and is the value determined as compensation for (a) Agricultural land, pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes, (b) Land in urban areas, it is the pre-displacement market value of land of equal size and use, with similar or improved public infrastructure facilities and services and located in the vicinity of the affected land, plus the cost of any registration and transfer taxes, (c) Houses and other related structures based on current market prices of materials, transportation of material to construction site, cost of labour and contractor's fee, and cost of any registration and transfer taxes. In determining replacement cost, depreciation of the assets and value of salvaged building materials are not taken into account and no deductions are made for the value of benefits to be derived from the project, (d) Crops, trees and other perennials based on current market value; and (e) Other assets (i.e. income, cultural, aesthetic) based on replacement cost or cost of mitigating measures.

xlvi. **Resettlement** refers to all measures taken by the Project Proponent to mitigate any and all adverse social impacts of a project on the PAPs, including compensation for lost assets and incomes and the provision of other entitlements, income restoration assistance, and relocation, as needed.

xlvii. **Resource:** A person, thing, or action that is used to produce a desired affect or product,

xlviii. **Sinks:** Sinks remove gases from the atmosphere either by destroying them through chemical processes or storing them in some other form. Carbon dioxide is often stored in trees.

xlix. **Social Assessment (SA) or Social Impact Assessment (SIA).** SA or SIA is a framework for incorporating social analysis and participatory process in project design and implementation.

l. **Sustainable development:** Development that ensures that the use of resources and the environment today does not compromise their use in the future.

li. **Urban runoff:** Storm water from city streets and adjacent domestic or commercial properties that may carry pollutants of various kinds into the sewer systems and from there to rivers, lakes or oceans

lii. **Vulnerable group.** These are distinct groups of people who might suffer disproportionately or face the risk of being marginalized from the effects of resettlement and specifically include: (i) female headed households with dependents, (ii) disabled household heads, (iii) households falling under the generally accepted indicator for poverty, (iv) elderly households with no means of support and landlessness, (v) households without security of tenure, and (vi) ethnic minorities.

liii. **VOC (volatile organic compound):** The term used to describe the organic gases and vapours that are present in the air. They are believed to be involved in ground-level ozone formation. Some VOCs are toxic air pollutants.

liv. **Wastewater:** Water that carries wastes from homes, businesses, and industries. It is usually a mixture of water and dissolved or suspended solids.

lv. **Wastewater treatment plant:** A facility containing a series of tanks, screens, filters, and other processes by which pollutants are removed from water.

lvi. **Water Quality:** A term used to describe the chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

lvii. **Wetlands:** Lands where water saturation is the dominant factor that determines the nature of soil development and the types of plant and animal communities living in the surrounding environment. Other common names for wetlands are bogs, ponds, estuaries

World Bank Environmental and Social Safeguards Framework

- The Bank requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. Concurrently, Social Assessments are also to be undertaken and mitigation proposed and carried out, keeping the Safeguards in view.

- The World Bank has 10 safeguard policies covering the following:

OP/BP 4.01	Environmental Assessment
OP/BP 4.04	Natural Habitats
OP/BP 4.36	Forests
OP 4.09	Pest Management
OP/BP 4.11	Physical Cultural Resources
OP/BP 4.10	Indigenous Peoples
OP/BP 4.12	Involuntary Resettlement
OP/BP 4.37	Safety of Dams
OP/BP 7.50	Projects on International Waterways
OP/BP 7.60	Projects in Disputed Areas

  Each of the Policies as above has specific Objectives, which are to be operationalized through specific Principles. These have been clearly stated by the World Bank.

- The World Bank has, over the years, changed its viewpoint to accommodate specific country systems as equivalent to what the Bank desires. The Bank considers a borrower's environmental and social safeguard system to be equivalent to the Bank's if the borrower's system is designed to achieve the objectives and adhere to the applicable operational principles as discussed below. Since equivalence is determined on a policy-by-policy basis, the Bank may conclude that the borrower's system is equivalent to the Bank's in specific environmental or social safeguard areas in particular pilot projects, and not in other such areas. Before deciding on the use of borrower systems, the Bank also assesses the acceptability of the borrower's implementation practices, track record, and capacity.

- If the borrower has to fill gaps in its system to meet the objectives and applicable principles as provided in the paragraphs below, and is committed to doing so, the Bank may, when determining equivalence take account of measures to improve the borrower's system. Similarly if the borrower has to fill gaps in implementation practices and capacity to achieve acceptability and is committed to doing so, the Bank may, when determining acceptability, take account of measures to strengthen borrower implementation practices and capacity. However, the World Bank stipulates that such measures are to be carried out before the borrower undertakes implementation of the relevant project activities, and may include Bank-supported efforts to strengthen relevant capacity, incentives and methods for implementation.

- **Environmental Assessment (OP/BP 4.01).** The First Objective is to help ensure the environmental and social soundness and sustainability of investment projects. The operational principle is to use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts. Use sectoral or regional environmental assessment when appropriate. The Second Objective is to support integration of environmental and social aspects of projects into the decision

making process. The Operational Principles as stated by the World Bank are, (a) assessment of potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including trans-boundary and global concerns, and potential impacts on human health and safety, (b) assessment of the adequacy of the applicable legal and institutional framework, including applicable international environmental agreements, and confirm that they provide that the cooperating government does not finance project activities that would contravene such international obligations, (c) making provision for the assessment of feasible investment, technical, and siting alternatives, including the "no action" alternative, potential impacts, feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions, and their institutional, training and monitoring requirements associated with them, (d) where applicable to the type of project being supported, normal application of the Pollution Prevention and Abatement Handbook (PPAH). Justification of the deviations when alternatives to measures set forth in the PPAH are selected, is to be provided; (e) Prevent and, where not possible to prevent, at least minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning that includes the proposed mitigation measures, monitoring, institutional capacity development and training measures, an implementation schedule, and cost estimates, (f) Involve stakeholders, including project-affected groups and local nongovernmental organizations, as early as possible, in the preparation process and ensure that their views and concerns are made known to decision makers and taken into account. Continue consultations throughout project implementation as necessary to address EA-related issues that affect them, (g) use of independent expertise in the preparation of EA where appropriate. Use independent advisory panels during preparation and implementation of projects that are highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns, and (h) Provision of measures to link the environmental assessment process and findings with studies of economic, financial, institutional, social and technical analyses of a proposed project. In addition provision has to be made for the application of the principles as above to sub-projects under investment and financial intermediary activities. Environmental Assessment (EA) is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, sitting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and trans-boundary and global environmental aspects. EA considers natural and social aspects in an integrated way. It also takes into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements.

***Guidance** – Seek Expert Advice for conducting and rechecking the EA before final Appraisal. Disclose draft EA in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders. Depending on the project, a range of instruments can be used to satisfy the Bank's EA requirement: environmental impact assessment (EIA),*

regional or sectoral EA, environmental audit, hazard or risk assessment, and environmental management plan (EMP). EA applies one or more of these instruments, or elements of them, as appropriate. When the project is likely to have sectoral or regional impacts, sectoral or regional EA is required

- **Natural Habitats (OP/BP 4.04).** The Objective here is to promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions. The Operational Principles are (a) to use a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development. Determine if project benefits substantially outweigh potential environmental costs, (b) to avoid significant conversion or degradation of critical natural habitats, including those habitats that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities, (c) Where projects adversely affect non-critical natural habitats, proceed only if viable alternatives are not available, and if appropriate conservation and mitigation measures, including those required to maintain ecological services they provide, are in place. Include also mitigation measures that minimize habitat loss and establish and maintain an ecologically similar protected area, (d) Whenever feasible, to give preference to siting projects on lands already converted, (e) to consult key stakeholders, including local nongovernmental organizations and local communities, and involve such people in design, implementation, monitoring, and evaluation of projects, including mitigation planning, and (f) to provide for the use of appropriate expertise for the design and implementation of mitigation and monitoring plans.

  Guidance – While some of the Principles are obvious, others are not. Experts such as Botanists, Zoologists etc. will be needed. Use experts to see that the Principles are followed, proper mitigation measures are proposed, and that there is a process of stakeholder consultation. Disclose draft mitigation plan in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.
- **Forests (OP 4.36)**. The Objective is to realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests. The Operational Principles are (a) Screen as early as possible for potential impacts on forest health and quality and on the rights and welfare of the people who depend on them. As appropriate, evaluate the prospects for new markets and marketing arrangements, (b) Do not finance projects that would involve significant conversion or degradation of critical forest areas or related critical natural habitats, or that would contravene applicable international environmental agreements, (c) Do not finance natural forest harvesting or plantation development that would involve any conversion or degradation of critical forest areas or related critical natural habitats, (d) Support projects that adversely impact non-critical natural forests or related natural habitats only if viable alternatives to the project are not available and only if appropriate conservation and mitigation measures are in place, (e) Support commercial, industrial-scale forest harvesting only when the operation is certified, under an independent forest certification system, as meeting, or having a time-bound action plan to meet, internationally recognized standards of responsible forest management and use, (f) Ensure that forest restoration projects maintain or enhance biodiversity and ecosystem functionality and that all plantation projects are environmentally appropriate, socially beneficial and economically viable, (g) Give preference to small-scale community-level management approaches where they best reduce poverty in a sustainable manner, (h) Support commercial harvesting by small-scale landholders, local communities or entities under joint forest management where monitoring with the meaningful

participation of local communities demonstrates that these operations achieve a standard of forest management consistent with internationally recognized standards of responsible forest use or that they are adhering to an approved time-bound plan to meet these standards, and (i) Use forest certification systems that require: (i) compliance with relevant laws; (ii) recognition of, and respect for, legal or customary land tenure and use rights as well as the rights of Indigenous Peoples and workers; (iii) measures to enhance sound community relations; (iv) conservation of biological diversity and ecological functions; (v) measures to maintain or enhance environmentally sound multiple benefits from the forest; (vi) prevention or minimization of environmental impacts; (vii) effective forest management planning; (viii) active monitoring and assessment of relevant forest management areas; and (ix) independent, cost effective, third-party assessment of forest management performance against measurable performance standards defined at the national level and compatible with internationally accepted principles and criteria of sustainable forest management through decision making procedures that are fair, transparent, independent, designed to avoid conflict of interest and involve the meaningful participation of key stakeholders, including the private sector, Indigenous Peoples, and local communities.

Guidance – The principles provided are very clear. Look at the relevant section in this document for compliance guidance. However, (a) insist on the inclusion of Forest experts on the team and (b) Disclose any time-bound action plans in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders.

- **Pest Management (OP 4.09)**. The Objective is to minimize and manage the environmental and health risks associated with pesticide use and promote and support safe, effective, and environmentally sound pest management. The Operational Principles are (a) Promote use of demand driven, ecologically based biological or environmental pest management practices (Integrated Pest Management [IPM] in agricultural projects and Integrated Vector Management [IVM] in public health projects) and reduce reliance on synthetic chemical pesticides. Include assessment of pest management issues, impacts and risks in the EA process, (b) Procure pesticides contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and intended users. Do not procure formulated products that are in WHO Classes IA and IB, or formulations of products in Class II unless there are restrictions that are likely to deny use or access to lay personnel and others without training or proper equipment, (c) Follow the recommendations and minimum standards as described in the United Nations Food and Agriculture Organization (FAO) International Code of Conduct on the Distribution and Use of Pesticides (Rome, 2003) and procure only pesticides that are manufactured, labeled, handled, stored, applied and disposed of according to acceptable standards as described in FAO Pesticide Guidelines on Storage, Labeling, and Disposal (Rome, 1985), (d) Support policy reform and institutional capacity development to (a) enhance implementation of IPM- and IVM-based pest management, and (b) regulate and monitor the distribution and use of pesticides.

  Guidance – Directions are straightforward. They are to be followed where applicable and the draft mitigation plan is to be disclosed in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders

- **Involuntary Resettlement (OP/BP 4.12)**. The Objective is to avoid or minimize involuntary resettlement and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of

project implementation, whichever is higher. The Operational Principles include (a) Assess all viable alternative project designs to avoid, where feasible, or minimize involuntary resettlement, (b) Through census and socio-economic surveys of the affected population, identify, assess, and address the potential economic and social impacts of the project that are caused by involuntary taking of land (e.g., relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected person must move to another location) or involuntary restriction of access to legally designated parks and protected areas, (c) Identify and address impacts also if they result from other activities that are (i) directly and significantly related to the proposed project, (b) necessary to achieve its objectives, and (ii) carried out or planned to be carried out contemporaneously with the project, (d) Consult project-affected persons, host communities and local nongovernmental organizations, as appropriate. Provide them opportunities to participate in the planning, implementation, and monitoring of the resettlement program, especially in the process of developing and implementing the procedures for determining eligibility for compensation benefits and development assistance (as documented in a resettlement plan), and for establishing appropriate and accessible grievance mechanisms. Pay particular attention to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, Indigenous Peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation, (e) Inform displaced persons of their rights, consult them on options, and provide them with technically and economically feasible resettlement alternatives and needed assistance, including (i) prompt compensation at full replacement cost for loss of assets attributable to the project; (ii) if there is relocation, assistance during relocation, and residential housing, or housing sites, or agricultural sites of equivalent productive potential, as required; (iii) transitional support and development assistance, such as land preparation, credit facilities, training or job opportunities as required, in addition to compensation measures; (iv) cash compensation for land when the impact of land acquisition on livelihoods is minor; and (v) provision of civic infrastructure and community services as required, (f) Give preference to land-based resettlement strategies for displaced persons whose livelihoods are land-based, (g) For those without formal legal rights to lands or claims to such land that could be recognized under the laws of the country, provide resettlement assistance in lieu of compensation for land to help improve or at least restore their livelihoods.

***Guidance** – Involuntary Resettlement is a sensitive area. Look at the detailed Guidance provided in this set of Guidelines under the appropriate topic and act accordingly. However, remember that it is necessary to disclose draft resettlement plans, including documentation of the consultation process, in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders. Further, as per World Bank mandate, ensure the taking of the following steps:*

- ***Apply the principles described as applicable and relevant, to subprojects requiring land acquisition, [refer relevant section of this document]***
- ***Design, document, and disclose before appraisal of projects involving involuntary restriction of access to legally designated parks and protected areas, a participatory process for: (a) preparing and implementing project components; (b) establishing eligibility criteria; (c) agreeing on mitigation measures that help improve or restore livelihoods in a manner that maintains the sustainability of the park or protected area; (d) resolving conflicts; and (e) monitoring implementation***

- ***Implement all relevant resettlement plans before project completion and provide resettlement entitlements before displacement or restriction of access. For projects involving restrictions of access, impose the restrictions in accordance with the timetable in the plan of actions.***
- ***Assess whether the objectives of the resettlement instrument have been achieved, upon completion of the project, taking account of the baseline conditions and the results of resettlement monitoring***

- **Indigenous Peoples (4.10).** The Objective is to design and implement projects in a way that fosters full respect for Indigenous Peoples' dignity, human rights, and cultural uniqueness and so that they: (a) receive culturally compatible social and economic benefits; and (b) do not suffer adverse effects during the development process. The Operational Principles are (a) Screen early to determine whether Indigenous Peoples are present in, or have collective attachment to, the project area. Indigenous Peoples are identified as possessing the following characteristics in varying degrees: self-identification and recognition of this identity by others; collective attachment to geographically distinct habitats or ancestral territories and to the natural resources in these habitats and territories; presence of distinct customary cultural, economic, social or political institutions; and indigenous language, (b) Undertake free, prior and informed consultation with affected Indigenous Peoples to ascertain their broad community support for projects affecting them and to solicit their participation: (a) in designing, implementing, and monitoring measures to avoid adverse impacts, or, when avoidance is not feasible, to minimize, mitigate, or compensate for such effects; and (b) in tailoring benefits in a culturally appropriate manner, (c) Undertake social assessment or use similar methods to assess potential project impacts, both positive and adverse, on Indigenous Peoples. Give full consideration to options preferred by the affected Indigenous Peoples in the provision of benefits and design of mitigation measures. Identify social and economic benefits for Indigenous Peoples that are culturally appropriate, and gender and inter-generationally inclusive and develop measures to avoid, minimize and/or mitigate adverse impacts on Indigenous Peoples, (d) Where restriction of access of Indigenous Peoples to parks and protected areas is not avoidable, ensure that the affected Indigenous Peoples' communities participate in the design, implementation, monitoring and evaluation of management plans for such parks and protected areas and share equitably in benefits from the parks and protected areas, (e) Put in place an action plan for the legal recognition of customary rights to lands and territories, when the project involves: (i) activities that are contingent on establishing legally recognized rights to lands and territories that Indigenous Peoples traditionally owned, or customarily used or occupied; or (ii) the acquisition of such land, (f) Do not undertake commercial development of cultural resources or knowledge of Indigenous Peoples without obtaining their prior agreement to such development, and (g) Prepare an Indigenous Peoples Plan that is based on the social assessment and draws on indigenous knowledge, in consultation with the affected Indigenous Peoples' communities and using qualified professionals. Normally, this plan would include a framework for continued consultation with the affected communities during project implementation; specify measures to ensure that Indigenous Peoples receive culturally appropriate benefits, and identify measures to avoid, minimize, mitigate or compensate for any adverse effects; and include grievance procedures, monitoring and evaluation arrangements, and the budget for implementing the planned measure.

  Guidance – The principles provided are very clear. More detailed guidance and explanations are provided under the relevant section in this document. However, two points are to be borne in mind as mandated by the World Bank, (a) Disclose the draft Indigenous Peoples Plan, including documentation of the consultation process, in a

timely manner before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders, and (b) Monitor implementation of the Indigenous Peoples Plan, using experienced social scientists.

- **Physical Cultural Resources (OP/BP 4.11).** The Objective is to assist in preserving physical cultural resources and avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites), aesthetic, or other cultural significance. The Operational Principles are (a) Use an environmental assessment (EA) or equivalent process to identify PCR and prevent or minimize or compensate for adverse impacts and enhance positive impacts on PCR through site selection and design, (b) As part of the EA, as appropriate, conduct field based surveys, using qualified specialists, (c) Consult concerned government authorities, relevant non-governmental organizations, relevant experts and local people in documenting the presence and significance of PCR, assessing the nature and extent of potential impacts on these resources, and designing and implementing mitigation plans, and (d) For materials that may be discovered during project implementation, provide for the use of "chance find" procedures in the context of the PCR management plan or PCR component of the environmental management plan.

  Guidance – The Government of Cambodia has laid down very clear rules for the protection of cultural property. On discovery of such property in project area, APSARA is to be immediately informed. In any case, no destruction or even unauthorized removal from site of such property or artifact is allowed.

- **Safety of Dams (OP/BP 4.37).** The Objective is To assure quality and safety in the design and construction of new dams and the rehabilitation of existing dams, and in carrying out activities that may be affected by an existing dam. Since these Guidelines are meant primarily for Road and Bridge construction, and not for dams, projects to which these Guidelines apply will not be constrained or affected by this Policy.

- Further Notes on some of the issues discussed above are as below:

  - ***Environmental Action Plans.*** Environmental action plans (EAPs) are prepared by the country concerned. They describe the major environmental concerns of a country, identify the principal causes of problems, and formulate policies and concrete actions to deal with the problems. An EAP is publicly available after the country concerned has given its consent to the proposed disclosure.

  - ***Integrated Safeguards Data Sheets***. The Bank prepares an Integrated Safeguards Data Sheet (ISDS) for each investment project and sector adjustment operation under preparation for Bank financing, which identifies key issues under the Bank's safeguard policies[20] and provides relevant information concerning their management in the proposed operation. The ISDS is prepared when the first formal review of the proposed operation is held by Bank management, and is made publicly available. As project preparation evolves, the ISDS is updated. It is revised before formal project appraisal; if changes to the project that are relevant to the ISDS are made after appraisal, a final revision of the ISDS is prepared. The updated ISDSs are also publicly available.
  - ***Environmental Assessment Reports.*** Whenever the Bank requires an environmental assessment (EA)the proposed borrower prepares an EA reportas a separate, free-standing document. The EA report is publicly available (a) after the borrower has made the draft EA report available at a public place accessible to project-affected

groups and local NGOs in accordance with OP/BP 4.01, *Environmental Assessment*, and (b) after such EA report has been officially received by the Bank, but before the Bank begins formal appraisal of the project

- ***Resettlement Instruments and Indigenous Peoples' Development Plans.*** Whenever the Bank requires a Resettlement Instrument (RI) or Indigenous Peoples' Development Plan (IPDP) for an operation, the proposed borrower prepares an RI or IPDP as a separate, free-standing document. As a condition of appraisal of the operation, the borrower provides the draft RI or IPDP, which conforms to the relevant policy and makes it available at a place accessible to, and in a form, manner and language understandable to the displaced or affected people and local NGOs. Once the Bank accepts the draft RI or IPDP as providing an adequate basis for project appraisal, and before the Bank begins formal appraisal of the project, the Bank makes it publicly available.

- More details and examples of publicly disclosed EA etc. are available on the World Bank site and it is advised that those officers concerned with either environmental assessment, project implementation, environmental and social safeguards monitoring, etc. should become familiar with such examples.
- Environmental requirements of the World Bank are specified in detail in its Operational Policy (OP) 4.01 and other related OPs. In instances in which the procedural and regulatory requirements differ, the more stringent applies. The World Bank environmental requirements are based on a three-part classification system.

  Category A-requires a full Environmental Assessment (EA).
  Category B-projects require a lesser level of environmental investigation.
  Category C-projects require no environmental analysis,

- The details of categorization are briefly descried below:

  (i) **Category A**: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. At present there is no Category A project invasive in the Cambodia, because all the proposed improvement are going on existing roads.

  (ii) **Category B:** A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. Maximum projects in Cambodia are falls under this category, so that an EIA is required for the entire project.

  (iii) **Category C:** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C proje

- As per the WB classification the road projects in Cambodia are categorized as category B requiring Environmental Assessment, because the entire ongoing and proposed project is within the ROW and on existing road. This classification is based on the type, location, sensitivity, and scale/magnitude of the Cambodian roads project. In other

words, this classification is based on the anticipated cumulative environmental and social impacts due to the construction and operation of the Project.

- **Public Consultation and Disclosure**. For all Category A and B projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them. For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category A and B projects proposed for IBRD or IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. For SILs and FI operations, the borrower/FI ensures that EA reports for Category A subprojects are made available in a public place accessible to affected groups and local NGOs. Any separate Category B report for a project proposed for IDA financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports for projects proposed for IBRD or IDA financing, and of any Category B EA report for projects proposed for IDA funding, are prerequisites to Bank appraisal of these projects

Vol. 1 of

STANDARD GUIDELINES

FOR

IMPLEMENTATION OF

ENVIRONMENTAL AND SOCIAL SAFEGUARDS

Technical Guidelines on Environmental Safeguards

General Guidelines for Environmental Impact Assessment of Highway and Road Projects

1. Developments of Highway / Road Projects are generally intended to improve the economic and social welfare of the people. At the same time it may also create adverse impacts on the surrounding environment. People and properties may be in the direct path of Road Works are affected. The Environmental impacts of highway projects include damage to sensitive ecosystems, soil erosion, changes to drainage pattern and thereby ground water, interference with animal and plant life, loss of productive agricultural lands, resettlement of people, disruption of local economic activities, demographic changes, accelerated urbanization and increase in air pollution. Highway development and operation should, therefore, be planned with careful consideration of their environmental impacts. To minimize these adverse effects that may be created by the Highway development projects the techniques of Environmental Impact Assessment (EIA) become necessary. Identification and assessment of potential environmental impacts should be an integral part of the project cycle. It should commence early in the planning process to enable a full consideration of alternatives, and to avoid later delays and complications. Highway authorities should have a clearly designated staff member with overall responsibility for environmental matters and knowledge of environmental laws and regulations.

2. As per the Ministry of Environment (MOE), construction of bridge-road equal or greater than 30 tones weight and or construction and improvement of National road equal or greater than 100km will require an IEE/EIA and approval from MOE. Permission for felling of road side tress is also required from the concerned authority. All projects or activities included, as under above category will require prior environmental clearance from the MOE in the form of an IEE/EIA. All the project under above category will also require Public Consultation.

3. General contents and issues, chapter-wise, are discussed below. Guideline for Environmental Impact Assessment survey is also separately provided.

4. The Chapters to be included in the EIA [Environment Impact Analysis] are:

    - Introduction
    - Detailed Project Description
    - Analysis of alternatives (Technology & Sites)
    - Description of the Environment
    - Anticipated Impacts and Mitigation Measures
    - Solid Waste Management
    - Environment Monitoring Program
    - Additional Studies
    - Project Benefits
    - Environmental Cost-benefit Analysis
    - Environmental Management Plan [EMP]
    - Summary and Conclusions [Summary EIA]
    - Disclosure of Consultants Engaged
    - Summary Project Details

5. **Introduction**. The points to be included in this Chapter are as follow:

- Purpose of the project, brief description of the project, project name, nature, size, its importance to the region and the country
- Profile of the project proponent, name and contact address with email, organizational chart, project consultants etc., should be mentioned clearly
- Land description, village, district, provinces and extent of the land must be mentioned clearly
- Whether the project attracts the provisions of EIA Laws of MOE, If so, applicability to the project should be discussed
- The proponent should confirm that the project meets all the MOE environmental regulations and standards applicable for project and its allied activities
- Any litigation(s) pending against the proposed project and/or any directions or orders passed by any court of law/any statutory authority against the project is to be detailed out
- In case of expansion/ modernization of the project, the environmental compliance status for the existing project should be explained.
- Royal Government of Cambodia Standards and code, which are relevant to the proposed project should be furnished.

6. **Project Description**. This Chapter covers in detail:

Broader details of the project, location and alignment

- Relevance of the project in light of the existing development plans of the region /province /nation
- Project coverage, master plan, phasing and scope
- Description of alternatives considered to avoid the ethnic minorities and indigenous people living in the proposed right-of-way/ or along the right of way going to be affected
- Procedures and criteria adopted for selection of the alignment of right of way and alternative alignments considered.
- Overall suitability of the identified alignment and the proposed activity in light of the existing Environmental Acts and deviations, if any
- Description of road alignment, broad geology, topography, connectivity, demographic aspects, socio, cultural and economic aspects, villages, settlements
- Details of land acquisition, rehabilitation of communities / villages present status
- Technologies involved for design, construction, equipment and operation
- Resources, manpower, time frame etc., required for project implementation
- Estimated cost of development of the project, environmental cost, funding agencies, whether Royal Government of Cambodia or any funding agencies or on the basis of Built Operate Transfer (BOT) etc

Essential Maps

- Highway\road alignment plan with the help of latest available cloud free satellite imagery of project alignment in 1:25,000 scale, and surrounding area covering 5km distance on either side of the proposed right of way showing the details of (i) Protected Areas notified under the Wild Life (Protection) Act, (ii) Critically polluted areas if any (iii) Notified Eco-sensitive areas, (iv) Interstate boundaries and international boundaries
- Alignment plan, with details such as nature of terrain (plain, rolling, hilly), details of villages, communities, districts and provinces, latitude and longitude for important locations falling on the alignment shall be submitted
- A map derived from the recent satellite imagery covering aerial distance of 5.0km from the proposed alignment delineating environmental sensitive areas
- Land use map of the study area to 1: 25,000 scale based on recent satellite imagery of the study area delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, builtup areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc
- Area drainage map covering 500 meters on either side of proposed right of way shall be clearly indicated. In case of any proposed diversion of nallah/canal/river either during the construction phase or operational phase, it shall also be shown in the map
- Detailed ground surveyed map in 1:2000 scale showing the existing features falling within the right of way namely trees, structures, archeological, religious, monuments sites including sensitive receptors like school and hospital, etc.

<u>Activities for Site Preparation</u>

- If the proposed route is passing through low lying areas, details of fill materials and initial and final levels after filling above mean sea level (AMSL), should be provided
- If the proposed route involves stripping, the details of the area to be stripped, locations, volume and quantity of earth to be removed, type of soil and proposal for utilization of removed top soil with location of dump site to be provided
- If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of dump site to be provided
- If the proposed route is passing through any hilly area, and avalanche area the details to be provided
- In case the road passes through a flood plain of the river, the details of micro drainage, flood passages and information on flood periodicity in the area should be provided
- If the proposed project involves any land reclamation, details to be provided for the activity for which land to reclaimed and the area of land to be reclaimed
- If the proposed route involves any migratory path of animals, details about fauna, habitat and period of the year in which activity take place, should be provided
- Is there a possibility that the construction of roads will cause impacts such as destruction of forest, poaching, reduction in wetland areas, if so, details are to be provided
- If there will be any change in the drainage pattern after the proposed activity, details of changes to be furnished

- If the proposed route is passing through a city or town, with houses and human habitation on the either side of the road, the necessity for provision of service ducts to be studied

7. **Analysis of alternatives (Technology & Sites).** In case, the scoping exercise results in need for alternatives this chapter shall include:

   - Description of various alternatives like locations or technologies studied
   - Description of each alternative
   - Summary of adverse impacts of each alternative
   - Selection of alternative (on the basis of eco-friendly development)

8. **Description of the Environment**

   Study area

   As a primary requirement of EIA process, the proponent should collect primary baseline data in the right of way as well as the area falling within 500 meters on the either side of the right of way and secondary data should be collected within 5 kms aerial distance from either side of the road. The study areas mentioned in this document should be considered for guidance purpose only. The exact study area for different environmental attributes (water, air, noise, soil etc) is to be submitted considering the proposed project activity and location, with proper reasoning, for review and approval by the expert appraisal committee. Monitoring should be done as per MOE guidelines.

   Report should contain details of secondary data, the source of secondary data, meteorological data from nearest station of meteorology along with wind roses and proposed monitoring locations should be marked on the study map. Similarly the proposed locations of monitoring stations of water, air, soil, noise etc. shall be shown on the study area map. One season monitoring data excluding monsoon should be collected. Period/date of data collection should be clearly indicated.

   Land Environment

   - Data of the proposed land and its availability should be ascertained from local authorities, revenue records etc.
   - Description of the existing situation of the land along the alignment. Study of the land use pattern, habitation, cropping pattern, forest area, environmentally sensitive places, mangroves, notified industrial areas, sand dunes, nature of the terrain (plain, rolling, hilly), sea, river, lake etc. by employing remote sensing techniques followed by ground truthing and also through secondary data sources
   - Details of villages, districts and provinces, elevation above mean sea level & latitude and longitude of important locations from where the alignment will be passing
   - Data on erosion potential, and natural drainage should be provided
   - Geology- rock types, history of any volcanic activity, seismicity, land slides and associated hazards
   - Soil – soil cover, physical and chemical properties should be provided.

   Air Environment

   - Climate and meteorology (max and min temperature, relative humidity, rainfall,

frequency of tropical cyclone); the nearest meteorological station from which climatological data have been obtained to be indicated

- Wind rose (Wind direction and speed, 24 hourly data)
- Representative air quality monitoring data in respect of RSPM, SO2, NOx, and CO will be generated. Frequency and methodology adopted should be as per MOE guidelines
- Monitoring stations are to be located based on dominating wind direction, habitations, notified sanctuaries and terrain features in the study area. The locations of monitoring stations should be clearly specified.

Water Environment

- Determine the sensitivity of the study zone and identify the main potential impacts, working from basic data on the drainage basin and watersheds, nature and frequency of flooding, water quality, water use, fauna species and habitats. Assess likely modification of baseline conditions arising from the project activity
- Details of springs, lakes, reservoirs within 500 meters of the proposed road right of way
- List the distance of the proposed alignment to the existing major water bodies used as drinking water in the downstream side of the alignment
- Fix up the locations of representative monitoring stations along the proposed project road for surface and ground water resources and document them
- Samples should be collected for both surface and ground water and examined for physicochemical, heavy metal and bacteriological parameters as per the guidelines of MOE.
- Delineation of water sheds and water drainage pattern in the study area using the topographical maps and the impacts of the proposed highways in changes the water course etc for examining the drainage patterns especially during monsoon season and during floods

Noise Environment

- Identify project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project. Discuss the effect of noise levels on near by habitation during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impacts if any
- Select the representative locations of monitoring stations along the alignment of the project covering sensitive locations such as residential, hospitals, schools, sanctuaries etc. Monitoring should be done for 24 hrs at each location.

Biological Environment

- Details on secondary data on the existing flora and fauna in the study area, carried out by an expert under the relevant shall be included in the list of flora and fauna along with classification and a statement clearly specifying whether the study area forms a part of an ecologically sensitive area or migratory corridor of any endangered fauna
- If the proposed project site involves any breeding or nesting ground, details about the name of the aquatic organism, type of habitat and period of year in which activity takes place should be provided

- If the proposed route requires cutting of trees, then the information should be provided for number of trees to be cut, their species, girth size, tree condition and whether it also involved any protected or endangered species
- Quantitative estimation of forest and non-forest flora
- Assessment of fauna and avifauna indicating endangered and endemic species with respect to the wild life protection act
- Location of national parks, sanctuary, and biosphere reserve, tiger reserve, elephant reserve and wildlife migratory routes with in aerial distance of 5.o km either side of proposed alignment
- Information on dependence of local people on minor forest products

Socio Economic and Health Environment

- Details of the properties, houses, businesses etc. activities likely to be effected by land acquisition and their financial loses annually.
- Data covering the vulnerable groups or persons including women, children, elderly, people below the poverty line, indigenous people and notified settlements
- Identification of historical, cultural and archeological sites including sensitive receptors like school and hospitals
- Data on diseases in the locality and existing health care facilities
- Data on demography including traditional skills and sources of livelihood along the proposed site

9. Anticipated Impacts and Mitigation Measures

This chapter shall describe the likely impact of the project on each of the environmental component, methods adopted for assessing the impact such as model studies, empirical methods, reference to existing similar situations, reference to previous studies, details of mitigation, methods proposed to reduce adverse effects of the project and reference to the models along with the inputs used should be mentioned. Mitigation measures should be proposed as required during the construction stage as well as the operation stage of the project for all the identified impacts.

10. Land Environment

Anticipated Impacts:

- The road itself – land requirement, removal of vegetation, fragmentation of natural habitat, removal of buildings and severance of form land causes, direct impacts. The most immediate and obvious effect of road development on soil is the elimination of the productive capacity of soil covered by the roads
- Impact of the project construction leading to soil contamination, soil erosion, destabilization of slopes, side tipping of spoils material, loss of properties, loss of fertile lands and diversion of natural surface water flows are to be studied in detail
- Assess whether there is a possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents)
- Indicate whether the proposed project will cause impediment to the movement of inhabitants

- Impacts on the local area developments and integration with local master plan

Mitigation Measures:

- The extent of environmental impacts in construction, operation and post operation is largely determined during planning and route or site selection. Early consultation and determination of alternatives can substantially prevent and reduce the potential environmental impacts of these projects
- While selecting new road alignments attention must be paid to avoid areas prone to landslides, soil erosion, fertile agricultural lands and environmental sensitive areas.
- Before finalizing the alignment erosion potential of each alternative should be carefully examined and the one involving least disturbance to the natural ground should be preferred
- Balancing filling and cutting requirements through alignment choice to reduce the need for borrow pits and to minimize excess spoil material generation is to be examined
- Drainage improvement requirements to minimize water logging and flooding due to disturbance of the natural drainage pattern are to be examined
- Afforestation plan to compensate for the cutting of the trees during the proposed road construction activity
- List the mitigative measures to address the impediments to the movement of inhabitants

11. Air Environment

Anticipated Impacts:

- The immediate surroundings may have a greater impact. The existing surrounding features such as habitation, hospitals, schools, notified sanctuaries etc. up to 500 meters and impact on them shall be addressed separately
- Impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials
- Prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be carried out

Mitigation measures:

- Selecting road alignment, which avoids passing close to housing, schools and work places; providing sufficient capacity to avoid traffic congestion, even with projected increase in traffic flow
- Planting tall leafy vegetation between roads and human settlements
- Water sprinkling and transporting construction materials with tarpaulin coverage during the construction stage. Purchasing road metal from the crushing units, which are consented to operate by MOE
- Crusher and hot mix units, if used on site, should be equipped with requisite air pollution equipment to meet the prescribed standard of MOE,
- Integration with the local government awareness campaign programmes on good practices of vehicle maintenance etc. to reduce the air emissions

- Environmental specifications for contractors should cover the required safeguards during the design and construction stage

12. Water Environment

Anticipated Impacts:

- Impact on surface water flow modifications can contribute to flooding, soil erosion, channel modification and siltation of streams
- Road drainage and excavation can lower the water table in surrounding areas while embankments and structures can raise water table by restricting flow. The potential effects include deterioration of vegetation, increased susceptibility to erosion loss of water for drinking as well as agriculture use
- Impact on water quality degradation (surface & ground water) can take place due to sedimentation, changes in biological activity in streams and on their banks
- Impact due to discharge of wastewater generation from the temporary project offices and temporary construction workers housing area
- Indicate whether there is a possibility of soil runoff from the bare lands resulting from earth moving activities such as cutting and filling will cause water quality degradation in downstream water courses or water bodies

Mitigation Measures:

- Avoiding alignments which are susceptible to erosion, such as those crossing steep slopes
- Minimizing the number of water crossings wherever possible
- Leaving buffer zones of undisturbed vegetation (with increased in proportion to slope) between road sites and bodies of water
- Mitigation measures such as providing adequate drainage modifications, settling basins, paving, infiltration ditches etc. is to be examined
- Adequate sanitation facilities and hygiene at construction workers colony should be provided
- Safe measures for temporary storage of fuels
- Environmental specifications for contractors should cover the required safeguards during the design and construction stage

13. Noise Environment

Anticipated Impacts:

- Noise levels may increase during construction activity, due to operation of various machines and equipments
- Noise levels may increase during operation of the highway due to increased traffic activities Prediction of noise levels should be done by using mathematical modeling at different representative locations
- Impact of vibrations during blasting activity, if any

Mitigation Measures:

- Development of bypass roads to avoid road alignment through noise sensitive areas

- Adoption of proper surface design and maintenance
- Provision of noise barriers. Specifications for installation of noise protection devices clearly indicating the location, design and material, and also provide for future maintenance requirements
- Prediction model outputs justify the selection of type of the noise barrier and thickness of the noise barrier etc.
- Planting tall leafy and dense vegetation between roads and noise sensitive areas
- Interaction with the local government and vehicular manufacturers to conduct awareness campaign programmes on good practices of vehicle maintenance etc. to reduce the noise emissions
- Environmental specifications for contractors should cover the required safeguards during the design and construction stage

14. Biological Environment

Anticipated Impacts:

- Loss of wildlife habitat and biodiversity due to change in land use
- Fragmentation of wildlife habitat and territories
- Changes in water quality, soil profile, noise, light and air pollution, which may affect the nature and character of habitats
- Pressure on habitats wildlife as a result of increased access provided by roads
- Loss of forest resources, economically important plants, medicinal plants and threat to rare, endemic and endangered species

Mitigation Measures:

- Identification of sensitive natural environments in the early planning stage so that alternative routes, changes in width of the road can be examined
- Possibility of twin new road corridors with previously established transport rights– ofway, such as railway lines
- Provision of animal crossings in identified areas
- Compensate the loss of forest coverage by compensatory plantation programme
- Development of green belt along the alignment
- Regeneration and conservation of flora and fauna including rare plants of economic importance, medicinal plants and wildlife species
- Institutional arrangements for implementation and monitoring of various mitigating measures
- Environmental specifications for contractors should cover management of work forces (control of poaching and fire wood collection), machinery (speed, noise, and traffic), and prevention of erosion and contamination during construction

15. Socioeconomic and Health Environment

Anticipated Impacts:

- Analysis of positive and negative impacts on the present status of livelihood
- Displacement of human settlement from proposed site. Impact on livelihood and

loss of properties

- Impact on community resources
- Impact on historical and archeological sites
- Impact on the existing travel areas due to faster traffic, access controls and median barriers
- Impact due to accelerated urbanization

Mitigation Measures:

- Rehabilitation plan for land outees, homestead outees, and for displaced persons. Institutional arrangement for effective implementation and periodical review through project implementation to be incorporated
- Criteria and method of calculation of compensation for loss of land and crops. Mechanism for providing effective guidance in financial planning to effected people.
- Training to local people for employing them in the proposed project
- Employment opportunity and access to other amenities such as primary education and health care facilities for local people
- Integration with the local master plan to prevent conflict of interest.
- Stipulation of environmental specifications for contractors

16. Solid Waste Management

- Waste generated during construction may impact soil, agriculture and water quality
- Waste generated from workers' camps may impact sanitation, water quality and agriculture
- Oil spillage/ leakage from machines and vehicles may contaminate earth
- Proper environmental specifications to be stipulated in the contact

17. Environmental Monitoring Program

- Summary matrix of environmental monitoring, for all phases of the project viz. construction and operation
- Technical aspects of monitoring for achieving effectiveness in mitigation measures
- Requirement of monitoring facilities and methods adopted
- Frequency, location, parameters of monitoring
- Compilation and analysis of data and reporting system
- Procurement schedules and budgets in detail
- Training requirements

18. **Additional Studies.** Additional Studies must be carried out where required.

Specific Condition	**Study Required**
Scoping Stage	• Studies directed by the Expert Appraisal Committee while

Specific Condition	Study Required
	deciding the TOR for the project
Public consultation	• Public hearing with the issues raised by the public and the response of the project proponent in tabular form should be prepared
Natural resource conservation and optimization	• Plan of action for conservation of natural resources by utilization of fly ash (if available), steel melting shops' slag and other metallurgical industries solid non hazardous waste
R & R action plans	• Detailed R&R plan with data on the existing socioeconomic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/ employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the project specific R&R Plan. • Details of budget provisions (capital & recurring) for the project specific R&R Plan
Accident prevention and Road Safety Management System	• Examine road design standards, safety equipment specifications and training to ensure that design details take account of safety concerns • Identification of accident prone areas and avoidance/ mitigation • Identification of habitat fragmentation and traffic accident of wildlife and mitigation measures should be furnished • Provision of speed breakers, safety signals, service lanes and foot paths should be examined at appropriate locations through out the proposed road to avoid the accidents • Accident data and geographic distribution should be reviewed and analyzed to predict and identify trends – incase of expansion of the existing highways • Preparation of traffic management plan • Laws, regulations and enforcement related to speed, alcohol and vehicle safety should be reviewed • Institutional frame work for monitoring of road safety • Post accident emergency assistsance and medical care to accident victims

19. Project benefits

It should bring out details of benefits by way of:

- Improvements in the physical infrastructure and road access
- Improvement in social services by quicker and safe transport mode
- Employment potential –skilled; semiskilled and unskilled labour both during construction and operational phases of the project with specific attention to employment potential of local population as well as necessity for imparting any specialized skills to them to be eligible for such employment in the project

- Reduction in traffic congestion through city/town/ and other locations
- Development of tourism
- Reduced pollution, vehicle maintenance, fuel saving due to better quality of roads
- Over all development in economy and improved life style

20. Environmental cost benefit analysis

This chapter shall include the Environmental Cost Benefit Analysis of the project.

21. Environment Management Plan (EMP)

- Administrative and technical set up (PIU) for the management of environment, clearly defining the roles and responsibilities of persons/ party handling various functions
- Summary matrix of EMP and budget provision for EMP, during preconstruction, construction and operation stage
- Summary matrix of Environmental monitoring, during construction and operation stage
- Institutional arrangements proposed with other organizations/Govt. authorities for effective implementation of environmental measures proposed in the EIA
- Safeguards/mechanism to continue the assumptions/field conditions made in the EIA, for arriving the site suitability

22. Summary & Conclusion (Summary EIA)

Summary EIA shall be a summary of the full EIA report condensed to ten A4 size pages at the maximum. It should necessarily cover in brief the chapters of the full EIA report: Introduction, project description, description of the environment, anticipated environmental impacts & mitigation measures, additional studies, environmental monitoring programme, project benefits, environmental management plan and disclosure of consultants engaged

23. Disclosure of consultants engaged

This chapter shall include the names of the consultants engaged with their brief resume and nature of consultancy rendered.

24. Summary of project details

S. No.	Description	Quantity
1	Length of new alignment proposed (kilometers)	
2	Width of the new alignment (meters)	
3	Length of existing alignment proposed to be strengthened/widened (kilometers)	
4	Width of the existing alignment (meters)	
5	Width of the existing alignment after widening (meters)	
6	Total length of the alignment (kilometers)	
7	Number of bridges Major Minor	
8	Length of bridges (meters) Width of bridges (meters)	
9	Number of culverts	
10	Length of culverts (meters)	
11	Number and distance (meters) between underpasses	

S. No.	Description	Quantity
12	Number of intersections	
13	Length of intersections (meters)	
14	Number of railway crossings	
15	Length of railway crossings (meters)	
16	Number of villages through which alignment passes	
17	Population of the villages through which alignment passes	

25. Details of National parks etc with in 5 Km either side of the highway/Roads

S. No.	Item	Name	Aerial distance (km) and reference point on the highway alignment
1	National park		
2	Marine park		
3	Sanctuary/tiger reserve Elephant reserve/ Turtle nesting ground		
4	Core zone of biosphere reserve		
5	Reserved forest		
6	Wildlife habitat		
7	Habitat of endangered/exotic species		
8	Coral reef		
9	Mangroves		
10	Lakes/reservoirs/dams		
11	Breeding site		
12	Nesting site		
13	Migratory Path		
14	National Protected Archeological sites		
15	Flood Prone Area		

26. GEMP consists of a set of mitigation measures to be taken during the construction phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the Environmental Management Action Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced.
27. A description of the various management measures suggested during design, construction / rehabilitation and operation of road is provided in the detailed Table at the end of this Chapter, and ESO/contractors are advised to follow up all the mitigation measures suggested in this report, so that development will become environmentally sound and sustainable.
28. This GEMP directs the MPWT/MRD/Contractors/ Supervision Consultant how to implement feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. This GEMP is developed for use by the above agencies to achieve environmentally sound practices during construction of State Highway and it will also help MPWT/MRD staff to successfully monitor the implementation of the suggested mitigation measures in their work.
29. The Environmental Management Plan for the Mitigation of Environmental Impacts would have been stated already in the EIA. A General Environmental Management Plan would take into account the initial EMP as stated and build on it. It is necessary to note that all mitigation measures etc. for sub-projects should fall in line with the overall directions as embodied in the accepted EIA. Specifically, the General EMP should also state the responsibilities of Contractor[s], and the Monitoring Plan. The general EMP should also pay specific attention to Public Consultation and the way that the consultations would be handled.

30. Contractor's **Responsibilities**. The execution of the works will be the responsibility of the contractor. It should be ensured that the environmental measures will also be implemented by the same contractor who executes the road works. This will ensure that the construction of the road and mitigation/enhancement measures will progress smoothly and efficiently. As executioners of the Environmental Management Plan, the contractors are expected to follow the specifications in letter and spirit. It is expected that a certain portion of its staff will have enough environmental awareness necessary for the successful completion of the works entrusted. The following are also be responsibilities of the Contractor:

31. Prepare an acceptable implementation plan, prior to commencement of works,

32. Undertake environmental training,

33. Monitor, audit and take corrective action as necessary,

34. Ensure the implementation plan remains relevant during the contract,

35. The Contractors shall have to employ a specialist in Environmental matters. The best situation would be the use of Environmental Specialist with relevant implementation experience of highway / road projects and with an understanding of the environmental issues. The role and responsibilities of the Specialist will be as follows:

36. Develop and detail out an implementation plan for the Environmental Provisions as envisaged in the EMP, and get it approved by the Engineer;

37. Continuously interact with the Environmental Expert of the Consultant regarding the implementation of the environmental provisions;

38. Conduct awareness campaigns for the settlements along the road, if at all required.

39. Periodically visit the construction activities in the ecologically sensitive areas identified along the corridor and ensure that the construction activities are taken with due precautionary arrangements. In case of any non-compliance, the Contractor will report to the Environmental Specialist of the Construction Supervision Consultant for further action

40. Identify suitable locations for sitting of labour camps, construction waste disposal locations, construction and vehicle parking/maintenance sites and obtain the approval of the Environmental Specialist of the Construction Supervision Consultant.

41. Ensure the implementation of the various mitigation measures proposed for the protection of flora and fauna etc., prior to the commencement of construction activities;

42. Ensure that proper environmental safeguards are being maintained at borrow sites and quarries from which the contractor procures material for construction;

43. Supervise and ensure adequate facilities including provision for the safety and health of the workers and their families for construction as well as for the maintenance of labour camps;

44. Ensure that proper facilities are available for the monitoring of ambient air quality, noise level and collection of water and soil samples.

45. Liaise with the various Government Agencies during the construction period and obtain the requisite clearances; and

46. Carryout the measurement of quantities of environmental enhancement, prepare the bills of quantities for the work carried out for enhancement.

47. **Public Consultation**. Public/community consultation should be held employing a range of formal and informal consultative tools including interviews, Focused Group Discussions (FGDs), meetings and workshops. The consultations should be carried out at three levels. Help of local authorities such as MPWT/MRD/MOE or Forest Community and Forest Administration, may be sought in this regard. These consultations could be held at three levels, as follow:

48. Local/village level consultation - These consultations could be held in rural, suburban and urban areas along the corridor of impact and the project road at location having substantial number of likely project affected people (PAPs) to inform people about the purpose and preliminary design of the project in order to get peoples opinion and issues of concern and are to be presented in the format given at **Annexure 3.**

49. District Level Consultation - The second phase of public consultation could be conducted at the district level, involving the MPWT/MRD/MOE, district authorities, NGOs and PAPs

50. Provincial **Level Consultation** - The next phase of public consultation could be conducted at the provincial level, involving the MPWT/MRD/MOE /PIU, district authorities, NGOs and PAPs.

51. **Reporting System**. Reporting system provides the necessary feedback for project management to ensure quality of the works and that the program is on schedule. The rationale for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the

project. The contractor is to report to the Supervision Consultant and PIU of MPWT/MRD staff on a regular basis. All subsequent reporting by the contractor shall be monitored as per these targets set by the PIU of MPWT/MRD before the contractor moves on to the site.

52. During the implementation period, the contractor may submit a compliance report include description of the items of EMP, which were not complied with. It would also report the management and field actions taken to enforce compliance. Certain items of the EMP might not possibly be complied with in the field due to a variety of reasons. The intent of the compliance report should is not be to suppress these issues but to bring out the circumstances and reasons for which compliance was not possible (such as jurisdictional issues). This would help in rationalizing the implementation of the EMP during the remaining duration of implementation. Solutions for further effective implementation should also come out as a result of the compliance monitoring reports. The monitoring and the subsequent reporting would include:

53. Monitoring of facilities at construction camps;
54. Monitoring of air, noise, soil erosion and water parameters including silt load;
55. Monitoring of survival rate of trees planted,
56. Monitoring of cleaning of drains, culverts and water bodies

57. To the extent possible it should be ensured that the bids themselves be structured so as to clearly take into account all the Environmental mandates. The Environmental Management Plan as formulated should be shared with potential contractors so that costs of environmental management are clearly taken into account and so that the contractors cannot complain of not having been properly informed about costs of environmental compliance.
58. Contractors may be asked to prepare their own EMP and submit the same together with their bid. The EMP would be carefully checked by the ESO and the EMP of the winning contractor should be sound in all respects. Contractors should be monitored in terms of their own EMP as well as the EMP for the project.

59. Table below provides details of a General Environmental Management Plan.

Elements of Generic Environmental Management Plan

Sl. No	Environmental Issue	Management Measures	Reference
1	Alignment, Width of the road and religious structures	The existing alignment is selected by shifting / adjusting the centerline of the road, adopting of suitable cross-sections to minimize land acquisition, loss of settlements and to avoid environmentally sensitive features like religious structures, trees and plants, public utilities etc. compatible with project activities.	Design Report
2	Preservation of Trees	All efforts will be made to preserve trees including evaluation of minor design adjustments/alternatives to save trees. Specific attention will be given for protecting giant trees, green tunnels and locally important trees (religiously important etc.). Tree cutting is to proceed only after all the legal requirements including attaining of In-principle and Formal Clearances from the Forest Dept./MAFF (Ministry of Agriculture, Forest and Fisheries) are completed and subsequently a written order is issued to the Contractor. Particular species declared as 'protected' by the Forest Dept. in the private land will be felled only after due clearance from the Forest Dept./ MAFF concerned agencies is obtained. At few locations project road passes through the forest areas where there is no proposal for acquisition (Forest land), however permission for civil work (proposed within forest area) is requisite requirement from the Forest Community and Forest Administration . So that contractor has to obtained permission for the same from the concerned Forest Community and Forest Administration before the work starts. In addition, since felling of trees is also involved in non forest areas, permission for the same from the Forest Community and Forest Administration /Concerned Officer has also to be obtained. In the event of design changes, additional assessments including the possibility to save trees shall be made. Stacking, transport and storage of the wood will be done as per the relevant norms. Systematic corridor level documentation for the trees cut and those saved will be maintained.	MAFF/FA/FC
3	Relocation of Community Utilities and	All community utilities and properties i.e., water supply lines, hand pumps will be relocated before construction starts, on any section of the project corridor. The PIU/MPWT/MRD, will relocate these properties in consultation and written agreement with the agency/ owner/community. Environmental	Design Report

Sl. No	Environmental Issue	Management Measures	Reference
	Common Property Resources	considerations with suitable/required actions including health and hygiene aspects will be kept in mind while relocating all community utilities and resources.	
4	Crushers, hot-mix plants and Batching Plants Location	Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants will be located at least 1000 m away from the nearest village/settlement preferably in the downwind direction. The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Expert of Supervision Consultant shall be necessary prior to their establishment. Arrangements to control dust pollution through provision of windscreens, sprinklers, and dust encapsulation will have to be provided at all such sites. Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and Consent/NOC for all such plants shall be submitted to the "PIU/MPWT/MRD, through Consultant. The Contractor shall not initiate plant/s operation till the required legal clearances are obtained and submitted. The engineer will ensure that the regulatory and legal requirements are being complied with.	Project Requirement and As per the MOE laws
5	Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction will confirm to the relevant MOE norms. The discharge standards promulgated under the Environment Protection will be strictly adhered to. Noise limits by MOE for construction equipments to be procured such as compactors, rollers, front loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified by MOE, EIA Laws The Contractor shall maintain a record of all vehicles and machinery used during the contract period, which shall be produced verification whenever required. Mobile equipment shall be placed at least 100metres away from the nearest dwelling.	Project Requirement and EIA Law of MOE
6	Borrow Areas	Finalizing borrows areas for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the contractor. Locations finalized by the contractor shall be reported to the Environmental Expert of Supervision Consultant	Project Requirement and EIA Law of MOE

Sl. No	Environmental Issue	Management Measures	Reference
		and who will in turn report to PIU. In addition to testing for the quality of borrow materials by the Consultant, the environmental personnel of the Consultant will be required to inspect every borrow area location prior to approval No borrow area will be opened without permission of the Environmental Expert/RE. The location, shape and size of the designated borrow areas will be as approved by the RE/Environmental Expert. The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; will be maintained dust free by the contractor. Sprinkling of water will be carried out twice a day to control dust along such roads during their period of use. During dry seasons (winter and summer) frequency of water sprinkling will be increased in the settlement areas and RE will decide the numbers of sprinkling depending on the local requirements. Contractor will rehabilitate the borrow areas as soon as borrowing is over from a particular borrow area.	
7	Quarry	Contractor will finalize the quarry for procurement of construction materials after assessment of the availability of sufficient materials, quality and other logistic arrangements. In case the contractor decides to use quarries other than recommended by the consultants, then it will be selected based on the suitability of the materials and as per established law. Contractor will also work out haul road network and report to RE/EE (Environmental Expert of Supervision Consultant) and RE/EE will inspect and in turn report to PIU before approval. The contractor shall obtain materials from quarries only after the consent of the Administration or will use existing approved sources of such materials. Copies of consent/ approval/ rehabilitation plan for opening a new quarry or use of an existing quarry source will be submitted to the Resident Engineer/EE. The quarry operations will be undertaken within the rules and regulations in force in the state.	Project Requirement and EIA Law of MOE
8	Arrangement for Construction Water	The contractor will use ground water as a source of water for the construction and can set up the own bore well facility for construction work. Contractor can use the ponds, which are not in use by community or identified to fill up for the project, but in	Project Requirement

Sl. No	Environmental Issue	Management Measures	Reference
		that case, before using any pond water contractor will obtain written consent from the owner and submit then to Consultant. To avoid disruption/disturbance to other water users, the contractor will extract water from fixed locations and consult the Environmental Expert or RE before finalizing the locations. The Contractor will provide a list of locations and type of sources from where water for construction will be used. The contractor will seek approval from the RE prior to the finalization of these locations The contractor will not be allowed to pump from any irrigation canal and surface water bodies used by community.	
9	Labor Requirements	The contractor preferably will use unskilled labor drawn from local communities to give the maximum benefit to the local community.	Project Requirements
10	Construction Camp Locations – Selection, Design and Lay-out	Construction camps will not be proposed within 500 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community applies only in case where a construction camp doesn't house plant sites. Location for stockyards for construction materials will be identified at least 1000 m from watercourses. The waste disposal and sewage system for the camp will be designed, built and operated such that no odor is generated.	Project Requirements
11	Arrangements for Temporary Land Requirement	The contractor as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/borrow areas etc. The Contractor will submit a copy of agreement to the Environment Expert /RE of Supervision Consultant.	Project Requirements
12	Implementation - Information Meetings	The contractor will organize at least 2 implementation information meetings in the vicinity of Project Site (minimum one in each section) for general public to consult and inform people about his plans covering overall construction schedule, safety, use of local resources (such as earth, water), traffic safety and management plans of debris disposal, drainage protection, canal training work during construction, pollution abetment and other plans, measures to minimize disruption, damage and in convenience to roadside users and people along the road. The contractor will maintain a channel of communication with the communities	Project Requirement

Sl. No	Environmental Issue	Management Measures	Reference
		through his designated Officer to address any concern or grievances. Periodic meetings will also be conducted during the construction period to take feedback from communities or their representatives to ensure minimum disturbance.	
13	Clearing and Grubbing	Vegetation will be removed from the construction zone before commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the concerned department. The Contractor under any circumstances will not cut trees other than those identified for cutting and for which he has written instructions from the PIU. The PIU will issue these instructions only after receiving all stages of clearances from the Forest Community and Forest Administration. Vegetation only with girth of over 30 cm will be considered as trees and shall be compensated, in the event of PIU's instruction to undertake tree cutting. ➢ The sub grade of the existing pavement shall be used as embankment fill material. ➢ The existing base and sub-base material shall be recycled as sub-base of the haul road or access roads. ➢ The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc.	Project Requirement and General Condition of the project
14	Disposal of debris from dismantling structures and road surface	The contractor shall identify disposal sites. The identified locations will be reported to the RE/Environmental Expert. These locations will be checked on site and accordingly approved by RE/Environmental Expert prior to any disposal of waste materials. All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the contractor as approved and directed by the RE/Environmental Expert. The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of RE. Debris generated from pile driving or other construction activities shall be disposed such that it does not flow	Project Requirement and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		into the surface water bodies or form mud puddles in the area.	
15	Other Construction Wastes Disposal	The pre-identified disposal locations will be a part of Comprehensive Waste Disposal Management Plan to be prepared by the Contractor in consultation and with approval of RE/Environmental Expert. Location of disposal sites will be finalized prior to initiation of works on any particular section of the road. The RE/Environmental Expert of Consultant will approve these disposal sites after conducting a joint inspection on the site with the Contractor. Contractor will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project corridors (if so desired by the owner/community and approved by the RE). Non-bituminous wastes other than fly ash may be dumped in borrow pits (preferably located in barren lands) covered with a layer of the soil. No new disposal site shall be created as part of the project, except with prior approval of the RE. All waste materials will be completely disposed and the site will be fully cleaned and certified by RE before handing over. The contractor at its cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.	Project Requirement and General Condition of the project
16	Stripping, stocking and preservation of top soil	The topsoil from all areas of cutting and all areas to be permanently covered will be stripped to a specified depth of 150 mm and stored in stockpiles. A portion of the temporarily acquired area and/or Right of Way will be earmarked for storing topsoil. The locations for stock piling will be pre-identified in consultation and with approval of RE The following precautionary measures will be taken to preserve them till they are used: (a) Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, silt fencing will protect the edges of the pile. (b) Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a	Project Requirement and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or vegetation. (c) It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil will be utilized for - ➢ covering all disturbed areas including borrow areas only in case where these are to be rehabilitated as farm lands (not those in barren areas) ➢ top dressing of the road embankment and fill slopes ➢ filling up of tree pits, and ➢ in the agricultural fields of farmers, acquired temporarily. Residual topsoil, if there is any will be utilized for the plantation at side of the main carriageway.	
17	Accessibility	The contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project road, providing temporary connecting road. The Contractor will take care that Schools and religious places are accessible to Public. The contractor will also ensure that the work on / at existing accesses will not be undertaken without providing adequate provisions and to the prior satisfaction of Environmental Expert/RE. The contractor will take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.	Project Requirement and General Condition of the project
18	Planning for Traffic Diversions and Detours	Temporary diversions will be constructed with the approval of the Resident Engineer (RE) and Environmental Expert(EE) of Consultant for which contractor will seek prior approval for such plans. Detailed Traffic Control Plans will be prepared and submitted to the RE for approval, seven days prior to commencement of works on any section of road. The traffic control plans shall contain details diversions; traffic safety arrangement during construction; safety measures for night – time traffic and precautions for	Project Requirement and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		transportation of hazardous materials. The contractor will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from Consultant and PD-MPWT/MRD. The temporary traffic detours will be kept free of dust by sprinkling of water / day and as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic).	
Construction Work			
19	Disruption to Other Users of Water	While working across or close to any perennial water bodies, contractor will not obstruct/ prevent the flow of water. Construction over and close to the non-perennial streams shall be undertaken in the dry season. If construction work is expected to disrupt users of community water bodies, notice shall be served well in advance to the affected community by the contractor. The contractor will take prior approval of the concerned Authority for any such activity. The PIU and the Engineer will ensure that contractor has served the notice to the downstream users of water well in advance.	Project Requirement and General Condition of the project
20	Drainage	Contractor will ensure that no construction materials like earth, stone, ash or appendage is disposed off in a manner that blocks the flow of water of any water course and cross drainage channels. Contractor will take all-necessary measures to prevent any blockage to water flow.	Project Requirement and General Condition of the project
21	Siltation of Water Bodies and Degradation of Water Quality	The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth for embankment construction. Contractor will ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.	Project Requirement and General Condition of the project
22	Slope Protection and Control of Soil Erosion	The contractor will take slope protection measures as per design, or as directed by the RE to control soil erosion and sedimentation. All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such as no separate payment will be made for them.	Project Requirement and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		Contractor will ensure the following aspects: ➢ During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. ➢ Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods. Other measures of slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks. ➢ In borrow pits, the depth shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. ➢ Along sections abutting water bodies, stone pitching as per design specification will protect slopes.	
Pollution			
Water Pollution			
23	Water Pollution from Construction Wastes	The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. Contractor will avoid construction works close to the streams or water bodies during monsoon. All waste arising from the project is to be disposed off in the manner that is acceptable and as per norms of the Chhattisgarh Environmental Conservation Board.	MOE law, Project Requirement and General Condition of the project
24	Water Pollution from Fuel and Lubricants	The contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 500 m from rivers and irrigation canal/ponds. All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the 'RE and PIU. Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. In all, fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the top soil will be stripped, stockpiled and returned after cessation of such storage.	MOE Laws and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to RE) and approved by the Environmental Expert. All spills and collected petroleum products will be disposed off in accordance with MOE guidelines. Resident Engineer' will certify that all arrangements comply with the guidelines of MOE or any other relevant laws.	
Air Pollution			
25	Dust Pollution	The contractor will take every precaution to reduce the level of dust from crushers/hot mix plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source and by erection of screen/barriers. All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. The contractor will provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation. The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 g/m3. The pollution monitoring is to be conducted at all the construction camps. Alternatively, only crushers licensed shall be used. Required certificates and consents shall be submitted by the Contractor in such a case to the 'PIU' through the 'RE/EE'. Dust screening vegetation will be planted on the edge of the RoW for all existing roadside crushers. Hot mix plant will be fitted with dust extraction units.	MOE Laws and General Condition of the project
26	Emission from Construction Vehicles, Equipment and Machineries	Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of MOE. The Contractor will submit PUC (Pollution under Control) certificates for all vehicles/ equipment/machinery used for the project.	MOE Laws and General Condition of the project
Noise Pollution			

Sl. No	Environmental Issue	Management Measures	Reference
27	Noise Pollution: Noise from Vehicles, Plants and Equipments	The Contractor will confirm the following: ➢ All plants and equipment used in construction shall strictly conform to the MOE noise standards. ➢ All vehicles and equipment used in construction will be fitted with exhaust silencers. ➢ Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. ➢ Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field). ➢ Maintenance of vehicles, equipment and machinery shall be regular to keep noise levels at the minimum. ➢ At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, concrete mixing, batching will be stopped during the night time between 9.00 pm to 6.00 am. No construction activities will be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 9.00 am to 6.0 pm. Monitoring shall be carried out at the all the construction sites and results will be submitted to PIU through the EE/Engineer.	MOE Laws and General Condition of the project
Safety			
28	Personal Safety Measures for Labour	Contractor will provide: ➢ Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc. ➢ Welder's protective eye-shields to workers who are engaged in welding works ➢ Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals ➢ Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete	International Labor Organization (ILO) Convention No. 62 and The Building and Other Construction workers

Sl. No	Environmental Issue	Management Measures	Reference
		mixing operation. ➢ Adequate safety measures for workers during handling of materials. ➢ The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract. The contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers are adhered to. The contractor will not employ any person below the age of 18 years for any work and no woman will be employed on the work of painting with products containing lead in any form. The contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. Contractor will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry is rubbed and scrapped.	
29	Traffic and Safety	The contractor will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the 'EE and ' Resident Engineer' for the information and protection of traffic approaching or passing through the section of any existing cross roads. The contractor will ensure that all signs, barricades, pavement markings are provided as per the International specifications. Before taking up of construction on any section of the existing lanes of the highway, a Traffic Control Plan will be devised and implemented to the satisfaction of 'EE' and ' Resident Engineer'	Project Requirement and General Condition of the project
30	Risk from Electrical Equipment(s)	The Contractor will take all required precautions to prevent danger from electrical equipment and ensure that - ➢ No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. ➢ All necessary fencing and lights will be provided to protect the public in construction zones.	The Building and other construction workers (

Sl. No	Environmental Issue	Management Measures	Reference
		All machines to be used in the construction will conform to the MOE norms, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per the satisfaction of the EE/'Resident Engineer'.	
31	Risk Force Measure	The contractor will take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. The contractor will make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment.	The Building and other construction workers
32	First Aid	Injuries might occur during the construction period. It is therefore, pertinent to provide first aid facilities for all the construction workers like construction campus and at all work places etc. The contractor will arrange for - ➢ a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone ➢ availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital ➢ equipment and trained nursing staff at construction camp. ➢ the first aid units should apart from an adequate supply of sterilized dressing material, and also contain other necessary appliances as per the factory rules of State Government	The Building and other construction workers
33	Informatory Signs and Hoardings	The contractor will provide, erect and maintain informatory/safety signs, hoardings written in English and local language, wherever required as per International specifications.	International specifications
34	Flora and Chance found Fauna	The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the RE and carry out the RE instructions for dealing with the same. The Environmental Expert/RE of Consultant will report to the near by forest office (range office or divisional	Forest Conservation Act

Sl. No	Environmental Issue	Management Measures	Reference
		office) and will take appropriate steps/ measures, if required in consultation with the forest officials.	
35	Chance Found Archaeological Property	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the RE of such discovery and carry out the RE instructions for dealing with the same, waiting which all work shall be stopped.	Project Requirement and General Condition of the project
Labor Camp Management			
36	Accommodation	Contractor will follow all relevant provisions for construction and maintenance of labor camp. The location, layout and basic facility provision of each labor camp will be submitted to RE/EE and PIU prior to their construction. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the RE/EE.	The Building and other construction workers
37	Potable Water	The Contractor will construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The Contractor will also provide potable water facilities within the precincts of every workplace in an accessible place, as per standards set MOE. The contractor will also guarantee the following: a) Supply of sufficient quantity of potable water (as per MOE) in every workplace/labor campsite at suitable and easily accessible places and regular maintenance of such facilities. b) If any water storage tank is provided that will be kept such that the bottom of the tank at least 1mt. from the surrounding ground level. c) If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other	The Building and other construction workers and Project Requirement and General Condition of the project

Sl. No	Environmental Issue	Management Measures	Reference
		source of pollution, the well will be disinfected before water is used for drinking. d) All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof. e) A reliable pump will be fitted to each covered well. The trap door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.	
38	Sanitation and Sewage System	The contractor will ensure that - ➢ the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place ➢ separate toilets/bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women ➢ adequate water supply is to be provided in all toilets and urinals all toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition.	Project Specific Requirement
39	Waste Disposal	The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner. Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by RE will have to be provided by the contractor.	Project Specific Requirement
Contractor's Demobilization			
40	Clean-up Operations, Restoration and Rehabilitation	Contractor will prepare site restoration plans, which will be approved by the Environmental Expert/RE. The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures; dispose all garbage, night soils in a hygienic manner.	Project Requirement and General Condition of the project

Guideline - 1

GENERIC GUIDELINES FOR ENVIRONMENT FRIENDLY CONSTRUCTION METHODOLOGY

The contractor shall be deemed to have acquainted himself with the requirements of all the current statutes, ordinances, by-laws, rules and regulations or their instruments having the force of law including without limitation those relating to protection of the environment, health and safety, importation of labour, demolition of houses, protection of environment and procurement, transportation, storage and use of explosives, etc.

1. PROTECTION OF ENVIRONMENT

- The contractor will take all necessary measures and precautions and ensure that the execution of the works and all associated operations on site or offsite are carried out in conformity with statutory and regulatory environmental requirements including those prescribed in EMP.
- The contractor will take all measures and precautions to avoid any nuisance or disturbance to inhabitants arising from the execution of works.
- All liquid waste products arising on the sites will be collected and disposed of at a location on or off the sites and in a manner that will not cause either nuisance or pollution.
- The contractor will at all times ensure that all existing water courses and drains within and adjacent to the site are kept safe and free from any contamination.
- The contractor will submit details of his temporary drainage work system (including all surface channels, sediment traps, washing basins and discharge pits) to the Project Implementation Unit / Environmental engineer of Independent Consultant for approval prior to commencing work on its construction.
- The contractor will arrange all the equipment in good condition to minimize dust, gaseous or other air-borne emissions and carry out the works in such a manner so as to minimize adverse impact on air.
- Any vehicle with an open load-carrying area used for transporting potentially dust-producing material will have properly fitted side and tailboards. Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards and will be covered with a clean tarpaulin in good condition.
- The contractor will take all necessary measures to ensure that the operation of all mechanical equipment and condition processes on and off the site will not cause any unnecessary or excessive noise, taking into account applicable environmental requirements.
- The contractor will take necessary measures to maintain all plant and equipments in good condition.
- Where the execution of the works requires temporary closure of road to traffic, the contractor will provide and maintain temporary traffic diversions that subject to the approval of the PIU.
- Where the execution of the works requires single-lane operation on public road the contractor will provide and maintain all necessary barriers, warning signs and traffic control signals to the satisfaction of the PIU/EE/RE.
- Wherever traffic diversions, warning signs, traffic control signals, barriers and the like are required, the contractor will install them to the satisfaction of PIU/ EE/RE prior to commencing the work, in that area.

- Contractor will install asphalt plants and other machineries away from the populated areas as per laid down regulations.
- Permit for felling of trees will be obtained from the Forest Community and Forest Administration before the execution of any work.
- Trees and plants going to be uprooted will be duly compensated and maintained up to 3 years.
- Mist sprays should be provided at appropriate places for preventing dust pollution during handling and stockpiling of stones and loose earth.
- Over Burden (OB) waste dumps shall be sprayed with water, as they are the major source of air borne particulate matter.
- OB waste dumps shall be reclaimed / afforested to bind the loose soil and to prevent soil erosion. The frequency of sprinkling should be fixed as per the seasonal requirement and in consultation with engineer.
- Regular water spraying on haulage roads during transportation of construction material by water sprinklers. The frequency of sprinkling should be fixed as per the seasonal requirements in consultation with engineer.
- Transfer point for transporting construction material shall be provided with appropriate hoods/ chutes to prevent dust emissions.
- Dumping of construction material should be from an optimum height (preferably not too high), so as to reduce the dust blow.
- Innovative approaches of using improvised machinery designs, with in-built mechanism to reduce sound emission.
- Procurement of drill loaders, dumpers and other equipment with noise proof system in operator's cabin.
- Confining the equipment with heavy noise emissions in soundproof cabins, so that noise is not transmitted to other areas.
- Regular and proper maintenance of noise generating machinery including the transport vehicles to maintain noise levels.
- Provisions should be made for noise absorbing pads at foundations of vibrating equipments to reduce noise emissions.

2. QUARRY OPERATIONS

The Contractor shall obtain materials from quarries only after the consent of the Forest Community and Forest Administration or other concerned authorities and in consultation with the supervision Engineer. The quarry operations shall be undertaken within the purview of the rules and regulations in force.

3. PREVENTION OF WATER COURSES FROM SOIL EROSION AND SEDIMENTATION SILTATION

The Contractor shall apply following mitigation measures to prevent sedimentation and pollution of watercourses.

- To prevent increased siltation, if needed existing bridges maybe widened downstream side of the water body;
- Cement and coal ash should be stacked together, fenced by bricks or earth wall, and kept away from water, to prevent leachate formation and contamination of surface and ground water;

- If need be, slope of the embankments leading to water bodies should be modified and rechannelised to prevent entry of contaminants into the water body;
- During construction silt fencing (consists of geo-textile with extremely small size supported by wire-mish mounted on a panel made up of angle frame) could be used along the road at all canals and rivers to prevent sediments from the construction site to enter into the watercourses.

4. POLLUTION FROM HOT-MIX PLANTS AND BATCHING PLANTS

Bituminous hot-mix plants and concrete batching plants shall be located sufficiently away from habitation, agricultural operations. The Contractor shall take every precaution to reduce the levels of noise, vibration, dust and emissions from his plants and shall be fully responsible for any claims for damages caused to the owners of property, fields and residents in the vicinity.

5. ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION

The Contractor shall at all times carry out work on the road in a manner creating least interference to the flow of traffic with the satisfactory execution. For all works involving improvements to the existing state highway, the Contractor shall, in accordance with the directives of the RE/EE, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close to the state highway. The Contractor shall take prior approval of the EE/RE regarding traffic arrangements during construction.

6. TRAFFIC SAFETY AND CONTROL

- Where subjected to the approval of the Engineer the execution of the works requires temporary closure of road to traffic use, the Contractor shall provide and maintain temporary traffic diversions. The diversion shall generally consist of 200 mm thickness of gravel 4.5 meters wide laid directly upon natural ground and where any additional earthworks are required for this purpose that will be provided under the appropriate payment items.
- Where the execution of the works requires single-lane operation on public road, the Contractor shall provide and maintain all necessary barriers, warning signs and traffic control signals to the approval of the Engineer.
- With the exception of temporary traffic arrangements or diversions required within the first 4 weeks of the Contract, the Contractor shall submit details of his proposals to the Engineer for approval not less than 4 weeks prior to the temporary arrangement or diversion being required. Details of temporary arrangements or diversions for approval as soon as possible after the date of the Letter of Acceptance.
- The color, configuration, size and location of all traffic signs shall be in accordance with the code of practice for road sign. In the absence of any detail or for any missing details, the signs shall be provided as directed by the environmental engineer(Independent Consultant)
- The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, marking, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the section of the road under improvement. Before taking up any construction, an agreed phased programme for the diversion of traffic or closer of traffic on the road shall be drawn up in consultation with the RE/EE.

- At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the lane width path for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device to the directions of the EE/RE. At night, the passage shall be delineated with lanterns or other suitable light source.
- One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns / lights.
- On both sides, suitable regulatory / warnings signs as approved by the EE/RE shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m away. The signs shall be of design and of reflector type, if so directed by the EE/RE.
- Upon completion of the works for which the temporary traffic arrangements or diversions have been made, the Contractor shall remove all temporary installations and signs and reinstate all affected roads and other structures or installations to the conditions that existed before the work started, as directed by the Engineer.

7. HEALTH AND SAFETY

The contractor shall take all measures and precautions necessary to ensure the health, safety and welfare of all persons entitled to be on the site. Such precautions shall include those that, in the opinion of the Engineer, are reasonable to prevent unauthorized entry upon the site and to protect members of the public from any activities under the control of the contractor. The contractor's responsibilities shall include but not be limited to:

- The provision and maintenance of the Contractor's Equipment in a safe working condition and the adoption of methods of work that are safe and without risks to the health of any person entitled to be on the site.
- The execution of suitable arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage, transport and disposal of articles and substances,
- The provision of lighting, including standby facilities in the event of failure that, in the opinion of the Engineer, is adequate to ensure the safe execution of any works that are to be carried out at right.
- The provision of protective clothing and safety equipment, with such personnel and equipment information, instruction, training and supervision that are necessary to ensure the health and safety at work of all persons employed on or entering on the site in connection with the works, including the Engineer's supervisory staff, all in accordance with the laws.
- Near towns, villages and all frequented places, trenches and foundation pits shall be securely fenced provided with proper caution signs and marked with lights at night to avoid accidents. Contractor shall take adequate protective measures to see that the excavation operations do not affect or damage adjoining structures.
- The contractor shall not use or generate any materials in the works, which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substances, which can cause injury to the health of workers, the Contractor shall provide protective clothing or appliances to his workers.

- The contractor will take all measures necessary to safeguard the health; safety and welfare of all persons entitled to be on site and will ensure that works are carried out in a safe and efficient manner.
- The contractor will provide, and ensure the utilization of appropriate safety equipment for all workmen and staff employed directly or indirectly by the contractor. Such safety equipment will include but not be limited to the safety helmets, goggles and other eye protectors, hearing protectors, safety harnesses, safety equipment for working over water, rescue equipment, fire extinguishers and first-aid equipment. The personnel working at vulnerable locations at site will wear safety helmets and strong footwear.
- The contractor will provide an adequate number of latrines and other sanitary arrangements at areas of the site where work is in progress and ensure that they are regularly cleaned and maintained in a hygienic condition.

8. FIRST AID

- The provision and maintenance of suitably equipped and staffed first aid stations throughout the extent of the works to the satisfaction of the Engineer. The contractor shall allow this in his prices and be responsible for the costs of all such site welfare arrangements and requirements.
- Injuries might occur during the construction period. It is therefore pertinent to provide first aid facilities for all the construction workers. At construction camps and at all workplaces first aid equipment and nursing staff must be provided. Since many of the workplaces may be far away from regular hospitals, an indoor health unit having one bed facility every 250 workers needs to be provided.
- Adequate transport facilities for moving the injured persons to the nearest hospital must also be provided in ready to move condition.
- The first-aid units apart from an adequate supply of sterilized dressing material should contain other necessary appliances as per the factory rules.

9. MAINTENANCE

- All buildings, rooms and equipment and the grounds surrounding them shall be maintained in a clean and operable condition and be protected from rubbish accumulation.
- Each structure made available for occupancy shall be of sound construction, shall assure adequate protection against weather, and shall include essential facilities to permit maintenance in a clean and operable condition. Comfort and safety of occupants shall be provided for by adequate heating, lighting, ventilation or insulation when necessary to reduce excessive heat.
- Each structure made available for occupancy shall comply with the requirements of the Uniform Building Code. This shall not apply to tent camps.

10. MAINTENANCE OF DIVERSIONS AND TRAFFIC CONTROL DEVICES

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversion shall be maintained in a satisfactory condition till such time they are required as directed by the EE/RE. The temporary traveled way shall be kept free of dust by frequent applications of water, if necessary.

Guideline -2

GUIDELINES FOR SITING & LAYOUT OF CONSTRUCTION CAMP

A SITING

The contractor based on the following guidelines shall identify the location of the construction site. The construction site shall be located:

The construction camps will be located at least 500 m away from habitations at identified sites. The living accommodation and ancillary facilities for labour shall be erected and maintained to standards and scales approved by the resident engineer.

On non agricultural lands, as far as possible

Not within 1000m of either side of locations (Wild life Sanctuary/Ecologically sensitive areas)

All sites used for camps must be adequately drained.

The camps must be located such that the drainage from and through the camps will not endanger any domestic or public water supply.

All sites must be graded, ditched and rendered free from depressions such that water does not get stagnant and become a nuisance.

B LAYOUT

The Contractor during the progress of work will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour to standards and scales approved by the engineer. All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. Safe drinking water should be provided to the dwellers of the construction camps. Adequate washing and bathing places shall be provided, and kept in clean and drained condition. Construction camps are to be sited away from vulnerable people and adequate health care is to be provided for the work force.

***Sanitation Facilities*:** Construction camps shall be provided sanitary latrines and urinals. Sewerage drains should be provided for the flow of used water outside the camp. Drains and ditches should be treated with bleaching powder on a regular basis. The sewage system for the camp must be properly designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses takes place. Compliance with the relevant legislation must be strictly adhered to. Garbage bins must be provided in the camp and regularly emptied and the garbage disposed off in a hygienic manner

Shelter at Workplace: At every workplace, there shall be provided free of cost, four suitable shelters, two for meals and two others for rest, separately for use of men and women labourers. The height of shelter shall not be less than 3m from floor level to lowest part of the roof. Sheds shall be kept clean and the space provided shall be on the basis of at least $0.5m^2$ per head.

Canteen Facilities: A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered necessary. The contractor shall conform generally to sanitary requirements of local medical, health and municipal authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.

***First aid facilities*:** At every workplace, a readily available first-aid unit including an adequate supply of sterilized dressing materials and appliances will be provided. Workplaces remote and far away from regular hospitals will have indoor health units with one bed for every 250 workers. Suitable transport will be provided to facilitate taking injured and ill persons to the nearest hospital. At every workplace an ambulance room containing the prescribed equipment and nursing staff will be provided.

Health Care Facilities: Health problems of the workers should be taken care of by providing basic health care facilities through health centres temporarily set up for the construction camp. The health centre should have at least a doctor, nurses, duty staff, medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses or critical cases.

The health centre should have MCW (Mother and Child Welfare) units for treating mothers and children in the camp. Apart from this, the health centre should provide with regular vaccinations required for children.

***Day Crèche Facilities*:** At every construction site, provision of a day crèche shall be worked out so as to enable women to leave behind their children. At construction sites where 20 or more women are ordinarily employed, there shall be provided at least a hut for use of children under the age of 6 years belonging to such women. Huts shall not be constructed to a standard lower than that of thatched roof, mud walls and floor with wooden planks spread over mud floor and covered with matting. Huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean. There shall be two maidservants (or aayas) in the satisfaction of local medical, health, municipal or cantonment authorities. Where the number of women workers is more than 25 but less than 50, the contractor shall provide with at least one hut and one maidservant to look after the children of women workers. Size of crèches shall vary according to the number of women workers employed.

Guideline - 3

GUIDELINES FOR SITE CLEARANCE

1. **Vegetation clearance.** Vegetation clearance shall comprise uprooting of vegetation, grass, brushwood, shrubs, stumps, trees and saplings of girth upto 30 cm. measured at a height of one meter above the ground level. Where only clearance of grass is involved it shall be measured and paid for separately. The procedure/ steps involved for uprooting, skating and felling trees are described below.

2. **Uprooting of Vegetation**

- The roots of trees and saplings shall be removed to a depth of 60 cm. below ground level or 30 cm. below formation level or 15 cm below sub grade level, whichever is lower.
- All holes or hollows formed due to removal of roots shall be filled up with earth rammed and levelled.
- Trees, shrubs, poles, fences, signs, monuments, pipe lines, cables etc. within or adjacent to the area, which are not required to be disturbed during vegetation clearance shall be properly protected by the contractor at his own cost.

3. **Staking and Disposal**

- All useful materials obtained from clearing and grubbing operation shall be staked in the manner as directed by the Engineer.
- Trunks and branches of trees shall be cleared of limbs and tops stacked properly at the places indicated by the Engineer- in – charge. These materials shall be the property of the Government.
- All unserviceable materials are disposed off in such a manner that there is no livelihood of getting mixed up with the materials meant for construction.

4. **Felling Trees**

- Marking of trees: Trees, above 30 cm. Girth (measured at a height of one meter above ground level) shall be approved by the Engineer-in-charge and then marked at the site.
- Felling of trees: Felling of trees shall include taking out roots up to 60 cm. below ground level or 30 cm. below formation level or 15 cm. below sub-grade level, whichever is lower. The felling of tree will be done after approval of Forest Community and Forest Administration
- Filling: All excavations below general ground level arising out of removal of trees, stumps etc. shall be filled with suitable material in 20 cm. layers and compacted thoroughly so that the surfaces at these points conform to the surrounding area.
- Sizing: The trunks and branches of trees shall be cleared of limbs and tops and cut into suitable pieces as directed by the Engineer-in-charge.
- Staking: The serviceable materials shall be staked in the manner as directed by the Environmental specialist of independent Consultants/Engineer-in-charge.
- Disposal: The material, which cannot be used or auctioned shall be removed from the area and disposed off as per the directions of the Engineer-in-charge. Unsuitable waste materials should not get mixed with construction material during disposal.

Guideline - 4

GUIDELINES FOR DISPOSAL SITE MANAGEMENT

1. The locations of Disposal sites have to be selected such that:

   - No residential areas are located downwind side of these locations,
   - Disposal sites are located at least 1000 m away from sensitive locations like Settlements, Water body notified forest areas, Sanctuaries or any other sensitive Locations.
   - Disposal sites do not contaminate any water sources, rivers etc for this site should be located away from water body, and Disposal site should be lined properly to prevent infiltration of water.
   - Public perception about the location of debris disposal site has to be obtained before finalizing the location.
   - Permission from the Villager/local community is to be obtained for the Disposal site selected
   - The Plan must be approved by Environment Expert and concerned officer of the Project, at the level of Project Manager, at the least.

2. **Precautions to be adopted during disposal of debris / waste material**

   The contractor shall take the following precautions while disposing off the waste material

   - During the site clearance and disposal of debris, the contractor will take full care to ensure that public or private properties are not damaged/affected, there is no dwellings below the dumpsite and that the traffic is not interrupted.
   - Contractor will dispose off debris only to the identified places or at other places only with prior permission of Engineer-in-Charge of works.
   - In the event of any spoil or debris from the sites being deposited on any adjacent land, the contractor will immediately remove all such spoil debris and restore the affected area to its original state to the satisfaction of the Engineer-in-Charge of works.
   - The contractor will at all times ensure that the entire existing canal and drains within and adjacent to the site are kept safe and free from any debris.
   - Contractor will utilize effective water sprays during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
   - Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards and will be covered with a tarpaulin in good condition.
   - Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after the discussion with local people and with the permission of Engineer-in-Charge of works.

- During the debris disposal, contractor will take care of surrounding features and avoid any damage to it.
- While disposing debris / waste material, the contractor will take into account the wind direction and location of settlements to ensure against any dust problems.

3. **Rehabilitation of disposal sites**

- The dumpsites filled only up to the ground level could be rehabilitated as per guidelines below and to be decided by the engineer and the supervision consultant
- The dumpsites have to be suitably rehabilitated by planting local species of shrubs and other plants. Local species of trees has also to be planted so that the landscape is coherent and is in harmony with its various components.
- In cases where a dumpsite is near to the local village community settlements, it could be converted into a play field by spreading the dump material evenly on the ground. Such playground could be made coherent with the landscape by planting trees all along the periphery of the playground.
- Some of the dumpsites could be used either for plantation or for growing agricultural produce such as ginger, turmeric or oranges etc.
- Care should always be taken to maintain the hydrological flow in the area.

Guideline - 5

GUILDE LINES FOR BORROW AREAS MANAGEMENT

1. Borrow areas will be finalized either form the list of locations recommended by Feasibility consultants or new areas identified by contractor. The finalization of locations identified Feasibility consultant depends upon the formal agreement between landowners and contractor. Agreement is not reached between the contractor and landowners for the identified borrow areas sites, In such cases arrangement for locating the source of supply of material for embankment and sub-grade as well as compliance to environment requirements in respect of excavation and borrow areas as stipulated from time to time by the Ministry of Environment and Ministry of Agriculture, Forest and Fisheries, Royal Government of Cambodia, and local bodies, as applicable shall be the sole responsibility of the contractor.

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

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

3. The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme approved by the Engineer in charge of the works.

4. The Contractor shall at least 7 working days before commencements of compaction submit be following to the RE for approval.

   - The values of maximum dry density and optimum moisture content obtained, as the case may be, appropriate for each of the fill materials he intends to use.
   - A graph of density plotted against moisture content from which, each of the values in (i) above of maximum dry density and optimum moisture content were determined.
   - The Dry density-moisture content – CBR relationships for light, intermediate and heavy compactive efforts and intermediate in-between the two for each of the fill material be intends to use in the sub-grade.

5. After identification of borrow areas based on guidelines. Contractor will fill reporting format and submit the same for approval to the concerned Engineer in charge of the Contract.

6. After receiving the approval contractor will begin operations keeping in mind following;

   - Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plants is operating at the place of deposition.
   - No excavated acceptable material other than surplus to requirements of the Contract shall be removed from the site. Should be contractor be permitted to remove acceptable material from the site to suit his operational procedure, then be shall make good any consequent deficit of material arising there from.

- Where the excavation reveals a combination of acceptable and un-acceptable materials, the Contractor shall, unless otherwise agreed by the Environmental engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the un-acceptable materials. The acceptable material shall be stockpiled separately.
- The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants are siting of temporary buildings or structures.

7. **Borrow Areas located in Agricultural Lands**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- Borrowing of earth will be carried out up to a depth of 1.5m from the existing ground level.
- Borrowing of earth will not be done continuously through out the stretch.
- Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
- Small drains will be cut through the ridges, if necessary, to facilitate drainage.
- The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal).

8. **Borrow Areas located in Agricultural land where un-avoidable**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.

9. **Borrow Areas located in Elevated Lands**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- At location where private owners desire their fields to be leveled, the borrowing shall be done to a depth of not more than 1.5m or up to the level of surrounding fields

10. **Borrow Areas near River side**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2 m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- Borrow area near to any surface water body will be at least at a distance of 15 m from the toe of the bank or high flood level, whichever is maximum.

11. **Borrow Areas near Settlements**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).

- Borrow pit location will be located at least 0.75 km from villages and settlements. If un-avoidable, the pit will not be dug for more than 30 cm and drains will be cut to facilitate drainage.
- Borrow pits located in such location will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with a layer of stockpiled topsoil in accordance with compliance requirements with respect MOE guidelines.

12. **Borrow Pits along the Road**

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- Borrow pits along the road shall be discouraged.
- It permitted by the Engineer; these shall not be dug continuously.
- Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
- Small drains shall be cut through the ridges of facilitate drainage.
- The depth of the pits shall be so regulated that there bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of bank, the maximum depth of any case being limited to 1.5m.
- Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10m.

13. **Re-development Borrow Areas**

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

Re-development plan will be prepared by the Contractor before the start of work inline and will require the satisfaction of owner.

14. **Borrow Area Rehabilitation**

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

Guideline - 6

GUIDELINES FOR QUARRY MANAGEMENT

1. The Contractor will finalize the locations from the list given by Feasibility Consultant's for procuring materials. The Contractor shall establish a new quarry only with the prior consent of the concerned officers only in cases when: (i) Lead from existing quarries is uneconomical and (ii) Alternative material sources are not available. The Contractor shall prepare a Redevelopment Plan for the quarry site and get it approved by the Department.

2. The construction schedule and operations plans to be submitted to the Department concerned prior to commencement of work shall contain a detailed work plan for procuring materials that includes procurement, transportation and storage of quarry materials.

Operation & redevelopment plan (if a new quarry is opened)
• Photograph of the quarry site prior to commencement • The quarry boundaries as well as location of the materials deposits, working equipments, stockpiling, access roads and final shape of the pit. • Drainage and erosion control measures at site. • Safety Measures during quarry operation. • Design for redevelopment of exhaust site. *Option-A: Revegetating the quarry to merge with surrounding landscape:* This is done by conserving and reapplying the topsoil for the vegetative growth. *Option-B: Developing exhausted quarries as water bodies:* The pit shall be reshaped and developed into pond, for harvesting rainwater. This option shall only be considered where the location of quarry is at the lowest point, i.e. surrounding areas/natural drainage slopes towards it.

3. Construction Stage. To minimize the adverse impact during excavation of material following measures are need to be undertaken:

- Adequate drainage system shall be provided to prevent the flooding of the excavated area
- At the stockpiling locations, the Contractor shall construct sediment barriers to prevent the erosion of excavated material due to runoff
- Construction of offices, laboratory, workshop and rest places shall be done in the up-wind of the plant to minimize the adverse impact due to dust and noise.
- The access road to the plant shall be constructed taking into consideration location of units and also slope of the ground to regulate the vehicle movement within the plant.
- In case of storage of blasting material, all precautions shall be taken as per The International Explosive Rules and Regulations.

4. Quarry operations including safety:

- Overburden shall be removed and disposed inline with Guidelines of Disposal Management
- During excavation, slopes shall be flatter than 20 degrees to prevent their sliding. In cases where quarry strata are good and where chances of sliding are less this restriction can be ignored.
- In case of blasting, procedure and safety measures shall be taken as per The International Explosive Rules and Regulations.
- The contractor shall ensure that all workers related safety measures shall be taken as per guidelines for Workers and Safety.
- The Contractor shall ensure maintenance of crushers regularly as per manufacturer's recommendation.
- Topsoil will be excavated and preserved during transportation of the material and measures shall be taken to minimize the generation of dust and prevent accidents.
- The PIU and the Technical Examiner shall review the quarry site for the management measures during quarry operation, including the compliance to pollution norms.

5. Post Construction Stage.

The Contractor shall restore all haul roads constructed for transporting the material from the quarries to construction site to their original state.

The PIU and the Technical Examiner shall be entrusted the responsibility of reviewing the quarry site for the progress of implementation of Redevelopment Plan. These shall include the following two cases;

- Redevelopment of quarries opened by the Contractor for the project
- Redevelopment of existing quarries operated by other agencies

In the first case, the Contractor shall be responsible for the Redevelopment Plan prior to completion after five years, during the defect liability period. The PIU shall be responsible for reviewing this case of redevelopment prior to the issuing the defect liability certificate.

In the second case, the redevelopment of exhaust quarry shall be the responsibility of the agency providing the permit to ensure the implementation of Redevelopment Plan.

Guideline - 7

GUIDELINES FOR WORKERS SAFETY AND ENVIRONMENTAL HYGIENE DURING CONSTRUCTION

1. House Keeping Practices

- Maintain washrooms and canteens clean
- Keep all walkways clear and unobstructed at all times
- Ensure that spillages of oil and greasy
- Stack raw materials and finished products clear of walkways or inside roads
- Do not leave tools on the floor or in any location where they can be easily dislodged
- Keep windows and light fitting clean
- Maintain the workplace floors dry and in a non-slippery condition
- Provide and maintain proper drainage system to prevent water ponding
- Use metal bins for oily and greasy rags and store all flammable materials in appropriate bins, racks or cabinets. Ensure that the meal bins for storing oily and grease rags should be covered with lids.
- Ensure that protruding nails in boards or walls are moved or bent over so that they do not constitute a hazard to people
- Make sure that hazardous/dangerous chemicals are kept in the goods stores with the appropriate labeling, display of the material-safety-data-sheet (MSDS) and other precautionary measures
- Display 'no smoking' signs in areas with high fire risks, e.g. paint stores, wood working area and others

2. Safe layout in the construction plant, camp and quarry areas

- Arrange border to perimeter fencing
- Ensure good visibility and safe access at site entrances
- Provide adequate warning signs at the entrance and exit where necessary
- Provide adequate space/area for loading and unloading, storage of materials, plant and machinery
- Display emergency procedure and statutory notices at conspicuous location
- Consider welfare facilities required
- Provide areas for dumping garbage and other waste materials, and also arrange for their regular clearance.
- Arrange storage, transport and use of fuel, other flammable materials and explosives in line with the license requirements to be obtained from appropriate authorities
- Plan emergency assembly points, fire escape routes and locate fire-fighting equipment
- Provide access Road and plant movement areas within the site.
- Ensure the availability of first aid facilities and display notices at the various works to show the location of these facilities
- Provide proper drainage and sewage & drainage facilities

3. Tree Felling

- Use hard hats during tree felling
- Ensure tools such as the axes are in good condition
- Determine proper foot and body position when using the axe. Do not cut above your head
- Wear appropriate foot protection
- Carry a first aid kit to the site
- Determine possible hazards in the area, e.g. electrical or telephone or other utility lines
- Prior to felling, determine the safest direction for the fall
- Determine the proper hinge size before directing the tree fall.

4. Noise Hazards and its control

- Note that indications of noise levels are:
- You have to shout to be heard;
- Your hearing is dulled just after work;
- You get head noises or ringing in the ears after work;
- You have difficulty hearing people while others are talking
- Use sound level meters to measure. If the sound level exceeds 85 dB(A), then preventive measures should be taken
- Make personnel aware of noisy areas by using suitable warning signs and insisting that ear protectors should necessarily be worn.
- Reduce noise at source by improved maintenance, replacing noisy machines, screening with noise absorbing material, making changes to the process/equipment, controlling machine speeds, ensuring that two noise-generating machines are not running at the same time, using cutting oils and hydraulic breakers.
- Appoint a competent person to carryout a detailed noise assessment of the site, designate ear protection zone, and give instructions on the necessary precautionary measures to be observed by site personnel, including the use of suitable type of ear protections.
- Wear and maintain ear muffs and ear plugs as required
- In construction or repair work, noise should be kept to a low-level bearing in mind the disturbance to local residents.

5. Road Works

- The use of signage is most important to caution the road users of possible unsafe conditions due to the road works.
- Use the appropriate signage devices as required by the site conditions/situation. The devices include regulatory signs, delineators, barricades, cones, pavement markings, lanterns and traffic control lights.
- In using signs, make sure that they are (i) simple, easy-to-understand and convey only one message, (ii) luminescent and with reflective properties, and iii) broad, prominent and of appropriate size.
- In using barricades, make sure that you keep traffic away from work areas and you guide the drivers to keep along a safe, alternative path.
- Ensure that proper personal protective equipment (PPE) is provided to all the workers.

- Cover existing road signs and install new ones at appropriate locations taking into account the distances that would be required and reaction times.
- Plan layout and traffic management so those hazards are not created.
- Deploy flagmen, who control traffic at the work areas. The flag should be 600mm x 600mm fastened to a 1m length staff.
- Flagmen should wear reflective safety vests along with hard hats
- If required, use wireless devices for flagmen to co-ordinate from either ends of the road, where works are being carried out.

6. Electrical hazards in construction areas

- Treat all wires as live wires
- Never touch dangling wires, but report them to your manager
- Unless you are a qualified electrician, do not attempt electrical repairs
- Never use electrical equipment if your hands are wet or you are standing in water
- If electrical equipment is sparking or smoking, turn the power off and report the condition to your supervisor
- Never use electrical wires that have physical damage
- Never allow equipment or traffic to run over electrical wires.

7. Use and Storage of Gas/LPG

- Store filled gas/LPG cylinder in the open area, i.e. outside of the building
- Transport, store, use and secure cylinders in upright position
- Ensure proper ventilation at the ground level in locations where gas/LPG is in use
- Avoid physical damage to the cylinders
- Never weld or cut on or near the cylinders
- Store empty cylinders secured and upright
- Make sure that the cylinder is closed immediately after use
- Investigate immediately if there is the smell of LPG or gas
- Never use destenched gas/LPG on site.
- Make sure that there is no other unrelated fire in the vicinity of the cylinder

8. Operation of Excavators

- Ensure that excavators are operated by authorized persons who have been adequately trained.
- Prevent unauthorized movement or use of the excavators
- Check regularly and maintain the machine thoroughly
- Ensure that all relevant information, including those related to instruction, training, supervision and safe system of work are provided to the operators.
- Ensure that the operation and maintenance manuals, manufacturer's specifications, inspection and maintenance log books are provided for the use of the mechanics, service engineers or other safety personnel during periodic maintenance, inspection and examination.
- During tipping or running alongside the trenches, excavators must be provided with stop blocks.

- Excavators must be rested on firm ground during operation
- Avoid operating the machine too close to an overhang, deep ditch or hope and be alter to potential carving edges, falling rocks and slides, rough terrain and obstacles.
- Locate and identify underground services by checking with all utility companies before excavations.
- Ensure that all excavations are supervised by experienced and competent persons.
- When reversing or in caste the operator's view is restricted, adequate supervision and signaling should be provided.
- Ensure that the type and capacity of the excavator are properly chosen for the intended purposes and site conditions. Never use a machine for any purposes other than it is designed for.
- Check and report for excessive wear and any breakage of the bucket, blade, edge, tooth and other working tools of the excavator.
- Check that all linkages/hinges are properly lubricated and ensure that the linkage pins are secured. Never use improper linkage pins.
- Never dismount or mount a moving machine
- Work only with adequate ventilation and lighting
- Ensure that the protective front screen of the driving cabin is fixed in position during excavations to avoid eye injury to the operator.
- Ensure switch-off of the unattended vehicle.

9. Operation of trucks and dumpers

- Ensure that only trained, authorized and licensed drivers operate the vehicles
- Enlist the help of another worker before reversing the vehicle
- Switch-off the engine of an unattended vehicle
- Lower the tipping bodies when the machine is unattended, but if it is necessary to leave them in the raised position they should be blocked to prevent their fall.
- Wear safety boots or shoes to avoid injuries during loading and unloading.
- Carryout periodic servicing to the manufacturer's requirements. All records of maintenance and repairs should be in writing or kept on site.
- Keep the vehicle tidy and the cabin free from tools and material, which might obstruct the controls.
- Keep to speed limits.
- No passenger should be carried on a dumper except the driver
- Never drive the vehicle across a slope
- Provide stop blocks when the vehicle is tipping into or running alongside excavations
- Do not overload the vehicle.
- Carry only well secured loads
- Park only on level ground, in neutral with the parking brake applied
- Never mount of dismount from a moving vehicle

10. Gas Welding

- Use the following personal protective equipment during welding
  - Face or hand shield fitted with filters
  - Goggles, particularly when chipping slag
  - Gloves long enough to protect wrists and forearms against heats, sparks, molten metal and radiation
  - High-top boots to prevent sparks from entering footwear.
- Screen of the work area with sturdy opaque or translucent materials because glare can cause eye injury.
- Key for opening the acetylene cylinder valve must be one the valve stem while the cylinder is in use so that the cylinder valve may be immediately shut-off in an emergency.
- Ventilate the workplace using air blowers and exhaust fans to remove poisonous fumes and gases that are given off during welding
- Take precautions against flying sparks and hot slag where welding is being done near flammable materials and check the area before leaving.
- Do not weld material degreased with solvents until completely dry.
- Do not use gas cylinders for supporting work or as rollers
- Do not use oil grease on oxygen cylinder fittings
- Do not use cylinders with damaged valves.
- Do not use too much force if valves are stuck.
- Replace valve caps after use
- Search for leaks in equipment by using a solution of soapy water.
- Shut the cylinder valve if acetylene from a cylinder catches fire at the valve or regulator due to leakage at a connection.
- Treat all gas cylinders as "full" unless you are sure otherwise.
- Never attempt to transfer acetylene from one cylinder to another or attempt to refill an acetylene cylinder.
- Place portable fire extinguishers near the welding area
- Secure all cylinders against accidental displacement.
- Always lift gas cylinders. Do not slide them along the ground or drop them from trucks.
- Keep gas cylinders in vertical position both in storage and when in use
- Keep the work place dry, secure, free from combustible materials and obstruction.
- Store the acetylene and oxygen cylinders separately, and in a proper store.
- Keep the gas cylinders from source of heat, flammable materials, corrosive chemicals and fumes.

11. Manual Handling and Lifting

- Use mechanical equipment in place of manual handling as far as possible.
- Assess the manpower required to handle or lift the load safety and arrange the manpower accordingly.
- In handling hazardous materials, the workers shall be informed of the hazards and safety precautions.

- All relevant persons shall be trained in the proper methods of lifting and carrying.
- Where team work is required, select the persons whose ages and physical builds are compatible for teaming up. Coordinate the actions of the team members by giving necessary instructions.
- Always lighten or suitably shape the load for manual handling as far as possible Keep a look out for splinters, sharp edges, loose banding and nails.
- Clear path or obstruction and tripping hazards.
- Stack and secure goods safety on trucks, otherwise they fall off and injure passers-by.
- Use personal protective equipment such as gloves, safety shoes, etc.
- Adopt the following procedure when you lift a load:
- Stand close to the object. Have a firm footing with feet spread on either side of the road.
- Bend the knees and keep your back as straight as you can
- Grasp object firmly. Be sure grip will not slip
- Breath in and throw the shoulder back wards.
- Straighten the legs, continuing to keep the back as straight as you can.
- Hold object firmly close to the body
- Always lift smoothly. Avoid jerky motions. Turn with feet instead of twisting the back.

12. Handling chemicals and hazardous substances

- Always substitute hazardous chemicals with harmless or less hazardous ones wherever possible.
- Enclose the process using chemicals or provide other engineering controls such as local exhaust ventilation, a fume cupboard or a safety cabinet.
- Exercise great care in the storage and use of chemicals because they may be explosive, poisonous, corrosive or combustible.
- Separate different chemicals physically
- Store chemicals classified as dangerous goods in a properly constructed and approved goods store. Keep proper records of all chemicals and hazardous substances delivered, stored and used on site.
- Consider unknown substances and liquids as dangerous until proven otherwise.
- All containers should be clearly labeled to indicate contents. Never use a wrongly labeled container for chemicals.
- Prohibit smoking in the vicinity of dangerous chemicals
- Ensure that you are wearing the correct personal protective equipment before you handle chemicals
- Maintain the Material Safety Data Sheet of all chemicals for reference on safety precautions to be taken and the use of suitable PPE.
- When opening containers, hold a rag over the cap or lid, as some volatile liquids tend to spurt up when released.
- Wash before you eat and do not eat at the work place.

- If the skin is splashed with a chemical, rinse it immediately with plenty of clean water. Eye should be flushed thoroughly with water followed by immediate medical attention.
- Eye fountain, emergency shower and breathing apparatus should be available in the vicinity of the workplace.
- Safety instructions for handling emergency situations should be displayed prominently at both the storage and use locations.

13. First Aid

- Provide first aid boxes at every site
- Ensure that training on the use of the first aid box is provided to a handful of staff working in the site.
- Display the list of persons who are trained on providing first aid.
- Ensure that every first aid box is marked plainly “First Aid” in English and local language.
- The responsible person or first aide should replenish the contents of the first aid box as necessary.

14. Personal protective Equipment

- Consider the provision of personal protective equipment only after all measures for removing or controlling safety hazards have been provided reasonably impractical.
- Ensure that sufficient personal protective equipment are provided and that they are readily available for every person who may need to use them.
- The management should ensure that all persons make full and proper use of the personal protective equipment provided.
- Provide instruction and training in the proper use and care of any specific protective equipment where necessary
- Do not willfully misuse, interfere with or ill-treat any protective clothing and equipment provided.
- Ensure that the personal protective equipment are in good condition. Report immediately any damage to the management for replacement. Always keep the personal protective equipment as clean as possible.
- **Eye protection**
    - Issue eye protection equipment where there is a foreseeable risk of eye injury
    - Ensure an adequate supply of goggles/shields is available.
    - Keep the goggles clean and make sure they are good fit.
    - Do not watch welding operations unless your eyes are protected from the damaging effect of flash.
- **Head Protection**
    - No person shall enter a construction site unless he is wearing a suitable safety helmet
    - Wear a safety helmet:
        - When there is the risk of being hit by falling objects
        - While on or near a construction site
        - During adverse weather conditions
        - When in any area designated as a “hard hat” area.

- Provide identification labels to all helmets in some way to prevent random exchange among wearers, with one helmet exclusive to each person.
- Inspect helmets for cracks of sign of impact or rough treatment before each usage. Destroy, remove and replace all worn, defective or damaged helmets.

- **Hearing Protection**
  - Provide ear plugs or ear muffs as required. Use re-usable ear plugs when the reduction required (15-25 dBA) is not excessive. Use ear muffs where a large attenuation of upto 40 dBA is demanded.
  - Do not use dry cotton wool for hearing protection because it cannot provide any.
  - Provide disposable ear plugs for infrequent visitors and ensure that they are never re-used.
  - Provide re-usable ear plugs for those who need to work continuously for a long period in a high noise area.
  - Use ear muffs with replaceable ear cushions because they deteriorate with age or may be damaged in use.
  - Avoid wearing spectacles with ear muffs.
  - Use soap and water or the recommended solvent for cleaning ear muffs.
  - Provide ear muffs for those who may need to get in and out of a high noise area frequently.
- **Respiratory Protective Equipment**
  - Wear suitable respirable for protection when there is a potential for small particles entering the lungs, e.g. emptying of cement bags.
  - Ensure that he explanatory can provide adequate protection.
  - Provide training to all persons using the respirators for their correct fitting, use, limitations and symptoms of exposure.
  - Clean and inspect all respirators before and after use.
  - Store respirators properly when not in use.
- **Safety Footwear**
  - Wear suitable footwear for work
  - Use safety footwear on site or in other dangerous areas
  - Wear suitable safety shoes or ankle boots when working anywhere where there is high risk of foot injuries from slippery or uneven ground, sharp objects, falling objects, etc.
  - All safety footwear, including safety shoes, ankle boots and rubber boots, should be fitted with steel toecaps.
  - Avoid wearing flip flops, high heeled shoes, slippers, light sport shoes in situations where there is a risk of foot injury.
  - Keep shoe lace knots tight.
- **Hand Protection**
  - Wear suitable gloves for selected activities such as welding & cutting and manual handling of materials & equipment.

- Do not wear gloves where there is a risk of them becoming entangled in moving parts of machinery
- Wash hands properly with disinfectant soap and clean water before drinking, eating or smoking. Wash hands immediately after each operation on site when the situation warrants.

- **Fire Prevention, Fighting and Equipment**
    - Before fire breaks cut
        - Store flammable material in proper areas having adequate fire protection systems.
        - Display sufficient warning signs.
        - Train selected personnel to use these fire extinguishers
        - Inspect fire extinguishers regularly and replace as necessary
        - Fire escape route should be kept clear at all times and clearly indicated.
        - Know the escape route and assembly point.
        - Display escape route maps prominently on each floor
        - Carryout fire drill regularly. Designate fire officers
        - Install fire alarm wherever required and test regularly.
        - Provide sufficient exit signs at prominent locations for directing people to the escape staircases and routes.
    - **When fire breaks out**
        - Alert all persons
        - Put off the fire with appropriate fire extinguishers only when you are sure that you are safe to do so.
        - Escape if you are in danger through the fire escape route to assembly point
        - Fire officers to carryout head count at the assembly point.
- **Incident and accident investigations**
    - Carryout the investigation as quickly as possible.
    - Conduct interviews with as many witnesses as necessary
    - Do not rely on any one sole source of evidence
    - Use the following tools:
- **Checklists for obtaining basic and typical information for accidents**
    - Notebook
    - Tape records
    - Camera
    - Measuring tape
    - Special equipment for the particular investigation
    - Obtain answers to the following questions:
        1. When did the accident occur?

2. Where did it occur?
3. Who was injured and what was damaged?
4. What caused the accident?
5. Why did it occur?
6. How could it have been prevented?
7. How can a recurrence be prevented?

- **Prepare a short but sufficient investigation report that contains the following**:
    - A summary of what had happened
    - A summary of events prior to the accident
    - Information gathered during the investigation
    - Details of witnesses
    - Information on injury or loss sustained
    - Conclusions and possible causes of the accident
    - Recommendations to prevent recurrence
    - Supporting materials (photos, diagrams, etc.)

SPECIFIC GUIDELINES FOR WORKERS SAFETY DURING CONSTRUCTION

Sl No.	Stage and Nature of Construction Hazard	Safety measures expected to be taken by the Contractors and Site Engineers
1	Excavation in soft loose & slushy soil above 2.00 m depth sliding of earth or collapsing of sides.	The Excavation beyond 1.5 m to 2.00 m to be done in steps of minimum 500 mm offsets as shown in Clause 2.18.2(b) and also planking and strutting should be done.
2	Excavation in slippery area (water logged) – The labor may fall or machinery on site may slip.	Try to dewater the area and spread minimum 150 mm thick sand layer to avoid slipping
3	Excavation in Rock where chiselling is involved – The fall of hammer may injure the hand, small rock pieces may injure the eyes and legs.	For hammer work, only experienced and skilled labor should be employed. Chisel should not be allowed to be held by hand, while hammering a chisel holding clamp should be provided. The labor should be provided with goggles and leg cover to protect eyes and legs, from injuries due to small rock pieces.
4	Excavation in Rock where blasting is involved - Careless handling may lead to injury to main worker or a passerby.	The work of blasting should be entrusted to only experienced persons. Provide sufficient length of fuse to give ample margin of time from the time of lighting to the time of explosion. A danger zone at least 180m diameter is to be flagged off 10 minutes before actual firing. All workmen should be sent away from danger zone except the firing man, who should be provided with a whistle.
5	Excavation for drain across road or manhole adjacent to a road – chances of a passer by falling into the excavated portion	The area should be well barricaded & a red lamp provided at night. A watchman should be deputed to prevent any movement of persons, or vehicles.
6	During Excavation or sometimes even while concreting – Snake bites or Scorpion stings –	In places where the movement of snakes is more the contractor should provide the labor with gum boots, gloves etc. and also make snake antidotes available on site. A particular care that has to be taken on such site is to always keep a vehicle available on site to rush the patient to a doctor. This applies to snake stringed patients as well.
7	Centering (form-work) and scaffolding –Form-work collapse while concreting or just before concreting especially when wooden ballies are used.	Many a times ballies joined together give way due to weak joint. Hence the use of joined ballies should be restricted. Only 2 joined ballies out of 8 ballies should be allowed. In case of double staging for a Slab at a height, utmost care should be taken to see that the top balli rests on the bottom balli. A particular care that should be taken during each concreting operating of slabs and beams is that, one carpenter and two helpers with spare ballies, nails etc. should be deputed below the slab/beam that is being concreted to watch any disturbance in the supports of the form-work below during concreting and in case of any doubt the concreting should be stopped immediately and the form work strengthened. Never allow bricks below a balli to make up the required height. This is most

Sl No.	Stage and Nature of Construction Hazard	Safety measures expected to be taken by the Contractors and Site Engineers
		dangerous.
8	Form-work for beams and slabs: The bottom of beam collapses and many a times brings down the slab as well, injuring the labor and supervision staff.	This case is noticed when slender ballies are used without bracing. In fact, no concreting should be allowed without bracing at 300 mm above ground, and at mid way, in normal beams & slabs. The bracings should be for the support of beams as well as slabs.
9	Form-work for sides of a slab–The labor just rests his foot on the plank and looses balance and falls resulting a fatal accident.	This is noticed when the carpenter fixes the side shuttering of a slab with a plank just tied by binding wire to the steel reinforcements and by wooden pieces nailed in wall and plank. This is so weak a portion that with little pressure the plank gives way. Hence side shuttering should be done with a direct balli support from ground or floor, and the practice of tying planks with binding wire to the steel reinforcement should be totally avoided. A temporary railing along the periphery of slab will guard the life of labor and independent consultant staff.
10	Form-work for beams and slabs–Opening the form- work–Accident due to fall of materials during removing the forms.	In fact, this is a most dangerous work. One should be very careful while form-work is removed. Only trained carpenters should be deputed for the work. A safe resting place outside the area of slab as a temporary measure should be constructed from where the Slab can be removed safely. Removal of form-work during night should not be permitted under any circumstances.
11	Scaffolding–Fall of work-man, Supervision Staff, Standing on Chalis not tied properly or tied only at one end. (Chalis mainly made of Bamboos).	This is a very common negligence on the part of labor who do scaffolding work. The Chalis on which they work either span over it's complete length or is tied loosely and many a times at one end only. Hence, care must be taken that the Chali do not span over the full length but some middle support should be provided and also the same is tied properly on both ends.
12	Ladders–Balli or bamboo ladders – The horizontal member breaks and the person falls. Some times the top face just rests on wall and the whole ladder tilts causing an accident.	The ladders should be strong enough to bear the weight of a labor with materials on head. As far as possible a hand rail should be provided at one end. The horizontal member should be preferably fixed with. bolt & nuts or strong nails. When the ladder is placed across a wall the top portion should be tied firmly to a strong support so that the ladder does not move laterally.
13	Column Reinforcements–Column reinforcements mainly in independent footings collapses – Injury to persons working nearby.	The tendency of bar-benders is to tie the vertical steel with coir rope or 8 mm steel rods as ties on all four sides of the column reinforcement. This method of supporting the column reinforcements results in a weak support. Hence, the column reinforcements should be supported by strong ballies on all four sides of reinforcements and as far as possible a combined platform should be constructed out of ballies over which the reinforcements can be supported.
14	Concreting chajjas – When chajjas are concreted with out care and on	While concreting chajjas care must be taken that the labor do not stand on the reinforcement and disturb the position.

Sl No.	Stage and Nature of Construction Hazard	Safety measures expected to be taken by the Contractors and Site Engineers
	opening the form-work the chajja would collapse, causing injury to labor on top or bottom of chajja.	Separate scaffolding must be tied over which the labor can stand and work without disturbing the reinforcements. The main reason is in chajja the steel is placed on top face but if the labor stands on the steel, it will bend and come to bottom face and hence the chajja will fall when form-work is removed, thus, causing injury to labor working on top, or bottom.
15	Dismantling–Dismantled materials may fall on passer by or the person engaged in dismantling work may fall due to slipping. The dismantled materials may fall on persons working below.	When work of demolition is to be taken up the area should be closed for all outsiders. No one should be allowed up to 50 m. from the place of demolition. The workers engaged in demolition should be asked to wear safety belts. Helmets must be worn by all the workers engaged in dismantling work. The place should be strictly guarded at night with red lights at prominent places, and watchman should be posted.
16	Electric-Connections/Cables etc. – High tension/L.T. Electric wire passing near the slab structure-while bending, lifting or tying reinforcements the bar benders may sustain the Electric Shock, causing fatal injury.	The work in such places, should not be allowed to the workers themselves, but in such position the work must be executed under the strict supervision of a responsible Foreman or a Supervisor.
17	Electric Connections/Cables etc. – Cables below ground may get punctured during excavation & thus electrocute the labor working. Similarly when concreting is in progress the punctured cable may prone to be fatal to the labor.	Before taking up the work all available drawings should be studied, local enquiry to be made to know the position of cables and work in such area should be got executed under strict supervision of an experienced Foreman or a Supervisor.
18	Electric Connections/Cables etc. – Temporary Electric lines near damp walls, near joinery stretched on a considerable length – There is every chance that the wire may get cut due to usage and may develop short circuits/leakages etc. and may electrocute the person touching the wire accidentally.	The Electric wires should be maintained by an electrician who should regularly check up the insulation of wires especially placed near steel items & damp areas. The temporary wiring should be supported properly. As far as possible a good quality wire should be used this may not get damaged easily.
19	Electric and gas welding work – Drilling, polishing work – Done by temporary cables used on a number of works – Due to the fact that the wires are old & when they come in contact with water even in the process of curing the surrounding area may get affected due to leakage in the electric current thus causing damage to the workers & supervision staff.	All wiring works to be inspected by experienced electrician. All wires to be properly insulated and fixed at height on temporary poles. No welding work should be permitted near damp area. The welders to be provided with welder's goggles & gloves. As far as possible machine in good condition should be used.

Sl No.	Stage and Nature of Construction Hazard	Safety measures expected to be taken by the Contractors and Site Engineers
20	Construction Machinery & Lifts – Concrete Mixers – Safety precautions. A mixer with hopper tried to be operated by an helper could not release brake in time thus causing injury to the person near hopper- sometimes fatal one.	The Mixers with hopper should be operated by an experienced mixer operator and such mixers should not be allowed to be handled by a helper or a labor.
21	Construction Machinery & Lifts - Lifts - Safety precautions. (1) The lift pit if left unguarded the children of workers may fall in the pit resulting in fatal accident	(1) A brick protection wall of minimum 1.00 m height should be constructed around the Lift Pit, thus, preventing the children going near the pit. A special care should be taken to see that the children are not allowed to come near the machinery.
	(2) The manually operated brakes of the lift failed or the communication between the labor at the top and the liftman failed and thus, the lift was not controlled and resulted in fatal accident.	(2) The condition of the lift must be maintained properly. The lift operator should be well trained. The labor receiving the bucket at top should be smart and active enough to convey the message of stopping & releasing the lift-to-lift operator properly.
22	Water Storage Tank for general use & curing - chances of children of workers falling in the tank with fatal accident.	The water tanks constructed on site should be protected by at least 1.00 m high walls on four sides, so that the children do not fall.
23	Misuse of lift by labor and sometimes supervision staff The lifts that are meant for lifting materials used by labor to go to upper floors – The labor thus traveling many a times get injured.	No person should be allowed to go to upper floors by lifts that are mainly meant for conveying the building materials. Fatal accidents have taken place due to above action of workers.
24	Site Cleaning–Cleaning top floors of buildings – Upper portion of any structure – Throwing waste materials broken concrete pieces, brick bats, sand etc. straightway from top to ground injuring person below or even a passerby.	This dangerous practice should not be allowed at all. The materials should be brought to the ground with the help of lift or the use of rope over pully with a bucket, thus bringing down materials safely.
25	Bar bending work-Helpers of bar benders to follow short cut method, throw surplus steel pieces from top floors to ground and may cause fatal injuries.	This is a very bad practice. The helpers should bring the rods to ground with the help of lift or rope & pulley.

Guideline- 8

GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL

1. All materials shall meet commercial grade standards and shall be approved by the concerned Engineer in charge of works, before being used in the work.

2. Construction Operations

- Prior to the start of the relevant construction, the Contractor shall submit to the RE/EE for approval, his schedules for carrying out temporary and permanent erosion/sedimentation control works as are applicable for the items of clearing and grubbing, roadway and drainage excavation, embankment/sub-grade construction, bridges and other structures across water courses, pavement courses and shoulders. He shall also submit for approval his proposed method of erosion/sedimentation control on service road and borrow pits and his plan for disposal of waste materials. Work shall not be started until the erosion/sedimentation control schedules and methods of operations for the applicable construction have been approved by the RE/EE.
- The surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations shall be limited to the extent practicable. The Contractor may be directed to provide immediate control measures to prevent soil erosion and sedimentation that will adversely affect construction operations, damage adjacent properties, or cause contamination of nearby streams or other watercourses. Such work may involve the construction of temporary berms, dikes, sediment basins, slope drains and use of temporary mulches, fabrics, mats, seeding, or other control devices or methods as necessary to control erosion and sedimentation.
- The Contractor shall be required to incorporate all permanent erosion and sedimentation control features into the project at the earliest practicable time as outlined in his accepted schedule to minimize the need for temporary erosion and sedimentation control measures.
- Temporary erosion/sedimentation and pollution control measures will be used to control the phenomenon of erosion, sedimentation and pollution that may develop during normal construction practices, but may neither be foreseen during design stage nor associated with permanent control features on the Project.
- Where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion or sedimentation control features can follow immediately thereafter if the project conditions permit; otherwise temporary erosion or sedimentation control measures may be required between successive construction stages. Under no conditions shall a large surface area of credible earth material be exposed at one time by clearing and grubbing or excavation without prior approval of the RE/EE.
- The Engineer may limit the area of excavation, borrow and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding and other such permanent erosion, sedimentation and pollution control measures, in accordance with the accepted schedule.
- Temporary erosion is sometimes caused due to the Contractor's negligence, care-lessness or failure to install permanent controls. Sedimentation and pollution control measures then become necessary as a part of the work as scheduled or ordered by the Engineer, and these shall be carried out at the Contractor's own expense. Temporary

erosion, sedimentation and pollution control work required, which is not attributed to the Contractor's negligence, carelessness or failure to install permanent controls, will be performed as ordered by the RE/EE.

- Temporary erosion, sedimentation and pollution control may include construction work outside the right of way where such work is necessary as a result of road construction such as borrow pit operations, service Road and equipment storage sites.
- The temporary erosion, sedimentation and pollution control features installed by the Contractor shall be maintained by him till these are needed, unless otherwise agreed by the RE/EE.

GUIDELINES FOR MEDIAN PLANTATION AND GRASS TURFING

1 GENERAL DESCRIPTION

1.1 The species to be planted in median would be of low or medium height with ornamental value to enhance the visual experience of the road corridor. It will also act as a screen to prevent glare from the incoming vehicles.

1.2 One or two rows of flowering shrubs are recommended in accordance to the varying width of the median of different sections. In sections where median width is less than 1.5 meter, only grass turf is recommended. In median width of 3 meters, one row of shrub whereas in 5 meter median width, plantation of two rows of flowering shrubs are proposed.

1.3 Only two rows of shrubs will be planted on median width of 5 meters and these plants will be at a spacing of 1.5 meters from the inner edge of the median.

1.4 The plants will be at spacing of 3x3 meters and size of the pits for planting will be 0.6m dia and deep. Therefore, total no. of plants per km will be 333 in case where single row is proposed and 666 in case of two rows.

1.5 The species recommended for median are mainly Bougainvillea and Kaner. Bougainvillea is considered as the most suitable species as it has a great aesthetic value and it is found in various colours and shades. It can also withstand extreme temperature and climate conditions and also has low requirements of water. These species have been proposed considering the climatic conditions, requirements of water and future management. However other species listed in the appendices may also be used.

1.6 The surface for the median plantation should be well prepared. The masses of loose debris on the median and any convexities will be removed and similarly and concavities are to be filled by good soil. The surface should have sufficient layer of good quality of soil so as to have a better growth and survival of grasses and shrubs.

1.7 The height of the plants will not be less than 1 ft. and need to be in polythene bags until the planting.

1.8 All plants supplied must be planted within three days of removal from the nursery.

1.9 The contractor will be required to water the area in case of sufficient rains water after planting.

1.10 Size of the pits for planting shrubs - 45x45x45 cm

1.11 No. of Plant per km - 800 (400 each side)

1.12 Use of compost of manure - 1/3 of volume of pit mixed with soil, and refilled

Table-1: Activities schedule for Plantation along the Road/Median

Year	Month	Sl. No.	Activities to be done
1st Year	Jan to Mar	1	Surveying & Clearing of the area
		2	Digging of Pits
		3	Procurement of Angles Iron and Barbed wire (or other fencing material), and erecting the fence
2nd Year	April to June	1	Purchase of Farm yard manure
		2	Brick/Iron etc. guard for 1st row
		3.	Plantation along the road
		4	Filling up of pits with Farm yard manure and soil
	July to August	1	Transportation of Plants
		2	Planting of Sapling
		3	Watering
		4	Weeding and Hoeing
	Sept to Nov	1	Weeding of Hoeing
		2	Watering 4 times a month
	Dec to Feb	1	Weeding of Hoeing
		2	Maintenance
	March	1	Watering 4 times a month
3rd Years	April to June	1	Watering 6 times a month
	July to August	1	Casualty Replacement (20% of the total plants)
		2	Weeding
		3	Maintenance by Mali
	Sep to Nov	1	Watering 2 times a month
		2	Maintenance by Mali
	Dec to Feb	1	Maintenance by Mali
	March	1	Watering 4 times a month
		2	Maintenance by Mali
4th Year	April to March	1	Watering
		2	Casualty Replacement (10% of the total plants)
		3	Maintenance by Mali

2 PLANTATION

Scope

Contractor to furnish all materials, labor and related items necessary to complete the work indicated on drawing and specified herein.

2.1 Materials

Saplings

- Saplings/Seedlings shall be well-formed and free from defects such as knots, sun-scaled, windburn, injuries, abrasion or disfigurement. All saplings shall be healthy, sound, free from plant diseases, insect's pests, of their egg and well-developed root systems.
- No plant will be accepted, if branches are damaged or broken. All the plant material must be protected from the sun and weather until planted.
- Any nursery stock shall have been inspected and approved by the Environment officer.
- All saplings will be delivered with legible identification labels.

- The root system shall be conducive to successful transplantation. While necessary, the root-ball shall be preserved by suitable material. On soils where retention of a good ball is not possible, the roots should be suitably protected in some other way, which should cause any damage to roots.

Topsoil/Good Earth

- Topsoil or good earth shall be a friable loam, typical of cultivated topsoil of the locality containing at least 2% of decayed organic matter (humus).
- Stored topsoil will be used for plantation at median and also for roadside plantation. Otherwise it could be taken from a well-drained arable site.
- It shall be free of subsoil, stones, earth skids, sticks, roots or any other objectionable extraneous matter or debris.
- It shall contain no toxic material.
- No topsoil shall be delivered in a muddy condition.

Manure

Only organic manure will be used for plantation. Composts from municipal solid wastes and distillery waste may be used. Manure shall be free from extraneous matter, harmful bacteria insects or chemicals (Subjected to safety norms).

General Condition

Shrubs shall be substantially free from pests and diseases, and shall be materially undamaged. Torn or lacerated roots shall be pruned before dispatch. No roots shall be subjected to adverse conditions such as prolonged exposure to drying winds or subjection to water logging, between lifting and delivery.

Supply and Substitution

Upon submission of evidence that certain materials including plant materials are not available at time of contract, the contractor shall be permitted to substitute other and plants, with an equitable adjustment of price. All substitutions shall be of the nearest equivalent species and variety to the original specified and shall be subjected to the approval of the Landscape Architect. Packaging shall be adequate for the protection of the plants and such as to avoid heating or drying out.

Each specimen of tree and shrub, or each bundle, shall be legibly labeled with the following particulars:

- Its name (Both common and Scientific)
- The name of the supplier, unless otherwise agreed.
- The date of dispatch from the nursery.

2.2 Planting

Plants and Shrubs

All saplings should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed and the ball covered with sand to prevent drying out. Bare rooted plants can be heeled in by placing the roots in prepared trench and covering them with earth, which should be watered into, avoid air pockets round the roots. Shrubs shall be planted as suggested by Environment officer.

Digging of Pits

- Tree pits shall be dug a minimum of three weeks prior to backfilling.
- The pits shall be 60 to 90cms in diameter and 90 to 120cms deep.

- While digging the pits, the topsoil up to a depth of 30cms may be kept aside, if found good (depending upon site conditions), and mixed with the rest of the soil.
- If the soil is normal it shall be mixed with manure.
- The bottom of the pit shall be forked to break up the subsoil.

Back Filling

The soil back filled watered through end gently pressed down, a day previous to planting, to make sure that it may not further settle down after planting. The soil shall be pressed down firmly by treading it down, leaving a shallow depression all round for watering.

Planting

- No pits shall be dug until final position has been pegged out for approval.
- Care shall be taken that the plant sapling when planted is not be buried deeper than in the nursery, or in the pot.
- Planting should not be carried out in waterlogged soil.
- Plant shrubs at the original soil depth; soil marks on the stem is an indication of this and should be maintained on the finished level, allowing for setting of the soil after planting.
- All plastic and other imperishable containers should be removed before planting.
- Any broken or damage roots should be cut back to sound for healthy growth.
- The bottom of the planting pit should be covered with 50mm to 75mm of soil.
- Bare roots should be spread evenly in the planting pit; and small mound in the center of the pits on which the roots are well aid on and evenly spread.
- Soil should be placed around the roots, gently shaking the shrubs to allow the soil particles to shift into the root system to ensure close contact with all roots and prevent air pockets.
- Back fill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid damaging the roots.

Staking

Newly planted shrubs must be held firmly although not rigidly by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.

Methods:

The main methods of staking shall be:

- A single vertical shake, 900mm longer than the clear stem of the shrubs driven 600mm to 900mm into the soil.
- Two stakes as above driven firmly on either side of the shrubs with a cross bar to which the stem is attached. Suitable for bare- rooted or Ball material.
- A single stake driven in at an angle at 45 degrees and leaning towards the prevailing wind, the stem just below the lowest branch being attached to the stake. Suitable for small bare- rooted or Ball material
- For plant material 3m to 4.5m high with a single stem a three- wire adjustable guy system may be used in exposed situations.

The end of stake should be pointed and the lower 1m to 1.2m should be coated with a non-injurious wood preservative allowing at least 150mm above ground level.

Tying

Each shrub should be firmly secured to the stake so as to prevent excessive movement. Abrasion must be avoided by using a buffer, rubber or Hessian, between the shrubs and stake. The shrubs should be secured at a point just below its lowest branch, and also just above ground level; normally two ties should be used for shrubs. These should be adjusted or replaced to allow for growth.

Watering

The Landscape Contractor should allow for the adequate watering in of all newly planted trees and shrubs immediately after planting and during the growing season, keep the plant material well watered.

Manure/Fertilizer usage

The fertilizers/manure usage should be such that the turn of all the fertilizers comes after, every 15 days from the beginning of the monsoon till the end of winter:

Organic well-rotted dry farm yard manure: 0.05 cum or tussle.

- Urea 25gm.
- Ammonium sulphate 25gm.
- Potassium sulphate 25gm.

All shrubs, which are supplied pot grown, shall be well soaked prior to planting.

- Watering in and subsequent frequent watering of summer planted container-grown plants is essential.
- Application of inorganic manure should as for possible be avoided. Form yard manure as biofertilizer with for better option.
- Shrub Planting in Planter Beds
- All areas to be planted with shrubs shall be excavated, trenched to a depth of 750mm, followed by refilling the excavated earth after breaking clods and mixing with sludge in ratio 8:1 (8 parts of stacked volume of earth after reduction by 20%: 1 part of stacked volume of sludge after reduction by 8%.)
- For planting shrubs and ground cover shrubs in planters, good earth shall be mixed with sludge in the proportion as above and filled in planters.
- Positions of planters should be marked out in accordance with the architectural drawing.

3 Grass Turfing

Preparation of Ground

During period prior to planting, the ground shall be maintained free from weeds. Grading and preparation of the area shall be completed at least three weeks prior to the actual sowing. Regular watering shall be continued until sowing by dividing the area into portions of approximately 5 m squares by constructing small bunds to retain water. These ‘bunds’ shall be leveled just prior to sowing of grass plants; it shall be ensured that the soil has completely settled.

Soil

The soil itself shall be ensured to the satisfaction of Landscape Architect to be a good-Fibrous loam, rich in humus.

Sowing the grass roots

Grass roots (cynodon dactylon or a local genus approved by the Landscape Architect) shall be obtained from a grass patch, seen and approved before hand.

The grass roots stock received at site may be stored and shall be manually cleared of all weeds with water sprayed over areas.

Small roots shall be dibbled about 5 cm apart into the prepared grounds. Grass will only be accepted as reaching practical completion when germination has proved satisfactory and all weeds have been removed.

Maintenance

As soon as the grass is approximately a 3 cm high it shall be rolled with a light wooden roller – in fine, dry weather – and when it has grown to 5 to 8 cms, above to the ground weeds must be removed and regular cutting with the scythe and rolling must begun. A top-dressing of an ounce of guano to the square yard or well decomposed well broken sludge manure shall be applied. When the grass is sufficiently secure in the ground to bear the moving machine, the blades must be raised an inch above the normal level for the first two or three cuttings. That is to say, the grass should be cut so that it is from 4 to 5 cms in length, instead of the 3 cm necessary for mature grass.

In the absence of the rain, during the monsoon, the lawn shall be watered every ten days heavily, soaking the soil through to a depth of at least 20 cms.

Damage failure or dying back of grass due to back neglect of watering especially for seeding out normal season shall be the responsibility of the contractor. Any shrinkage below the specified levels during the contract or defect liability period shall be rectified at the contractor's expanse. The contractor is to exercise care in the use of rotary cultivator and moving machines to reduce to a minimum the hazards of flying stones and brickbats. All rotary mowing machines are to be fitted with safety guards.

Rolling

A light roller shall be used periodically, taking care that the area is not too wet and sodden.

Edging

These shall be kept neat and must be cut regularly with the edging shears.

Manuring / Fertilizer use

The area shall be fed once in a month with liquid manure prepared by dissolving 45 gm of ammonium sulphate in 5 litres of water.

Watering

Water shall be applied at least once in three days during dry weather. Watering whenever done should be thorough and should wet the soil at least up to a depth of 20 cms.

Weeding

Prior to regular mowing the contractor shall carefully remove rank and unsightly weeds.

Maintenance

The Contractor shall maintain all planted areas within contract boundaries for the entire contract period (for one year until the area is handed over in whole or in phases). Maintenance shall include replacement of dead plants, watering, weeding, cultivating, control of insects, fungus and other diseases by means of spraying with an approved insecticide or fungicide, pruning, and other horticulture operations necessary for proper growth of the plants and for keeping the landscape sub-contract area neat in appearance.

Pruning and Repairs

Upon completion of planting work of the sub-contract (for plantation) all trees should be pruned and all injuries repaired where necessary. The amount of pruning shall be limited to the necessary to remove dead or injured twigs and branches and to compensate for the loss of roots and the

result of the transplanting operations. Pruning shall be done in such a manner as not to change the natural habit or special shape of trees.

Nursery Stack

Planting should be carried out as soon as possible after reaching the site. Where planting must be necessity delayed, care should be taken to project the plants form pilfering or damage from people animals. Plants with bare-roots should be heeled- in as soon as received or otherwise protected from drying out and others set closely together and protected from the wind. If planting is to be delayed for more than a week, packaged plants should be unpacked, the bundles opened up and each group of plants heeled in separately and clearly labeled. If for any reason the surface of the roots becomes dry the roots should be thoroughly soaked before planting.

4. COMPLETION

On completion, the ground shall be formed over and left tidy.

Special Conditions and Particular Specifications:

- Wherever applicable, work shall be done according to C.P.W.D. specifications
- At the time of invitation of tender.
- Water shall be made available, near the tube well at one point. Contractors shall make their own arrangement for drawing water from there. Water charges as per the value of work done shall be deducted from the contractors Bills.
- If electricity is required for the works, the same shall be made available at one point within the site of works, for which recovery at the prevailing rate per unit shall be deducted from the contractors' bill.
- The work mentioned in the schedule of Quantities includes grassing as well as planting of trees and shrubs. 'Contractors' quoted rates shall include execution of these works at different levels. No extra cost shall be paid for any item, for working at these levels.
- The Contractor shall provide all facilities to subcontractor (plantation) / Environment Officer / or his authorized representatives to make frequent inspection of their Nursery and ascertain the process / quality of various categories of trees/plants etc., grown by them.
- The safe custody and up-keep of various categories of plants brought to site is the sole responsibility of the contractor and he shall employ sufficient supervisory personnel to ensure the safety of these items.
- The site of work may be handed over to the contractors for execution of work in phases, as soon as the same are available. Nothing extra shall be payable for such phased execution of work.
- While excavating / executing the work the contractors shall ensure that existing cables / pipe lines / structures / fittings are not damaged.
- The Contractor shall co-ordinate his work with other agencies employed by the Clients and ensures that the work of other agencies is not hampered in any way during the duration of contract.
- The Contractor shall keep the site of works neat and clean during the execution of the work. Any debris found at or near the site of work shall be rescued immediately as and when so required by the Contractor.
- On completion of the work, the site of work shall be thoroughly cleaned and all debris removed before the work is handed over satisfactorily.
- The Contractors shall, without any additional charge to the clients, renew or replace any dead or defective plants/grass and shall fully maintain the whole landscape for a period of 12 months after the certified date of completion.

- Shrubs/small tree shall be of minimum length straight and symmetrical with a crown and having a persistent main stem. The size of crown shall be in good over all proportion to the height of the tree.
- Small trees and shrubs shall be well formed with the crown typical of the species or variety.
- General Requirements of Plants:

Plants shall be typical of their species and variety, well-developed branches, and well foliated with fibrous root system. Plants shall be free from defects and injuries. Plants shall not be pruned before planting.

Plants shall be free from defects and injuries.

Plants shall not be pruned before planting.

Plants shall not be freshly dug and nursery grown.

Nursery grown plants shall have been at least once transplanted.

Bark shall be free from abrasion.

All trees, soon after planting, shall be properly supported with bamboo stocks to ensure their safety against winds or any other factor, which may affect it adversely.

5. General Requirements Of Earth Manure And Fertilizers

Earth: Good earth shall be agricultural soil of loamy texture, free from kankar, morrum, shingles, rocks, stones, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 50mm in any direction. It shall have pH ranging between 6.5 to 7.5.

Manure: Manure shall be of well decayed organic matter obtained in dry state from the Municipal dump or other similar source approved by the Project Engineer. The manure shall be free from earth, stone or other extraneous matter. Manure shall be supplied, at site well screened.

Fertilizers: If the soil tests indicate pH value not as per the above specification namely between '6.5 to 7.5', following measures need to be taken.

If pH exceeds 7.5, aluminium sulphate or equivalent fertilizer should be added at the rate of 1 kg per cubic metre to lower the pH by one full point.

If pH is below 6.5, add ground limestone or equivalent fertilizer at the rate of 1 kg per cubic metre to raise pH by one full point.

GUIDELINES FOR THE STORAGE, HANDLING, USE AND EMERGENCY RESPONSE FOR HAZARDOUS CHEMICALS

1. REFUELING/MAINTENANCE PROCEDURE

- Truck or suitable containers will bring in all fuel and fluids. There will be no storage of fuel, oil or fluids within 100m (or 50m) of the permanent water line.
- Prior to re-fueling or maintenance, drip pans and containment pans will be placed under the equipment. Absorbent blankets may also be required to be placed under the equipment and hoses where there is a possibility of spillage to occur.
- All used oils or fluids will be properly contained and transported to appropriately licensed (authorized) disposal facilities;
- Following re-fueling and maintenance, the absorbent blankets (if any) and spill pans will be picked up and the fuel truck or container moved outside of the 100m (or 50m) wide area.

Emergency Spill Procedure

Should a spill occur, either though spillage or equipment failure, the applicable emergency spill procedure must followed.

2. SPILL PROCEDURE (INSIDE THE STREAM)

In the case of a spill, overflow or release fluid into the stream waterway (whether water is flowing during the spill or not), do what is practical and safely possible to control the situation, then get help.

- **Stop the flow**
  - Stop the release into the stream waterway
  - Shutdown equipment
  - Close valves and pumps
  - Plug hoses
- **Remove Ignition Sources**
  - Shut off vehicles and other engines
  - Do not allow tiger torches, vehicles, smoking or other sources of ignition near the area. Keep a fire extinguisher on hand but keep it a safe distance away from the potential ignition source (if a fire starts, the extinguisher must be easily accessible).
- **Contract the environmental Officer and initiate Emergency Response**
  - Notify the site supervisor and the Contractor's Environmental Officer as soon as possible
  - The Environmental Officer will review the situation and decide if Emergency Services like Fire Brigade are required
  - Appropriate parties to be notified of the spill are
    - The contractor's Project Manager
    - The Engineer through his designated Environmental Officer
    - The Client

- ❖ Regulatory Agencies like Pollution Control Board, Municipal Authorities, as applicable.
- ❖ Site Safety Officer

➢ **Cleanup and Disposal**

- Emergency Services will be engaged for the containment, cleanup and disposal of contamination release into the environment

➢ **Reporting**

- The contractor's Environmental Officer will document the event and submit reports to the Engineer, the Client and appropriate regulatory agencies like the Pollution Control Board (s).

➢ **Procedure Review**

- The Engineer will review the report, determine if changes are required to procedures and recommend implementation of all required changes….

3. SPILL PROCEDURE (ON LAND)

In the case of a spill, overflow or release fluid onto land, do what is practical and safety possible to control the situation, and then get help.

➢ **Stop the flow**

- Stop the release into the water body
- Shut down equipment
- Close valves and pumps
- Plug hoses

➢ **Remove Ignition Sources**

- Shut off vehicles and other engines
- Do not allow tiger torches, vehicles, smoking or other sources of ignition near the area. Keep a fire extinguisher on hand but keep it a safe distance away from the potential ignition sources (if a fire starts the extinguisher must be easily accessible).

➢ **Contain the Spill**

- Dike around the spill to contain the material
- Spread absorbent or place a spill blanket on the spill
- Enlist the help of personnel on site
- Notify your supervisor as soon as possible

➢ **Notification**

- Appropriate parties to be notified of the spill are:
  - ❖ The Contractor's Project Manager
  - ❖ The Engineer through his designated Environmental Officer
  - ❖ The Client
- Regulatory Agencies like Pollution Control Board, Municipal Authorities, as applicable
- Site Safety Coordinator

- **Cleanup and Disposal**
  - The Engineer's Environmental Officer will ensure that a proper cleanup and disposal method is determined.
- **Reporting**
  - The Contractor's Environmental Officer will document the event and submit reports to the Engineer, the Client and appropriate regulatory agencies like the Pollution Control Board (s).
- **Procedure Review**
  - The Engineer will review the report, determine if changes are required to procedures are recommend implementation of all required changes.

4. SPILL PROCEDURE (WITHIN PONDS)

In the case of a spill, overflow or release fluid due to equipment or hose failure, do what is practical and safely possible to control the situation, and then get help

- **Stop the flow**
  - Stop the release
  - Shut down equipment
  - Close valves and pumps
  - Plug hoses
- **Remove Ignition Sources**
  - Shut off vehicles and other engines
  - Do not allow tiger torches, vehicles, smoking or other sources of ignition near the area. Keep a fire extinguisher on hand but keep it a safe distance away from the potential ignition sources (if a fire starts the extinguisher must be easily accessible).
- **Contain the Spill**
  - Stop any pumps that may be moving the water from the area where the spill occurred
  - Enlist the help of personnel on site
  - Notify your supervisor as soon as possible
- **Notification**
  - Appropriate parties to be notified or the spill are:
    - ❖ The Contractor's Project Manager
    - ❖ The Engineer through his designated Environmental Officer
    - ❖ The Client
    - ❖ Regulatory Agencies like Pollution Control Board, Municipal Authorities, as applicable
  - Site Safety Coordinator
- **Cleanup and Disposal**
  - The Engineer's Environmental Officer will ensure that a proper cleanup and disposal method is determined. Absorbent pads will soak up the spilled material.

The pads will be contained and removed from site for disposal at a licensed (authorized) facility.

- **Reporting**
  - The Contractor's Environmental Officer will document the event and submit reports to the Engineer, the Client and appropriate regulatory agencies like the Pollution Control Board (s)
- **Procedure Review**
  - The Engineer will review the report; determine if changes are required to procedures and recommend implementation of all required changes.

DETAILED GUIDELINES FOR ENVIRONMENTAL SURVEY AND PREPARATION OF ENVIRONMENTAL ASSESSMENT REPORT

1. INTRODUCTION

Highway network is one of the important components of transportation system at the National, Provincial and local levels. In order to increase the efficiency of the transportation system, construction of new roads and improvements to existing roads are being under taken in urban and rural areas by the MPWT/MRD. Construction of roads is often coupled with environmental deterioration. It is not only important but also essential at planning stage itself to consider environmental impact of the proposed road works. In the case of major works on existing highways, the impact of these works on the surroundings should be studied and attempts should be made to enhance the environmental quality through improvement.

The degree of impact of road construction on the different environmental aspects vary depending on factors such as the types of area (urban or rural), the terrain (plain, rolling or hilly) the land-use pattern of the area (residential, educational, industrial etc.). For example, road construction in the hills is beset with problems like landslides, soil erosion, etc., which are of serious environmental consequences. In residential and other urban areas, quality of air, noise pollution, proper traffic circulation and the like are more important. In the rural areas where speeds are high, it is more a question of having an aesthetically pleasing alignment fitted gracefully into the surroundings and providing pleasing visual experience. Where a road has to pass through forest land, obtaining necessary clearance from the department of forests and wildlife is important. Thus, depending on the situation, the aspects requiring detailed study should be identified and the investigations organized accordingly.

For preparing a Road project, surveys and investigations are usually conducted in different stages. First is the Reconnaissance Survey during which information about the sites are collected and inception report is prepared. Second stage is feasibility study in which a number of alternatives alignments are studied on maps/ drawings/ photographs, etc., and the investigated in the field. During this phase, information on terrain, topographic features, soils, materials, drainage, etc., are collected and analyzed and environmental screening report is prepared suggesting possible alternative.

The data collected during screening and reconnaissance survey is further supplemented taking into consideration preliminary design. The draft Environmental Assessment should be prepared side by side with the screening report so that both are evaluated together for selection of the most appropriate alignment / route on which more detailed investigations in the Preliminary Survey phase is conducted. The draft Environmental Assessment should then be finalized based on any new information coming forth from the Preliminary Survey.

For airport projects the major issues involved are change in land use pattern, noise pollution, air pollution, change in drainage pattern etc and area of study is 5.0 km radial aerial distance around the site.

1.1 Alignment Selection

While selecting new road alignments, attention must be paid to avoid areas prone to landslides, soil erosion and other damaging sensitive features. It should be made obligatory to associate geo-technical engineers, geologists, forest and soil conservation experts, economists and other specialists right from the inception stage to ensure selection of most suitable alignment.

Road alignments should avoid large-scale cuttings and fillings and follow the lie of the land as far as possible. Use of tunnels to avoid deep cuts should be considered where feasible and economical.

To the extent feasible, roads should be aligned away from streams and torrents except where these are to be crossed. Since the greatest damage always occurs along watercourses, special attention is necessary to create protection belts of forests on both sides.

Before finalising the alignment, erosion potential of each alternative should be carefully examined, and the one involving least disturbance to the natural ground should be preferred.

1.2 Design

The road should be designed as balanced section i.e. cut and fill section should be equal as far as possible. Where the road is in cutting, half cut and half fill type section, which involves least disturbance to the natural ground should be adopted subject to considerations of economy and road stability being satisfied.

The cut slopes should be made stable for the type of strata in the initial construction stage itself by adoption of appropriate slopes with benches, etc., including the use of stabilizing structures like breast walls, pitching, etc.

1.3 Construction

Area for clearing and grubbing should be kept to the minimum subject to the technical requirements of the road. The clearing area should be properly demarcated to save desirable trees and shrubs and to keep tree cutting to the minimum.

Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise temporary erosion control measures should be provided between successive construction stages. Under no circumstances, however, should very large surface area of erodible earth material be exposed at any one time by clearing and grubbing.

The method of balanced cut and fill formation should be adopted to avoid large difference in cut and fill quantities.

The cut slopes should be suitably protected by breast walls, provision of flat stable slopes, construction of catchwater and intercepting drains, treatment of slopes and unstable areas above and underneath the road, etc. This must be planned in advance and specific provisions made in the project estimate.

Where rock blasting is involved, controlled blasting techniques should bc adopted to avoid over-shattering of hill faces.

Excavated material should not be thrown hapazardly but dumped duly dressed up in a suitable form at suitable places where it cannot get easily washed away by rain, and such spoil deposits may be duly turfed or provided with some vegetative cover.

1.4 Drainage

Drainage of the water from hill slopes and road surface is very important. All artificial drains must be linked with the existing natural drainage system for which separate detailed engineering survey may be carried out and planning done. Before the road is opened to traffic, proper drainage system including suitable interceptor and catchwater drains must be completed. This part of the project must be given due importance as most of the road damages are caused because of negligence in providing proper drainage system and much will be saved in subsequent road maintenance.

The surface drains should have gentle slopes. Where falls in levels are to be negotiated, check dams with silting basins should be constructed and that soil is not eroded and carried away by high velocity flows.

Location and alignment of culverts should be so chosen as to avoid severe erosion at outlets and siltation at inlets.

The cross-drainage structures should discharge safely on the valley side, and in this connection, all necessary precautions/safeguards should be taken to ensure that the discharging waters do not cause erosion even when they flow for long periods. For this purpose, erosion control works like pitching/paving of the channel and outfall points, drop walls, flexible apron, etc., should be considered and provided for as a part of initial design and construction.

Along with other road components, due attention should be paid to the maintenance of drainage and soil conservation works. Drain, catchpits etc., should be cleared of all debris and repaired where necessary before the on set of the rainy season. Eroded areas should be promptly made up and provided with vegetative cover.

1.5 Grassing and Planting

Deforestation for road construction/works should be bare minimum and strict control must be exercised in consultation with the forest authorities. Double amount of new trees must be planted as integral part of the project within the available land and if necessary, separate additional land may be acquired for this purpose. Suitable provisions may be made in the project estimate.

Depending on the availability of land and other resources. afforestation of roadside land should be carried out to a sufficient distance on either side of the road. The selection of plant species will depend on climate, altitude and soil conditions, but preference should be given to deep rooted trees and plants. For preparing the detailed scheme of afforestation, persons having knowledge of soil conservation or forestry should desirably be associated.

Vegetative cover should be established on all cut/fill slopes. The activity of establishing vegetation on barren slopes should be treated as part of the regular maintenance operations on all hill roads.

Strip forests suitable for the site conditions for a minimum distance of 50 m on either side of the road boundary or as per the availability of land should be provided. These shall be raised and maintained by forest authorities. No felling except of dead or dying trees should be permitted in this area.

2. BASELINE ENVIRONMENTAL DATA COLLECTION

2.1 Climatic Condition

Seasonal information on wind pattern, humidity, cyclones and storms in the project area along with the data on snowfall during the last 5 to 6 years as well as fog conditions and other unusual weather conditions are to be collected.
Date in respect of rainfall and monthly temperature may be collected as per the format placed at **Annexure a**.

2.2 Sample Collection and Analysis

Keeping in the view the sensitivity of the area, identify the suitable sites for sampling of water, ambient air and noise levels and plan number of samples to be collected at each site for each of these three environmental components, so that such samples would be the representative of the project area.
Further, identify the testing laboratories and obtain MPWT/MRD approval for the sampling and analysis of the following parameters:

2.1.1 Water Quality Parameters

pH, Total Dissolved Solids, Total Hardness as ($CaCO_3$), Calcium (as Ca^{++}), Chlorides (as Cl^{-}), Nitrate Nitrogen, Sulphate (as So_4^{--}), B.O.D., Alkalinity (as $CaCo_3$) Total Coliform (MPN/100ml), Dissolved Oxygen, Oil and Grease etc.

2.1.2 Air Quality Parameters

e.g. SPM, RPM, SO_2, NO_X, CO, HC, etc.

2.1.3 Noise Levels Parameters

e.g. L_{eq}, L_d, L_n etc.

3. SURVEY OF ENVIRONMENTAL FEATURES

3.1 Whether any of the environmental features exist within 5 km of the project site mentioned in **Annexure b** are to be surveyed. If so, indicate aerial distance and the name of the site as per the format.

3.2 Environmental screening surveys of the existing Right of Way (RoW) are to be done as per the **Annexure c**.

4. INVENTORISATION OF TREES

Tree inventories are to be prepared as per the **Annexure d**.

5. BIODIVERSITY STUDY

In case of regions having areas of biological significance, a biodiversity assessment along the project road is to be carried out to identify the following:

- Identification of ecological areas rich in terms of biodiversity, including the marshy and swamp lands along the corridor;
- Inventorisation of the flora with its diversity, evenness and density along the road alignment;
- Mapping the occurrence of medicinal plants and their importance to the community;
- Estimates of green cover, inventorisation of trees to be lost due to the project road;
- Identification of locations supporting rare and endangered plant species and species of endangered orchids; and
- Identification of locations supporting endangered fauna.

6. SLOPE STABILITY

In cases where the region consists of hilly terrain and upgradation and widening may involve substantial cutting of the hillsides leading to potential slope/hill stability concerns, road users safety, safety of down-slope populations, damage to the road formation, damage to hillside flora and fauna and disruption to traffic. To address the stability of cut-slopes and occurrence of landslides data on following aspects is required to be collected.

- Geo-morphological zoning;
- Identification of current and potential landslide locations; and
- Identification of vulnerable locations with respect to earthwork or excavation (of the hillside).

7. PUBLIC CONSULTATIONS

Public/community consultation should be held employing a range of formal and informal consultative tools including interviews, Focused Group Discussions (FGDs), meetings and workshops. The consultations should be carried out at three levels. Help of local authorities such as PIU/MPWT/MRD/ESO/ Forest Community and Forest Administration could be sought in this regard. These consultations could be held at three levels.

7.1 Local/village level consultation

These consultations could be held in rural, suburban and urban areas along the corridor of impact and the project road at location having substantial number of likely project affected people (PAPs) to inform people about the purpose and preliminary design of the project in order to get peoples opinion and issues of concern and are to be presented in the format given at **Annexure 5**

7.2 District level Consultations

The second phase of public consultation could be conducted at the district level, involving the MPWT/MRD/ESO/MOE/AGFF, district authorites, NGOs and PAPs.

7.3 Provincial Level Consultations

State Level Consultations could be conducted, involving the concerned state organizations such as Provincial staff of MRD/MPWT/MOE/MAFF/ Forest Community and Forest Administration etc.

8. OTHER RELEVANT SURVEYS

8.1 The following data may be collected from different sources:

S. No.	Data	Probable Sources
1	Statistical Handbook	Department of Planning
2	Proposed Alignment Plan on GT Sheet	Survey Division/MPWT
3	Notification of Forest, Wildlife Sanctuary etc. along the road alignment	Ministry Of Environment (MOE) / Ministry Of Agriculture Forestry and Fisheries(MAFF)
4	Forest Maps/ Soil Maps/ GI Sheets	Ministry Of Land Management, Urban Planning & Construction/MAFF
5	Forest Area marked on GT sheet along the proposed alignment	(MAFF)
6	Meteorological Data	Ministry Of Water Resources And Meteorology
7	Geological Map	Survey Division/MPWT
8	Hydrological Map	Ministry Of Water Resources And Meteorology
9	List of NGOs	Various offices of the Royal Govt of Cambodia and Ministry Of Social Affairs Labour Vocational Training And Youth Rehabilitation
10	Form for obtaining EIA clearance	MOE

8.2 The entire stretch of road for the project area may have different Forest Offices having jurisdiction on particular section of the stretch. Therefore, breakup of Road Alignment as per Jurisdiction of concerned Forest Offices is to be compiled in the following format:

S. No.	Name of stretch of the road	Chainage	*Forest Offices*	Area of tree cover on both sides of the road in hectare	
				Left	Right

8.3 The data collected should clearly indicate the distance of the item from the edge of the road alignment to the left or to the right of the road.

- Locations identified for labour/construction camps.
- Locations identified for dumping of waste material.
- Locations identified to be avoided for dumping of waste material.
- Locations of borrow pits for borrowing of earth.
- Locations of quarry sites for borrowing stone/blue metal, sand etc.

- List of existing culverts.
- List of access roads leading to the highway connecting inside villages that may need attention and protection.
- List of religious structures (temples, mosques, graveyards, shrines etc.) cultural properties and any archaeological monuments along the road.
- List of road furniture e.g. footpaths, railings, storm water drains, crash barriers, traffic signs, speed zone signs, pavement markets, bus shelters etc.
- List of community utilities that will be affected e.g. hand pumps, wells, animal shelters, schools/colleges, hospitals, resporent, petrol pumps, bus stands, railway tracks, hotel, post office, market place, police station/check post, shops, hut/small shop, medical facility, STD/PCO, Power Stations, Defence Installations, Post & Telegraph Office, Municipal Corporation, Telecom lines, Water pipelines, Sewer line, Under- ground Tele-cable, Oil / gas pipelines, Power lines and other community structures to be removed or relocated.
- List of sites vulnerable to soil erosion.
- Forestland required.
- Density of vegetation in the forestland.
- Distance of nearest park / Sanctuary / Biosphere Reserve / Monuments / Heritage site / Reserve Forest.
- Erodability classification of the proposed land.
- Windrose at sites.
- Frequency of inversion.
- Frequency of cyclones / tornadoes / cloudburst.
- Water balance at site.
- Lean season water availability.
- Endemic health problems in the area due to wastewater / air / soil-born diseases.
- Health care system existing.
- Nature of soil (Clayey, Sandy, Silty, Loam etc.)
- Permeability along the rout in various sections.
- Current land use of the proposed project site Area (in ha.)
  - Agricultural
    (Irrigated / Non-irrigated)
  - Homestead
  - Forest
  - Notified Industrial Area / Estate
  - Grazing
  - Fallow i.e. uncultivable
  - Mangroves
  - Orchids
  - Sand dunes
  - No development

- Marshes
- National Park / Sanctuary

- Does the proposed project conform to the approved land use all along the route / alignment (To be certified by the concerned Department). If not clearly indicated, which of the stretches are not as per the approved land use.
- Does it conform to the Regional/ Provincial Development Plan?
- Does the proposed alignment / route involve migratory path of animals? If yes give name of fauna and habitat and period of the year in which the activity takes place.
- Number of Railway crossings and their lengths.
- Number of Bridges and their lengths.
- Name and number of water bodies.

9. MOE CLEARANCE

9.1 Ministry of Environment has laid down guidelines for issue of environment clearance for infrastructure projects.

9.2 The Sub-decree specifies which investments require Initial Environmental Impact Assessment (IEIA) and a full scale EIA according to: type or size of project and its location as specified in the Annex of the Sub-decree. All projects which are required by the Sub-decree must first conduct an IEIA and submit this to the MoE Environmental Impact Assessment Department (EIAD)for review and approval. Where the project has "no significant" impact or the impacts can be mitigated the EIAD will approve the project. On the other hand should the project have significant impacts an EIA will need to be undertaken. On completion the EIA is submitted to the EIAD for review and approval. Normally a decision should be made in 30 days.

9.3 With regard to the Sub-decree on environmental impact assessment process the only requirements that require an IEIA or an EIA are:

- National road construction with lengths of 100 km or more, and
- Construction of bridge-roads that are designed to carry more than 30 tonnes.

10. REFERENCES

10.1 Various regulatory and funding agencies stipulate the advisory mandatory requirements, rules, regulations, guidelines pertaining to environmental aspects for the various infrastructure projects from time to time. These are generally included in the following website which need to be studied carefully by all the environment specialists so that they are able to effectively tackle the requirements stipulated therein during the field visits, data collection, interaction with various stake holders and preparation of required reports:

http://www.camnet.com.kh/moe/EnvironmentLow.htm

http://www.rid-mpwt.gov.kh/

http://www.worldbank.org/

http://www.adb.org/documents/guidelines/environmental_assessment/eag

also see the references given in Chapter 3 of this report

Note: The above checklist should not be regarded as exhaustive. Depending on the conditions as prevailing in the field at the project site, information on other additional aspects may be required. Accordingly, it is therefore suggested that data on other aspects as may be deemed fit should also be collected.

11. REPARATION OF EIA

Collection and Review of Documents and Policies and Establishment of Liaison with Environmental Authorities

The Consultant will collect and study the following and any other documents pertaining to the proposed project and assess the availability of data:

- Environmental policy, Acts including legal and administrative framework of the Royal Government of Cambodia,
- Requirements of the ADB/WB/JICA,
- Data about project roads,
- Consultation with environmental authorities, and
- Relevant documents, maps and aerial photographs.

Applicability of various rules, regulations and guidelines with respect to the road project will be determined in order to follow the same during the EIA study and report preparation.

Public Consultation and Information Disclosure

Public consultation will be carried out as per the OP 4.01 of WB especially with project-affected persons, NGOs and stakeholders and their views/outcome incorporated in the report with suitable suggestions for compensation, if any. This section will list milestones in public involvement e.g. dates, attendance, topics of public meeting etc. This section will also provide a summary of information disclosed to date and procedures for future disclosure.

Collection and Generation of Baseline Data

The study area will comprise the road corridor and the surrounding area that may be affected by the project. The boundaries of the study area will be established as per the WB guidelines by taking into account the ecological boundary of important environmental components.

Based on the available base map of the project area, topography and other available information from official and the non-official sources on environmental issues stemming from existing roads and on field investigation and consultation with stake holders, representative baseline data on physical and biological environment (viz. climate, and meteorology, air, noise, hydrology, surface water quality and topography, flora and fauna, rare and endangered species, significant natural habitats, biological diversity sites, sensitive habitats including parks and reserves, cultural property/religious places, educational institutions, induced development and health) will be generated. All the information collected from the field and secondary sources will be collated and presented in the form of a strip map.

In addition, primary data will also be collected to provide current condition of the vegetation through vegetation analysis in the buffer zone specifically affected by the road works. A rapid wildlife assessment will also be carried out to provide a picture of the movement of wildlife along the road areas."

Determination and Evaluation of Major Impacts on the Environment and Analysis of Alignment Alternatives

The potential impacts will be assessed based on available maps, survey and discussion with local officials, NGOs and the public.

(i) Impact due to project location

Deforestation and loss of vegetation cover, deterioration of ecologically sensitive areas, soil erosion, impact on biological diversity, natural habitats, and cultural properties, affect on water resources, affect on air and water quality along with noise level, biophysical, physical, road safety and any other environmental issues relevant to the project will be assessed to find out the project location impact. The consultant will also evaluate and assess the possible accessibility to mining and quarry areas.

(ii) Impact due to project design

Environmental implications viz. disruption of natural drainage pattern, impact on cultural property, impact on surface water, land slides, soil erosion, agricultural land, interference with movement of wildlife, livestock, and road crossing for animals due to design of road alignment and pavement as well as bridges and culverts will be assessed.

(iii) Impact due to project construction

Stream and lake sedimentation, water logging of borrow pits and quarries, disposal of construction spoils, air and water pollution, noise level, fuel and oil spills, sanitary conditions and health risks associated with construction camps and workers camping in the area will be assessed. Construction impact on indigenous people, cultural property, biological diversity and induced development such as development of markets, residential settlements, temporary shacks and tourism will also be assessed. The consultant will also evaluate and assess the possible accessibility to mining and quarry areas for construction.

Air and water quality, noise pollution and vibration from blasting will be assessed and suitable mitigation plan along with guidelines will be prepared.

(iv) Impact due to project operation

Surface spills and surface runoff, pollution like air, noise and water, roadside waste, traffic safety issues will be analyzed based on traffic growth projection and mitigation measures will be incorporated in EA report. The consultant will also evaluate and assess the possible impact of mining and quarry areas.

(v) Health and potential health impacts due to the project

During the design, construction and operation phases associated impacts on the health will be assessed and feasible and cost effective remedial measures to minimize health risks will be explored.

(vi) Evaluation of impact

Each parameter (viz. biological diversity, pollution, natural habitats, indigenous people, cultural property, induced development) of the environmental impact will be assessed according to its relative importance. The matrix method will be used for evaluation and assessment of the associated impacts.

(vii) Analysis of Alignment Alternatives

With and without project scenarios will be assessed to determine the potential impact associated with the project. This assessment will consider alternative design, construction technology and operative/implementing procedures.

Where a new alignment is an option, the alignment selection will be based on:

- the ease with which cut can be balanced against fill;
- minimum disturbance to ecology/geology,
- minimum removal of vegetation and trees,
- savings in vehicle operating costs (including fuel consumption)
- improvement to road safety/geometrics,
- minimisation of land acquisition,
- the ability to follow natural line.

Economic Assessment

Under this task the economic analysis conducted as part of the project feasibility study will be drawn. It will include the following elements, which should be integrated into the overall economic analysis of the project:

- costs and benefits of environmental impact
- costs, benefits and cost-effectiveness of mitigation measures
- discussion of impacts that have not been expressed in monetary values, in quantitative terms where possible etc.

Environmental Management Plan

(i) Management Plan to Mitigate Negative Impacts

The envisaged environmental impact of the project during construction and after its completion will be reviewed. The review will include, among other things, effect on peoples livelihoods, noise, air quality, biological diversity, natural habitats, landscape and protected areas as well as temporary and permanent damage to the environment, particularly forests, areas with known archeological value along the proposed alignment, potential risks from toxic and hazardous chemicals and indirect environmental impacts such as induced industrial development along alignment. Data will be derived from existing published data, field survey and consultation with key interest groups.

Appropriate mitigation measures for all identified adverse impacts and alternative approaches, if any, will be proposed. A short and concise mitigation plan will be designed suggesting the relevant mitigation measures, institutional responsibility for implementation and monitoring during and after construction. The mitigation plan will include feasible and cost effective measures to prevent or reduce significant negative impact such as those to land, water, air, biological diversity, natural habitats, protected areas, buffer zones, wild life reserves, national parks and historical/cultural monuments, drainage, soil and road safety to acceptable levels.

A monitoring plan will be prepared to help in monitoring the implementation of the recommended mitigation measures and the impact of the proposed road work during construction and after completion. The plan will define certain indicators of environmental performance that can be monitored on regular basis.

(ii) Cost Estimate

Incremental costs for mitigating/minimizing adverse environmental impacts including cost for landscaping, maintaining biological diversity and natural habitats, pollution control (air, water, noise), environmental monitoring, training, compensatory and avenue plantation and supervision will be estimated.

Identification of Institutional and Monitoring Needs to Implement the Environmental Management Plan

The capability of Project Implementation Authority will be reviewed to ensure that the proposed management and monitoring plan based on the EIA will be properly implemented. Institutional Strengthening and Monitoring Framework will be suggested as required.

Preparation of EIA Report

Outline of EIA Report should be as follows but it will be updated as per the requirement of funding agencies:

Executive Summary

1. Introduction
2. Description of the Project
3. Description of the Environment

4. Project Alternatives
5. Anticipated Environmental Impacts and Proposed Mitigation Measures
6. Environmental Management Plan
7. Public Involvement and Disclosure
8. Economic Assessment
9. Conclusions

Annexure -a

PROFORMA FOR CLIMATIC CONDITIONS

Total Monthly Average Rainfall / Strom Fall (5 Year data5)

Month	Rainfall (mm) Years					
	2004	2005	2006	2007	2008	2009
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Average Monthly Temperature

Month	Maximum (° C)	Minimum (° C)
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Annexure -b

SURVEY OF ENVIRONMENTAL FEATURES WITHIN TEN KILOMETRES FROM THE PROJECT SITE

S. No.	Item	Name	Aerial Distance (in km)
1	National Park		
2	Marine Park		
3	Sanctuary/ Tiger Reserve/ Elephant Reserve/ Turtle nesting ground		
4	Core Zone of Biosphere Reserve		
5	Reserved Forest/Protected Forest		
6	Wildlife Habitat		
7	Habitat of endangered/exotic species		
8	Coral Reef		
9	Mangroves		
10	Costal Zone (CRZ)		
11	Lakes/Reservoirs/Dams		
12	Breeding Site		
13	Nesting Site		
14	Pollution Sources and their impact of the quality of Air, Water and Land		

Annexure - c

ENVIRONMENTAL SCREENING SURVEY OF THE EXISTING RIGHT OF WAY (ROW)

S. No.	Environmental Features		Direction (Left / Right) and distance from the road alignment
1	Settlement	Rural Urban / Semi Urban / Urban	
2	Business Amenities and Others	Industries (Large/Medium/Small)	
		Thermal Power Plant	
		Commercial Sites	
		Recreation Facilities	
		Rly. Station / Airport	
		Bus / Taxi Stands	
		Others	
3	Domestic/ Industrial Disposal Sites	Effluent	
		Solid Waste/Garbage Dump	
		Hazardous Waste	
4	Archaeology	Holy Places	
		Monuments / Graveyard	
		Art and Cultural Sites	
5	Sensitive & Critical Natural Habitats	E/F/T Reserve/ Sanctuary	
		Wildlife / National Park	
		Mountain / Hill	
		Wetland / Marshes	
		Scenic / Recreation Points	
		Coastal Zone	
		Others	
6	Flora & Fauna	Rare Animals/Birds/ Plants	
		Species Diversity – Plants	
		Species Diversity – Animals	
		Migratory Species	
		Nesting / Breeding Sites	
7	Water Resources	Drainage / Rivers / Channels / Canals	
		Sea/ Creek	
		Lakes / Dams	
		Ponds/ Reservoirs	
		Wells	

S. No.	Environmental Features		Direction (Left / Right) and distance from the road alignment
		Hand pump	
		Deep Tube well	
8	Type of Land	Irrigated	
		Non-irrigated/Waste/Barren	
		Soil Type	
		Agricultural Crops	
		Plantations	
		Grazing Land / Orchard	
9	Govt. / Private Establishment	Power Stations	
		Defense Installation	
		Post & Telegraph Office	
		Hospital / Health Center	
		School / College / Univ.	
		Municipal Corporation	
		Nagar Panchayat	
		NH / SH / EW	
		ROB/MAB/MIB/SUB/CUL	
10	Natural Disasters (period of occurrence, duration & causalities)	Flood/Draught	
		Silting / Soil Erosion	
		Land Slide / Cyclone	
11	Markets / Haat / Road side Markets	a. Frequency (Monthly, Weekly, Daily) b. Timings	
12	Utilities	Telecom Lines, Water pipelines, Sewer line, Underground Tele-cable, Oil/gas pipelines, Power line, others	

E= Elephant F= Forest T= Tiger NH= National Highways
SH= State Highways EW= Expressways RU= Rural Urban SU= Sub Urban
U= Urban ROB= Road Over Bridge MAB= Major Bridge MIB= Minor Bridge
SUB= Submergible Bridge CUL= Culverts

Name of Recorder:	**Name of Scrutinizer:**
Signature with Date:	**Signature with Date**

Annexure-d

INVENTORISATION OF TREES

Details of Tree Inventory

From Km_____ to Km_____

Left / Right

Sl. No.	Location		Type of Ownership (private/PF/RF/ MPWT/MRD/ Others	Local Name of Tree	Botanical Name of Tree	Girth size of Tree (at chest height cm)	Numbers marked in field	Condi of Tre & G)
	Chainage (Km)	Offset (from the edge of the road						

* : G: <30, G1: 30-60 cm, G2: 60-90 cm, G3: 90-120 cm, G4: 120-150 cm, G5: 150-180 cm, G6: 180-270 cm, G7: >270 cm

** : D-Dry, G-Green,

Note: For airport project all the affected trees have to be recorded.

Various Formats for Data collection **List of Settlements**						
Sl. No.	**Village\Town**	**Chainage (km)**		**Length (KM)**	**Side(Left/ Right/Both)**	**Average Distance from C/L(m)**
		From	**To**			
1						
2						
3						
4						
5						
6						
7						
8						
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11						
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22						
23						
24						
25						
26						
27						
28						
29						
30						

List of River/Canal/Nallas/Drains					
Sl. No.	**Name/ Type**	**Chainage (km)**	**Side (Left/Right/Both)**	**Location**	**Remark**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
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21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

List of Ponds						
Sl. No.	**Location**	**Chainage**	**Side (Left/Right)**	**Distance from C/L (m)**	**Ownership**	**Remark**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
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27						
28						
29						
30						

List of Education Institute					
Sl. No.	**Name/Type**	**Chainge**	**Side (Left/ Right)**	**Distance from C/L (m)**	**Location**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
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25					
26					
27					
28					
29					
30					

List of Hand Pump					
Sl. No.	**Chainge (km)**	**Side (Left/Right)**	**Distance from C/L (m)**	**Location**	**Ownership**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
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27					
28					
29					
30					

List of Water Logged Stretches				
Sl. No.	**Location**	**Chainage (km)**	**Side (Right/Left)**	**Length (m)**
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
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30				

List of Blank (without tree cover) Stretches				
Sl. No.	**Location**	**Chainage (km)**	**Side(Left/ Right/Both)**	**Length (m)**
1				
2				
3				
4				
5				
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8				
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10				
11				
12				
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28				
29				
30				

List of Deep Tubewell				
Sl. No.	**Chainage (km)**	**Side(Left/ Right/Both)**	**Distance from C/L (m)**	**Location/Village**
1				
2				
3				
4				
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27				
28				
29				
30				

List of Industries					
Sl. No.	**Name/Type**	**Chainge**	**Side (Left/Right)**	**Distance from C/L (m)**	**Location**
1					
2					
3					
4					
5					
6					
7					
8					
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10					
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27					
28					
29					
30					

List of Religious Structures					
Sl. No.	**Name/Type**	**Chainage (km)**	**Side(Left/ Right)**	**Distance from C/L (m)**	**Location**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
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30					

PHOTOGRAPHY DETAILS						
Reel no	**Photo no**	**Place**	**Chainage (km)**	**Side(Left/ Right)**	**Distance from C/L (m)**	**Location**

Annexes

ANNEX 1

POLICY, LEGAL, ADMINISTRATIVE FRAMEWORK, APPLICABLE CODES AND SPECIFICATIONS

This chapter reviews the existing institutional and legislative framework pertaining to this project, at the National and Provincial levels. Regulations concerning, procedures and requirements that are directly relevant to the project, the ability and capacity of the institutions and agencies to successfully execute the environmental management plans have also been assessed in brief.

1.1 INSTITUTIONS

In The institutional responsibilities within the road sector are divided between the Ministry of Public Works and Transport (MPWT) and the Ministry of Rural Development (MRD). MPWT is the lead agency responsible for overseeing the PRIP project, reporting overall project implementation to the Government represented by the Ministry of Economy and Finance (MEF), and fulfilling World Bank requirements. As executing agencies, MPWT and MRD will cooperate according to the provisions of the Project Implementation Plan and the Memorandum of Understanding on implementation. Cambodian technical and personnel capacity remains weak. EA expertise in the Ministry of Environment (MOE) and other ministries is limited. Domestic skills in the implementation of environmental impact mitigation measures and compliance monitoring are scarce. Neither the MPWT nor the MRD have environmental units responsible to manage EA and/or environmental impact mitigation. The MOE can do this but the responsibility rests with the other ministries as the project proponents

Within the MPWT structure environmental matters are handled on an *ad hoc* basis as projects are implemented within the structure of a Project Implementation Unit (PIU) that is established for each project under the guidance of a Project Director. Implementation of environmental and social projects is normally the responsibility of a Consultant and or an NGO. Under such an arrangement, staff who have been trained in these specialized skills are not retained and return to previous positions at the completion of the project. This has prevented the development of any environmental skills being centralized within the existing MPWT structure. With increasing environmental responsibility being demanded of ministries, there is a need to strengthen environmental monitoring and compliance within MPWT. Under the Project, a specialized Environmental and Social Office (ESO) is to be created within the Department of Planning (DOP) in MPWT to oversee environmental and social matters. The ESO would formalize the role of environmental and social analysis within the MPWT while also supporting project activities.

The newly created ESO within the DOP would have a variety of roles one of which would be overseeing the execution of the environmental components of road development projects as these are approved for implementation. To facilitate this Environmental Specialist (ES) from the ESO will be attached to a specific PIU.

During Detailed Design, the ESO will have two main functions. These are:

(i) Assisting the Design Team in reviewing the environmental components that have been identified within the IEE /EIA as requiring attention during this phase.

(ii) Preparation of the detailed Environmental Management Plan (DEMP) that sets out monitoring requirements, responsibilities and reporting procedures. The ESO would develop the DEMP in association with the Ministry of Environment (MOE), Ministry of Water Resources and Meteorology (MWRM), Ministry of Agriculture Forestry and Fisheries (MAFF), and the Ministry of Culture and Fine Arts (MCFA). The DEMP will establish the Contractor's responsibilities and stipulates specifications that will meet the various ministerial requirements for; sediment release, re-vegetation of disturbed areas, acceptable solid waste disposal methods dust, noise, and vibration. Discovery of artifacts. Transport of forest products and wildlife. The DEMP will be attached to the Contract Documents and will

form part of the Project Specifications. The Contractor will need to address the contents of the DEMP during the bid and this will be evaluated at the time of the bid.

So far as the Ministry of Rural Development [MRD] is concerned, again it was seen that there is a lack of skilled human resources especially in the evaluation of environmental management plans and implementation of the Safeguard Policies. There is only one person in the MRD (PRIP) project who looks after environmental and social issues. Projects are administered at the provincial level and there are no trained personnel at that level. Engineers and Provincial Project Officers do not have any formal training in safeguards implementation. For governmental projects the guidelines are weaker than those for donor funded projects, and these are also not implemented to the best extent, as per MRD opinion. There is a general lack of capacity in managerial skills and the Ministry is yet to have a formal Training Policy and Training Plans.

The lack of capacity was thus seen to be in areas covering operational and managerial areas as well and it was therefore decided that capacity building efforts should not be restricted to only technical areas covering implementation capability for environmental safeguards, though they would continue to receive the highest priority. From a holistic perspective it was also understood that since the overarching issue is to strengthen the efficiency and quality of implementation of road projects, needed structural and processual underpinnings within the concerned Ministries must simultaneously be strengthened.

1.2 INSTITUTIONAL SET-UP PROPOSED FOR THE PROJECT

The organization of the ESO is the most important task since a great reliance is being placed on the implementation of environmental and social safeguards in Road Asset Management. Currently the ESO is placed under the Directorate of Planning, and in the proposed structure it has been given a separate Departmental identity. Thus this will be called the Department of Environmental and Social Safeguards [DESS].

The basic functions of the DESS are recommended to be as follows:

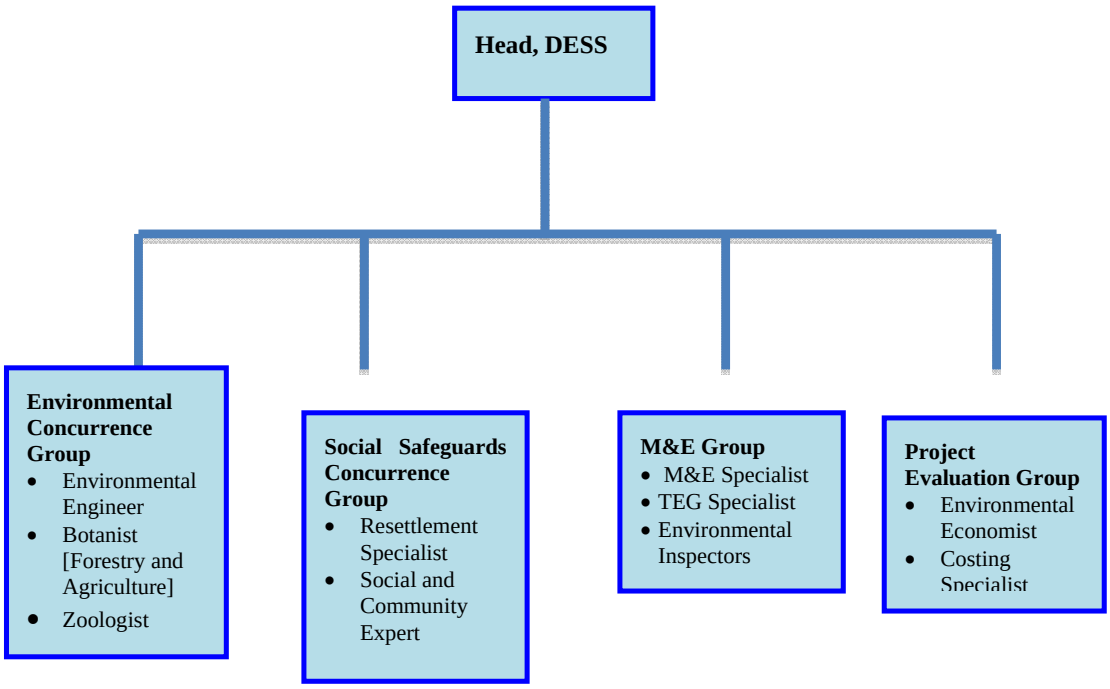
- Review of projects and sub-projects with regard to environmental and social issues before they are cleared for tendering
- Ensuring that costs of environmental and social management and mitigation measures have been properly taken into account at the time of project preparation and providing concurrence thereon. This step would be mandatory before financial concurrence on any project or sub-project can be taken.
- Ensuring that Monitoring and Evaluation measures with regard to Environmental and Social safeguards are working properly and to receive and review necessary reports in these regards.
- To conduct monitoring and evaluation exercises *suo moto* with a view to ensuring that ground level reports are authentic
- To suggest and recommend measures to Strategic Planning Function by which environmental and social risks could be mitigated.
- To provide compliance reports to Agencies and other entities as may be required.
- To provide assurance to the policy making body and the executive body with respect to compliance with safeguards
- To coordinate with the Ministry of Environment and such other related agencies or ministries as may be necessary.

The specializations that will be needed in DESS will be from the following:

- Environmental Engineering
- Social Impact Evaluation and Social Safeguards implementation
- Resettlement and Rehabilitation

- Forestry and Agriculture
- Soil
- Civil Engineering [roads and bridges]
- Zoology
- Environmental Economics
- Hydraulics [water bodies]
- Costing
- M&E

A suggested structure for the DESS is as shown in the diagram that follows. It will be noticed that a specialized group has been suggested for evaluation and monitoring. This is an important function as has been discussed earlier, and considerable emphasis needs to be put on the same.



Forestry and Agriculture is another specialization, which needs to be introduced into the ESO because Cambodia is primarily an agricultural country with a wealth of forest resources that need to be conserved. This is particularly important in case of secondary and tertiary roads. While the tertiary roads are not the responsibility of the MPWT nevertheless there are always spillover and consequent environmental and social effects which need to be considered by the ESO.

The functions of the Project Evaluation Group will include providing concurrence to projects and sub-projects from the environmental costs point of view and reevaluation of IRR and ERR of projects with regard to environmental and social safeguards implementation and maintenance. This is a function that is currently not being performed at all. The Amendment Form for the Ministry's PIP shows that while there are columns for recording environmental and social impacts, in practice these are only being paid lip-service to, and that no environmental and social impact mitigation costs are being taken into account. Obviously, this situation needs to change.

Unlike in some other departments and functions, separate secretarial staff need not be provided to each of the specialized groups within the DESS. This is because it is not anticipated that there will be a lot of

secretarial work in this unit. Most of the work will be concerned with the evaluation – either field or desk level- that are to be performed by the Specialists only.

However, in line with the structure of the Strategic Planning Function, in the DESS also, a horizontal structure is recommended. It is too early for MPWT, and the workload too undefined, to create a hierarchical structure. However it should be noted that some persons may be moved upwards, although that opportunity may not be available to all. Considering the ill effects of stagnation of specialists, the government may consider whether some positions, such as those of the zoologist or the botanist or the soil scientist, may not be on deputation/Secondment from other ministries where such specialized personnel are already available. Alternatively, these positions could be con

1.3 LEGAL REQUIREMENTS

The Ministry of Environment (MoE) was established soon after the UN sponsored election of July 1993. The MoE is responsible for promoting environmental protection and developing sustainable natural resource management in the country. The MoE has the responsibility to oversee the initial environmental examination and environmental impact assessment process. Since its inception, the MoE has been developing and strengthening environmental policies, plans and legal instruments. The EIA Sub-decree has been adopted pursuant to the Law on Environmental Protection and Natural Resources Management. Two of the most relevant legal instruments are discussed below.

The Law on Environmental Protection and Natural Resources Management was enacted by the National Assembly in December 1966. This is an enabling law, providing a framework within which specific regulations need to be developed. Specific policies and regulations are left to subsequent legislation – Prakas or Sub-decrees. The Sub-decrees encompass environmental impact assessment, water pollution control and solid waste management. Others are under review with the Council of Ministers. The law provides opportunities for public participation in the environmental assessment process and mandates penalties for environmental pollution.

The Sub-decree on Environmental Impact Assessment Process. Article 6 of the Environmental Law requires that all public and private investment require an EIA prior to approval, according to the criteria and procedures that are stated in the Annex of the EIA Sub-decree. The Sub-decree is intended to:

- promote conservation, protection and appropriate use of natural resources to maintain sustainable economic development and enhance environmental quality;
- integrate environmental impact assessment within project planning and decision making, and;
- promote public participation in the decision making process.

The Sub-decree specifies which investments require Initial Environmental Impact Assessment (IEIA) and a full scale EIA according to: type or size of project and its location as specified in the Annex of the Sub-decree. All projects which are required by the Sub-decree must first conduct an IEIA and submit this to the MoE Environmental Impact Assessment Department (EIAD) for review and approval. Where the project has “no significant” impact or the impacts can be mitigated the EIAD will approve the project. On the other hand should the project have significant impacts an EIA will need to be undertaken. On completion the EIA is submitted to the EIAD for review and approval. Normally a decision should be made in 30 days.

With regard to the Sub-decree on environmental impact assessment process the only requirements that require an IEIA or an EIA are:

- National road construction with lengths of 100 km or more, and
- Construction of bridge-roads that are designed to carry more than 30 tonnes

Under these regulations the Ministry of Public Works and Transport (MPWT) will not need to submit an IEIA/EIA if the project does not attract the above provision to MOE. Environmental approval will be required by internal assessment within MPWT and this will be carried out by this TEG to make the project environmentally sound and sustainable.

Other regulations that are of relevance to the Project include:

- Law on Cultural Heritage, 1996 – with regard to preservation and discovery of cultural relics
- Law on Forestry Management, 1988 – with regard to forest use and wildlife hunting

MINISTRY OF AGRICULTURE, FOREST AND FISHERIES (MAFF):

This ministry is responsible for conservation and protect of trees along the road, so that permission is required if project involved felling of any trees from department of forest of the same ministry.

The Permission for felling of trees will obtained from the Forest Community/Forest Administration or as required from other concerned authority.

Declaration On Management and Elimination of Forest Anarchy

It is anticipated that although there are Royal Decree-legislation No. 35, dated 25 June 1998 on forest management, Royal Decree issued on 11 November, 1993 on protected areas, the existing law of environmental protections and nature management issued on 24, December 1996, and other forest regulations which are gradually enforced in different periodical stages in order to halt forest offense, some illegal forest cutters still continue to cut and destroy forest resources. As a matter of fact, the government is fully aware that the forest anarchy has ironically threatened the forest resource and if the present activities still continue, they will be completely destroyed. The loss of forests will, as a result, affect the balance of agro- ecological systems and fishery in Cambodia in the future. This declaration is enforced to protect the natural resources in Kingdom of Cambodia.

1.4 INTERNATIONAL TREATIES AND CONVENTIONS

There are various international treaties and conventions to which Royal Government is a party and these are binding upon the country. Though, most of these treaties and environmental agreements are not directly applicable to the Project, some of the treaties and environmental agreements are discussed briefly below.

Multilateral Environmental Agreements (MEAs)

- Convention on Biological Diversity (CBD) - 1995
- Convention on International Trade of Endangered Species (CITES) - 1997
- Convention on Wetlands of International Importance (Ramsar) - 1999
- World Heritage Convention (WHC) - 1991
- Cartagena Protocol on Bio-Safety - 2003

Some of these briefly described below:

(i) Ramsar Convention on Wetlands

The Convention on Wetlands was signed in Iran in 1971 and came into force in 1975. It is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation, and wise use of wetlands and their resources. The broad aim of the Convention is to halt the worldwide loss of wetlands and to conserve the existing ones through wise use and management. There are presently 152 Contracting Parties to the Convention, with 1608 wetland sites, totaling 140 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance. The Royal Government of Cambodia is a Party to Ramsar Convention.

(ii) Convention Concerning the Protection of the World Cultural and Natural Heritage

The Convention concerning the Protection of the World Cultural and Natural Heritage was adopted in the general conference of United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris in 1972. The Convention was adopted to establish an effective system of collective protection of the cultural and natural heritage of outstanding universal value, organized on a permanent basis and in accordance with modern scientific methods. The Convention promotes an international perspective on cultural heritage by inviting member states to submit an inventory of properties forming its national cultural and natural heritage to be included in a list of World Heritage sites. The Royal Government of Cambodia is a member state of this convention.

(iii) Convention on Biological Diversity

The Convention on Biological Diversity was adopted at Rio de Janeiro Earth Summit in 1992 with 150 signatories. The Convention on Biological Diversity is dedicated to promote sustainable development with the aim of conservation of biodiversity through sustainable use of components of biodiversity and sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable manner. The Cartagena Protocol on Bio safety is a supplementary agreement that seeks to protect biological diversity from potential risks posed by Living Modified Organisms (LMOs) resulting out of modern biotechnology. The Convention on Biological Diversity is legally binding on the signatory parties. Royal Government is a party and has ratified to the Convention on Biological Diversity.

(iv) Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) is an international agreement between governments to safeguard certain species from over exploitation. The aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The text of the Convention was adopted in 1973 and it entered into force on 1st July, 1975 in Washington, DC. At present, there are 169 parties to the agreement. Royal Government is also a party to the Convention.

Applicability of International Treaties and Conventions:

DPR consultant and contractor shall identify the above mentioned site, and try to avoid these sites by proposing new alignment and the mitigation measures while preparing the Environmental Management Plan will make the project sustainable and can help achieve some of the goals in the regional context.

Cambodia is having following limited natural resources, so that its protection is more important, so that road developmental project will take care of these during design, implementation and operation:

Biodiversity Resources

- 123 mammal Species
- 545 bird species
- 88 reptile species
- 2,300 species of vascular plants
- 435 fish species from 97 families
- 24 species of hard coral
- 14 species of soft coral

23 Protected Areas

- National Parks: 7
- Wildlife Sanctuaries: 10
- Landscape Protected Areas: 3
- Multi-Use Protected Areas: 3

Species on the IUCN Red List

- 39 mammal species
- 36 bird species
- 15 reptile species
- 38 plant species

Referred Website for details

http://www.aseanbiodiversity.org/index.php?option=com_content&view=article&id=154&Itemid=142

ANNEX 2

ENVIRONMENTAL MONITORING AND REPORTING

The purpose of the monitoring programme is to ensure that the envisaged purpose of the project is achieved and results in desired benefits to the target population. To ensure the effective implementation of the EMP, it is essential that an effective monitoring program be designed and carried out. The environmental monitoring programme provides such information based on which management decision may be taken during construction and operational phases. It provides basis for evaluating the efficiency of mitigation and enhancement measures and suggest further actions that need to be taken to achieve the desired effect.

The monitoring includes:

- Visual observations;
- Selection of environmental parameters at specific locations;
- Sampling and regular testing of these parameters.

Objectives

The Objectives of environmental monitoring programme are:

- Evaluation of the efficiency of mitigation and enhancement measures;
- Updating of the actions and impacts of baseline data;
- Adoption of additional mitigation measures if the present measures are insufficient;
- Generating the data, which may be incorporated in environmental management plan in future projects.

Methodology

Monitoring methodology covers the following key aspects:

- Components to be monitored;
- Parameters for monitoring of the above components;
- Monitoring frequency;
- Monitoring standards;
- Responsibilities for monitoring;
- Monitoring costs.

Environmental monitoring of the parameters involved and the threshold limits specified are discussed below:

AMBIENT AIR QUALITY MONITORING (AAQM)

The air quality parameters via: Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_X), Carbon Monoxide (CO), Hydro-Carbons (HC), Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM) and Lead (Pb) shall be regularly monitored at identified locations from the start of the construction activity. The air quality parameters shall be monitored in accordance with the National Ambient Air Quality Standards as given in **Table 2.1.** The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan **Table 2.5.**

Table : National Ambient Air Quality Standards

Sl No	Parameters	1 hr Average mg/m3	8 hr Average mg/m3	Annual average mg/m3
1	Carbon Monoxide	40	20	-
2	Nitrogen Dioxide	0.3	0.1	-
3	Sulfur Dioxide	0.5	0.3	0.1
4	Ozone	0.2	-	-
5	Lead	-	0.005	-
6	Total Suspended Particulate (TSP)	-	0.33	0.1

Remark: This standard applied to evaluation of ambient air quality and to monitoring of air pollution status. Standard methods of analysis of ambient air quality are specified in guideline of Ministry of Environment.

WATER QUALITY MONITORING

Water quality parameters such as pH, BOD, COD, DO coli form count, total suspended solids, total dissolved solids, lead, Cadmium, Zinc etc. shall be monitored at all representative locations during the construction stage as per MOE Standard, presented in **Table 2.2** and **2.3** respectively. The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan **Table 2.5.**

Table : Primary Water Quality Standards

(Water Quality Standard in public water areas for bio-diversity conservation)

1- River

No	Parameter	Unit	Standard Value
1	pH	mg/l	6.5 – 8.5
2	BOD_5	mg/l	1 – 10
3	Suspended Solid	mg/l	25 – 100
4	Dissolved Oxygen	mg/l	2.0 - 7.5
5	Coliform	MPN/100ml	< 5000

2- Lakes and Reservoirs

No	Parameter	Unit	Standard Value
1	pH	mg/l	6.5 – 8.5
2	COD	mg/l	1 – 8
3	Suspended Solid	mg/l	1 – 15
4	Dissolved Oxygen	mg/l	2.0 - 7.5
5	Coliform	MPN/100ml	< 1000
6	Total Nitrogen	mg/l	1.0 – 0.6
7	Total Phosphorus	mg/l	0.005 – 0.05

3- Coastal water

No	Parameter	Unit	Standard Value
1	pH	mg/l	7.0 – 8.3

No	Parameter	Unit	Standard Value
2	COD	mg/l	2 – 8
4	Dissolved Oxygen	mg/l	2 - 7.5
5	Coliform	MPN/100ml	< 1000
5	Oil content	mg/l	0
6	Total Nitrogen	mg/l	1– 1.0
7	Total Phosphorus	mg/l	0.02 – 0.09

Table : Primary Water Quality Standards

(Water Quality Standard in public water areas for public health protection)

No	Parameter	Unit	Standard Value
1	Carbon tetrachloride	µg/l	< 12
2	Hexachloro-benzene	µg/l	< 0.03
3	DDT	µg/l	< 10
4	Endrin	µg/l	< 0.01
5	Diedrin	µg/l	< 0.01
6	Aldrin	µg/l	< 0.005
7	Isodrin	µg/l	< 0.005
8	Perchloroethylene	µg/l	< 10
9	Hexachlorobutadiene	µg/l	< 0.1
10	Chloroform	µg/l	< 12
11	1,2 Trichloroethylene	µg/l	< 10
12	Trichloroethylene	µg/l	< 10
13	Trichlorobenzene	µg/l	< 0.4
14	Hexachloroethylene	µg/l	< 0.05
15	Benzene	µg/l	< 10
16	Tetrachloroethylene	µg/l	< 10
17	Cadmium	µg/l	< 1
18	Total mercury	µg/l	< 0.5
19	Organic mercury	µg/l	0
20	Lead	µg/l	< 10
21	Chromium, valent 6	µg/l	< 50
22	Arsenic	µg/l	< 10
23	Selenium	µg/l	< 10
24	Polychlorobiohenyl	µg/l	0
25	Cyanide	µg/l	< 0.005

NOISE QUALITY MONITORING

As with air and water quality, the noise levels shall be monitored at already designated locations in accordance with the Ambient Noise Quality standards given in Table below. The location,

duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan **Table 2.5.**

Table National Ambient Noise Quality Standards as per MOE

Sl. No.	Area	Limit Leq in dB (A)		
		From 6 AM to 18	From 18 to 22	From 22 to 6 AM
1	Quiet Area- - Hospital - Libraries - School - Kindergarten	45	40	35
2	Residential - Hotel - Administration Office - House	60	50	45
3	Commercial and service areas and Mixed	70	65	50
4	Small industrial factories intermingling in residential areas	75	70	50

Remark: This standard is applied to control of noise level of any source of activity that emitted noise into the public and residential areas.

ENVIRONMENTAL MONITORING PLAN

Monitoring plan for various performance indicators for construction and monitoring stages is summarized in Table below.

Table : Tentative Environmental Monitoring Plan (considering construction period is about three years)

Env. Component	Project Stage	Monitoring						Institutional Responsibility	
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
Air	Construction Stage	SPM, RSPM, SO_2, NO_X, CO,	High volume sampler to be located 50 m from the plant in the down wind direction.	As prescribed by MOE	Hot mix Plant / Batching Plant	Quarterly for three years	Continuous 24 hours or for 1 full working day	Contractor through approved monitoring agency	PIU/ESO
		SPM, RSPM	High volume Sampler to be located 40 m from the earthworks site downwind direction.	As prescribed by MOE.	Stretch of the road where construction is in progress at the site	Quarterly for three years	Continuous 24 hours or for 1 full working day	Contractor through approved monitoring agency	ESO/PIU
	Operational Stage	SPM, RSPM, SO_2, NO_X, CO,	High volume sampler to be located 50m from the plant in the downwind direction.	As prescribed by MOE	Major urban areas or as decided by PIU-Envi Expert	Three times in a year for one year	Continuous 24 hours or for 1 full working day	ESO/PIU	ESO/PIU
Water Quality	Construction Stage	P^H, BOD, COD, TDS, TSS, DO, Oil & Grease and Pb	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Water quality standards by as prescribed by MOE	Major urban areas or as decided by PIU-Envi Expert	End of summer before the onset of monsoon every year for 3 years	-	Contractor through approved monitoring agency	ESO/PIU
	Operation Stage	Flooding and Cleaning of drains/water bodies	Flooding locations to be identified and choked drains, water bodies under going siltation and subject to debris disposal should be monitored under cleaning operations	Water quality standards of MOE and cleaning shall be to the satisfaction of the PIU	Major urban areas or as decided by PIU Envi Expert	Thrice in monsoon and post-monsoon seasons in a year for 1 year	-	ESO/PIU	ESO/PIU
Noise Levels	Construction Stage	Noise levels on dB (A) scale	Free field at 1 m from the equipment whose noise levels are being determined	Noise standards by MOE	At equipment yards	Once every month (max) for three years, as required by the engineer	Readings to be taken at 15 seconds interval for 15 minutes every hour and then averaged	Contractor through approved monitoring agency	ESO/PIU
	Operation Stage	Noise levels on dB (A) scale	Equivalent Noise levels using an integrated noise	Noise standards by MOE	As directed by the Engineer)	Thrice a year for 3 years	Readings to be taken at 15	ESO/PIU	ESO/PIU

Env. Component	Project Stage	Monitoring						Institutional Responsibility	
		Parameters	**Special Guidance**	**Standards**	**Location**	**Frequency**	**Duration**	**Implementation**	**Supervision**
			level meter kept at a distance of 15 m from edge of Pavement			during the construction period	seconds interval for 15 minutes every hour and then averaged.		
Soil Erosion	Construction Stage	Turbidity in Storm Water Silt load in ponds, water courses	----	As specified by the PIU, Water quality standards of MOE	As specified by the engineer /PIU	Pre-monsoon and post-monsoon seasons for 3 years	----	Contractor	ESO/PIU
	Operational Stage	Turbidity in Storm Water Silt load in ponds, water courses	----	As specified by the engineer PIU, Water quality standards of MOE	As specified by the engineer PIU,	Three times a year for one year	----	ESO/PIU	ESO/PIU
Plantation of trees	Construction as well as Operational Stage	75% Plant Survival	The success of tree planting. Rate of survival after six months, one year and 18 months in relation to total planted	-	All along the project corridor	Maintenance for three to five years after plantation	-	NGO, and ESO/PIU	ESO/PIU
Construction Sites and Construction Camps	Construction Stage	Monitoring of: Storage Area Drainage Arrangements Sanitation in Construction Camps	Guidelines 01, 02 but to be checked for adequacy.	To the satisfaction of the PIU and the Water quality standards given by MOE	At storage area and construction camps	Quarterly in the construction stage	----	Contractor	ESO/PIU

REPORTING

The Monitoring and Evaluation of the management measures envisaged are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to the plans. It provides the necessary feedback for project management to keep the program on schedule. The rationale for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the project.

The reporting system will operate linearly with the contractor who is at the lowest rung of the implementation system reporting to the Supervision Consultant, who in turn shall report to the PIU. All reporting by the contractor and Supervision Consultant shall be on a quarterly basis. The PIU shall be responsible for preparing targets for each of the identified EMAP activities. All subsequent reporting by the contractor shall be monitored as per these targets set by the PIU before the contractors move on to the site. The reporting by the Contractor will be a monthly report like report of progress on construction and will form the basis for monitoring by the PIU, either by its own Environmental Officer or the Environmental Specialist hired by the Supervision Consultant.

PRE-CONSTRUCTIONS STAGE

The reporting from the PIU to the MPWT/MRD will be one of the arrangements relating with setting targets at the beginning of this stage of the Project. These activities need to be completed before the site can actually be handed over to the Contractor for the commencement of construction. The PIU will report on the following items in the pre-constructions Stage:

* Tree Transplantation

* Tree Felling

* Relocation of Utilities

* Cultural Property Relocation

* Bus Stop Relocation

* Relocation of Community resources -wells and hand pumps

CONSTRUCTION STAGE

The construction period is a very crucial stage of a road project as it entails carrying out multiple activities. which are all, synchronised and dependant on each other and performance of one activity is bound to affect the other. The Environmental Management Action Plan (EMAP) need not only to ensure reporting on mandatory items such as quarrying and borrowing but should also ensure reporting on safety and health indicators at all work sites. The reporting system should so as to keep a check on use of child labour by contractors. The objective of reporting during the construction is not only progressive and compliance monitoring of the construction of the road but also a check on concerned environmental issues.

The reporting by the PIU to MPWT/MRD for this stage comprises of

* Construction Stage Targets for Enhancement and Mitigation (One time reporting)

* Construction Stage Targets for Landscaping (One time reporting)

* Construction Stage Targets for Pollution Monitoring (One time reporting)

* Summary Reporting for Enhancement and Mitigation works.(Quarterly reporting)

* Quarterly Summary Reporting for Landscaping Works. (Quarterly reporting)

* Summary Reporting for Pollution monitoring. (Quarterly Reporting)

The reporting by the Contractor to the PIU shall be on the following items

® **Targets before commencement of construction**

* Temporary acquisition of Land for Diversion

* Setting up of Construction Camps

* Establishing Quarries

* Establishing Borrow Areas

* Setting up Stock Yards

® **Construction Stage Targets for Enhancement and Mitigation**

* Enhancement and mitigations of Cultural Properties

* Enhancement and mitigation of Water Bodies

* Enhancement and mitigation of Junctions

* Enhancement and mitigation of Bus Stops

* Enhancement and mitigation of Truck Lay-bys

* Provision of Access control gates

* Provision of Ramped Access to embankment

* Provision of Stepped Access to Embankment

* Provision of Sedimentation Chamber

* Provision of Chain link fencing

* Provision of Cascade and Gabion Structure

• Provision of Barrier to prevent Garbage dumping

.Enhancement and mitigation

®*D* **Environmental issues during construction**

* Pollution Monitoring

* Work Camp Hygiene and Safety

* Water used for Construction

* Dust Suppression at Stockyard

* Dust Suppression at Quarries

* Dust Suppression at Borrow Areas

* Construction time Road Safety at Temporary Bridge Diversions

* Construction time Road Safety during Partial Closure of Carriageway

® **Landscaping**

* Landscaping

* Survival of Transplanted Trees

* Survival Reporting of executed Landscaping works

OPERATION PERIOD

Operation period reporting shall comprise of compliance pollution monitoring and ensuring all quarries and borrow areas used during the road construction are effectively redeveloped. Also, survival reporting of landscaping is an important component of the Operation Period Reporting System. The reporting by the Contractor to the PIU shall be on the following items

* Pollution Monitoring

* Survival of Road Landscape

* Survival of Transplanted Trees

• Maintenance of Road Landscape

• Redevelopment of Borrow Areas

* Redevelopment of Quarries

The formats for the reporting of the various environmental issues through the various stages of the project implementation are presented in **Annexure-3.**

ANNEX 3

ENVIRONMENTAL MONITORING AND REPORTING FORMATS
P1: IDENTIFICATION OF DISPOSAL SITE LOCATIONS
(To be filled by the Contractor)

Name of Corridor _____

Link No._____

(Give chainages and nearest settlements from both ends)

Sl. No.	Criteria on which information for each site is to be collected	Site 1	Site 2	Site 3	Site 4
1	Existing Land Use				
2	Area covered (m^2)				
3	Total Material that can be dumped within the site (m^3)				
4	Depth to which dumping is feasible (m)				
5	Distance of nearest watercourse (m)				
6	Nearest Settlement (m)				
7	Date/s of Community Consultation/s				
8	Whether the community is agreeable to siting of dumping site (Y/N)				
9	Date of Permission from Villager/local community				
10	Proposed future use of the Site				
11	Selected Site (tick any one column only)				

Enclosures (Tick as appropriate)

1. Map of each location
2. Photographs
   a. Each Disposal location
   b. Each community consultation
3. Photo copy of Agreement

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……..	*SIGNATURE* ……..	*SIGNATURE* ……..
NAME ……..	*NAME* ……..	*NAME* ……..
DESIGNATION ……..		
CONTRACTOR	*ENVIRONMENTAL EXPERT* *TECHNICAL ASSISTANCE CONSULTANT*	*PD-PIU*

P2: SETTING-UP CONSTRUCTION CAMP AND STORAGE AREA

(To be filled by the Contractor)

Name of Corridor _____

Link No. _____

Construction Stage Report: Date _____ Month_____ Year_____

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)

Format to be submitted before target date of establishing camps

Location of Camp

Sl. No.	Item	Unit	Details	Remarks by PIU if any
1.	**Detail of item camp**			
a.	Size of Camp	m x m		
b.	Area of Camp	Sq.m		
c.	Distance from Nearest Settlement			
d.	Distance from Nearest Water Source	Type/Size/Capacity/ present Use/Ownership		
	Date of camp being operational dd/mm/yy			
	Present land use			
	No of trees with girth > 0.3m.			
e.	Details of Storage area (Availability of impervious surface)	Mxm		
f.	Availability of separate waste disposal from storage area	Cum		
2.	**Details of toposoil stacking**			
a.	Quantity of top soil removed	sq.m		
b.	Detail of storage of topsoil	Describe stacking arrangement		
3.	**Details of workforce**			
a.	Total No of Labourers	Nos		
b	Total no of Male Workers	Nos		
c.	No of Male Workers below 18 years of ago	Nos		
d.	Total No of Female Workers	Nos		
e.	No of Female workers below 18 years of ago	Nos		
f.	No of children	Nos		
4.	**Details of dwelling units**			
a.	No of dwellings/huts	Nos		
b.	Minimum Size of Dwelling	Mxm		
c.	No. of openings per dwelling	Nos		
d.	Minimum size of opening	Mxm		
e.	Walls	specifications		
f.	Roofing	specifications		

Sl. No.	Item	Unit	Details	Remarks by PIU if any
g.	Flooring	specifications		
h.	Drinking Water Tank	specifications		
i.	Capacity of Drinking water Tank	Cum		
j.	Size of Drinking Water Tank	Mxm		
k.	Total no of WC	Nos		
l.	No of Wcs for female workers	Nos		
m.	Minimum Size of WC	Mxm		
n.	Total No of Bathrooms for female workers	Nos		
o.	Size of septic tank for WC/Baths	Mxm		
p.	Capacity of Water Tank for WCs/ Bathrooms and general purpose			
q.	Fencing around camp	Y/N		
5	**Details of facilities**			
a.	Availability of secunty guard 24 hrs a day	Yes/No		
b.	Details of First Aid Facility	Yes/No		
c.	Availability of Dav Care Centre	Yes/No		
d.	Availability of dust bins (capacity 60 Itr)	Nos		

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……	*SIGNATURE* ……	*SIGNATURE* ……
NAME ……	*NAME* ……	*NAME* ……
DESIGNATION ……		
CONTRACTOR	*ENVIRONMENTAL EXPERT TECHNICAL ASSISTANCE CONSULTANT*	*PD-PIU*

P3: ESTABLISHMENT OF BORROW AREAS

(To be Submitted by Contractor for taking consent for opening of Borrow area)

Name of Corridor _____

Link No. _____

Sl No.	Location				Area (m2)	Quantity of Available Material	Type of Material	Distance from nearest Water Course (m)	Distance from nearest Settlement	Land Use		No. of Trees to be Affected	Approved by EE/PIU/RE (Y/N)	Remark
	Name of Village	Chainage (km)	Side (LHS / RHS)	Haul road length (m)						Before	After			

Atta

SUBMITTED ***CHECKED*** ***APPROVED***

REHABILITATION PLAN MEASURES

LOCATION 1:

Location 2:

REMARKS

SIGNATURE ……

NAME ……

DESIGNATION ……

CONTRACTOR

SIGNATURE ……

NAME ……

ENVIRONMENTAL EXPERT

TECHNICAL ASSISTANCE CONSULTANT

SIGNATURE ……

NAME ……

PD-PIU

ch Photograph of Proposed Site, Location Map, Agreement

P4: ESTABLISHMENT OF HOT MIX PLANT / BATCH MIX PLANT
(To be Submitted by Contractor for taking permission from PIU)

Name of Corridor _____

Link No._____

Sl No.	Location				Area (m2)	Distance from nearest Water Course (m)	Distance from nearest Settlement	Existing Land Use	Prevalent Wind Direction	Weather in Down Wind Direction (Y/N)	Approved by EO (Yes / No)	Remarks
	Name of Village	Chainage (km)	Side (LHS / RHS)	Haul road length (m)								

- Attach Photograph of Proposed Site

REMARK

SUBMITTED

SIGNATURE ……

NAME ……

DESIGNATION ……

CONTRACTOR

CHECKED

SIGNATURE ……

NAME ……

ENVIRONMENTAL EXPERT

TECHNICAL ASSISTANCE CONSULTANT

APPROVED

SIGNATURE ……

NAME ……

PD-PIU

P5: ROAD SAFETY REPORTING FORMATS

Name of Corridor _____

Link No. _____

One time reporting before commencement of construction in the Construction Zone

Sketch of construction zone showing all sub zones and location of signs, etc. to be attached with format

(Reporting by Contractor to PIU)

Format on Acquisition of Temporary diversions to be attached with format

Construction stage: Monthly Report - Date …… Month…….Year……..

DIVERSION NO. ___ Location (km____)

Sl. No.	Item	Unit	Compliance	Remarks
	Details of Construction Zone			
1.	Length of Construction Zone	km		
2.	Distance between this and next construction zone	km		
3.	Length of transition sub zone (should be min 50 for a speed of 50 km / hr)			
4.	Length of work sub zone in urban stretch (should be <2 km)	km		
5.	Length of work sub zone in rural stretch (5-10 km)	km		
6.	Distance between two work sub zones			
	Signage's in Construction Zones			
1.	Sign saying 'Men at Work' 1 km ahead of transition sub zone	Y/N		
2.	Supplementary sign saying diversion 1 km provided	Y/N		
3.	Sign saying 'Road Closed ahead' provided	Y/N		
4.	Compulsory Right Turn / Left sign provided	Y/N		
5.	Detour sign placed			
6.	Sharp deviation sign placed at end of advance warning sub zone	Y/N		
	Signage in Transition Sub Work Zone			
1.	Signage saying 'Keep Right / Left' provided	Y/N		
2.	Delineators placed along length of transition	Y/N		
	Signage in work sub zone			
1.	Hazard Marker placed where railing for CD structure on diversion starts	Y/N		
2.	Barricade on either side of work sub zone	Y/N		
	Signage in Termination sub zone			
1.	Sign for indication of end of work zone 120 m from end of termination sub zone	Y/N		
	Road Delineator			
1.	Roadway indicators provided			
2.	Hazard Makers provided			

Sl. No.	Item	Unit	Compliance	Remarks
3.	Object Makers Provided			

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ………………	*SIGNATURE …………………..*	*SIGNATURE ………………….*
NAME ………………….	*NAME …………………….*	*NAME ……………………..*
DESIGNATION …………..		
CONTRACTOR	*ENVIRONMENTAL EXPERT*	*PD-PIU*
	TECHNICAL ASSISTANCE CONSULTANT	

P6: ARRANGEMENT FOR TEMPORARY LAND
Reporting by Contractor to PIU (MPWT/MRD)

Name of Corridor _____

Link No._____

Construction stage: quarterly Report – Date: _____ Month_____ Year _____

(Site Layout of all locations to be attached with format)

Sl. No.	Item	Target date for Establishm-ent	Date of Establishm-ent	Location					Present Land use	Size (mxm)	Existing Trees >30 cm girth	Dist. From nearest settlement	Dist. From nearest water source	Site approved or not (Y/N)	Remarks by PIU if any
				Name of Village	Chainage (km)	Side (LHS / RHS)	Area (m2)	Haul road length (m)							
1.	Borrow Areas														
	BA1														
2.	Workers Camps														
	WC1														
3.	Site for Batching Plant														
	BP1														
4.	Site for Hot Mix Plant														
	HMP1														
5.	Stock Yard														
	SY1														

REMARKS

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……	*SIGNATURE ……*	*SIGNATURE ……*
NAME ……	*NAME ……*	*NAME ……*
DESIGNATION ……		
CONTRACTOR	*ENVIRONMENTAL EXPERT* *TECHNICAL ASSISTANCE CONSULTANT*	*PD-PIU*

P7: POLLUTION MONITORING

Name of Corridor _____

Link No._____

Construction Stage: Report – Date: _____Month _____Year_____

Mitigation measures suggested in last report complied or Not…….

If not reasons thereof……..……

(Location at which monitoring to be conducted as per EMP)

S. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion			Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential / Industrial / Commercial)	Remarks
1. Air Monitoring													
								SPM RSPM SOx NOx	SPM RSPM SOx NOx				
2. Water Monitoring													
								pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease	pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease				
3. Soil Monitoring													
								pH Organic Matter	pH Organic Matter				

S. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion			Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential / Industrial / Commercial)	Remarks
								Alkalinity Conductivity Water holding capacity Pb	Alkalinity Conductivity Water holding capacity Pb				
4. Noise Monitoring													
								$L_{day\ equivalent}$ $L_{night\ equivalent}$ $L_{equivalent}$	$L_{day\ equivalent}$ $L_{night\ equivalent}$ $L_{equivalent}$				

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……	*SIGNATURE ……*	*SIGNATURE ……*
NAME ……	*NAME ……*	*NAME ……*
DESIGNATION ……		
CONTRACTOR	*ENVIRONMENTAL EXPERT* *TECHNICAL ASSISTANCE CONSULTANT*	*PD-PIU*

P8: TREE CUTTING/ STUMP REMOVAL

Name of the Road:

Date:_____ Month _____Year_____

Sl. No.	Section (Km)	Distance from edge of existing road	Identification Number Marked in Field	Species		Girth (cm)	Dry / Green	Average Height (m)	Remarks
				Local	Botanical Name				

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……..…	*SIGNATURE ……..…*	*SIGNATURE ……..…*
NAME ……..…	*NAME ……..…*	*NAME ……..…*
DESIGNATION ……..…		
CONTRACTOR	*ENVIRONMENTAL EXPERT*	*PD-PIU*
	TECHNICAL ASSISTANCE CONSULTANT	

P9: IDENTIFICATION OF SOURCE OF WATER FOR CONSTRUCTION

Name of Corridor _____

Link No._____

Construction Stage: Monthly Report – Date. Month……..Year

S. No.	Source (Name)	Location /Ch.	Distance from Road	Permission Required	Remarks

REMARK

SUBMITTED	***CHECKED***	***APPROVED***
SIGNATURE ……..…	*SIGNATURE ……..…*	*SIGNATURE ……..…*
NAME ……..…	*NAME ……..…*	*NAME ……..…*
DESIGNATION ……..…		
CONTRACTOR	*ENVIRONMENTAL EXPERT*	*PD-PIU*
	TECHNICAL ASSISTANCE CONSULTANT	

C1: DETAILS OF EARTHWORK

(To be filled by the Contractor)

Name of Corridor _____

Link No. _____

Monthly Report for Each Borrow Area under use

Reporting Month……..
Date of Submission……..

Location of Borrow Area under use

	Name of Village	Chainage (km)	Side (LHS / RHS)	Haul road length (m)
I				
II				

(Show on a Sketch Plan clearly indicating distance and approach Road)

2. Details of Borrow Areas

2.1	Capacity of the Borrow Area	
2.2	Percentage of the capacity exhausted	
2.3	Total quality of the Earth Excavated (in cum)	
2.4	Quantity of Top Soil removed from the Borrow Areas	
2.5	Location of Top Soil stored removed	
2.6	Quantity of Top Soil stored at the beginning of the month	
2.7	Quantity of Top Soil utilized at the end of the month	
2.8	Location (s) where Top Soil has been utilized (Specify on a location plan)	
2.9	Quantity of earthwork excavation from existing road	
2.10	Total quantity of earthwork reused in cum. (5%)	
2.11	Location disposal (if other than sites) (Specify clearly on a location plan)	
2.12	Quantity of earthwork re-used in fill operation	
2.13	Location of borrow areas in disuse / exhausted	
2.14	Outline a rehabilitation plan for each of the exhausted borrow areas with special reference to Erosion Protection Measures. Also, submit at separate detailed rehabilitation plan for exhausted borrow areas for approval supported adequately with layouts, plans and drawings.	

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C2: DETAILS OF HOT MIX PLANT

(To be filled by the Contractor)

Name of Corridor _____

Link No. _____

Monthly Report for Each Hot Mix Plant

Reporting Month……..

Date of Submission……...

1. Environment Features of the surrounding area

1.1	Name and location of Hot Mix Plant (w.r.t. PIU km ch.)	
1.2	Wind direction	
1.3	Name (s), distance population and type of settlements in a 1.5 km radius of site.	

2. Draw Sketch Plan of HMP clearly indicating distance and approach Road.

3. Details of HMP and Mitigation Measures taken

3.1	Installed Capacity	
3.2	Average Utilization	
3.3	Make	
3.4	Model	
3.5	Last Serviced	

4. Explain Air Pollution Control Measures taken at the HMP site

5. Explain Noise Pollution Control Measures taken at the HMP site

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C3: DETAILS OF LAND FILL OPERATIONS

(To be filled by the Contractor)

Name of Corridor _____

Link No. _____

Monthly Report for Each Contract Package

Reporting Month……..

Date of Submission …….

1. Environment Features of the surrounding area

1.1	Location of each land fill site (Provide sketch Map below)	**Name of Village**	**Chainage (km)**	**Side (LHS/RHS)**	**Haul road length (m)**
	I				
	II				
1.2	Capacity of each land fill site				
1.3	Safety measure taken at land fill site (s)				
1. 2. 3. 4. 5.					

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C4: DETAILS OF MACHINERY IN OPERATION

(To be filled by the Contractor)

Name of Corridor _____

Link No. _____

Monthly Report for Each Contract Package

Reporting Month……..

Date of Submission ……..

(Attach copy of CECB emission control certificate every 3 months)

1. Details of Machinery Operation

1.1	Total machinery in operation (Nos.)		
1.2	Number of pavers		
1.3	Number of rollers		
1.4	Number of excavators		
1.5	Number of graders	Nos.	
1.6	Number of dumpers	Nos.	
1.7	No. of workshops with repairs facility (furnish location and type of facility provided)	Workshop on Location	Facility Provided
1.8	Number of vehicles in repair at each location		
1.9	Number of oil interceptor provided in each repair / fuelling site		
1.10	Total quantity of oil and wastes recovered in each interceptor during last month.	Oil waste	Liters, Kg.
1.11	Details of waste disposal. (Whether Sold/ Disposed)		

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name ……	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C5: REDEVELOPMENT OF BORROW AREAS

(To be filled by the Contractor)

Name of Corridor _____

Link No._____

Construction stage: Monthly Report – Date: _____ Month_____ Year

Drawing for Redevelopment to be attached for each Borrow Area, (photographs of sites before use & after rehabilitation to be attached)

Sl. No.	Borrow Area No.	Borrow Area Location					Land use	Rehabilitation Measures	Date of approval of Rehabilitation	Date of Handing Over to Owner	Remarks
		Name of Village	Chainage (km)	Side (LHS / RHS)	Area (M2)	Haul road length (m)					

REMARK

Submitted	Checked	Approved
Signature ……	Signature ……..	Signature ……
Name ……	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert	PD-PIU
	Technical Assistance Consultant	

C6: SAFETY CHECK LIST

(To be filled by the Contractor)

1 **Contract No.** _____

2 **Name of Contractor** _____

3 **Representation** _____

4 **Name of Safety Officer** _____

5 **Date of Inspection** _____

Location 1 ……. Location 2 …… Location 3 …….……

Adequate at time of Inspection **Needs Improvement** **Needs Immediate Attention**	**Location 1**			**Location 2**			**Location 3**			**Remark**
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	
General										
House keeping										
Stacking of Material										
Passageway										
Lighting										
Ventilation										
Others										
Electrical										
Switches										
Wirings										
Fixed Installation										
Portable Lighting										
Portable Tool										
Welding Machine										
Others										
Fire Prevention										
Fire Fighting Appliance										
Dangerous Goods Store										
Gas Welding Cylinders										
Others										
Others										
Dust Control										
Noise Control										
First Aid Equipment										
Washing Facility										
Latrine										
Canteen										
Provision of Personal Protective										
Helmet										
Eye Protector										
Ear Protector										

Adequate at time of Inspection **Needs Improvement** **Needs Immediate Attention**	**Location 1**			**Location 2**			**Location 3**			**Remark**
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	
Respirator										
Safety Shoes										
Safety Belts										
Others										

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C7: ACCIDENT REPORT

(To be completed on Occurrence of Injury by the Safety Officer)

Type of Accident

D01	Fall of person from a height		D11	Explosion
D02	Slip, trip or fall on same level		D12	Fire
D03	Struck against fixed objects		D13	Contact with hot or corrosive substances
D04	Struck by flying or falling objects		D14	Contact with poisonous gas or toxic substances
D05	Struck by moving objects		D15	Contact with electric current
D06	Struck / caught by cable		D16	Hand tool accident
D07	Stepping on hail etc.		D17	Vehicle / Mobile plant accident
D08	Handling without machinery		D18	Machinery operation accident
D09	Crushing / burying		D19	Other (please specify)
D10	Drowning or asphyxiation			

Agent Involved in Accident

E01	Machinery		E11	Excavation / underground working
E02	Portable power appliance		E12	Floor, ground, stairs or any working, surface
E03	Vehicle or associated equipment / machinery		E13	Ladder
E04	Material being handled, used or stored		E14	Scaffolding/gondola
E05	Gas, vpour, dust, fume or oxygen		E15	Construction formwork, shuttering and falsework
E06	Hand tools		E16	Electricity supply cable, wiring switchboard and associated equipment
E07	Floor edge		E17	Nail, sllnter or chipping
E08	Floor opening		E18	Other (Please specify)
E09	Left shaft		E19	
E10	Stair edge			

Unsafe Action Relevant to the Accident

F01	Operating without authority		F11 .	Failure to use eye protector
F02	Failure to secure objects		F12 .	Failure to use respirator
F03	Making safety devices inoperative		F13 .	Failure to use proper clothing
F04	Working on moving or dangerous equipment		F14 .	Failure to use warn others or given proper signals
F05	Using un-safety equipment		F15 .	Horseplay
F06	Adopting unsafe position or posture		F16 .	No unsafe action
F07	Operating or working at unsafe speed		F17 .	Others (please specify)
F08	Unsafe loading, Placing, mixing etc.		F18 .	
F09 .	Failure to use helmet		F19 .	
F10 .	Failure to use proper footwear			

G01 .	No Protective gear		G08 .	Unsafe layout of job, traffic etc.
G02 .	Defective protective gear		G09 .	Unsafe process of job methods
G03 .	Improper dress / footwear		G10 .	Poor housekeeping

G04 .	Improper guarding		G11 .	Lack of warming system
G05 .	Improper ventilation		G12 .	Defective tool, machinery or materials
G06 .	Improper illumination		G13 .	No unsafe condition
G07 .	Improper procedure		G14 .	Others (please specify)

Personal Factor Relevant to the Accident

H01 .	Incorrect attitude / motive		H04 .	Unsafe act by another person
H02 .	Lack of knowledge or skill		H05 .	No unsafe personal factor
H03 .	Physical defects		H06 .	Other (please specify)

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

Part-II – To be completed Upon Finalization of Employee's Compensation Claim

101 ( ) No permanent incapacity

102 ( ) Less than 5% incapacity

103 ( ) More than 5% incapacity

104 ( ) Fatal

Submitted	Checked	Approved
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C8: POLLUTION MONITORING

Name of Corridor _____

Link No._____

Construction Stage: Report – Date: _____Month _____Year_____

Mitigation measures suggested in last report complied or Not…….

If not reasons thereof……..……

(Location at which monitoring to be conducted as per EMP)

Sl. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion			Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential / Industrial / Commercial)	Remarks
1. Air Monitoring													
								SPM RSPM SOx NOx	SPM RSPM SOx NOx				
2. Water Monitoring													
								pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease	pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease				
3. Soil Monitoring													
								pH Organic Matter Alkalinity Conductivity Water holding	pH Organic Matter Alkalinity Conductivity Water holding				

Sl. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion			Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential / Industrial / Commercial)	Remarks
								capacity Pb	capacity Pb				
4. Noise Monitoring													
								$L_{\text{day equivalent}}$ $L_{\text{night equivalent}}$ $L_{\text{equivalent}}$	$L_{\text{day equivalent}}$ $L_{\text{night equivalent}}$ $L_{\text{equivalent}}$				

REMARK

SUBMITTED

SIGNATURE ……

NAME ……

DESIGNATION ……..

CONTRACTOR

CHECKED

SIGNATURE ……..

NAME ……

ENVIRONMENTAL EXPERT

TECHNICAL ASSISTANCE CONSULTANT

APPROVED

SIGNATURE ……

NAME ……..

PD-PIU

C9: ENHANCEMENT MEASURES

(To be filled up by Contractor)

Name of Corridor _____

Link No._____

Sl. No.	Corridor Name	Name of the Site	Chainage (km)	Consent taken (Y/N)	Total budget		Date of Start of work	Remarks
					Total	Utilized		

Remarks

Submitted	Checked	Approved
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..		
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

C10: RESTORATION OF CONSTRUCTION SITES

(To be filled by the Contractor)

Name of Corridor _____

Link No._____

(Reporting by Contractor to PIU)

Construction stage: Monthly Report – Date …… Month …… Year.

SL. NO.	***CONTRACT PACKAGE***	***LABOR CAMP***		***CONSTRUCTION* Camp**		***PLANT SITE***		***BORROW AREAS***		***DISPOSAL LOCATIONS***		***TOP SOIL***	
		O	***R***	***O***	***R***	***O***	***R***	***O***	***R***	***O***	***R***	***PRESERVED***	***RESTORED***

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

O1: POLLUTION MONITORING

Name of Corridor _____

Link No._____

Construction Stage: Report – Date: _____Month _____Year_____

Mitigation measures suggested in last report complied or Not ……

If not reasons thereof……

(Location at which monitoring to be conducted as per EMP)

S. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential / Industrial / Commercial)	Remarks
					SPM RSPM SOx NOx	SPM RSPM SOx NOx				
					pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease	pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease				
					pH Organic Matter Alkalinity Conductivity Water holding capacity Pb	pH Organic Matter Alkalinity Conductivity Water holding capacity Pb				
					$L_{\text{day equivalent}}$ $L_{\text{night equivalent}}$ $L_{\text{equivalent}}$	$L_{\text{day equivalent}}$ $L_{\text{night equivalent}}$ $L_{\text{equivalent}}$				

Remark

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert/Technical Assistance Consultant	PD-PIU

O2: CLEANING OF CULVERT OPENINGS AND LONGITUDINAL DRAINS

(To be filled by PIU, (MPWT/MRD)

Name of Corridor _____

Link No._____

Construction Stage: Report – Date_____ Month_____ Year

Sl. No.	Structural No	Pre monsoon	Date	Post monsoon	Date
Name of the Corridor					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert	PD-PIU
	Technical Assistance Consultant	

PIU 1: FORMAT FOR KEEPING RECORDS OF CONSENT OBTAINED BY CONTRACTOR

Name of Corridor _____

Link No. _____

Construction Stage: Report – Date: _____Month_____Year_____

Sl. No.	Contractor's Name	Clearance	Applicable Acts	Agencies	Obtained on	Valid upto	Remarks
	NAME OF CORRIDOR						

REMARK

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

PIU 2: CHECKLIST FOR ENVIRONMENT INSPECTION

(Points / Issues to be covered)

Name of Road_____

Date of Inspection_____

Sl. No.	ESMP Measures
1	Provision of a personnel accountable for implementation of ESMP / Safety Measures with Contractor
2	Consent of PCB to Establish HMP
3	Consent of PCB to operate HMP
4	Compliance of PCB Conditions for HMP installation and operation
5	Whether compliance reported through monthly Progress report to Divisional Office of Executive Engineer
6	PUC taken for all Construction vehicles
7	Concrete platform with trap under bitumen boiler, Fuel Tank for HMP and generator set provided or not
8	Precautions to prevent contamination of soil by emulsion, Bitumen, oil and lubricant taken while storing
9	Providing cover to fine construction material & bituminous mix during transportation
10	Borrow areas:
	a) Borrow areas approved by Department
	b) Existing land was used
	c) Nos Opened
	d) Available Quantity
	e) Utilized Quality
	f) Balance Quantity
	c) Nos of Borrow areas Rehabilitated
11	Spoil and debris disposal:
	a) Present status of land
	b) Closure and completion plan
12	Site specific traffic Safety management Plan:
	a) Contractor installed the warning / regulatory Traffic signs at the construction site
	b) The arrangement adequate
13	Safety equipment i.e helmet, gloves, gumboot, mask, earplugs etc. provided to workers
14	Health Facility at camp and work site i.e. First Aid kit & suitable vehicle for conveyance in case of emergency / accident
15	Permit for Procuring River sand
16	Licence from Department of mines for quarrying
17	Consent to establish / operation of crusher

Sl. No.	ESMP Measures
18	Provision of labour camp with sanitation & potable water
19	Fire precautions at Hot Mix Plant and site Office
20	Air and noise monitoring done in camp site
21	Whether any cultural property is being impacted
22	Status of drainage provision in camp area
23	General House Keeping

Remark

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

PIU3: SUMMARY SHEET

(To be filled monthly by PIU and Submitted to MPWT/MRD

Name of the corridor _____

Link No._____

Month_____

Date_____

Sl No.	Description	Remarks
1	**No Objection Certificate**	
A	Hot mix Plant	
	Location 1	
	Location 2	
	Location 3	
B	Cement Batching Plant	
	Location 1	
	Location 2	
	Location 3	
2	**Pollution Under Certificate**	
	Vehicles	
	Machineries	
3	**No Objection Certificate for Diesel Gen set**	
	Location 1	
	Location 2	
4	**Labour Camps**	
	No. of sites Identified	
	Approved	
	Opened	
	Conforms to conditions imposed at the time of opening of sites	
	Closed	
5	**Workers**	
	No of workers employed	
	No of male workers	
	No of female workers	
	No of day workers	
6	**Borrow Area**	
	No. of sites identified	
	Approved	
	Opened	
	Quantity of available material	
	Quantity of material Utilized	
	Quantity of Topsoil preserved	
	Quantity of top soil used	

Sl No.	Description	Remarks
	No of sites closed	
	No. of sites Rehabilitated	
7	**Quarry**	
	No. of sites identified	
	Approved	
	Opened	
	Material available	
	Material obtained	
	No. of sites Rehabilitated	
8	**Disposal Locations**	
	No. of sites identified	
	Approved	
	Opened	
	Amount of Waste disposed	
	Type of waste disposed	
	No. of sites Rehabilitated	
9	**Road Safety**	
	Road Safety norms followed as per guidelines, SP-55 and approved Traffic plan	
10	**Cleaning of Culvert/ drains**	
	No. of culverts/ drains	
	Nos Cleaned	
11	**Trees**	
	No of trees marked for cutting in field	
	No of trees cut	
	No of trees to be Planted	
	Trees Planted	
12	**Haul Roads**	
	Adequacy of maintenance of Haul Road Network	

Remark

Submitted	**Checked**	**Approved**
Signature ……	Signature ……..	Signature ……
Name …….	Name ……	Name ……..
Designation ……..	Designation ……..	Designation ……
Contractor	Environmental Expert Technical Assistance Consultant	PD-PIU

ANNEX 4

Status Sheet for Monitoring of Environmental Conditions on the Project site during Construction

S. No.	Particular of Works	Compliance		Remark
		Yes	No	
1	Monitoring of Ambient Air Quality, Water Quality & Noise Level at all the construction camps			
2	Counting of Trees (going to be cut due to the proposed work)			
3	Permission of Tree Cutting from Competent Authorities like Forest Community and Forest Administration (as applicable)			
4	Permission for Work within Forest Area (if required/project road passes through the project area)			
5	Status of Site Clearance			
6	Location Plan for Worker's camp, Quarrying /Borrowing, Material / Machinery Storage etc. and Permission of land use for the same from competent authority like Chhattisgarh Environmental Conservation Board			
7	Status of Development of worker camp as per Contract agreement			
8	Sources of water for construction			
9	Have you obtained permission from the government, if you are using river water			
10	Are any water bodies/ water sources being affected? Give details for each case			
11	Permission for operation of Quarrying and Borrowing			
12	Quarry-The contractor shall obtain materials from quarries only after the consent of the Department of Mining / CECB(both the states) / District Administration or will use existing approved sources of such materials			
13	Borrow Areas-Finalizing borrows areas for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable			
14	Schedule for using explosives for construction works			
15	Arrangement for Blasting (permission and safety)			
16	Are you taking proper precaution before blasting activity?			
17	Have you notified the time for blasting			
18	Road side Utility relocation plan (Detailing / Permission and reestablishment schedule etc.)			
19	NOC from Chhattisgarh Environmental Conservation Board			
20	Status of dust control at crusher and along the road where construction is under progress			
21	Traffic relocation / detouring during construction phase			
22	Traffic Safety / Road side signage			
23	Is the contractor working to approved traffic management plan?			
24	Are the warning signs sufficient in number			
25	Are the warning signs adequately clear			
26	Is the contractor maintaining the diversion properly			

S. No.	Particular of Works	Compliance		Remark
		Yes	No	
27	Is the riding surface adequate			
28	Is the contractor providing proper segregation for traffic lanes from adjacent hazards, such as excavation, etc			
29	Diversion should be identified and assessed individually			
30	Noise Pollution: Noise from Vehicles, Plants and Equipments- i. All plants and equipment used in construction will strictly conform to the MOE noise standards. ii. All vehicles and equipment used in construction will be fitted with exhaust silencers. iii. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.			
31	Emission from Construction Vehicles, Equipment and Machineries- i. Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of MOE. The Contractor will submit PUC (Pollution under Control) certificates for all vehicles/ equipment/machinery used for the project.			
32	Status of Dust Control during construction Activities			
33	Dust Pollution- i. The contractor will take every precaution to reduce the level of dust from crushers/hot mix plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source and by erection of screen/barriers. ii. The contractor will provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation.			
34	Establishment of Cautionary / informatory / Safety Boards etc.			
35	Water Pollution from Fuel and Lubricants- The contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 500 m from rivers and irrigation canal/ponds.			
36	Drainage- Contractor will ensure that no construction materials like earth, stone, ash or appendage is disposed off in a manner that blocks the flow of water of any water course and cross drainage channels. Contractor will take all-necessary measures to prevent any blockage to water flow.			
37	License for labors			
38	Does the labour / Construction have the First Aid			
39	Total capacity of Labour camp			
40	Has the contractor provided and maintaining temporary living accommodation and ancillary facilities for labour to			

S. No.	Particular of Works	Compliance		Remark
		Yes	No	
	the standards and scale approved by the RE			
41	Number of workers staying in the camps			
42	Supply of safety equipments and safety devices (helmet / shoe / goggles etc.) to the workers			
	Does the contractor have a safety plan during construction			
43	Labour Camp Management i. Accommodation- maintained necessary living accommodation and ancillary facilities in functional and hygienic manner ii. ii. Potable Water- Supply of sufficient quantity of potable water (as per IS) in every workplace/labor campsite at suitable and easily accessible places and regular maintenance of such facilities iii. iii. Sources of water for the camp iv. iv. Sanitation and Sewage System- the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place, separate toilets/bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women, adequate water supply provided in all toilets and urinals and all toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition.			
44	No. of washing and bathing arrangement			
45	No of Functional Toilets in the camp			
46	Capacity of the sewerage system in the camp			
47	Are the garbage bins provided in the camps and regularly emptied and the garbage disposed of in a hygienic manner, to the satisfaction of the RE			
48	General cleanliness of camps area			
49	Name and location of each hot mix plant under operation			
50	Owned or sub-Contract			
51	Land use status of plant area			
52	Total soil removed for later reapplication (cum)			
53	Installed capacity of the Hot Mix Plant			
54	Do the exhaust gases comply with the requirements of the relevant			
55	Good House Keeping Practices for various work places of Projects e.g. Worker's Camp, Crusher, Construction area of Road etc.			
56	Safety arrangements for worker, public, and associated Environment during construction			
57	Insurance Policy			
58	Is the storage of fuel/lubrication done satisfactorily?			

ANNEX 5

Community Perception of Environmental Scenario

Km: From- **To-** **Team No-**

Q.1- What do you think about the quality of water from ponds, wells, rivers or canals in your area?

Good

Satisfactory

Polluted

Q.2- If the quality of water is polluted /poor, then in your opinion what are its reasons?

Ingress of industrial effluent in the source

Sewage leakage/discharge in the source

Animal water holes

Rain water storage

Others, please specify

Q.3- Is the noise level in your area disturbing / irritating?

Yes

No

Q.4- If the Noise level is disturbing / irritating then in your opinion, it is due to

Vicinity of industry

Vehicular Traffic

Construction work

Work shop / scooter repair shop

Aviation zone

Others, please specify

Q.5- How, in your opinion, the noise level can be brought to satisfactory level in your area.

Q.6- Is the quality of air, which you breath is healthy and clean

Yes / No

Q.7- If not, then what are the reasons?

Due to vehicular pollution

Due to Industrial pollution

Due to poor sanitation

Due to tanneries in the vicinity

Due to domestic smoke

Others, please specify

Q.8- Are there any places of Archeological / historical importance in your vicinity, if yes, please give details

Q.9- Is there any previous history of natural disaster viz. Floods, Drought, earthquake etc. in your area, if so give details with year of occurrence and damage.

Location:		Year	Period of occurrence	Duration	Causalities
Flood	Yes / No				
Drought	Yes / No				
Earthquake	Yes / No				
Cyclone	Yes / No				

Q.10- Are any rare species of Birds, Animals etc. visiting your area during winter, if so please give details and locations

Name of the Species	Location

Q.11- Do you have any market place, melas etc. in your areas and it is likely to be affected by proposed expansion of road, if yes then which site do you suggest for relocation of the markets.

Q-12- Drainage along the road, Good, Satisfactory, Bad? Reasons therefor

Q-13- How best drainage can be maintained operational?

Q.14- Do you have any suggestion to improve the Environment with respect to Air, Water and Noise in your area?

Particulars	**Name**	**Signature/Date**
Recorder		
Scrutinizer		

ANNEX 6

TECHNICAL SPECIFICATION FOR ENVIRONMENTAL MANAGEMENT (FOR SBD)

1. MOE Technical Specification (REFER THE FOLLOWING)

- Sub-decree on Solid Waste Management
- Sub-decree on Water Pollution Control
- Declaration 01
- Sub-decree on EIA
- Sub- decree on Air Pollution and Noise Distribution

2. AASHTO/NCHRP

- Framework for Analyzing air quality and other impats of transportation control measures, 1999
- Guidance on environmental streamlining through programmatic agreements and delegationof authority, 2002
- Protocol and Software for assessing the environmental impact of highway construction, 2000
- Methodology for assessing the indirect environmental impacts of Projects, 2002
- Guidance for selecting compensatory wetland mitigation options, 2002
- Handbook for assessing the social and economic effects of Tansportation projects, 2000
- Best Practices for controlling Highway runoff, 2006
- Guidance on Documentation needed for Environmental Assessments and Environmental Impact Statements. 2004
- Assessment of 'smart growth' laws and land-use development and transportation decisions, 204
- Methodology for assessment and mitigation of land development impacts, 2004
- Best Practices for integrating environmental stewardship into roadside operations and maintenane activities, 2004
- Alternative mitigation Strategies to protet the natural environment, 2005
- Analysis of secondary/indirect and cumulative effects of transportation project, 2006
- Guidelines for Improving Environmental Cost Estimates, 2008
- Guidelines for Implementation of Community and Cultural Resource Commitments, 2008
- Compendium of Best Practice for Environmental Compliance and Stewardship at Transportation Maintenance facilities, 2009
- Compendium of Best Practice for Incorporating Environmental Commitments into Transportation Project Construction Contract Documents, 2009

Vol. 2 of

STANDARD GUIDELINES

For

IMPLEMENTATION OF ENVIRONMENTAL AND SOCIAL SAFEGUARDS

Social Safeguards

Contents of Volume 2

List of Acronyms & Abbreviations

CPR	Common Property Resource
CoI	Corridor of Impact
DMS	Detailed Measurement Survey
RWG	Resettlement Working Group
EMDP	Ethnic Minority Development Plan
ESO	Environment and Social Office
GRC	Grievance Redress Committee
IA (EA)	Implementing (Executing) Agency
ID	Identity Card
IPDP	Indigenous Peoples Development Plan
IRS	Income Restoration Scheme
ISA	Initial Social Assessment
MA	Monitoring Agency
M&E	Monitoring and Evaluation
MEF	Ministry of Economy & Finance
PAP	Project Affected Persons
PIB	Public Information Booklet
PIU	Project Implementation Unit
RAP	Resettlement Action Plan
ROW	Right of Way
RP	Resettlement Plan
R&R	Resettlement and Rehabilitation
SA	Social Assessment
SIA	Social Impact Assessment
TOR	Terms of Reference
VRC	Village Resettlement Committee
WB	World Bank

1

Social Impact Assessment

1.1 The Project Process Cycle and Major Steps in the Project Cycle

1. **Major Steps in Project Process**

All development projects go through a well defined project process cycle beginning from inception to implementation and passing through various phases that include: project identification, pre-feasibility study, feasibility study or preliminary designs, detailed technical design, and implementation. The level of information and details on social, economic, environmental and technical aspects vary from a very general nature at the project identification stage to very detailed and specific at the feasibility and technical design stage. The resettlement planning and implementation activities run parallel to the technical and engineering activities in a project following the same project process cycle. General description of these activities is summarized below.

2. Project Identification

The first step in planning of a project involves project identification. At this stage only preliminary information on the location and scope of projects is generally available. Very rarely the project proponents are in a position to describe specific location or physical boundaries of projects at this stage. At this stage, project proponents are required to collect some basic information regarding potential social issues and impacts and make a preliminary assessment of potential environmental and social benefits and impacts of the projects.

3. Pre-feasibility

Pre-feasibility is a step forward from project identification and its main purpose is to refine the project objectives, conducting specific technical studies and economic analyses and preparation of preliminary designs. The pre-feasibility gives an account of the scope of the project and resources needed for its implementation. More specific information on the scope of the project and its likely impact areas are generally available during the pre-feasibility stage of projects, although information on precise project boundaries may not be available at this stage. Based on the available information, the pre-feasibility will also determine whether the potential social impacts of the proposed project are likely to be significant. Identification of key stakeholders including project affected persons and groups and beneficiaries is made and a more specific information on the scale and degree of potential social impacts and socio-economic characteristics of project affected persons and groups is collected through field investigations, surveys and interviews with selected population within and adjoining the project areas. Following main activities are generally carried out during the project – identification:

- Identifying likely social impacts and issues relevant to the project
- Review & screening of existing data
- Determining the level and amount of information required for subsequent phase in the project

4. The social output at this stage of project planning process is initial social assessment. Initial Social Assessment involving identification of potential social issues and impacts and key stakeholders is undertaken during the project identification stage. The exercise also includes screening of available information for assessment of the types, scale and degree of impacts and to determine the need for various documents that may be necessary for project process. Based on the results of the screening exercise decision is taken on the level of surveys and the types of information required for various documents and necessary Terms of Reference (ToR) for subsequent studies are prepared.

5. Feasibility

Feasibility studies are carried out as an activity refining technical aspects in a project. The project proponents or assigned agency studies incorporating all the components and aspects of the project. During the feasibility study stage project boundaries are finalized, although these may be further modified after the feasibility studies are completed, if necessary, during the detail technical design stage. Technical aspects in the projects are finalized and preparations for detailed technical designs are made. In parallel to the feasibility studies, social assessment study is completed to address resettlement and other social issues during the feasibility stage of project preparation. Where necessary additional information on indigenous population groups is collected and Consultation with stakeholders is carried out. Normally approval for projects is obtained upon completion of the feasibility studies following which detailed engineering designs & bidding documents are prepared. Since the information collection and analysis on social impacts is carried out in parallel to preparation of preliminary design of projects, the exercise also includes assessment of various design options for avoiding or minimizing adverse impact and selection of suitable design option.

6. Based on the recommendations of the screening exercise and where the projects may result in indirect social impacts on population within the project or adjoining areas a detailed social assessment study may be necessary. The Social Assessment (SA) study is conducted during the feasibility phase of the project preparation. Detailed investigations carried out for SA studies include identification of the types and scale of social impacts, stakeholder analysis and institutional analysis. The studies help in formulation of appropriate mitigation measures and instruments necessary to address social issues in the project. Social Assessment generally covers macro level social issues and provides a framework for more detailed investigation and for planning and implementation of mitigation measures to address specific issues.

7. Detailed Design

Approval for project is obtained upon completion of the feasibility studies following which detailed engineering designs & bidding documents are prepared. In the detailed design stage, technical aspects in the projects are finalized and preparations for detailed technical designs are made. In parallel to the preparation of technical designs, resettlement plan and indigenous population development plan, where necessary, is completed. To address resettlement issues during the detailed design stage, detailed census and socioeconomic surveys are completed and inventory of affected assets prepared as an essential element of resettlement preparation. Where necessary, information on indigenous population groups is collected and indigenous population development plan is prepared. Consultation with stakeholders is carried out throughout the resettlement preparation stage. Based on detailed surveys and field investigations, necessary documents such as the Resettlement Plans, indigenous population Development Plans and land acquisition plan are prepared and finalized.

8. Resettlement Plans (RPs) is prepared based on field surveys covering census of affected people and detailed inventory of affected assts within the project boundaries. Normally very few changes in design criteria are made between the feasibility study and detailed design. However, in case of any major change in design parameters effecting project boundaries, corresponding changes in

resettlement planning is necessary and the information is updated as per the detailed designs. In case the changes in design parameters are only minor, corresponding changes in the resettlement plans are made during implementation of resettlement activities without any need for revision of these reports.

9. Indigenous Population Development Plans (IPDPs)- In case the initial poverty and social assessment identifies major impacts on some indigenous population groups, and further confirmed during the social assessment studies, warranting the preparation of standalone IPDP, necessary surveys and investigations would be necessary during the feasibility study phase of project preparation. IPDP preparation activities are carried out in parallel to the resettlement planning activities and IPDPs are prepared as an integral part of project preparation.

10. Implementation

    The final stage of the project cycle is the implementation of project. However, implementation of resettlement activities is given higher priority during the implementation phase of project. Land acquisition, compensation payment and relocation activities of displaced persons are completed prior to start up of civil works in a project, except in some linear projects where civil works on some sections of the project may begin even when resettlement implementation in other sections is still ongoing. Successful implementation depends upon timely disbursement of resources, efficient institutions and human resources, adequate consultation with and participation of affected persons in the project process and timely delivery of entitlements plus adequate monitoring of activities.

1.2 What is Social Impact Assessment?

Social impact assessment is a process of analysing, predicting and evaluating the future social and economic effects of proposed policy, program and project decisions and actions on the well-being of people, and their businesses, institutions and communities. Its goal is to protect and enhance the quality of life by ensuring that potential socio-economic impacts are minimized and sound environmental decisions are made. Social impact assessment involves identifying: significant potential positive and negative changes in peoples' cultural traditions and lifestyles, their physical and psychological health, their families, their institutions and their community. And, it identifies ways of avoiding, mitigating, enhancing or managing those changes (e.g., monitoring and impact agreements).

1.3 What Does Social Impact Assessment Do?

Social Impact Assessment:

- Predicts the nature and size of potential negative and positive effects on individuals, businesses and communities;
- Develops and implements appropriate recommendations and impact management measures;
- Avoid or decease potential negative socio-economic impacts and enhance positive impacts; Identifies net social and economic impacts occurring after mitigation measures are applied,
- including roadway routing, design and operating conditions; and,
- Helps resolve public issues by working with the community to address the potential impacts.

1.4 When Do We Do Social Impact Assessment?

SIA is done as part of the planning process and therefore alerts the planner and the project roponent (through the social assessor) to the likelihood of social impacts. Like a biological, physical, or economic impact—social impacts have to be pointed out and measured in order to be understood and communicated to the impacted population and decision-makers. Social impact assessment provides a realistic appraisal of possible social ramifications and suggestions for project alternatives and possible mitigation measures.

The most crucial stage is during the preparation of the feasibility study. If during the feasibility study a thorough examination of all relevant social dimensions is incorporated in the project, it will help in ensuring a high quality of project design. Conversely, if these examinations have not been conducted, project authorities will have significant difficulties in subsequent stages of project life.

1.5 The value of social analysis

- Social analysis determines the suitability of programs proposed and the programme should make a significant impact on the economic and social development.
- Economic growth is more likely to reduce poverty when development is equitable and sustainable. Since poverty is multi-dimensional, equitable and sustainable development entails measures that strengthen inclusion, empowerment and/ or security outcomes to sustain the gains of economic development.
- Social analysis enables to assess whether a proposed program or operation is likely to meet its social development objectives and to recommend measures to help meet them.
- Social assessment enables to examine the project's sustainability and to take action to enhance it.

1.6 Is Social Assessment needed for all projects?

Social impacts are most often associated with large, complex projects in certain sectors such as extractive industries, infrastructure or energy. However, smaller projects across a range of other sectors can also have social issues or hold potential for bringing value that might not be immediately obvious. These may include such projects in general manufacturing, agribusiness, tourism; expansion, restructuring or privatization of existing facilities. Where project impacts are minor, the level of detail and the range of social impacts discussed in the following sections may not always be relevant and should be adjusted to fit the scope and scale of the project. However, regardless of the size or nature of a project, the fundamentals of the social assessment process (which will help to identify and address any potential social impacts or determine opportunities for enhancing sustainability) remain valid.

1.7 Transport Sector and Social Analysis

Strengthening of transport projects helps disadvantaged groups to benefit equitably from new opportunities—not just for jobs, but for more productive and better-paying jobs that will raise incomes. Social analysis can identify the needs, priorities, and patterns of potential transport use among different groups. This is essential for devising appropriate technical solutions that will achieve social development outcomes. Without careful social analysis, transport systems can exclude the poor and disadvantaged in benefiting from it. Like wise, women's patterns of activity and transport needs may differ from those of men, sometimes significantly. Gender analysis may be used to understand these differences and frame appropriate measures to ensure that women benefit from transport projects.

Social analysis forms the basis for creating complementary economic and social services that will maximize the benefits of greater population mobility. Also, it helps in overcome the neglect of vulnerable people such as the elderly and disabled, who are often overlooked in transport policy and planning. Transport projects that foster the longer distance movement of people may, inadvertently, broaden the distribution of communicable diseases, such as HIV/AIDS. Transport projects can also, inadvertently, foster human and drug trafficking. In both cases, social analysis of patterns of risk behaviours and consultation with those affected can form the basis of effective legislation and awareness campaigns aimed at preventing trafficking and the spread of disease.

Social analysis can help identify patterns of land use that underpin less disruptive, integrated land-use planning decisions—for example, limiting land acquisition strictly to the specific project needs to reduce the extent of displacement. Social analysis forms an essential basis for implementing social

safeguard standards. It can help identify effective strategies to involve stakeholders and civil society in transport planning and management.

1.8 Transport Sector and Social Safeguards

11. **Land Acquisition and Resettlement -** Construction and, to a lesser extent, rehabilitation of transport infrastructure may lead to displacement of people from land, housing, roadside shops and businesses, and sources of income and livelihood. Transport projects themselves determine the ultimate scope and intensity of displacement—hence, the importance of looking carefully for alternative design and finding measures that may be feasible to reduce the impacts. As noted, involuntary displacement may worsen poverty and vulnerability. This, combined with loss of social networks and social capital, may expose vulnerable people to risks such as traffic accidents or human trafficking. The presence of such risks reinforces the need for effective resettlement plans.

12. **Indigenous Peoples -** Transport projects, particularly those extending into remote areas, may raise issues pertinent to the indigenous peoples because such people may be exposed to new hazards. Indigenous peoples as groups have social or cultural identities distinct from that of the dominant or mainstream society. Interventions affecting indigenous peoples should be consistent with their needs and aspirations; compatible with their cultures and social and economic institutions; implemented with their informed participation; and without negative effects of development on them.

2

Poverty and Social Assessment

2.1 Initial poverty and social assessment

An initial social assessment (ISA) is required for every development project in order to identify the people who may be beneficially and adversely affected by the project. It should assess the stage of development of various subgroups, and their needs, demands, and absorptive capacity. It should also identify the institutions to be involved in the project and assess their capacities. The ISA should identify the key social dimensions aspects (such as involuntary resettlement, indigenous peoples, poverty reduction and women in development) that need to be addressed under the project.' The ISA should be undertaken as early as possible in the project cycle and preferably by the time of fact-finding for a project preparation.

2.2 Objectives & Scope

Information on potential social issues and likely impacts that a project may cause needs to be collected and assessed during the Initial Social Assessment (ISA) stage. ISA is an important exercise that forms the basis for more detailed studies during the project preparation stage.

The major social issues and policies that relate to the ISA include gender, resettlement, indigenous population, and other vulnerable groups including the poverty groups. The objective of the ISA is to assess the scope of the relevant social issues in a project and identify the need for further in-depth surveys and documentation requirements during the project preparation. Additionally, ISA should also identify whether or not relevant social issues could be integrated and covered by one consolidated document. If for example, in addition to resettlement, indigenous population issues are identified in a project, the resettlement plan could be prepared incorporating ‘indigenous population development plan. On the other hand, if a project has minor resettlement issues but affects indigenous population groups, the document may primarily be an ‘Indigenous Population Development Plan’. Integrating social dimensions into a single document, where possible, will make efficient use of resources during project preparation, especially for surveys and data collection, and implementation.

The need and mechanism for integration of social dimensions will vary depending on the project and should be assessed by a social scientists / resettlement specialist assigned to the project on a case-to-case basis during the ISA stage.

2.3 Information Required

The information collected during the ISA through field visits to selected areas and dialogues with the key stakeholders provides the basis for assessment of the types of information and depth of analysis required and documentation necessary for project processing, professional inputs and the skills required for succeeding phase of project preparation. To correctly identify the relevant social issues, including the possible social risks that a project may cause, and to assess the type and level of information required, the scope of the ISA be expanded to include additional information on the degree and scale of likely impacts on vulnerable groups that would enable proposed categorization of projects and in determining the types of documents required. Table 2.1, 2.2, 2.3, 2.4 and 2.5 shows checklists of information that needs to be collected to address resettlement issues, and a summary

form that should be produced after completion of ISA. The suggested checklist covers the possible social risks that a displaced household may experience due to the project. The 'summary information', as suggested in tables would facilitate downstream decisions on the need for technical assistance and resources for further studies in project preparation. Necessary allocation of resources – including additional staff – would be necessary for a more active involvement of resettlement specialists during the project preparation and implementation.

Active involvement of a resettlement specialist or a social scientist with experience in resettlement, as member of the project team, is strongly recommended for conducting ISA, and during the project preparation and implementation stage.

2.4 Project Screening

ISA is followed by the screening of information collected to determine the type, degree and scale of impacts and to determine the level of surveys required for subsequent stages of project preparation.

Public Participation

ISA should be carried out using a public consultation and participatory process. Following completion of ISA, project screening should assess whether the project has adequately consulted with the key stakeholders, relevant NGOs and affected persons and if they have incorporated the feedback into the project. The feedback from consultation should include suggestions to improve the process as the project moves forward.

Level of Social Impacts

The information collected during the ISA will provide the basis for determining severity of impacts and the level and depth of subsequent field surveys, investigations and documentation (RP / IPDP / SA etc.).

'Significant' and 'Insignificant' Impacts

In general the criteria used to determine the scale of impact i.e. significant or insignificant, is based on the number of people affected in a project. Project with significant impacts require preparation of a full resettlement plan while in a project with 'insignificant' impacts preparation of a short resettlement plan, or the Land Acquisition and Compensation Report (LACR), is considered sufficient. However, the threshold based entirely on the number of affected persons does not take into consideration the 'degree' of impacts. In projects affecting a large number of people with only marginal impacts, preparation of a detailed resettlement plan cannot be fully justified. On the other hand, a project may cause severe impact to only a few households due to the entire loss of productive assets, or where assets are affected only partially but the remaining assets are rendered un-viable for continued use, requiring relocation, a simple resettlement plan may not be adequate. Therefore, the screening criteria should take into consideration not only the scale (number of affected people, vulnerable groups and indigenous people) but also the degree (severe or marginal) of impacts.

Impacts on cultural properties and religious structures

In case of any likely impact on cultural properties and religious structures such as temples, shrines etc., and attempts should be made to reconsider design parameters to avoid any impacts on such structures. Consultation with potential PAPs should also focus on their views upon possible impacts on such structures.

Project Categorisation

A set criterion is used as a guide to categorize the project by World Bank and Asian Development Bank. This is some what along the same line as is done for environmental categories. The categorisation of project from resettlement impact point of view is more explicit in the case of ADB as compared to WB. Nonetheless, the WB OP 4.20 has differentiated between projects needing full

RAP, abbreviated RAP, resettlement policy frame work or a process framework. The categorisation of project in reference to magnitude of impacts for World Bank is provided in Box 1.

Box 1- Project Categorisation by World Bank	
Safeguard documentation required	**Category explanation**
A resettlement plan	A resettlement plan is required for all operations that entail involuntary resettlement.
An abbreviated resettlement plan	Where impacts on the entire displaced population are minor(Impacts are considered "minor" if the affected people are not physically displaced and less than 10 percent of their productive assets are lost.), or fewer than 200 people are displaced, an abbreviated resettlement plan may be agreed with the borrower.
A resettlement policy framework	The purpose of the policy framework is to clarify resettlement principles, organizational arrangements, and design criteria to be applied to subprojects to be prepared during project implementation.
A process framework	A process framework is prepared when Bank-supported projects may cause restrictions in access to natural resources in legally designated parks and protected areas. The purpose of the process framework is to establish a process by which members of potentially affected communities participate in design of project components, determination of measures necessary to achieve resettlement policy objectives, and implementation and monitoring of relevant project activities

The categorisation of project in reference to magnitude of impacts for Asian Development Bank is provided in Box 2.

Box 2- Project Categorisation by Asian Development Bank

Project category	Definition	Category explanation
S1	projects with significant impacts on people	a. 200 persons (40-50 households) or more[1] severely affected due to: ▪ >20% loss of productive assets or where the loss is less than 20% but the remaining assets are rendered economically unviable; ▪ Displacement due to the loss of land and/or structures ▪ Permanent loss of incomes and employment b. 200 or more persons (40-50 households) belonging to the following vulnerable groups severely[2] affected due to the project: ▪ indigenous population[3] ▪ squatters and those with weaker titles ▪ indigenous peoples ▪ poverty groups ▪ women headed households Project categorized as 'S1' will require full Resettlement Plan or a standalone IPDP, as the case may be. In projects with 'S1' category the impacts would be considered **significant.**
S2	impacts of the project are marginal	Impacts are marginal[4] although the number of people affected may be more than 200 in the case of loss of productive assets or for vulnerable groups (indigenous population, poverty group, squatters, and women headed households). Only a simple resettlement plan or a Land Acquisition and Compensation Report would be required for category 'S2' projects. Impacts in 'S2' category of projects would be considered **Marginal** or **Insignificant**.
S3	No Impact	Project does not result in acquisition of assets, displacement, loss of incomes and employments, restricted access to community resources, community ties, and restrictions imposed on cultural practices of vulnerable and/or indigenous population groups. No further studies on resettlement issues necessary for 'S3' category of projects.

Table 2.1

[1] *Where in a project more than 200 people affected but severally affected people remain < 200, the sub-project may be considered as Social category 'S2'.*

[2] *Loss of income due to restricted access to community resources, loss of community ties, displacement, and restrictions on cultural practices.*

[3] *If in a project an indigenous population group and/or settlement is affected, even if the number is less than 200, the sub-project should be considered as Social category 'S1' and a IPDP should be prepared.*

[4] *Most of the linear projects will fall in this category. In the case of indigenous population, if the affected persons are spread over a large area (over the whole length of the road for example), do not form a community and are fully integrated in mainstream population, socially and economically, the impacts will not be considered severe even if the number of affected persons exceeds 200. However, in such case a 'Indigenous Population Development Plan' as part of the RP, may be necessary.*

Initial Social Assessment[5]
Checklist of Information on Resettlement

Project :_____

Location: _____

Estimated Number of Project Affected Persons[6] (PAPs):_____

Types of Impacts (Social and Economic Risks)[7]:

Social Impacts	Yes / No / Likely/ Not applicable	Where possible, provide details (Expected number of households, area of land, types of structures likely to be affected)
• Is land acquisition necessary[8]		
• Presence of squatters		
▪ Loss of structures resulting in displacement		
• Displacement of people due to loss of productive assets		
• People losing means of livelihood and incomes (Temp. / Permanent)		
• Is there any risk of economic marginalization of PAPs		
• Basic facilities / services will be inaccessible (Temp. / Permanent)		
• Impact on crops, trees and other fixed assets		
▪ Tenants/Lessees losing any fixed assets		
• Loss of community assets		
• Loss of existing social & community ties		
• Potential loss of any cultural properties , historical sites or places of worship		

[5] *Information for ISA should be collected in consultation and coordination with project proponent, local authorities, local NGOs and community leaders of affected community. Where possible, sufficient time should be spent for group discussions with community likely to be affected by the project.*
[6] *The number of people likely to be affected should be based on rapid assessment*
[7] *It may not always be possible to get information on some of the above impacts at the preliminary social assessmrnt stage. However, consultants should pay particular attention to these types of impacts during the project preparation stage.*
[8] *Provide location map indicating project area boundary, total area, access, use of adjoining land etc.*

Table 2.2: Impacts on Vulnerable Groups, if any:

Types	Yes / No / Likely/ Not applicable	Remarks (Where possible, provide estimated number of households & persons)
• Poverty group affected		
• Women headed households affected		
• Indigenous Population Affected		
• Other vulnerable groups[9] affected		

Table 2.3: Institutional Constraints, if any

Description	Yes / No / Likely/ Not applicable	Remarks
• Will coordination between several local and provincial govt. be required		
• Does the sub-project proponent has the capacity for resettlement implementation		
• Are any training and capacity building interventions required prior to RP/EMDP implementation		

Brief Description of the project indicating ownership[10] of land and area:

[9] *This may include disabled, child labor, bonded labor, etc.*

[10] *If the land has already been acquired in the past, indicate the year of acquisition, number of owners, any acquisition of structures and other fixed assets, rates at which the compensation was paid, if any, and other allowances and assitance provided to owners. In case the state land is 'repossessed' from any occupiers, provide information on the year the land is 'repossessed', describe the previous use of land, number of occupiers, any loss of incomes to occupiers, and any compensation or assistance to occupiers for their losses, if any.*

Table 2.4: Identification of indigenous peoples in sub-project area

Impact on indigenous peoples (IPs)	Not known	Yes	No	Remarks or identified problems, if any
Are there IPs present in project locations?				
Do they maintain distinctive customs or economic activities that may make them vulnerable to hardship?				
Will the project restrict their economic and social activity and make them particularly vulnerable in the context of project?				
Will the project change their socioeconomic and cultural integrity?				
Will the project disrupt their community life?				
Will the project positively affect their health, education, livelihood or social security status?				
Will the project negatively affect their health, education, livelihood or social security status?				
Will the project alter or undermine the recognition of their knowledge, preclude customary behaviors or undermine customary institutions?				
In case no disruption of indigenous community life as a whole, will there be loss of housing, strip of land, crops, trees and other fixed assets owned or controlled by individual indigenous households?				

Table 2.5: Preliminary Screening of Indigenous Population

When to do screening: At the time of the first consultation with a commune.
What information to collect: The screening will collect demographic data of indigenous population who live along the zone of influence.
How to collect the information: It can be obtained from indigenous people leaders, village leaders and commune authorities.
Who will do the screening: Consultants or Trained District staff

Province: _____ District: _____ Commune: _____ Subproject: _____

Name of Villages, Communes along the Influenced Zone	Name of Indigenous Population group along the influence Zone	No. of Indigenous Population Households along the influenced zone	No. of Total Indigenous Persons along the influenced Zone.	
			Women	Men

2.5 Social Impact Assessment (SIA)

When is SIA necessary?

Initial social assessment at project identification stage determines likely social issues and the types of detailed surveys and field investigation, as well as documentation (Resettlement Plan and/or Indigenous Population Development Plan) required in accordance with the Resettlement Policy and

the Decree. However, where an ISA during project preparation indicates complex array of social issues including indirect socio-economic impacts on population within or in the vicinity of project areas and differential impacts on indigenous population groups, an independent and detailed SIA is recommended during project preparation.

2.6 Definition, Function and Scope of SIA

Definition of SIA

SIA is an approach for incorporating social analyses and participatory processes into project design and implementation. Social analysis investigates demographic factors, socio-economic determinants, social organizations, and socio-political context affecting needs and values of affected populations. For these reasons, social analysis is indispensable for improving project effectiveness, including directly increasing the economic and social benefits in development programs.

Although there is not a singular accepted definition, there is general agreement about the concept of SIA in principle. Social Impact Assessment is defined as the process of analyzing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and induced process of social change so as to create a more sustainable bio-physical human environment.

The conduct of SIA can enhance quality at entry, increase economic returns, and lay the groundwork for projects that are more sustainable due to their enhanced impact on local communities. The results of the SIA establish a social baseline against which changes resulting from the intervention can be measured in the future.

Functions of SIA

SIA has three specific functions:

(i) to assess the social issues and impacts on project affected persons requiring targeted project investments and to identify the principal stakeholders and interactions among them;
(ii) to help in the design of social services that may be provided in order to improve their quality of life, and achieving the project's economic and social goals through relevant technical and programmatic activities; and
(iii) to help in the formulation of a social strategy for participatory implementation of development (i.e. impacts), goals of development (such as poverty alleviation), and processes of development (e.g. participation, capacity building). Thus, SIA should also be involved in assisting communities to determine their development priorities, and as a process for incorporating social dimensions into development projects.

SIA is an umbrella or overarching framework that embodies all human impacts including aesthetic, archaeological and cultural heritage impacts, demographic and community impacts, development and economic impacts, gender assessment, health impacts, indigenous population groups' rights, institutional and political impacts, poverty assessment, resource issues (access and ownership of resources), and other impacts on societies.

Scope of Social Impact Assessment

Regional Socioeconomic Profile/Characteristics: This includes the following four sub-components:

(i) **Impacts on the socio-economic, cultural, and livelihood activities of affected populations.** The objective is to establish a profile of affected populations, broken down by age, gender, ethnicity, social structure, employment and labour patterns, sources of income (including production and marketing activities), local tenure and property rights arrangements, access to social services and facilities (including health, education, and agricultural extension and credit); use of community and natural resources relevant to formulation of development strategies in order to assist in determining project impacts on the social, economic, cultural, and livelihood activities of affected communities;

(ii) **Impacts on migration and future economic growth**. Identification and assessment of potential impacts of project in terms of patterns of migration and future economic growth due to the government's initiatives, possible population movements from other areas in the project provinces, increased mobility of communities, impacts of the project on isolated rural communities (in particular indigenous population, loggers and foresters/farmers, etc).

(iii) **Impacts on vulnerable populations**. The impacts of the project on vulnerable groups, such as indigenous population groups, women, displaced populations, and aged groups of people should be identified, analyzed, and adequately addressed. The SIA should look into the potential social impacts and issues related to increased access to markets, population movement, in-migration of outsiders into the project area, air and noise pollution, and spread of infectious diseases (including HIV/AIDS). The SIA findings should be strategic in order to suggest measures to minimize and mitigate adverse impacts.

(iv) **Impacts on development and reducing poverty**. Based on the assessment of potential social and economic impacts, the SIA should establish criteria that will assist in the formulation of development strategies, and to the extent possible, the equitable distribution of project development benefits, especially maximizing the impacts on poverty alleviation.

Stakeholder Analysis: An important activity in SIA is stakeholder analysis. Key stakeholders must be consulted and their inputs must be taken seriously in project design and evaluation. The key elements of stakeholder analysis include:

(i) identification of key stakeholders involved in various aspects of the project (project implementing and executing agencies and groups from civil society);
(ii) description of socio-economic organizations of local communities that may affect project outcomes;
(iii) identification of key formal and informal institutions operating at village and sub-regional levels and assessment of their role in community decision making processes as these affect project activities; and
(iv) assessment of local capacities in terms of participation in planning, implementation and supervision, and evaluation.

The methodology adopted for stakeholder analysis should include qualitative participatory interviews and focus group discussions with diverse community groups and individuals.

Institutional Analysis: Institutional analysis covering principal organizations/ institutions, related to project components and sub-components including key formal and informal institutions at village and sub-regional levels, and should incorporate:

(i) identification of internal and external conditions, factors and processes, that impact organizational effectiveness in addressing social objectives;

(ii) assessment of the agencies responsible for dealing with social issues (especially indigenous population and displaced people), ensuring that they have the required understanding, commitment, staffing, financial resources, and capacities to plan and implement social programs designed to meet their needs;
(iii) reviews of operational and project related management skills within the project proponent and other executing agencies, including identification of required measures and training needs, to strengthen and to build existing capacities for addressing social issues on a sustainable basis; and
(iv) recommendations and measures to strengthen the existing institutional structure in order to enhance participation of local communities for dealing with social issues. The institutional analysis will also include an assessment of the role of community level institutions in community decision-making.

Public Participation and Consultation: SIA process should ensure that consultations are carried out with key stakeholders (including affected community members), especially informal community leaders, including religious leaders, who often play pivotal roles in mobilizing people, to obtain their inputs for identification of problems and priorities, formulation of development strategies to enhance community ownership and commitment, facilitate approval process, and ensure their involvement in implementation. The consultation process that would ensure that the objectives of the project are acceptable to the intended beneficiaries, and would include identification of:

(i) potential conflicts which may arise and propose ways to resolve these conflicts;
(ii) mechanisms for community participation in setting out priorities, implementation of rehabilitation work, and expansion of infrastructure and public facilities; and
(iii) in consultation with key stakeholders, key social issues and make recommendations on measures necessary for mitigating adverse impacts.

Given the range of social issues that need to be considered, the SIA should be selective and strategic. The SIA should begin with identification of people and communities, including indigenous groups, that would be affected by the project, and define operationally relevant social issues that may affect project design, delivery, and outcomes.

2.7 Characteristics of Effective SIA

There are a number of different models about how SIA should be implemented, and its scope. To be effective, major characteristics of SIA should include the following:

Participation and Consultation

Public participation, information, education and consultation are key elements in the SIA process. Popular support for any issue can be greatly increased if the public is informed about it adequately and comprehensively. This is particularly true for issues where lack of involvement by, or non-cooperation from, the public will lead to negative effects. Combined with citizen involvement in the planning and regulatory processes, it also can contribute to more sustainable interventions.

Using participatory approach with key stakeholders (communities, non-governmental organizations, civil society groups) can bring about broad-based community participation in needs identification; setting needs-based priorities for the delivery of basic and environmental services; in generating "ownership" of components of key initiatives and thus creating sustainability through community involvement; in minimizing, and where necessary, resolving conflict; strengthening social capital and environmental quality beyond the life of a project-based intervention.

Impacts on Private Assets, incomes and livelihood

One of the key concepts of SIA is to protecting individual property rights, with clear statements of impacts required to ensure that individual rights are not transgressed. Where these rights are violated, SIA could be seen as contributing to mitigation and compensation mechanisms. To that extent, SIA tends to concentrate on negative impacts. The scope should be expanded to maximize benefits to potential affected communities or converting affected communities to beneficiaries. There is now a greater concern with maximizing social utility and development potential while ensuring that such development is generally acceptable to the community, equitable and sustainable, and that the adverse impacts are minimized, if cannot be completely avoided. The improvement of social well being of the wider community is generally recognized as an objective of development projects and plans.

Focus on Poverty & Other Vulnerable Groups

An important focus of SIA is poverty reduction and providing assistance to other vulnerable groups that face risks of marginalization. These marginalized communities or group of people may also include those without any security of tenure. Adequate attention needs to be paid to these marginalized people.

Mitigation of Social Impacts

SIA is a process that includes various types of impacts; some of the major ones are highlighted above. In short, it covers everything, but reports impacts in terms of what matters, or will likely matter, to people. In the development context, the role of SIA goes far beyond an advance prediction, to consideration of the empowerment of local people, enhancement of the position of women, minority groups and other disadvantaged members of society, development of capacity building, alleviation of all forms of dependency, increase in equity, and a focus on poverty reduction.

2.8 SA Methods and Tools

The methodology for the stakeholder and institutional analyses combine multiple tools and employ a variety of methods for collecting and analyzing data, including both quantitative approaches (statistical analysis of information available through secondary sources and socio-economic surveys) and qualitative methods (expert and key informant interviews, focus-group discussions, beneficiary assessments, rapid and participatory rural appraisal, gender analysis).

The selection of SIA methodologies should emphasize consultation and participation of PAPs, especially the project implementing and executing agencies at the national, regional, and sub-regional levels. These may include local populations and NGOs who are actively participating in project activities. The discussions between the officials of the relevant ministries, local government officials and other institutions and organizations in civil society, should be participatory and broad-based leading to the identification, selection, and agreement on project components and sub-components.

2.9 Organization of the SIA Process

The SA activities generally consist of: (a) preparation and desk review; (b) data collection; (c) analysis and processing; and (d) documentation.

A. Preparation and Desk Review:

Adequate preparation for SIA is critical to producing good quality and strategic results. The main activities will include:

(i) Review of the ongoing and planned government development programs;

(ii) Review of the primary conditions of the community, sub-regional and other government institution profiles, including their capacity to address social issues;
(iii) Identification of issues and problems that would need further investigation during field work for data collection and formal or informal interviews and consultations with key stakeholders;
(iv) Selection of targets for sample surveys and fieldwork, especially given the large number of institutions involved and other constraints, using carefully selected sampling; selected sample of institutions must be representative of major stakeholder interests at different levels and geographical distribution; and
(v) Preparation for field work in (sample survey) selected areas would cover assessment targets, scope, methodology (or methodologies) to be adopted, organizations to be covered, schedule, design of interview schedule, manpower and other resources required, and outputs to be expected.

B. Field Work for Data Collection:

The field-work should include at least the following activities:

(i) Formulation of a set of questions centered on the social issues related to the components/sub-components of the project, including those areas earlier identified as key concerns (impacts on affected populations, stakeholders, institutions, and consultation and participation approaches).
(ii) Discussion and interviews with focus groups (e.g. different groups of road users, indigenous population and other project beneficiaries) in order to solicit views on project components and sub-components, constraints, degree of satisfaction and the need for change, and perceptions on the proposed project.
(iii) Interview schedules and other survey instruments for collection of information.
(iv) Dialogues with government officials in charge of the project, including institutional management and employees, in order to determine the reasons that facilitate or deny access to public facilities, markets and other income earning opportunities and explore possible ways to address any institutional and other constraints that may exist and to assess capacities and interest in addressing social issues.

C. Data Analysis and Dissemination of Findings:

Data analysis shall focus on issues of operational importance. It is essential that the findings of the surveys and interviews are discussed with key stakeholders so that the conclusions and recommendations are appropriate and receive full commitment (especially from counterpart executing agencies).

D. Documentation and Output of the SIA Study:

The expected outcome of SIA would be in the form of a report, with detailed documentation of the findings of surveys. The report on SIA or Social Management Plan (SMP), should contribute to redefining project objectives and formulating project design appropriate to these objectives. Specifically, the report should contain:

(i) Project background, definition of project beneficiaries with relevant social dimensions (socio-cultural and demographic characteristics, ethnic diversity, and social organizations);
(ii) Explanation of the process and function of SIA study, including the strategies and methodologies adopted;
(iii) Identification of stakeholders, their needs, willingness to support the project, the convergence between project priorities and those of the beneficiary groups, priorities of project components;
(iv) Elucidation of the social issues and socio-economic impacts that need to be addressed, community groups, including indigenous population and other vulnerable groups (women

headed households, poverty groups, aged and destitute affected households, etc.), that are likely to be impacted by the project, and measures to minimize socio-economic inequalities, and to maximize equitable distribution of benefits; and poverty alleviation impacts of proposed investments; and

(v) Major institutions that have a stake and that are expected to play significant roles in project design and implementation, with descriptions of their structure, functional relationships with other institutions, skills and capacity for addressing social issues and measures to enhance their capacities and skills;

(vi) Recommendations for different stakeholder groups including indigenous population, to ensure their commitment and to build their capacity for participating in the project.

E. Social Management Plan (SMP)

The SMP will be a direct by product of the SIA. It will contain: a summary of the SIA, description of stakeholders and key organizations, issues identified directly impacting all Project Affected Persons aside from those to be resettled (temporary land acquisition, downstream water quality leading to fisheries losses, usually temporary impacts on domestic water supplies, etc), their mitigation measures, implementing agency (Project Developer), schedule, budget, and monitoring and evaluation. It should be noted that although the SAP may include some of the issues related to resettlement and indigenous population, the focus should be on issues that are not likely to be covered adequately in RAP and/or IPDPs.

3

Resettlement Plan

3.1 Resettlement Plan

The scope and level of detail of a Resettlement Action Plan (RAP) will vary with circumstances, depending on the project's complexity and the magnitude of its effects. At a minimum the RAP must ensure that the livelihoods of affected persons by the project are restored to levels prevailing before inception of the project. The overall objective of a RAP should be to promote the improvement of the living standards of affected persons by the project. Very often simple restoration of livelihood may be insufficient to protect affected persons from adverse impacts, especially induced effects, such as competition for resources and employment, inflation and the breakdown of social support networks. Thus, resettlement activities should result in measurable improvements in the economic conditions and social well-being of affected persons and communities.

3.2 Outline of Full Resettlement Plan preparation

Essential Components of a comprehensive RAP are as follows.

1. Project Description
2. Land Acquisition
3. Potential Impacts of the Project
4. Impact on Gender and other Vulnerable Group
5. Public Participation and Grievance Redress
6. Policy and Legal Framework
7. Entitlements
8. Resettlement Management Organisation
9. Relocation Planning
10. Rehabilitation & Livelihood Restoration
11. Resettlement Budget & Financing Plan
12. Phased Resettlement Implementation
13. Monitoring & Evaluation
14. Social Mitigation Measures

Project Description

At the very outset the project proponent should assess where and to what degree the project involves land acquisition, and thereby, involuntary resettlement and other negative impacts for local communities. Some kind of land use assessment is necessary to ascertain whether land must be acquired through involuntary means. If land is to be acquired, further assessment is important to determine the magnitude of socioeconomic impacts. It is important that a land acquisition assessment (LAA) be undertaken as early as possible, so that sufficient time is available to prepare a Resettlement Action Plan (RAP).

Information to be provided in this component:

- A general description of the project and the project area
- List of project components that create resettlement
- Identification of the project area
- List of alternatives considered to avoid or minimise resettlement: describe alternative options, if any, considered to avoid or minimise land acquisition and its effects
- Explain the results of these efforts - explain why remaining effects are unavoidable
- Describe the main objectives of the RAP

Land Acquisition

This component will describe:

- The country's framework for land acquisition through eminent domain and other regulatory measures.
- Policies, laws, and guidelines relating land acquisition and resettlement, and,
- Procedures for land acquisition and the payment of compensation.

Information to be included in this component**:**

- Describe scope of land acquisition (use maps), and why it is necessary
- Describe the alternatives considered to avoid or minimise land acquisition and its effects, and why remaining effects are unavoidable
- Describe the consultation process with agencies responsible for land acquisition and resettlement
- Include a review of the laws, regulations and guidelines that apply to land acquisition and resettlement
- Describe the mechanisms established to minimise resettlement, to the extent possible

.

Actions to be undertaken**:**

A land acquisition assessment (LAA) is necessary to ascertain whether land needs to be acquired through eminent domain. The LAA provides some indication of magnitude and scope of the resettlement impact. More detailed surveys will be carried out by the Census and Socioeconomic surveys. The LAA can identify the scale and complexities of the resettlement impact.

The LAA addresses the following issues:

- How much land area is required for the project?
- Who owns the land?
- In the case of state-owned land, is it subject to customary claim, squatters, or encroachers?
- How is the land, including state-owned land, currently used?
- What is the rough estimate of resettlement impacts to result from acquisition?
- Will it be possible to identify all resettlement impacts in the project before appraisal?

Box 3 - Requisite Information and Likely Available Sources

Land Acquisition Assessment Indicators	Information Sources
1. Quantity of land required	Planning documents, including engineering designs and maps
2. Location and ownership of land required	Fields verification
3. Use of land required	Land acquisition laws and regulatory procedures
4. Determining necessity of involuntary land acquisition	Information from project implementing agencies
5. Legal process of asset acquisition	Information from implementing agency.

Land Acquisition Assessment Indicators	Information Sources
6. Proposed timing of land acquisition, including details regarding land already acquired	Project planning documents
7. Land Use	Secondary data (government statistics; social or demographic research)
8(a) Productive use (e.g., agricultural or commercial), including present use of public lands designated for the project, and including seasonal or periodic uses; estimated number of households affected in each category. **8(b)** Estimated number of residential households affected, sorted by category of structure (e.g. by construction materials). **8(c)** Tenure status of present users. **8(d)** Presence of squatters or encroachers. **8(e)** Presence of public or community infrastructure. **8(f)** Presence of cultural, historical, or sacred sites. **8(g)** Presence of natural conservation sites or programs	Fields verification
Institutional Capacity	**Information Sources**
9. Which administrative entities are to be involved in land acquisition?	Project planning documents
10. Which personnel are responsible for RAP preparation and implementation?	Implementing agency
11. What is the current capacity of these entities and personnel to manage land acquisition and resettlement implementation?	Land acquisition laws and regulatory procedures

Potential Impacts of the Project

This component deals with identifying the resettlement impacts of the proposed development project. If a complete land acquisition assessment is undertaken, it will provide some preliminary information about the socioeconomic impacts of the project. Census and socioeconomic surveys are the starting point of resettlement planning. A survey of the number of affected persons, the extent and nature of the impacts on them, their existing socioeconomic conditions, and an examination of social, environmental and economic conditions is required to provide an adequate basis for resettlement planning and to establish a baseline by which to measure the effectiveness of resettlement activities. For more information refer to **Box 4** for the census survey and on inventory of assets to be acquired for a socioeconomic survey.

Box 4 - Census Survey and Inventory of Assets to be Acquired	
Purpose	A census (a listing of project-affected persons and households) is conducted to establish eligibility of entitlements. This is especially important in settings where disclosure of project plans is likely to encourage land invasion or other forms of fraudulent claims for compensation. The census and inventory also provide much of the foundation to establish baseline information on household income, livelihood patterns, standard of living and productive capacity. This baseline is the reference point by which the extent of income restoration and the effectiveness of other rehabilitation efforts can be measured.
Baseline	Baseline information is required for restoration of incomes and living standards. This

Box 4 - Census Survey and Inventory of Assets to be Acquired	
Information	includes information on: ▪ the full resource base of the affected population, including income derived from the informal sector and from common property; ▪ public infrastructure and community services that will be affected.
Special Groups	Particular attention must be paid to vulnerable groups living in the project area. These groups may include households headed by women, people with disabilities, the extremely poor, the elderly and groups that suffer social and economic discrimination. People who may not occupy a site required by a project at the time of enumeration should be accounted for in the census. Refugees or people internally displaced by civil conflict may be unable or unwilling to return to a location to exercise their land claims. This entails a system for checking and validating land claims.
Time & Resources	Since both the census and inventory require visits to all affected households, it generally is more efficient to do them together. The time and resources required for gathering information also will vary significantly depending upon the project and the complexity of its impacts. In general terms, however, gathering information is likely to require time from the first identification that land acquisition is necessary until RAP preparation.
Cut-off Date	Completion of the census represents a provisional cut-off date for eligibility for resettlement assistance, especially for the non-titleholders. This makes it essential to ensure sufficient awareness of the cut off date and to prevent influx of opportunist people to claim resettlement assistance.
Conducting a Census Survey	Agree on what data to be collected: ▪ The census survey should identify and inventory every family of the affected population and all their immobile assets. A census survey presumes the availability of sufficient detailed and current maps and a determination of the precise area that will be affected by the development undertaking. Cases where the precise area of impact is not known, the census survey will only be approximate and thus not complete and accurate basis for detailed planning. ▪ Information about type and extent of common properties and intangible assets (e.g., land, public infrastructure, buildings, business enterprises) in the affected land should also be collected. If there is a lag of couple of years or more between the census and actual acquisition, demographic and socioeconomic factors may change significantly, diminishing the validity of census data. It is good practice to hold the census within one year of land acquisition if possible. Yet, in situations where an early census has been necessary to establish eligibility, but where implementation is delayed, a reasonable solution may be to update the earlier census prior to implementation, based upon agreed procedures for handling transfer of entitlements through inheritance, maturation, or property transactions. If there is a lag or two years or more between gathering of baseline data and actual acquisition, baseline data should be updated.

Information to be included in this component**:**

- Describe the efforts made for minimizing displacement - describe alternative options, if any, considered to avoid or minimise land acquisition and its effects. Explain the results of these efforts - explain why remaining effects are unavoidable.

- Description of project components and activities that give rise to resettlement. Include maps of the areas or zone of impact of such components or activities. Include maps of population settlements, infrastructure, and natural resources, such as natural vegetation areas, water resources, and land use patterns.
- Enumerate the affected persons and list/register them according to location -establish a list of legitimate beneficiaries before the project's onset to counter spurious claims from those moving into the project area solely in anticipation of benefits. See **Box 5** for elements of a census survey.

Box 5 - Elements of a Census Survey (100 percent of the affected households)

Census and Assets Inventory	**Sources of Information**
1. Determining eligibility for entitlements	Property and residence registrations, with on-site verification
2. Determining categories of entitlement	Property registration with on-site verification of possession or use of assets
3. Providing (partial) basis for valuation and compensation	On-site assessment of quantity and quality of assets

- Inventory of lost and affected assets at the household, commercial and community level.
- Information on vulnerable groups or persons for whom special provisions may have to be made.
- Include findings from the socioeconomic census and survey conducted in the project. See **Box 6** for elements of a socioeconomic survey. In addition to information about productive activities, sources of income and property rights, the socioeconomic survey should assess that in the following table.

Box 6 - Elements of a Socioeconomic Survey

Socioeconomic Assessment	**Sources of Information**
1. What forms of property (including common property), social specialization, or division of labour form the basis of economic activities?	Land acquisition assessment
2. What risks does the project present and which groups are vulnerable to them?	Plans, maps, other secondary sources
3. Whose cooperation (e.g., village heads, or leaders of professional groups, women's groups, or cultural groups) is essential to effective resettlement design and implementation?	Field observation
4. Can an unaffected "control group" be identified that is suitable for comparative purposes regarding income restoration?	Household surveys, focus group discussions, participatory rural appraisal (PRA) methods

- Summarise key effects in terms of land acquired, assets lost, and people displaced from homes and livelihoods.
- Analysis of survey results and studies (census and socioeconomic surveys) establish compensation parameters, to design income restoration and sustainable development initiatives.
- Describe consultations with affected persons (including host communities) regarding mitigation effects and development opportunities.

Actions to be undertaken**:**

- Prepare a detailed large-scale map (if possible supported with aerial photographs) on which individual affected households are identified with registration numbers derived from the population census.
- Undertake land surveys and map different types of land according to use.
- From these survey maps, prepare various thematic maps that identify the location and extent of important types of land use categories, location of common property resources, cultural property, road and transport networks, and the location of employment and services.
  N.B: Mapping of the project area will provide a spatial reference or baseline with which to protect the project from claims by people who move into the affected area after the cut-off date.
- Conduct Census of affected persons by the project of all losses for each household, enterprise or community affected by the project.
- Prepare a socioeconomic profile for each population in a way that identifies differences in the needs, demands and absorptive capacity of each subgroup. Household Census involves: individuals, related population, individual and collective assets, including house, land, crops, other buildings, infrastructure, and animals. Specific requirements are function of compensation and R&R policies. Refer Box 7 for a list of data suitable for a census survey.

Box 7 – Data for census Survey

1. Background information	**2. Family Census**
• Name of village • Name of higher order administrative unit (county or province to differentiate local places that have the same name • Head of village (paramount chief, mayor, administrator) • Interviewer, name and identification number • Date of survey (may be more than one if return visits required) • Supervisor (or questionnaire verifier), name and identification number	• Unique code for household • Name of each person living in household (including help and workers). Name should be standardized (e.g., last name, first name). • Unique code for each person • Relationship of each person to head of household • Birth and year of each person • Gender of each person • Marital status of each person • Religion of each person • Caste of each person • Education level of each person • Occupation (primary and secondary) of each person • Income (by primary and secondary occupation and other) of each person • Preferences for compensation of each person • Disability or special considerations of each person • For children under 12 and adults over 50 in HH arm band measurement
3. Land Tenure	**4. Land Use**
• Type of land ownership (own-entirely; own-share; rent; sharecrop; squat; informal use right) • If owned by HH, name of HH member • If not owned by HH, name of owner	• Total plot/land size • Area used for family dwelling (%) • Area used for business (%) • Area used for agricultural production (%) • Area used for grazing (%)

• If not owned by HH, location of owner • If own-share, name of co-owner • If own-share, location of co-owner • If informal use right, define agreement • Number of years used	• Area used for fish ponds (%) • Area used for forest (%) • Area used for grassland (%) • Area used for wasteland (or not use(%) • Total plot/land size affected by project • Phase affected by project
5. Structures • Type of structure • Owner of structure in HH • Use of structure • Size of structure • Number of rooms • Size of rooms • Use of rooms • Wall construction material • Flooring material • Roofing material • Number of doors and windows • Notes of special requirements (e.g. kitchen roof rafters used to store and dry seeds for agriculture	**6. Other structures** • Number and type of fencing used • Length of each type of fencing used **7. Private Infrastructure** • Water system by type (including potable water wells, roof collection, livestock wells, ponds, and irrigation) • Number of each type of water system • Size of each type of water system • Which water system is affected by project • Number of latrines • Number of users of each latrine • Number and type of drains
8. Livestock and other animals • Number and type of livestock and animals owned • Owner of animals in HH • Breeds of animals • Health and conditions of each (to be checked by vet or animal husbandry specialist)	**9. Agricultural Production** • Type of crops • Owner of crops in HH • Total yearly production of each crop type • Use of each crop (home or sale) • Average yield of each crop • Seasonality of yearly production cycle • Number of paid man days non-family labour • Markets where produce is sold • Total HH income from sale of agriculture products
10. Trees • Number and types of trees • Owner of trees in HH • Age of trees • Ave. yield of fruit bearing trees • Use of fruit (home or sale) • Total HH income from sale of fruit	**11. Farm Inventory** • Type of agriculture equipment • Number of each type of agricultural equipment • Owner of agriculture equipment in HH • Number of people hired as farm labour (seasonal) • Location of suppliers for agriculture inputs (seeds, fertilizer, etc.)
12. Business Inventory • Type of business • Owner of business in HH	**13. Household Equipment** • Type of lighting (fire, kerosene, flashlight, electric) • Type of transport and owner of each (bike,

• Type of business equipment • Number of each type of business equipment • Number of paid man days non-family labour • Markets where goods are sold • Seasonality of business • Total HH income from business • Location of suppliers for business inputs	motorcycle, truck, animal cart) • Type of furnishings and owner of each (bed, chairs, tables, china cupboard) • Type of entertainment and owner of each (radio, stereo, TV)

- Prepare an Inventory of lost assets: Provision must be made to accommodate individuals and groups who are not present at the time of registration but who have a legitimate claim to membership in the affected community.
- Register the affected population by residence or locality: This will establish a list of legitimate beneficiaries.
- Conduct Socioeconomic Studies (SES). The SES is carried out on a sample of affected persons, usually 20 -25 percent of the total affected population, usually through a household questionnaire.
- Analyse surveys and studies. The analysis of the data collected in the census, assets inventory and socioeconomic studies must provide information to:

- prepare a list of Affected Persons according to the existing compensation policy
- establish an entitlement matrix for all losses
- design appropriate livelihood restoration and development interventions
- provide indicators for future monitoring and evaluation for RAP implementation.

- Consult with affected population regarding resettlement assistance. See **Box 8** for consultations on the results of surveys.

Box 8 - Consultations on the Results of Surveys

After completion of the census and survey, the results and information must be disseminated. This may require the establishment of some form of project public information unit to provide information and answer queries. The information unit should be accessible. Field units may be needed to serve the affected persons located in distant or inaccessible areas.

Based on the information provided by the surveys and studies, conduct consultations with affected persons regarding the Resettlement Action Plan (RAP) strategy for livelihood restoration. These consultations can be held with representatives of the affected population, including representatives of host communities. Depending on the local cultural context, information may best be disseminated in varying forms (e.g., printed, visual or oral).

This stage of consultation may be protracted, depending on geographic distances among PAPs and host communities, seasonal access problems, cultural and social issues, and other factors. Geographically remote and culturally distinct PAPs often are fewer in number and costly to interview. Consultation with such groups is essential.

Gender and Other Vulnerable Groups

Vulnerable groups include scheduled tribes, scheduled castes, single-headed households, those headed by the elderly and women, and families living below the poverty line, destitute, aged, and

orphans. It is envisaged that in the course of preparing and implementing RPs, the interests of these vulnerable groups would be adequately protected.

Women are likely to be particularly vulnerable

Women are likely to experience differential socioeconomic setbacks due to their disadvantaged positioning within socioeconomic structures and processes. This is likely to be manifested most in the loss of common property resources as a result of their forced eviction from ROW. The following information should be collected during the socioeconomic survey:
(i) Number of women-headed households
(ii) Socio-demographic characteristics of affected women
(iii) Health status, including number of children per woman
(iv) Women's role in the household economy, i.e. information on usual activity, occupation, etc.
(v) Time disposition
(vi) Decision-making power among women PAPs
(vii) Occupations, livelihood activities, and asset ownership
As women are often the worst victims of transition between displacement and resettlement, they have to be integrated in the project as full-fledged participants taking part in all stages of the project (from planning through implementation) and on to the post-project stages. This is the only way to make sure that the process of resettlement and rehabilitation is an exercise in equitable distribution of resources and benefits in a gender-sensitive manner.

Task**s**

The following tasks should be accomplished during preparation, as well as implementation stage:
(i) Ensure involvement of women in the project
(ii) Ensure facilities are provided in construction camps
(iii) Provide support to vulnerable groups other than women

Steps

Under each task below the listed steps should be followed.

How women can be involved in the project

Participation of women can be ensured specifically in the following ways:

1. Ensure women take part in the consultation process.
2. Ensure that women are consulted and invited to participate in group-based activities to gain access and control over resources. Compensation for land and assets lost should be the same for all the affected or displaced families; special care needs to be taken by NGOs for women's groups, while implementing acquisition and compensation as well.
3. Ensure that women are included in the issuance of identity cards, opening accounts in the bank, receiving compensation amounts through cheques in their name, etc. This will further widen the perspective of participation by the women in project implementation.
4. Provide separate training to women's groups for upgrading skill in alternative livelihoods and assist beneficiaries to start production and businesses.
5. Initiate women's participation through self help group formation in each of the villages affected by the project. These groups can then be linked to special development schemes of the Government.
6. Encourage women to evaluate the project outputs from their point of view, and their useful suggestions should be noted when taking necessary action for further modifications in the project, creating better and congenial situation for increasing participation from women. If all these are done in a participatory manner, it might bring sustainable results in terms of income restoration of women as a vulnerable group.

Involvement of women in construction activities

Wherever possible, women's involvement in construction activities should be encouraged in order to help them have access to benefits of project activities. The construction works for widening and strengthening the project corridor starts after the R&R activities are over and COI is clear of any encroachment and other encumbrances. The construction contractors set up their construction camps in identified locations, where labor force required for construction activities will be provided with temporary residential accommodation and other necessary infrastructure facilities. The labor force required for construction activities has to be of a highly skilled nature, as there is a lot of mechanized work in construction of the highway. In addition, unskilled labor, which women can certainly contribute, is required.

Apart from this, women as family members of skilled and semi-skilled laborers will also stay in the construction camps and will be indirectly involved during the construction phase. The families of laborers will include their children. The construction contractors are expected to bring along skilled labor whereas local labor available will be used for unskilled activities. The labor force, both migratory as well as local, will have both male and female members.

Public Participation and Grievance Redress

Participation is a process by which Affected Persons assume responsibility over their lives. Participation is most important because the success of resettlement, like the success of most of the projects that cause it, depends in part upon the responsiveness of those affected. See **Box 9** for consultation and participation in resettlement.

Box 9 - Consultation and Participation in Resettlement

Projects resulting in physical or economic displacement have special consultation responsibilities. Participation as a generic term usually encompasses two distinct dimensions:

A. Dissemination and consultation: involving the exchange of information -

Dissemination refers to the transfer of information from project officials to the affected population. Providing early and accurate information to Affected Persons, allays fears, dispels misconceptions and builds trust, providing a foundation for collaboration between the affected population and project authorities.

Consultation refers to joint discussion between project officials and the affected population, serving as the conduit for transfer of information from the latter to the former. It also implies a sharing of ideas. Consultation can be fostered by holding public meetings and identifying focus groups. Household surveys represent an opportunity for direct consultation.

B. Collaboration or participation: involving varying forms of joint decision-making-

Collaboration refers to mechanisms for joint decision-making, for e.g., setting up committees, tribunals, etc. Though collaboration and participation often are used interchangeably, participation more broadly includes the transfer of decision-making power to those affected (e.g., providing options). Participation, in this sense, represents a step by which Affected Persons assume responsibility over their lives. Participation is most important because the success of resettlement, like the success of most of the projects that cause it, depends in part upon the responsiveness of those affected.

Agree on a Process for Consultation and Participation:

a - Identify all stakeholders. This should include those likely to be critical of resettlement.

Stakeholders are those who have a direct interest in project development, and who will be involved in the consultative process. There are primary and secondary stakeholders. Primary stakeholders include the affected persons, the beneficiaries of the project, the host populations are any proposed resettlement sites and the project proponent. Secondary stakeholders are the other individuals or groups with interest in the project, such as the national government and politicians, local authorities, policy makers, advocacy groups, and NGOs.

b - Prepare a description of all stakeholders who will be involved in the consultation process.

Box 9 - Consultation and Participation in Resettlement

Identify NGOs actively involved in resettlement or with the potential to act effectively.

c - Prepare a consultation and participation process with the various stakeholders.

d- Agree on an information disseminating strategy including the preparation of a Resettlement Booklet, if appropriate.

Affected persons should be fully informed of their rights and responsibilities. To achieve this objective, information must be made accessible and understandable. Information should be translated where necessary. The affected population should be notified of the availability of information by way of public notice boards and mobile announcements, newspapers, leaflets and flyers, town crier and door-to –door canvassing. Special efforts should be made to reach vulnerable groups lacking access to public media and information exchange.

e - Agree on the participation mechanisms to facilitate the consultation process.

The objective of these consultations should be to secure the participation of all affected persons by the project in their own resettlement planning and implementation, particularly in the following areas:

- Alternative project design
- Assessment of project impacts
- Resettlement strategy
- Compensation rates and eligibility for entitlements
- Choice of resettlement site and timing of relocation
- Development opportunities and initiatives
- Development of procedures for redressing grievances and resolving disputes
- Mechanisms for monitoring and evaluation and implementing corrective restoration

f- Identify the institutional and financial provisions for continuing consultation throughout project preparation and implementation.

g- Workout the grievance redress framework (informal and formal channels) that will be put in place by the project proponent setting out the time frame and mechanisms for resolution of complaints about resettlement.

Information to be included in this component**:**

- Description of all stakeholders who will be involved in the consultation process.
- Description of the consultation and participation process with affected persons, host community, NGOs, and local government and related authorities conducted and to be conducted in the different stages of the project cycle.
- Describe the plan for disseminating information to project affected persons (PAPs), including a Resettlement Booklet, if appropriate.
- Description of the participation mechanisms to facilitate the consultation process.
- Description of the institutional and financial provisions for continuing consultation throughout project preparation and implementation.
- Description of the grievance redress framework (informal and formal channels) that will be put in place by the project proponent setting out the time frame and mechanisms for resolution of complaints about resettlement. See **Box 10** for the grievance redress process.

Box 10 - Grievance Redress Process

Regardless of its scale, involuntary resettlement inevitably gives rise to grievances among the affected population over issues ranging from rates of compensation and eligibility criteria to the location of resettlement sites and the quality of the services at those sites. Timely redress of such grievances is vital to the satisfactory implementation of resettlement and to completion of the

project schedule.

Agree on a Grievance Redress Process:

- Plan the step-by-step process for registering and addressing grievances.
- Identify mechanisms for appeal.
- Agree on provisions to approach civil courts in case other provisions fail.

The Project Proponent must ensure that procedures are in place to allow affected persons to lodge a complaint or a claim without cost and with the assurance of a timely and satisfactory resolution of that complaint or claim. The project may have to make special accommodations for women and members of vulnerable groups to ensure that they have equal access to grievance redress procedures. The project management should make every effort to resolve grievances at the community level. Recourse to the legal system should be avoided except as a last resort.

Grievance redress framework

The Resettlement Action Plan (RAP) should describe the grievance redress framework that will be put in place by the project proponent. This description should include:

- Institutional arrangements.
- Procedure for recording and processing grievances.
- Mechanisms for adjudicating grievances and appealing judgments.
- A schedule with deadlines for all steps in the grievance redress process

Policy Framework and Legal Framework

Information to be included in this component**:**

- Description of key national, donor related (where applicable) and project specific compensation and resettlement policies, laws and guidelines that apply to the project
- Include the analysis of the policies, laws, regulations and guidelines relevant to resettlement activities of the project.
- Explain how the national policy on involuntary resettlement will be achieved.
- Description of any compensation guidelines, methodologies used to value losses, proposed types and levels of compensation to be paid, compensation and assistance eligibility criteria and how and when compensation will be paid.

Actions to be undertaken**:**

- Identify policy and legal framework applicable to the project.
- Review applicable national, state, sector and project resettlement guidelines, policies and procedures.
- Identify all categories of impacts associated with the project (from census and socioeconomic surveys) See **Box 11** for various categories of impact.

Box 11 - Categories of Impact

Census and socioeconomic survey data are used to categorize impacts and project affected persons. All impacts must be reflected in this categorization since it forms the basis for determining eligibility and for designing assistance packages.

Typical categories of impact include:

- Permanent land acquisition (individually or collectively held)
- Temporary leasing (individually or collectively held)

- Loss of housing
- Partial impacts on houses and other structures
- Relocation of various types of enterprises: state, private
- Loss of sales and customers
- Temporary affected enterprises
- Loss of employment in enterprises
- Loss of employment in agriculture
- Loss of access to open resources
- Temporary loss of employment in agriculture due to temporary land acquisition
- Impacts on public infrastructure and other community assets
- Loss of standing crops
- Indirect impacts in the disturbance zone
- Relocation

In addition to the above, there are impacts on communities left behind, host communities, and indirectly affected communities (e.g. those affected downstream along a river that has been dammed). These impacts are not generally measured at the household level. Impact measurement and associated mitigation is aimed at wider communities.

- Agree on entitlement polices for each category of impact with the project proponent See **Box 12** for entitlement policies for categories of impact.

Box 12 - Entitlement Policies for the Categories of Impact

Entitlement policies describe the specific resettlement provisions (e.g., compensation at replacement cost, replacement lands, etc.) for affected assets to which project affected persons in each category of impact are entitled.

Essential elements of an entitlement policy include:

- Paying replacement cost for affected assets Preference for land-for-land
- Replacement/provision of income generating assets
- Transfer arrangements (from affected to relocation areas)
- Provision of adequate infrastructure
- Transition allowances for the duration of the transition.

Although the nature of the entitlement would vary depending on the specific circumstances of each project, the following is a list of components that could form part of an entitlement package for resettlement:

- Compensation for property (land, houses, commercial buildings)
- Compensation for loss of income
- Compensation for service workers and migratory people
- Allocation of land for resettlement
- Assistance to acquire income generating assets
- Assistance to move to new relocation site
- Assistance during transition period
- Preferential subsidies for agriculture and non-agriculture pursuits
- Assistance for house construction
- Civic and other public amenities at the resettlement site
- Employment for affected persons.

Entitlements

Information to be included in this component

- Eligibility – provide a definition for project affected (displaced) persons and criteria for determining their eligibility for compensation and other resettlement assistance, including relevant cut-off dates.
- Eligibility Policy – Include details of the eligibility policy for all categories of loss, including compensation rates.
- Include an Entitlement matrix.
- Resettlement measures – Describe the packages of compensation and other resettlement measures that will assist each category of eligible displaced persons to achieve the objectives of the RAP.
- In addition to being technically and economically feasible, the resettlement packages should be compatible with the cultural preferences of the displaced persons, and prepared in consultation with them.
- Valuation of and compensation for losses. Explain the methodology to be used in valuing losses (affected structures, land, trees, and other assets) to determine their replacement cost; and a description of the proposed types and levels of compensation under law and such supplementary measures as are necessary to achieve replacement cost for lost assets. See **Box 13** for valuation at replacement cost.
- Responsibility and Schedule for compensation payments.
- Dispute resolution and grievance redress procedures.

Box 13 - Valuation at Replacement Cost

Replacement cost is the method of valuation of assets which helps determine the amount sufficient to replace lost assets and cover transaction costs. In applying this method of valuation, depreciation of structures and assets should not be taken into account. For losses that cannot easily be valued or compensated for in monetary terms (e.g., access to public services, customers and suppliers; or to fishing, grazing or forest areas), attempts are made to establish access to equivalent and culturally acceptable resources and earning opportunities.

Replacement cost for land

For agriculture land, replacement cost is the pre-project or pre-displacement, whichever is higher, market value of land or equal potential or use located in the vicinity of the affected land, plus the cost of land preparation to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.

For land in urban areas, replacement cost is the pre-displacement market value of land equal size and use, with similar or improved public infrastructure facilities and services and located in the vicinity of the affected land, plus the cost of any registration and transfer taxes.

Replacement cost for houses and structures

Replacement cost is the market cost of the materials to build a replacement structure, plus the cost of transporting building materials to the construction site, plus the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes. (The cost of the land upon which the house or structure sits is considered in Replacement cost of land).

1. The schedule of rates obtained from the Ministry of Public Works: The Ministry of Public Works will have a schedule of rates for preparing estimates for construction projects, which agencies themselves use to assess costs for construction materials and labour. When applied to calculation of replacement cost, rates current for the period of actual replacement must be used; and

2. The rates quoted by contractors for similar structures in other construction projects / programmes: Where rate schedules do not exist or out of date, recent quotations by contractors for similar types of construction in the vicinity of the project can be used for calculating replacement cost. In projects offering the options of cash compensation or alternative accommodation, the construction cost estimates for alternative accommodation could be used for calculating cash compensation payable.

Replacement cost for other assets

1. Public infrastructure: In-kind replacement under force account within an agreed time schedule, or full compensation to the agency replacing the service is required.

2. Cultural property and community-owned facilities: In-kind replacement or compensation at replacement cost for land and structures (e.g., religious churches, mosques, temples, or shrines; private or community-operated schools; village meeting houses; local libraries).

3. Cash crops: Arrangements should be made to allow for harvest or market value should be paid for lost cash crops. Average annual market value of crops for the previous 3 years is deemed appropriate as crop compensation. Compensation for subsistence crops can be in-kind, or can be an amount of cash sufficient to purchase equivalent supplies. Value of crops can be obtained from local agriculture department office.

4. Trees: Where markets do not provide sufficient information about the value of fruit or timber, compensation for fruit-bearing and non-fruit-bearing trees should be at net present value calculated for the productive life. In the case of immature trees, a less costly alternative may be to directly replace seedlings. Department of Horticulture in case of fruit bearing trees and Department of Forest in case of other trees are the sources for arriving at cost.

5. Other assets: Tube wells, graves, fishponds, poultry houses, fences, and other tangible assets should be replaced in kind (or with functional equivalents), relocated, or be compensated at replacement cost.

Action to be undertaken**:**

- Determine eligibility for compensation and other resettlement assistance when determining the eligibility of those lacking legal land title or residency permits is an issue, project-specific "cut-off dates" can be used to discourage entry into the area by people seeking to establish claims for assistance. See **Box 14** on how to resettle squatters and encroachers.

Box 14 - Resettling Squatters and Encroachers

Many development projects displace persons lacking full legal title to land or structures. Often affected are residential squatters in urban or rural areas, and agricultural or forest encroachers. Unlike persons asserting long-standing or ancestral customary claims to property, squatters and encroachers typically claim use rights or even ownership following relatively recent occupation of unutilised or unprotected land.

Project proponents seeking to enforce legal property systems, may not want to extend eligibility for compensation or rehabilitation entitlements to those lacking legal title or other forms of official recognition. Squatters and encroachers in occupation of land before project initiation are likely to have invested in structures or land improvements that should be compensated. The Project proponent (and the donor, where applicable) have a legitimate interest in preventing fraudulent claims from squatters or encroachers arriving in the project area after project initiation specifically to obtain resettlement benefits.

a Project affected persons on untitled land should receive compensation or rehabilitation assistance equivalent to replacement cost for lost assets.

Squatters and encroachers have a personal investment in structures or agricultural crops. Under the policy they are entitled to compensation at replacement cost (or an equivalent amount of rehabilitation assistance) for these lost assets.

b Project affected persons lacking legal title to land can be rehabilitated instead of compensated.

Compensation implies legal recognition of property rights, and often project proponents are reluctant to

"compensate" squatters and encroachers. To obtain assistance for those with de facto use or occupation rights, the provision of "rehabilitation assistance" is practices as a substitute for compensation. This is acceptable provided that such packages are the equivalent, at minimum, of full replacement cost for lost assets. Rehabilitation packages must provide *agricultural encroachers* with options for replacement land. Replacement parcels for agricultural encroachers should be at least of a minimum size and quality sufficient for economic viability, and should include some form of regularised title. Rehabilitation provisions for those *residing on encroached land, but not deriving their primary income from land,* should be sufficient to allow them to restore residential living standards, but need not include replacement land as an income-restoration measure.

c Squatters in public safety zones should receive rehabilitation assistance.

Project proponents are not expected to grant squatters or encroachers rights to highway impact areas, drainage pipes or facilities, railway right-of-way, or other areas necessary to maintain public health or safety. No formal compensation for lost land or structures within safety zones is required. However, those displaced from such zones (established before consideration of the project) must be eligible for standard rehabilitation packages, and income-restoration measures if necessary. Generally, there is no requirement to provide compensation or other resettlement benefits for those encroaching into adjacent public safety zones as a supplement to their own private land holdings. They would be entitled to compensation at replacement cost to the extent that their own private lands are acquired.

d Landlords in public safety zones are not entitled to compensation or rehabilitation.

The rationale for requiring rehabilitation of squatters living in public safety zones is to protect or improve living standards of poor or vulnerable groups. It does not give protection of illegal rents accruing to squatter landlords from structures built in public safety zones.

e Unlicensed street vendors and pavement dwellers are not directly affected.

Unlicensed street vendors (e.g., mobile enterprises lacking structures or other fixed improvements to land) and pavement dwellers (e.g., squatters living without fixed structures along roads) lose no land or assets through displacement and hence are not covered. *Vendors with official site licenses,* however, have recognized rights and must be provided with an alternative site and compensation for any transition expenses. For *unlicensed vendors*, provision of a transition allowance is recommended. Attention to project design can provide opportunities to restore or improve incomes or living standards in some cases, or to avoid such dislocation in others.

Guarding Against Fraudulent Claims

a Only project-affected squatters and encroachers are entitled

The objective is to protect squatters and encroachers from eviction without compensation or rehabilitation only as a direct result of development projects. Squatters or encroachers subject to prior and active (e.g., in advance of exploratory project discussions) eviction notices, or those evicted in connection with national or regional property regularization programs not associated with the development project would not be covered.

b Cut-off dates and land-use surveys essential to protection from fraudulent claims.

To prevent false claims for compensation or rehabilitation following disclosure of project plans, the project proponent should decide on an explicit eligibility cut-off date. A census and socioeconomic survey should be undertaken as close as possible to the cut-off date to determine the number of project affected persons, and the amount of structures and other assets affected. Project managers should also examine public lands allocated for the project for evidence of private use.

- Work out details of the Eligibility Policy for all categories of loss, including compensation rates.
- Prepare an Entitlement matrix.
- Work out the packages of compensation and other resettlement measures that will assist each category of eligible displaced persons to achieve the objectives of the NIRP.

- Establish a timetable for payment of compensation and delivery of related entitlements to each category of eligible people. It may be advisable for compensation payments to be staggered or paid out in instalments to allow affected persons to establish themselves at the new site. This will also allow resettlement planners to determine if payments are being used for their intended purpose, and if not to adjust the compensation framework accordingly.

Resettlement Management Organisation

The RAP must identify and provide details on the roles and responsibilities of all organizations – public or private, governmental or non-governmental – that will be responsible for resettlement activities. The capacity of these organizations to carry out their responsibilities should be assessed. See **Box 15** for the organisational framework for resettlement management.

Box 15 - Organisational Framework for Resettlement Management

Establishing a Resettlement Unit

As soon as the Initial Social Assessment is completed, the project proponent should decide, based on the likely impact, whether a resettlement unit is required. A resettlement unit may be required for projects with significant impact. Projects with limited land acquisition affecting only a few families or having limited adverse impacts may not require a resettlement unit. In these cases, existing institutional arrangements should be identified for compensation and resettlement and include agreements in the project documentation with appropriate lines of accountability within the existing institutional framework.

If the scope of resettlement is large a separate resettlement unit will probably be required to deal with issues concerning compensation and rehabilitation of affected persons. The following issues should be dealt with at the project preparation stage:

- Form and size of the resettlement unit
- Mandate of the resettlement unit
- Financial and administrative authority of the resettlement project director
- Staffing and budget
- Requirements for training and capacity building.

Typically a resettlement unit is established within the department or agency responsible for the main development project. This will enable the agency to coordinate all resettlement activities, including land acquisition and compensation payments normally carried out by other agencies.

Resettlement Advisory Group

Depending on the scale of resettlement, it may be appropriate to create a resettlement advisory group to coordinate the implementation of the RAP. This level of authority is required to ensure timely implementation of resettlement activities and redress of grievances.

This advisory group should comprise representatives of the project proponent, relevant government line and administrative departments, community organisations, NGOs involved in support of resettlement and representatives of the communities affected by the project, including host communities.

Resettlement Committees

The formulation of resettlement committees within the affected population should be encouraged early in the resettlement process. These committees should comprise the formal leadership of the affected population, and representatives of interest groups within the community that may have no formal leadership, such as landless households, artisans, and women. The resettlement committees can play an important role in negotiating compensation, designing strategies for restoration and development of livelihood strategies and monitoring overall implementation of the RAP.

Box 15 - Organisational Framework for Resettlement Management

Staffing and Budget

In many cases resettlement units are understaffed. Care should be taken to allocate staff and other resources needed before project approval. An adequate ratio of resettlement staff to affected persons depends on a variety of factors, such as number of affected persons, the number of sites and the complexity of the issues.

Staff Training and Capacity Building

Based on the analysis of existing capacity and resettlement needs, staff development and training should be planned and budgeted.

Resettlement Implementation Agency

Involvement of NGOs in resettlement projects is considered particularly useful in the following areas:

- Gathering and sharing information
- Planning and implementing income generating schemes
- Developing information campaigns and community participation
- Strengthening local institutions and community self-reliance
- Delivering services to hard-to-reach communities in a more efficient and cost effective manner.

The following criteria should be used in selecting implementing agency for resettlement work:

- Be from the project-affected area or having prior work experience in the area.
- Have a good track record in terms of programme planning and implementation in areas like rural development, poverty, gender issues, environment and participation.
- Have appropriate staff with technical and social skills in resettlement, community development and participation.
- Be registered with the government as an NGO with good standing and sound financial condition for project implementation purposes.
- Not be involved with any political party or religious groups directly or indirectly.

Information to be included in this component**:**

- Details on the roles and responsibilities of all organizations (public or private, governmental or non-governmental) that will be resettlement activities (include the findings of an analysis of the agencies responsible for resettlement activities and project implementation).
- Assessment of the institutional capacity of such agencies.

Actions to be taken**:**

- Identify as early as possible appropriate agencies mandated to plan and implement compensation, income restoration and rehabilitation programmes.
- Soon after the Initial Social Assessment is completed, the project decides, based on the likely impact, whether a resettlement unit is required.
- Allocate staff and other resources needed for the resettlement unit before project approval.
- Based on the analysis of existing capacity and resettlement needs, plan and budget staff development and training.

Relocation Planning

This component will include details of site selection, site preparation and relocation.

Information to be included in the Relocation Plan**:**

- List of alternative relocation sites that were considered.
- Describe in detail the site selected, and why it was selected.
- Information relating to the provision of housing, infrastructure, and social services.

- Describe efforts to protect, move and restore cultural property and relocation of artefacts and structures associated with religious worship.
- Environmental Protection & Management: Include a description of the boundaries of the relocation area and an assessment of the environmental impacts of the proposed resettlement and measures to mitigate and manage these impacts (coordinated as appropriate with the environmental assessment of the main investment requiring the resettlement).

Actions to be undertaken**:**

- Based upon consultations with project-affected persons, prepare a preliminary list of possible relocation sites.
- Agree on site layout and housing design and other features of residential sites.
- Acquire / purchase land for agreed relocation sites.
- Prepare final designs and construct.
- Consult with the communities and with designated government agencies with regard to the movement of cultural property, and arte facts and structures associated with religious worship, etc.
- Prepare to mitigate adverse social and environmental impacts in host communities receiving those who are resettled.
- Prepare Relocation Schedule.

Box 16 - Things to look while selection resettlement site

- Be as close as possible to the affected areas. However, this criterion can be relaxed when surrounding areas do not present enough potential for sustainable economic activities;
- Accessible through existing roads. However, some exception could be made for remote sites when the construction of inexpensive economically viable roads is feasible;
- Ensure proximity to employment opportunities
- Do not include protected areas, classified forest, natural reserves or environmentally sensitive lands such as slopping terrain or shallow soils. However, in certain situations where indigenous peoples are relocated, it may be necessary, depending upon their preference, to provide lands in some of the above categories;
- Even and smooth topography and avoid mountainous areas, rolling topography and steep slopes;
- Soils that is adequate for irrigated or rained agriculture with minimal reclamation works. Saline soils or lands susceptible to floods and water logging should be preferable avoided unless inexpensive reclamation works can be implemented;
- Good potential for surface or groundwater irrigation;
- Preferably a low population density, large holdings and a good potential for further development. Areas already developed should be avoided unless there is an active market for land purchase;
- Be able to accommodate a reasonable number of project-affected families at one location to minimize the land and village development costs.
- Proximity to social infrastructure such as schools and clinics.

Rehabilitation and Livelihood Restoration

Resettlement is to be planned as a development activity for the affected persons. Those bearing the burdens of displacement deserve to be beneficiaries of the projects affecting them, and resettlement plans, accordingly, should provide opportunities for increasing the incomes and living standards of those affected.

Information to be included the Resettlement Plan:

- Describe the process of consultation with affected persons (including women and vulnerable groups) regarding income restoration planning and implementation.
- Description of income restoration programmes including multiple options.

- Special measures for affected persons disadvantaged in terms of income generation and employment.
- Special measures for women and vulnerable groups after consultation with them.

Actions to be undertaken

- Analyse economic activities (sources of income) of all affected persons (by gender, age group, education, skills, income, household size, preference, options) to assess their needs to establish baseline.
- Analyse and survey existing economic conditions and identify potential income restoration measures.
- Determine if compensation alone is sufficient to restore income for some categories of impact.
- Fit the identified needs and aspirations of affected persons in each category of impact to existing and potential economic opportunities.
- Plan income restoration strategies for each category of impact, including an analysis of the technical, financial, economic and institutional feasibility of the proposed strategies.
- Confirm the availability of all physical and financial resources necessary to implement the income restoration strategies for each category of impact.
- Develop a framework for institutional supervision and evaluation.

Resettlement Budget and Financing Plan

Costs and funding sources for all aspects of resettlement activities should be confirmed in the project. This includes commitment to carry out resettlement satisfactorily. The following decisions regarding financial and budgetary issues must be made during feasibility:

- Provisions for and sources of funding for compensation and resettlement
- Provisions for contingency funds in resettlement budget
- Annual budget allocations and provisions for budget modifications, and
- Head of the resettlement unit (or agency) has the necessary financial and administrative authority for disbursement of funds.

Estimate all costs carefully

A common mistake is to underestimate the actual cost of resettlement planning and implementation. Details of actual costs should be included in the RAP budget. Resettlement costs could be itemized by categories of impact, entitlement, and other resettlement expenditures, such as project management, training, and monitoring. The results should be presented in tabular form.

Justification for all assumptions

The RAP budget must include a justification for all assumptions made in calculating compensation rates and other cost estimates. Budget allowances can be made to offset currency fluctuations as a contingency. This is important when resettlement will be carried out in the relatively distant future or in phases over a long period.

Identify source of funding

The RAP budget should clearly indicate the source of funding.

Information to be included in the Resettlement Budget and Finance Plan**:**

- Itemized budget for all resettlement activities, including compensation for land acquisition. The annual resettlement budget should show the budget-scheduled expenditure for key items.
- Include a justification for all assumptions made in calculating compensation rates and other cost estimates (taking into account both physical and cost contingencies).
- Include information about the source of funding for the Resettlement Action Plan (RAP) budget.

Box 17 - Sample Resettlement Budget						
Type	**Item**	**Entitlement**	**Unit**	**Quantity**	**Rate in Rs.**	**Cost**
Land Acquisition	Agricultural land	Replacement cost.	Hect.			
	Residential land	Replacement cost.	Sq. mt.			
	Commercial land	Replacement cost.	Sq. mt.			
Structure Acquisition	Permanent structure	Replacement value	Sq. mt.			
	semi-Permanent structures	Replacement value	Sq. mt.			
	Thatched structures	Replacement value	Sq. mt.			
Assistance	Disruption allowance	As per entitlement policy	No.			
	Transport allowance	As per entitlement policy	No.			
	Repair allowance	As per entitlement policy	No.			
	Rental allowance	As per entitlement policy	No.			
	Allowance for vulnerable group	As per entitlement policy	No.			
Loss of business/ income or employment	Loss of livelihood	As per entitlement policy	No.			
Loss of crops	Standing crops	Replacement cost	Lump sum			
	Trees	Replacement cost	No.			
Common resources	Loss of access	As per entitlement policy	No.			
Electric & /or water connection		Replacement or compensation	Sqm./no.			
Public facilitates	Religious structure	Replacement or compensation	No.			
	Hand Pumps	Replacement or compensation	No.			
	Schools	Replacement or compensation	Sq. mt.			
	Compound wall	Replacement or compensation	Sq. mt.			
	Public toilet	Replacement or compensation	Sq. mt.			
Special assistance	To vulnerable/indigenous/ethnic	As per entitlement policy	No.			

Box 17 - Sample Resettlement Budget						
Type	**Item**	**Entitlement**	**Unit**	**Quantity**	**Rate in Rs.**	**Cost**
	minorities					
Support for RAP implementation	Implement agency cost		Lump sum			
	Miscellaneous cost		Lump sum			
	Independent evaluation		Lump sum			
Total						

Phased Resettlement Implementation

The RAP budget should be linked with a detailed implementation schedule for all key resettlement and rehabilitation activities. This schedule in turn should be synchronized with the project schedule of civil works construction. Linking schedules in this way creates an imperative for coordinating resettlement with other project activities throughout the chain of project management.

Information to be included in this component**:**

Implementation schedule should cover all aspects of resettlement activities. The schedule should indicate how the resettlement activities are linked to the implementation of the overall project

Actions to be undertaken**:**

- Agree on chronological steps in implementation of the resettlement Programme.
- Prepare a detailed monthly implementation schedule. See **Box 18** for a sample RAP implementation schedule.
- Ensure that the civil construction schedule is linked to the completion of resettlement for each respective component/subsection of the project.

Box 18 – RAP implementation Schedule															
Sn.	**Task**	**Months**													
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1	Identifying and engaging implementing agency														
2	Set up of IRC working group														
3	Set up of provincial resettlement sub-Committee														
4	Staff Mobilization and training of Staffs														
5	Verification of PAPs and DMS														
6	Updating the census /socioeconomic data base														
7	Finalization of Entitlement & ID Card Preparation														
8	Grievance Redress Mechanism														
9	Distribution of ID Card														
10	Consultation with PAPs														
11	Opening of Bank /post office account														
12	Notice of COI Clarence														
13	Distribution of compensation and assistance														
14	Preparing of relocation														

Box 18 – RAP implementation Schedule															
Sn.	Task	Months													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	Relocation of community resources														
16	Preparation of monthly progress report				*	*	*	*	*	*	*	*	*	*	*
17	Submission of quarterly progress report							*			*			*	*

Note: The period of RAP implementation will vary according to the type of project and can extend over a number of years; the months shown here are for illustration purposes only.

Monitoring and Evaluation

The RAP must provide a coherent monitoring plan that identifies the organizational responsibilities, the methodology and the schedule for monitoring and reporting. The objective of monitoring is to provide feedback on implementation, and to identify problems and successes as early as possible to facilitate timely adjustment of implementation arrangements. Monitoring of RP implementation is of critical importance in all projects involving involuntary resettlement for several reasons: (1) resettlement is on the critical path on any project and can cause severe delays; (2) it affects people's lives directly, and can cause severe hardship; (3) it is the main mechanism to alert management to delays and problems in implementation.

Role of PAPs in monitoring- Mechanism for PAPs to play effective role in monitoring process is essential to successful overall project monitoring. A direct channel for PAPs to voice their concerns, perceptions, and acceptance or rejection of project interventions is critical to successful implementation. Monthly meetings, focus group discussions, or other such participatory venues should be part of the implementation strategy, and thus the responsibility of the implementing agency. In addition to line agency's interaction with PAPs, it is advisable to engage external consultants to contact PAP during monitoring, and to verify results of internal project reporting. The minutes of meetings should be recorded and the major issues raised communicated to the regular management review process. More systematic surveys may be used, perhaps on an annual basis, to obtain quantitative information about initial effects of project interventions.

A - Internal monitoring

During project preparation, and as part of the RAP, the implementing agency is required to develop a monitoring and reporting framework for resettlement activities. Central to this framework should be the census of PAPs and the inventory of assets that constituted the basis for the agreed RAP. The organizational unit responsible for project reporting on resettlement (project resettlement unit, where it exists) should oversee the progress in resettlement preparation and implementation through regular progress reports, submitted through normal channels, monitoring key indicators of finance, inputs and activities. The indicators for internal monitoring are given in box 19.

Box 19 – Monitoring Indicators	
Types of Monitoring	**Basis for Indicators**
Budget and timeframe	▪ Have all land acquisition and resettlement staff been appointed and mobilized for the field and office work on schedule? ▪ Have capacity building and training activities been completed on schedule? ▪ Are resettlement implementation activities being achieved against agreed implementation plans? ▪ Are funds for resettlement being allocated to resettlement agencies on time? ▪ Have resettlement offices received the scheduled funds?

Box 19 – Monitoring Indicators	
Types of Monitoring	**Basis for Indicators**
	▪ Have funds been disbursed according to the RAP? ▪ Has the social preparation phase taken place as scheduled? ▪ Has all land been acquired and occupied in time for project implementation?
Delivery of PAP's entitlements	▪ Have all PAPs received entitlements according to numbers and categories of loss as set out in the entitlement matrix? ▪ Have PAPs received payments on time? ▪ Have PAPs' loss from temporary land borrowing been compensated? ▪ Have all PAPs received the agreed transport costs, relocation costs, income substitution support and resettlement allowances, according to the schedule? ▪ Have all replacement land plots or contracts been provided? Was the land developed as specified? Are measures in track to provide land titles to PAPs? ▪ How many affected households have received land titles? ▪ How many PAPs have received housing as per relocation options in the RAP? ▪ Does the quality of housing meet the standards agreed? ▪ Have relocation sites been selected and developed as per agreed standards? ▪ Are the PAPs occupying the new houses? ▪ Are measures for assistance for host communities implemented as planned? ▪ Is restoration proceeding for social infrastructure and services? ▪ Are PAPs able to access schools, health services, cultural sites and activities? ▪ Are income and livelihood restoration activities being implemented as set out in the income restoration plan; for example, utilizing replacement land, commencement of production, numbers of PAPs trained and provided with jobs, micro-credit disbursed, number of income generating activities assisted? ▪ Have affected businesses received entitlements including transfer and payments for net losses resulting from business and production loss?
Consultation, grievance and special issues	▪ Have consultations taken place as scheduled including meetings, and group and community activities? Have resettlement leaflets been distributed? ▪ How many PAPs know their entitlements? How many know whether the entitlements have been received? ▪ Has any PAP used the grievance redress procedure? What was the outcome? ▪ Have conflicts been resolved? ▪ Was the social preparation phase implemented? ▪ Were special measures for indigenous peoples implemented?

Information to be included in the Monitoring Plan**:**

- Institutional arrangements to monitor resettlement activities by the implementing agency – internal and external monitoring arrangements.
- Describe financial arrangements to carry out both internal and external monitoring arrangements.
- Describe internal monitoring process and provide a list of monitoring indicators.
- Describe external monitoring process and provide a list of monitoring indicators.
- Describe frequency of reporting and content for both internal and external monitoring.

- Describe process for integrating feedback from internal and external monitoring into implementation.
- Evaluation of the impact of the resettlement for a reasonable period after all the resettlement and development activities has been completed.

Actions to be undertaken**:**

- Plan the internal monitoring process.
- Prepare database on affected persons to ensure efficient monitoring and evaluation of resettlement.
- Identify capable institutions for external monitoring.
- Determine the methodology for external monitoring.
- Identify key monitoring indicators for internal and external monitoring.
- Identify process for integrating feedback from internal and external monitoring in to implementation.

B - External Evaluation Study

The contracted monitoring agency should conduct an evaluation study of severally affected PAPs to determine whether or not the objectives of the RAP in terms of restoration of incomes and living standards have been achieved. The methodology for the evaluation study should be based on the follow-up socio-economic survey to determine the impact of the project on income levels and living standards of the affected people who are severely affected by the project. Social and economic assessments of the results of delivered entitlements and a measurement of the income and standards of living of the PAPs before and after resettlement are integral components of this activity. This survey should be conducted following the same methodology as adopted for the inventory preparation. A sample ToR for hiring external evaluator is provided in attachment 1 and outcome indicators in Box 20.

Box 20 – RAP out come Indicators	
Benefit monitoring	▪ What changes have occurred in patterns of occupation, production and resources-use compared with that of the pre-project situation? ▪ What changes have occurred in income and expenditure patterns compared with that of the pre-project situation? What have been the changes in cost of living compared with that of the pre-project situation? Have PAPs' incomes kept pace with these changes? ▪ What changes have taken place in key social and cultural parameters relating to living standards? ▪ What changes have occurred for vulnerable groups?

Attachment 1: Sample Terms of Reference For
EXTERNAL EVALUATION OF RP IMPLEMENTATION

1. Background of the Project

2. Summary of Project Impacts

3. External Evaluation

Objectives
Broad objectives of monitoring include the following:

a) To provide project management with an effective tool for assessing 'Resettlement and Rehabilitation Plan ' implementation at various stages and to identify problem areas and recommend remedial measures for efficient implementation of the policy.

b) To assess the effectiveness of 'income restoration' and other rehabilitation measures for affected households/communities.

Evaluation Targets and Functions

The evaluation targets and functions will include the following:

- Review the existing baseline and data gather additional socio-economic baseline data, if necessary, on sample families which are entitled to receive compensation for all of their lost assets or for resettlement and rehabilitation;
- Evaluate implementation of the compensation policy and public information campaign;
- Identify and discrepancy between the policy requirements and actual practice, as well as any local level grievances;
- Provide recommendations for improving implementation of policy.

Methodology

Evaluation methodology will consist of the following:

a. Random review of acquisition and compensation documents to ensure full compliance with policy's requirements. This review should sample about 30% of all project's entitlements.

b. Random site visits, where land acquisition processes are taking place, to ascertain that compensation has been duly paid prior to the start up of construction works under the projects; compensation is assessed based on the principle of replacement cost and grievances, if any, are solved. This activity should cover at least 20% of all concerned families each year. For these purposes monitoring will include the following aspects:
    - Inventory of affected assets;
    - Assessment of compensation for all types of affected assets based on replacement cost;
    - Compensation is paid prior to initiation of works.

c. Special studies aimed to ascertain adequacy of compensation paid for land acquisition and/or other fixed assets, against current market prices.

d. Field visits and survey, to ascertain that affected people are adequately informed of project objectives, impacts, compensation policy and entitlements through an effective public information campaign. This activity should cover at least 30% of all the PAFs.

e. To assess if grievance procedures are adequately explained to the affected people and implemented. This activity should cover at least 30% of all the project affected families.

Sample

To verify the quantitative aspects of implementation, sample surveys of various types of impacts should be conducted. A stratified scale as specified should cover target groups for each category, such as land-owners, affected house owners, tenants or workers. While making quantitative assessments of land acquisition activities all the provinces should be covered.

Evaluation Indicators

The following aspects of the resettlement policy will be monitored and evaluated regularly by the external evaluator:

a) Payment of Compensation

(i) Whether assessment of compensation for all types of affected assets, especially for affected land, is based on the current market values;

(ii) The compensation for affected structures should be equivalent to the replacement cost of materials and labour based on standards and special features of construction, and no deductions made for depreciation or value of salvageable materials;

(iii) Full payments to be made to all affected persons sufficiently before land acquisition

(iv) Payment of all the allowances to PAPs prior to the start up of civil works and their shifting to the new sites, where applicable

b) Linkage to Resettlement and Construction

(i) The completion of land acquisition and resettlement activities on a phase, section or sub-section of the project at least one month before the start of physical works on that phase, section or sub-section.

c) Provision of Resettlement Site

(i) Affected people who are entitled to land-for-land option and for relocation to a resettlement site and who opt for relocation to a resettlement site, should be consulted about the location of the site;

(ii) Site location, site design, infrastructure, and plot allocation should enable affected people to restore living standards;

d) Provision of Training, Employment and Availability of Credit Assistance

(i) Training should be provided for one member of each eligible affected family who will be relocated, if the family chooses to opt for training;

(ii) The kind of training will depend on the preference of the affected person and the availability of a training course;

(iii) The option of post-training credit assistance should be provided to affected persons on the basis of low interest rates, and credit eligibility for otherwise ineligible groups such as women and low-income earners;

(iv) Training should be provided within three months of the date of relocation;

(v) Job placement to entitled persons should be provided within 2 months of the date of land acquisition

e) Public Consultation

(i) Affected persons should be informed and consulted about resettlement activities, such as implementation schedule for the project and shifting of PAPs from their present location, resettlement site design, location and plot allocation;

(ii) The monitoring team should attend at least one public consultation meeting each month to monitor public consultation procedures, problems and issues that arise during the meetings, and solutions that are proposed

f) Level of Satisfaction

(i) The level of satisfaction of affected persons with various aspects of the RAP should be monitored and recorded;

(ii) The operation of the mechanisms of grievance redress and the speed of redress of grievances should be monitored.

g) Standard of Living

(i) Throughout the implementation process, the trends of living standards should be observed and the potential problems in the restoration of living standards should be identified and reported

h) Awareness of Compensation Policy

(i) Public awareness of the compensation policy and their entitlements among the PAPs will be assessed;

(ii) Assessment of awareness of various options available to PAPs as provided for in the policy for land acquisition, compensation and resettlement.

Reports:

The External Evaluation Agency shall prepare and submit the Client (no. of copies) copies of each of the following reports:

- Inception report: to be submitted 30 days after work begins; the report shall contain a brief methodological inception and schedule for the completion of the work described herein with the attention to use all outcomes of available reports.
- Mid term report: at the end of halfway through RAP implementation briefing the works on-going or accomplished in the RAP implementation, Identification of problem, issues and recommended solutions, so that project authority is informed about the ongoing situation, and can resolve problems in a timely manner. Also the report should bring out the issues need intervention from higher authority, in RAP implementation process, if any.
- Final report: Evaluation agency shall prepare a comprehensive report summarizing all activities carried out under RAP implementation with all facts and figures and critical evaluation of project out come with respect to improvement in standard of life of affected families.

3.2 Sample Outline of Abbreviated Resettlement Plan

Scope of land acquisition and resettlement

- Describe alternative options, if any, considered minimizing land acquisition and its effects, and why the remaining effects are unavoidable.
- Summarize key effects in terms of land acquired, assets lost, and people displaced from homes or livelihoods.

Objectives, policy framework, and entitlements

- Describe the national policy and legal framework for resettlement that applies to the project (including relevant national and local land, compensation and resettlement policies, laws and guidelines), and any gaps in this framework compared with donor's policy on involuntary resettlement.
- Propose measures to bridge any gap between donor's and the national/local policies on involuntary resettlement.
- Prepare an eligibility policy and entitlement matrix for all categories of loss, including compensation rates at replacement costs.

Gender-related impacts and mitigating measures

- Identify the socioeconomic conditions, needs, and priorities of project-affected women.
- Propose measures to ensure that the process of land acquisition and resettlement does not disadvantage women. (New land/house titles should be in the names of both spouses. For land/houses given as replacement property, titles should be in the name of the person[s] who acquired the original property.)

Information dissemination, consultation, and disclosure

- Identify project stakeholders.
- Describe mechanisms for stakeholder participation in planning, management, monitoring, and evaluation.
- Describe the activities undertaken to disseminate project information and summarize results of consultations with affected people.
- Confirm disclosure of the draft resettlement plan to affected people and describe arrangements to disclose any subsequent plans.
- Identify local institutions or organizations to support people affected.
- Review potential role of Non Government Organisations and Community Based Organisations, including women's groups.

Grievance redress mechanisms

- Establish mechanisms for resolving complaints and conflicts related to resettlement, including formal and informal channels for redress of grievances, appeals procedures, and related time frames.

Compensation, relocation, and income restoration

- Describe arrangements for valuing and disbursing compensation.
- Describe arrangements for housing relocation, including transfer and establishment.
- Describe income-restoration measures to be implemented.
- Identify any environmental risks, and describe management and monitoring steps.

Institutional framework

- Identify main tasks and responsibilities in planning, managing, and monitoring land acquisition and resettlement.
- Provide for involvement of women's groups in resettlement planning, management and operations, job creation, and income generation.
- Identify measures to ensure that female staffs are hired by the resettlement agency to work with and assist affected women in all aspects of resettlement activities.

Resettlement budget and financing

- Identify land acquisition and resettlement costs and funding sources.
- Establish arrangements for timely disbursements to affected people.

Implementation schedule

- Establish time-bound actions for project activities to ensure compensation and assistance for affected people before award of civil works contracts.

Monitoring and evaluation

- Specify arrangements for monitoring and evaluation.
- Provide for monitoring and evaluation of resettlement impacts on women.

4
Indigenous Population Development Plan

4.1 What is an Indigenous Peoples Plan?

An Indigenous Population Plan is required for projects with impact on Indigenous Population. An Indigenous Population Plan may take the form of

- an Indigenous Population Development Plan for projects that have significant impacts on Indigenous Population,
- an Indigenous Population Development Framework for projects that have significant impacts on Indigenous Population, or
- an Indigenous Population Specific Action for projects that have limited impacts.

4.2 What is an Indigenous Peoples Development Plan (IPDP)?

An Indigenous Population Development Plan is a planning document to incorporate Indigenous Population concerns into the project design. It includes provisions for project implementation, monitoring, and evaluation. The Indigenous Population Development Plan is time-bound, with an adequate budget for its implementation.

What is an acceptable Indigenous Population Development Plan?

An acceptable Indigenous Population Development Plan addresses:

- aspirations, needs and preferred options of the affected Indigenous Population;
- local social organization, cultural beliefs, ancestral territory, and resource use patterns among the affected Indigenous Population;
- potential positive and negative impacts on Indigenous Population;
- measures to avoid, mitigate, or compensate the adverse project effects;
- measures to ensure project benefits will accrue to Indigenous Population;
- measures to strengthen social, legal, and technical capabilities of government institutions to address Indigenous Population issues;
- the possibility of involving local organizations and non-governmental organizations with expertise in Indigenous Population issues;
- budget allocation; and monitoring.

4.3 When is an Indigenous Population Development Plan prepared?

An Indigenous Population Development Plan is required for any ADB-funded development activities when

- an Indigenous Population community is the main beneficiary of a development project;
- a project component may significantly benefit the community; and/or
- the project or project component may have significant adverse impacts on Indigenous Population.

Is an Indigenous Population Development Plan necessary **even if the Indigenous Population will generally benefit from a development project?**

Yes, because positive development impacts in areas such as education, health and livelihood may significantly alter Indigenous Population's traditional ways of life affecting their customary rights,

resource use, cultural integrity, indigenous knowledge, and traditional support systems. An Indigenous Population Development Plan is necessary to improve their participation in sharing benefits and address any unintended effects that may reinforce their vulnerability.

4.4 Outline of Indigenous Population Development Plan

(i) Provide an overview of the characteristics of the ethnic population in the project area

- The dominant indigenous population group(s):
  (a) relations of the dominant ethnic group(s) to the land in the project area
  (b) main socio-cultural characteristics of the dominant ethnic group(s)
  (c) the socio-cultural influence of the dominant ethnic group(s) on the ethnic minorities in the project area
- The minority indigenous population group(s) :
  (a) relations of the minority ethnic group(s) to the land in the project area
  (b) main socio-cultural characteristics of the minority ethnic group(s)
  (c) degree of acculturation to the dominant culture (language, religion, customs, etc)

(ii) Provide a profile of the dominant and minority ethnic groups in the project area

- Prepare a socioeconomic profile of the ethnic groups
- Describe the main activities of the ethnic groups
- Describe the local resources utilized by each ethnic group
- Describe the actual rights to land and natural resources for each group

(iii) Identification of existing problems perceived by IPs in the project area

- Describe the problems that restrict IPs' main economic activities
- Describe the problems with the availability of local resources utilized by IPs
- Describe the problems with the continuation of IPs' rights to land and natural resources;

(iii) Identification of the IPs' demands

- Examine the variations in existing knowledge and skills, including any socio-cultural norms that may reduce demand for the project and/or influence the way services are provided.
- Assess the ability and willingness of the IPs to pay for project inputs and/or provide labor to improve their production systems;
- Identify and examine efforts which have already been made by members of the IP communities and examine the experiences of those involved and their perceptions of whether these efforts have been successful
- Assess the demand of the IP communities in areas which will be affected by the project activities and determine the preferred methods for the delivery of services under the project activities;

(v) Description of the differing culturally defined roles of males and females and assessment of the cultural importance of these differences in the likelihood that certain practices will be adopted and retained under the project. Assess the culturally defined access to land and resources and identify the potential cultural constraints for men and women in obtaining access to resources, services and facilities that may be provided under the project;

(vi) Identification of the anticipated project impacts and communicates as much information about the project to the IP communities;
(vii) Identification of national and local government policies in relation to IPs (legal status, citizenship, health, education, access to natural resources);

(viii) Assessment of local institutional, personnel and financial capacity of the relevant agencies and organizations and institutions working with and for IPs and identify a strategy for their participation;

(ix) If needed, preparation of an indigenous peoples development plan (IPDP) ensuring meaningful participation of the IPs and facilitate the involvement of NGOs where appropriate;

(x) Identification of indicators of the IP-specific achievement of the project outputs, purposes and goals.

5

Resettlement Implementation Guidelines

5.1 Pre-Implementation Arrangements

Involuntary resettlement involves the displacement of people arising from development projects such as, dams, bridges, national parks, and roads which encroach on their productive assets, cultural sites and income sources viz., land, grazing fields, other assets, etc. What distinguishes involuntary from voluntary resettlement is that the former involves people who may be displaced against their wishes, as they are often not the initiators of their movement. Therefore, involuntary resettlement can have a dramatic impact on the lives of the people living in an area of influence of development projects. It can cause a sudden break in social continuity and can result in impoverishment of the people who are relocated. The resettlement may provoke changes, which could dismantle settlement patterns and modes of production, disrupt social networks, cause environmental damage, and diminish people's sense of control over their lives. It can threaten their cultural identity and create profound health problems.

When resettlement is badly planned or inadequately implemented it always represents a significant additional cost to the main project and can have long term consequences for the affected population and the surrounding region. It can provoke local resistance and political tension, and cause significant delays in the execution of the project, leading to cost overruns, reduced project benefits and, in extreme cases, even suspension of the project. These additional costs almost invariably outweigh the investments that would have been needed to plan and execute an acceptable resettlement program. Therefore, addressing involuntary displacement and/or loss of other economical assets of people caused by projects and programs in a fair manner does help in long way in sustaining project benefits across the society.

In terms of planning and implementation of resettlement in a development projects, responsibilities lie with the project proponent, but without full support of local provincial administrative organs, it's planning and implementation becomes difficult. Provincial governments play active roles in supporting and coordinating implementation of development plans initiated by line departments and their regional representative offices/departments. However, due to the hierarchical administrative system coordination between line agencies and provincial administration is often difficult. Major institutional and organizational problems at provincial government level include:

- Resettlement activities cut-across several disciplines & none of the line agencies cover all aspects of resettlement and rehabilitation (R&R) activities in their normal course of responsibilities.
- Awareness of acts and bylaws, international practices relevant to resettlement is minimal in local staff.
- Resettlement staffs are often drawn from mainly administrative background without basic qualification and understanding of resettlement issues.
- Often the roles and responsibilities of assigned staff from relevant organizations in resettlement planning and development are not clearly defined.

However, understanding the basic requirement of resettlement implementation arrangement and following certain steps, the implementation process can be achieved with desired result. The R&R activities are successfully completed when the pre implementation steps are completed timely manner, these are:

Institutional Set-up

The first and foremost task prior to start-up of resettlement implementation includes organizational set-up within the project proponent or implementing agency if that is not already in existence. Additionally, capacity of other institutions that, in one way or another, likely to participate in resettlement implementation, should be analyzed and necessary provisions made to strengthen capacity to ensure that all the institutions fully understand the policy provisions, methodologies and procedures necessary for efficient resettlement implementation.

Establishing Inter ministerial Resettlement Committee (IRC)

Under the Cambodian system of operation an inter-ministerial resettlement committee is established for every new donor funded project. The IRC is chaired by Ministry of Economy and Finance (MEF) with members coming from Ministry of Public Works and Transport (MPWT); Council of Minister (COM); Ministry of Agriculture, Forestry and Fishery (MAFF); Ministry of Land Management Urban Planning and Construction and Governors and Vice Governors of affected provinces.

Establishing Resettlement Working Group (RWG)

RWG is an ad hoc group established in each development project that is required resettlement. Normally, RWG is headed by a representative of Department of Resettlement[11] and representative of project's EA acts as deputy head. Members are from relevant government agency and local authority. RWG is responsible for conducting detail measurement survey; preparing statistics of impact i.e. number of affected household and assets; organizing public meeting and consultation; identifying landlessness and vulnerable households; receiving and to some extend resolving complaints; arranging contract with AHs and payment of compensation. The RWG will be responsible for resettlement activities as described in Box 21.

Box 21 - Responsibilities of RWG in resettlement activities

- Overall planning of the resettlement programs;
- Organizing to implement RAP on schedule and in compliance with the policies provided therein and the common principle of compensating and/or rehabilitating Project Affected Persons (PAPs) to improve or at least restore PAPs living standards;
- Directly guiding, following up, supervising and monitoring internally the RP implementation;
- Updating inventory, where necessary, finalizing entitlements and payment of compensation and other assistance to PAPs, including planning and delivery of economic rehabilitation assistance;
- Conducting public consultation and participation activities and grievance redress in accordance with the framework provided in the RAP;
- Contracting out with independent evaluation agency to assess resettlement implementation and propose necessary amendments/remedial actions.
- Amending or complementing the RAP in coordination with concerning government agencies in case of any problems identified by internal and/or external monitoring of RP implementation to ensure that the objectives of the RAP are met;

[11] *Department of Resettlement (DR) was created in early 2008 under MEF. It acts as secretariat to IRC. Previously, it was known as Resettlement Unit, established in 2004. It is now legitimated under the MEF organizational structure. DR is responsible for reviewing and approving resettlement plan proposed by EAs and implementing the RP. Main tasks include conducting detail measurement survey; public consultation; updating RP; budgeting resettlement cost; contractual arrangement; compensation payment; grievance redress; following up implementation of income restoration program; and internal monitoring. The DR implements the RAP through resettlement working group established specifically for a development project*.

Box 21 - Responsibilities of RWG in resettlement activities
➢ In coordination with PIU, ensuring timely provision of budget for R&R activities; ➢ Preparing periodic supervision and monitoring reports on RAP implementation for submission to PIU & funding agency.

Establishing Provincial Resettlement Sub-committee (PRS**)**

PRS is an ad hoc agency created in the province where project located in or part of project cut across and that required resettlement. PRS is headed by provincial vice governor and has very close cooperation with RWG. PRS is responsible for coordination and make it easy for RWG in conducting its work at ground. PRS also settle all disputes, including lodged complaint, which may occur during RP implementation.

Formation of Village Level Committee (VLC) & Grievance Redress Committee (GRC)

In addition to strengthening capacity for implementing appropriately, involvement of local level administrative agencies as well as civil society is imperative for successful and timely completion of R&R activates. Such involvement does help in value addition to the project goal. Formation of VLC and GRC at appropriate level is a step in that direction. The VLC & GRCs would include members from village leaders, local government, NGOs and mass organizations. In order for the members of VLCs & GRCs to impart their responsibilities efficiently, it is absolutely necessary that all the members fully understand the provisions of the Policy and entitlements to PAPs. Therefore, project proponents should provide with project related document, especially resettlement plan to local government officials and members of VLCs & GRCs prior to start-up of resettlement implementation activities. The project authority should ensure that the project related documents are translated in local language for those members are not comfortable with English.

Strengthening Resettlement Capacity

It is must that the staffs involved in resettlement implementation are fully conversant with the process and procedures necessary for resettlement implementation, management, supervision and monitoring. Although the staffs should be given training in all aspects of resettlement planning and implementation, the priority of any capacity building exercise should be given to the specific functions and tasks assigned to the staff. In general, the training in the following aspects would be necessary for implementing resettlement plan successfully:

Box 22 - Training Module
1. Resettlement principles and policy; 2. Resettlement planning procedures; 3. Resettlement implementation procedures and sequence of activities; 4. Methodology for compensation assessment; 5. Data management system; 6. Public participation and consultation procedures; and 7. Supervision and monitoring of resettlement.

Data Management, Documentation Reporting Procedures

Project authorities should establish computerized data management system to ensure that all the information collected during RAP preparation i.e. census, inventory and socioeconomic baseline surveys is codified and maintained in standard data management system. It is necessary to design and finalize the data input procedures and formats for output. The output forms should be designed in advance to facilitate implementation activities. Key output forms are suggested as follows;

Box 23 – Key output forms
a. Summary of impacts on land, structures, tree crops and other fixed assets b. Socioeconomic data for PAPs c. Entitlements to compensation for lost assets d. Entitlements to allowances and other assistance e. List of PAPs entitled to economic rehabilitation with details on socio-economic background and preferences for rehabilitation assistance measures f. Summary compensation form for each PAP g. Socioeconomic data for PAPs h. Entitlements to compensation for lost assets i. Entitlements to allowances and other assistance

Additional forms may be designed and produced depending upon the needs and requirements. The staff assigned for data management should also be responsible for preparation of supervision and monitoring reports based on the information provided by the field staff.

Setting-up Implementation Procedures

Prior to initiating any resettlement implementation activities, project authorities must formalize procedures for specific activities in the field. The key areas that would require particular attention include the following:

Compensation Payment Procedures

Project proponent is directly responsible for all the activities related to resettlement implementation in general and for payment of compensation to the PAPs in particular. Project proponents will make arrangements for payment of compensation and allowances and should set-up procedures and schedule for payment. Project authority has little role in payment of statutory compensation, however, payment other than statuary requirement is the responsibility of project authority.

Fund Transfer and Payment

The project authority shall be the responsible agency to co-ordinate and payment to PAPs. Timely transfer of fund to the organization responsible for payment of compensation & assistance does help in early disbursal of PAPs dues. The ESO staff shall remain witness and signatory to distribution of non-statutory payment to PAPs.

Payment Modalities

The payment of compensation to PAPs falls under two heads, viz. statutory compensation and assistance. The payment modalities vary from country to country and from project to project depending on the suitability of system and prevailing procedures. But, it is important to have the procedure set in the beginning for smooth and timely disbursement of compensation and assistance to the affected people. Whoever or whatever is the procedure of payment modalities, the ultimate responsibility of timely payment lies with the project authority. Payment of compensation can be made either in cash or through bank accounts in the joint name of husband and wife. But the preferred option for payment should be through bank account. However, where access to bank facilities is not available to PAPs, compensation payments can be made in cash. PAPs should be asked to bring with them the Identity cards issued by project authority to claim their entitlements.

The payment shall be made at public places on assigned date and time. The payment exercise shall be witnessed by local authorities and representatives of PAPs, local NGOs and mass organizations. Where the payment is through bank accounts, project proponents will coordinate with relevant bank-branch on the procedures, opening of bank accounts in the names of PAPs, and deposit the amounts due to the PAPs.

Contracting External Evaluation Agency

Prior to start up of resettlement implementation activities, the project proponents will contract an independent agency (consultant, research institutions, NGOs or any other institution) or an individual with skills and experience in resettlement to carry out midterm and post-implementation evaluation.

5.2 Resettlement Implementation

Implementation of resettlement plans is a very different concept than simply preparing the plan that may be required and found acceptable by project proponents. Displacement by a project and relocation is an experience that cuts across all aspects of a person's social, cultural and economic patterns. Administrative, legal and financial considerations can play critical part and result in inequality in the resettlement options offered to affected persons in a project.

For successful implementation of resettlement activities, close supervision and monitoring by the project proponents is necessary. To facilitate management of resettlement implementation, project authorities should identify specific activities that are necessary for successful implementation and the time-frame required for completion of each activity. This should be either represented through a chart or table or any other form to facilitate regular monitoring. A sample of sequence of activities determined for a linear project is shown in *attachment.2.*

Basics of Resettlement Implementation

Implementation Schedule

Implementation schedule should be prepared at the beginning of resettlement implementation with targets specified for completion of each of the activity. A close watch should be kept on activities that are on critical path and likely to be critical in completion of resettlement. Planning and implementation of economic rehabilitation is the most complex set of activities that generally result in delays. Additionally, delays can also be caused due to the problems such as conflicting claims over land ownership and land use rights issues. Implementation schedule should be revised when appropriate and in extraordinary circumstances. Repeated revisions will dilute the importance of the exercise.

Monitoring and Supervision

Internal monitoring and supervision by project proponents and external monitoring of resettlement implementation by the contracted individual/agency are the most critical and important exercised that can make implementation successful, if carried out regularly and earnestly. The monitoring will identify any problems in the field operation and alert authorities to take appropriate actions in a timely fashion.

Flow of Funds

Lack of budgetary allocation and timely availability of funds for resettlement are one of the major reasons for failure of resettlement in most projects. Project authorities must ensure that required funds are available to meet resettlement costs according to the implementation schedule.

6

Steps in Resettlement Implementation

Steps in Resettlement Implementation

Resettlement implementation commences when the necessary resources (funds and human resources) are deployed. The most important requirement is the establishment of the institutional (management) structure, as proposed in the RAP, to provide leadership for the entire resettlement program. During implementation, specific situations can arise leading to additional time and resource requirements, besides routine interventions by project authorities. Such situations include—but are not limited to—seasonal factors, social and economic concerns, training of support staff and financial constraints, lack of coordination between project authorities and various line departments, etc. This section of guideline is designed to guide those involved in resettlement implementation through step by step approach.

6.1 Task 1 – Preparatory Stage

The best way to familiarize with the project is to collect and go through the various documents prepared as part of project preparation, especially resettlement plan prepared by consultant. The preparatory stage also includes familiarize with the project area and the intended persons for whom the plan will be implemented. The main preparatory stages tasks involve are as:

Box 24 – Preparatory stage tasks	
Collection of related documents (i) Resettlement Action Plan (ii) List of PAPs in RAP (iii) Completed socioeconomic survey forms (iv) Photographs of structures likely to be affected (v) Videocassettes/CDs of the entire stretch (cross reference document in a digital form) (vi)Videocassettes/CDs of consultation meetings with PAPs by DPR consultants (vii) Strip-plan containing Corridor of Impact data, chainage, etc.	**Familiarize with the project area** (i) Familiarization with the area and rapport building with PAPs, including identification of opinion leaders (ii) Preliminary verification and updating of the list of PAPs and structures likely to be affected (iii) Demarcation of two consecutive edges of Corridor of Impact joined by a straight line

6.2 Task 2 – Start of Implementation

Step 1 – Verification Survey

Verification of baseline data generated in RAP is the first task of implementation process to be undertaken by the implementing agency (IA). This also involves correcting and updating available data wherever required. It could include recording changes in the number of affected people and updating the inventory of affected properties and assets. The steps in undertaking a detailed verification survey are as follows:

Box 25 – Steps in verification survey

- Modifications, if required, in the socioeconomic survey questionnaire to ensure that covers all the required information
- Preparation of guidelines/checklist for detailed survey
- Training of survey staff of IA and pre-testing of the questionnaire
- Advance information to PAPs about the dates and time of detailed survey
- Conducting verification survey
- Recheck the detailed verification survey, to ensure that all PAPs are included

Step 2 – Estimation of loss of Structures

The implementing agency should undertake estimation of area affected of a structure. Extent of loss would be determined primarily in terms of the portion of the structure coming within COI. Ideally, IA should deploy civil engineers or alternatively hire the services of a government-approved valuer to carry out this task. The objective is to establish the extent of loss and subsequently estimate the replacement cost. After the detailed measurement survey of property, implementing agency should take the signature of PAP on a DMS format as conformation that the measurement has been carried out to his/her satisfaction. The major tasks are as:

Box 26 – Steps in estimation of structure impact

- Measurement of each affected structure and other immovable assets
- Establishing construction typology
- Collect information on total area of the structure/land to be affected.
- Collect information on distance of structure/ land from the existing centreline.
- Plot the structure/land on a strip map with existing highway and proposed design.
- The area within COI shall be considered as the affected portion.

The first two tasks run parallel with the verification activity. These provide the required information for valuation. Additional information required would include Basic Schedule of Rates (BSR) of MPWT.

Step 3 - Estimation of Replacement Cost

The replacement cost is worked out based on construction material used and extent of loss as registered during verification survey. Basic Schedule of Rates (BSR) of Ministry provides the unit rates for construction items. Using the BSR as guide, the engineer can arrive at the compensation value of a structure. BSR also provides rates for hand pumps, dug-wells, tube wells, etc. including installation charges. If the rates for other items such as hand pumps, dug-wells, tube wells etc. can also be obtained from the relevant ministry dealing with it. For arriving at the replacement cost, the following steps should be taken:

Box 27 – Steps for replacement cost

- Identify the province under which the proposed highway construction/widening has to take place
- Collect BSR of that particular division (ensure that the latest revision is included)
- Calculate the total area of the affected structure
- Confirm the unit for rate analysis provided in BSR. Convert the measurement data of the structures collected during verification according to the units followed in BSR
- Calculate the replacement cost by multiplying the total units of the structure as measured with the rate provided in BSR according to different construction types As BSR is usually revised annually, it is more likely to be closer to the replacement value. Hence, it could be a good basis for estimating replacement costs.

6.3 Task 3 -Land Acquisition

ESO/DESS plays a very limited role in the entire land acquisition process, as most of the activities are the undertaken by resettlement unit of MEF, who is assisted by provincial resettlement sub committee for the project. Main steps involved in the land acquisition process are as follows:

Box 28 – Steps of Land Acquisition Process
➢ Publication of preliminary notification and start of survey
➢ Payment for damage on account of survey, if any
➢ Hearing of objections, if any
➢ Issue of Declaration that land is required for a public purpose
➢ Issue of order for acquisition of land by the competent authority
➢ Marking and measurement of land
➢ Notice to persons interested
➢ Inquiry into measurements, value, and claims and award by competent authority
➢ Payment of compensation
➢ Possession of acquired land

6.4 Task 4 - Preparation of micro plan and Issue of ID Cards

Step 1 Preparation of micro plan

A micro plan is the base document for the entire implementation process. The entitlements and compensation are finalized on the basis of micro plan. The base for preparing the micro plan is the verification exercise. Before preparing the micro plan, IA staff should be well-versed in the policy and entitlement framework, definitions of Below Poverty Line families, vulnerable families, subsistence allowances, shifting allowances, replacement value etc. The preparation of the micro plan includes the following tasks:

Box 29 – Micro Plan preparation
➢ Verification and socioeconomic updating survey
➢ Valuation of structures
➢ Calculation of replacement value for structures and land
➢ Preparation and finalization of micro plan formats
➢ Self-verification of the prepared micro plan by the implementing agency
➢ Submission of the micro plan to DR
➢ Approval of the micro plan by DR
➢ Formal approval of the micro plan by MEF

Contents of a Micro Plan

A micro plan normally has four sections as given below. A summary indicating financial implications under assistance and compensation also has to be included in the micro plan. Thus it includes (a) Identification (b) Socio-demographic information (c) Economic information (d) Entitlement (compensation and assistances).

Box 30 – Contents of Micro plan	
Identification information	**Socio-demographic information**

Box 30 – Contents of Micro plan	
➢ APs ID no. ➢ Chainage ➢ Name of District, block, and village	➢ Name of household head or entitled person ➢ Age, sex , marital status, caste
Economic information	**Entitlement Information**
➢ Occupation ➢ Income ➢ Any skill possessed ➢ Ownership detail, whether owner or tenant or shareholder, etc. ➢ Bank account details	➢ Loss (of structure or land, etc.) ➢ Category -residential, commercial, etc. ➢ Entitlement as per loss and category (in line with entitlement framework) ➢ Compensation amount ➢ Replacement value as productive asset grant (difference between compensation and market value) ➢ Whether vulnerable or not–as this finalizes the entitlements

The micro plan should also be supported by annexes which explains the Methodology adopted for arriving at the replacement value, Justification of entitlement proposed (give reference to clauses of entitlement framework) and Possible list of trades in which PAPs would be trained and amount required thereof.

Step 2 - Preparation and Issue of ID Cards

Once the final verification of PAPs is carried out and micro plans prepared, identity cards (ID cards) stating the identification of PAPs, information on losses and eligible entitlements are prepared and distributed to the concerned PAPs. ID cards not only identify the person as project affected, but also carry certain vital information, such as loss type and extent of loss, and entitlements to compensation and other assistance. For ID card preparation and distribution, the following steps would have to be taken:

Box 31 – Steps for ID card Preparation
➢ Holding group meetings for sharing of importance of ID cards with PAPs and for raising awareness about the whole exercise ➢ Taking still photographs of PAPs (concurrent activity with verification exercise) ➢ Preparation of ID card format ➢ Approval of the draft ID card format ➢ Preparation of ID cards by filling up all the required information as per approved format, including pasting of photographs. ID cards shall be prepared not only for available PAPs, but also for those who have moved out on their own ➢ Ensuring signatures of PAP and ESO staff on the card ➢ Lamination of ID cards (lamination will make it tamper-proof) ➢ Consultation with individual PAPs to inform them about the importance of ID cards and its contents in detail ➢ Issue of ID cards in the presence of witnesses. Date of distribution shall be fixed and PAPs shall be pre-informed about the date of distribution of ID cards.

Step 3 – Release of Fund

Upon approval of micro plan the actual amount to be disbursed to the PAPs will be known. The project authority shall make necessary arrangement for the release of fund to the concerned authority for disbursement. The fund normally includes both statutory and assistance part. Statutory part is distributed through the district authority thus shall be released to the concerned district authority. The payment of assistance part can be distributed through local office of project authority or through district authority.

6.5 Task 5 – Opening of Joint Account

Preferably the disbursement of assistance is done through cheque. This process has number of advantages (1) transparent payment (2) reduces corruption (3) controls fraud in transfer of money (4) controls splurge of compensation money by AP (5) give women member equal control over money. PAPs those do not have bank account in joint name shall be advised to open account and implementing agency shall help then in doing so. For opening of bank accounts, IA shall -

Box 32 – Procedure for opening joint account

- Make copies of the photographs taken during verification. Expense of making copies of photographs shall be borne by project authority.
- Inform PAPs in advance of the date for opening of joint accounts (at least a week before).
- Arrange for a vehicle for bringing PAPs to the Bank on the fixed date. Expense incurred toward hiring a vehicle shall be borne by project authority.
- Accompany the selected group to the Bank and help in completing the necessary requirements and submit completed forms to the Bank. IA shall ensure that issue dates of cheques prepared for disbursement of assistances is not prior to that of opening of joint accounts.)

6.6 Task 6– Preparation of Cheque

Payment of compensation to PAPs shall be handled by the RWG. The RWG shall prepare the cheque in the name of PAPs as per the micro plan. It is advisable that the cheque is prepared at field level offices of province to avoid commission charged by bank on outstation cheque. If the cheque is prepared at Ministry level the commission charged by the bank for outstation cheque shall be added to the compensation amount. Thus the RWG has an important role to play in advising and helping in preparing cheques. All the cheques shall be with account payee stamp on it.

6.7 Task 7– finalization of disbursement dates

It is necessary to finalize disbursement dates in a phased manner. The dates can be commune wise; on the basis of category, such as kiosks; squatters, encroachers, and titleholders; or it can be on the basis of location, such as contiguous settlements. Phasing can also be on the basis of priority stretches. This can be decided on the basis of any of these factors which are suitable to project authority for smooth functioning. The date, time, venue and documents to be brought by PAPs should be intimate at least a week in advance.

6.8 Task 8- Disbursement of Compensation

It is suggested that the distribution of cheque to PAPs shall be in a public place and in the presence of villagers. The venue can be commune office, school etc. The IA shall maintain record for disbursement of compensation to PAPs. The register shall have following columns; name of road, date, PAPs ID, name, cheque no., amount of compensation and a signature. The PAPs shall sign on the register as evidence of receipt of assistance form the project authority. Also, the project authority

can have the photocopy of each cheque and have signature of PAPs on it as well for their record. The cost of photocopy shall not be recovered from PAPs. The representative of RWG staff and local official shall sign at the end of each page of register as witness to disbursement.

6.9 Task 9 – Notice to vacate the CoI

Once the payment of compensation and assistance is received by the PAPs notice to vacate the CoI can be issues to them. The notice to vacate should be a letter giving them time frame by specifying date by which the PAPs should dismantle and vacate the place. However, the notice period should of minimum of two to three months so that the PAPs can have time to relocate them selves. It is suggested that the notice to vacate may be handed over to PAPs during the distribution of cheque and their signature should be obtained as receipt of notice. In addition to this, the project authority should place the notice with PAPs name at prominent locations such as village notice board, market place etc. for every bodies view.

7

Community Participation and Consultation

7.1 Community Participation and Consultation

Effectiveness of RP implementation is directly related to the degree of involvement of those affected by the project. Their involvement vastly increases the probability of their successful resettlement. It also serves as "tool for managing two-way communication between the project sponsor and the public. Community participation and consultation is not an isolated event or activity. It is a continuous process and an approach that needs to inform all the activities to be undertaken for the implementation of RP.

Type of Consultations

Box 33 Types of Consultation	
Dissemination	Refers to the transfer of information from project officials to the affected population. Providing early and accurate information to project affected persons (PAPs) allays fears, dispels misconceptions and builds trust, providing a foundation for collaboration between PAPs and project authorities.
Consultation	Refers to joint discussion between project officials and the affected population, serving as the conduit for transfer of information from the latter to the former. Systematic consultation also implies a sharing of ideas. Experience shows that consultation yields many of the best resettlement alternatives, fruitful procedures for continued participation, and independent information regarding actual implementation.
Collaboration	Is used interchangeably with participation and refers to mechanisms for joint decision-making, such as committees and tribunals. Participation more broadly includes the transfer of decision-making power to those affected—for example, by providing options—and in this sense, represents a step by which affected persons assume responsibility over their life. Participation should be undertaken as a continuous process throughout identification, planning and implementation of resettlement. The establishment of clear indicators for measuring inputs, outputs and outcomes related to resettlement issues is an essential element in this process.

Consultations are required at various stages of implementation process:

- When IA moves in, rapport building with PAPs is the first activity and requires consultation. This is carried out at the time of verification survey.
- At the time of verification survey, one-to-one consultations are held while updating baseline socioeconomic information.
- Shifting of non-titleholders from COI. This issue may require several rounds of consultations.
- Identification and finalization of site for relocation of Commune Property Resources and PAPs, marketplace, etc.
- Relocation of PAPs, CPRs, etc.

- Awareness generation for control of highway-related diseases
- Highway/Road safety aspects
- To arrive at a replacement value of a structure or land
- Identification of PAPs eligible for training and assessment of training needs
- Identification and finalization of trades for training
- Identification of master trainer and assessment of trainer
- Formation of self-help groups formation of any other groups for eco-rehab.

Box 34 Key points of consultation

- Semi-structured guidelines in accordance with the agenda will always come handy in any consultation.
- Ensure that separate consultations are held for male and female groups, commercial and residential PAPs, etc.
- Ensure that the group is small (not more than 12–15 members in a group).
- Ensure that all participants sign the attendance sheet and the sheet is attached to the proceedings.
- If a consultation is being held to arrive at a major decision or decisions, preferably it should be video graphed. However, still photography for every consultation held is a must. Photographs must be attached to the proceedings. Ensure that every proceeding is filed in duplicate.
- Decision taken during consultation should be followed up, and the final decision must be made public.
- Ensure that staff involved in consultation is well acquainted with language and culture of PAPs and have adequate experience in interactive planning methods.
- Facilitator shall prompt and guide the group, but shall never get involved in the decision-making process.
- Always start the discussion with village problems and gradually shift to project-related issues.

7.2 Institutional Mechanisms for Grievance Redress

Effective redress of grievances of project-affected person is crucial to smooth implementation of project to prevent time and cost overruns. In order to ensure effective redress of grievances, appropriate institutional mechanisms have to be in place. According to existing provisions under land law, individuals have no right of appeal and are obliged to sell their assets at the values determined by the Government. The common reason for grievances of people losing assets is amount of compensation paid. Considering this, village level committees and grievance redress committees at appropriate level should be formed all project locations.

Institutional Arrangement

The institutional arrangements for grievance redress need to be put in place, according to RAP. Usually, the arrangements have to be made at the village and province levels.

The Village Level Committee is composed of PAP representatives (including vulnerable groups), village members of the affected villages and the IA representative implementing the RP. The major role and responsibility of PLC would be to -

- Meet regularly at a known venue, date, and time, specifically to redress grievances;
- Help people identify their problems and raise relevant queries;
- Provide help in amicable settlement of disputes at the community level; and
- Carry forward the un-redressed grievances to GRC at the province level.

In Grievance Redress Committee, apart from Provincial Deputy Cabinet as head of the committee, the committee is composed of NGO representative; representatives of ESO, representative of PAPs; and representatives from line departments. The functions of GRC are to -

- Provide support for PAPs on problems arising out of property acquisition;
- Record grievances; categorize, prioritize, and solve them within a month;
- Inform project authority of serious cases within an appropriate time frame;
- Report to the aggrieved parties about the developments regarding their grievance and decision of project authority.

IA's role in grievance redress

The implementing agency has an important role to play in redress of grievances. In the course of facilitating the redress of grievances, IA is supposed to carry out the following tasks:

- Public Consultation for information dissemination regarding functions and importance of GRC;
- Assessment of PAPs' grievances on a continuous basis;
- Accompanying and representing PAPs at the Grievance Committee Meetings;
- Documentation of all cases referred to GRC and maintenance of the related records.
- Nominate a suitable person to be a member of GRC.
- Help PAPs in filling the grievance application and also in clearing their doubts about the procedure, as well as the context of the GRC award.
- Record the grievance and bring it to the notice of GRCs within 7 days of receipt of the grievance from PAPs.
- Submit a draft resolution with respect to the particular grievance of PAP, suggesting multiple solutions, if possible, and deliberate on the same in the GRC meeting through the IA representative in GRC.

7.3 Restoration of Common Property Resources (CPRs)

For relocation of CPRs, such as temple, hand pump, village gates, wells, etc., IA shall try to motivate PAPs to relocate beyond the road reserve. Religious properties should be handled carefully and discuss with PAPs and other interested parties, such as the priest, members of the temple committee, etc., to finalize the date for shifting, rituals to be followed, etc. IA will have to conduct several rounds of consultations to arrive at a unanimous decision by the community. For smooth relocation, IA will form a Village-level Committee (VLC) composed of village elders, priest, schoolteachers, and other influential persons in the village. VLC members shall be identified during group discussions with the villagers.

7.4 Income Restoration

To restore and improve pre-project levels of PAPs' incomes and to rehabilitate the socioeconomic and cultural systems in affected communities, income restoration plan must be efficiently implemented. Income restoration programs should proceed exactly as in any other economic development program. A key to success is that the schemes should be designed in consultation with PAPs and should be explicitly approved by them.

Short-term income restoration activities are designed to restore PAPs' income during the periods immediately before and after relocation. For this, IA shall ensure that:

- Adequate compensation is paid before relocation
- Short-term, welfare-based grants and allowances are provided as per entitlement matrix,
- PAPs' access to project-related employment opportunities according to skills and needs are promoted

In the Long-term, develop a range of feasible income restoration options in consultation with the community. As much as possible, mechanisms to dovetail existing government poverty alleviation programs shall also be developed in consultation with the community and affected people. Specifically, the tasks to be undertaken by implementing agency for restoration of income of PAPs are as follows:

- Identification of target groups
- Identification of income restoration activities
- Training includes Training Needs Assessment (TNA), Identification of trainers/training agencies, Arrangements for training
- Monitoring of PAPs engaged in new vocations

In highway sector projects, income restoration interventions are much more complex due to occupational diversity of PAPs. This occupational diversity poses a problem for mitigation measures in the context of economic rehabilitation. The task becomes even more challenging due to the inherent pressure of completing highway construction work within a short time. It has been suggested that dovetailing with government development schemes may help income restoration of PAPs.

7.5 Addressing Other Social Issues

In addition to involuntary resettlement, there are other social issues concerning highways. These issues are trafficking of women and children, child labour, HIV/AIDS and other highway-related diseases, and road safety. The role of IA in implementing social responsibility is limited but can bring some value addition to the project benefits by adopting the following:

Trafficking of Women and Children -

Organization of awareness generation camps (video–audio segments will be more effective, short films on trafficking, skits, walks, etc. apart from display material and lecture sessions)

Child Labour

- Keeping constant vigil on construction camps and sites
- Tie up with Supervision Consultants will lend support for monitoring of sites and camps
- Have regular meetings with Supervision Consultant, and Contractors on these issues
- Hold regular consultation with families
- IA can identify non-hazardous activities to keep children engaged in meaningful economic activity
- Keeping co-ordination with local organizations working on child labour issues

HIV/AIDS

- Tie up with National State AIDS Authority (NAA), which provides Information, Education, Communication (IEC) materials.
- Hold camps at regular intervals
- Conducting awareness campaign and display of posters
- Distribution of free condoms (if possible) or else make truckers and construction workers aware of the importance of condoms and other safe sex methods
- Keep regular vigil on persons indulging in high-risk behaviour
- Identify and train commercial sex workers (CSWs) in alternative IRS

Highway/Road Safety

IA can pay an important role in road safety issue by involving meaningfully. IA's intervention in addressing this issue can be by various methods as follows:

- Identify accident sites where maximum pedestrians or any slow-moving vehicle meets an accident, and locations where accidents are fatal. The accident sites thus identified shall be the location for awareness generation camps.
- Hold discussion with residents of settlements along the project highway to identify accident sites involving local population.
- During consultation with PAPs, IA shall try to identify reasons behind accidents as this will help in preparing IEC materials or to put up necessary signboards, etc.
- Apart from preparing IEC materials, such as posters, pamphlets, car or truck stickers, shall tie up with supervision consultant to put up all necessary signboards and highway markings.
- IA shall distribute the IEC materials in the settlement along the project highway.
- Thematic wall paintings on highway side eateries or other shops frequented by regular highway users or habitants of settlements shall be carried out by IA.
- IA shall invite opinion leaders, such as village elders, schoolteachers, or unemployed educated youths, for training on highway/ road safety issues. After receiving training, this group will, in turn, train other villagers.
- Target women and children, as they are the most vulnerable and prone to highway/road accidents.
- Train schoolchildren on aspects of highway/ road crossing and other safety issues.

7.6 Special Attention to Vulnerable Groups

Vulnerable groups include Indigenous people/ethnic monority, women-headed households and families living below the poverty line, the destitute, elderly and orphans. In the course of preparing and implementing RAP, interests of these vulnerable groups should be adequately protected.

As women are often more adversely affected during the transition between displacement and resettlement, they have to be integrated in the project as full-fledged participants taking part in all the stages of the project (from planning through implementation) and on to the post-project stages. This is the only way to ensure that the R&R process is an exercise in equitable distribution of resources and benefits in a gender-sensitive manner. Participation of women can be ensured specifically in the following ways:

- Involve women in the consultation process.
- Ensure that women are consulted and invited to participate in group-based activities to gain access and control over resources.
- Ensure that women actually take part in issuance of ID cards, opening accounts in the bank, receiving compensation through cheques in their name, etc. This will further widen the perspective of participation by women in project implementation.
- Provide separate training for women's groups for upgrading skills in alternative livelihoods and assist them until the beneficiaries start production and business.
- Initiate women's participation through self-help group formation in each village affected by the project. These groups can then be linked to special development schemes of the Government.
- Encourage women to evaluate the project outputs from their point of view, and their suggestions should be noted when taking action for further modifications in the project, creating better and congenial situation for increasing their participation. All these must be done in a participatory manner to generate sustainable results in terms of income restoration of women.

IA's Responsibilities toward Other Vulnerable Groups

- Identification of indigenous population families as per impact category, such as residential, commercial, agriculture, etc.
- Collect socioeconomic information on affected households, including land tenure system (during verification exercise).
- Prepare a dossier based on the information collected.
- In case a large number of indigenous/ethnic people are affected, a separate Indigenous Peoples Development Plan (IPDP) shall be implemented. Verify/review the IPDP plan prepared as part of DPR based on its own assessment of the area.
- Ensure that the affected indigenous/ethnic people households are represented during various consultations.
- Ensure that the affected indigenous/ethnic people families receive the provisions made in RAP according to the entitlement framework.
- Ensure that the indigenous/ethnic people families are resettled following their traditional settlement pattern, housing, concept of dwelling space utilization, livestock rising, kitchen gardening, and other necessary requirements. For this, elaborate consultations shall be made on each and every aspect with PAPs.
- Ensure that the indigenous/ethnic people are allowed to participate in the planning process, implementation, and M&E of R&R.
- Ensure that nothing is imposed upon indigenous/ethnic households in the name of up-liftment. If any betterment (on the outsider's terms) is to be suggested, these communities should be made fully aware of the facilities, their uses and maintenance, through persuasive and participatory approaches so that they are convinced of accepting such facilities.
- Ensure that community properties, such as their shrines; sacred groves, etc., are relocated as per their custom and culture. Community gathering places shall be provided according to their choice in the resettlement site.
- Caution is needed on the part of IA to avoid any imposition that may harm/disturb the ethnic identity of the people.
- Identification of BPL families and ensure that assistance to such families is provided according to the entitlement framework.

7.7 Monitoring and Evaluation Mechanisms

Monitoring is essentially an exercise in strategic learning that can be used for enhancing the quality of RAP implementation. According to existing arrangements, there are two types of monitoring namely (a) internal, which is normally carried out by the project authority itself and (b) external or independent monitoring by an external agency.

Internal monitoring - As part of RAP document, monitoring indicators and reporting requirements for resettlement activities are normally provided based on the project specific requirements. The organizational unit responsible for monitoring resettlement on behalf of MPWT or MRD shall oversee the progress through regular progress reports from the field staff. This overall monitoring and reporting framework provides a routine flow of information from field level to headquarters.

External monitoring - External monitoring is required to provide an independent assessment of resettlement implementation and impacts and to suggest adjustments of delivery mechanisms and procedures as required. An independent agency or an individual expert is hired for concurrent monitoring of implementation of the resettlement exercise. M&E consultants use both qualitative, as well as quantitative research tools. Verification of micro plans and interviewing of PAPs require through structured questionnaires, group discussion with PAPs and informal/formal dialogue with project officials.

IA's tasks - The objective of M&E is not only to ensure smooth implementation of the R&R program, but also to ensure that IA has followed the steps provided in RAP and approved policy of the project authority. Therefore, IA has to ensure

- Deployment of adequate staff & professionals as suggested in RAP
- Adherence to the agreed time-plan. Any modification, if required, should be carried out in consultation with the project implementing authority, and maintaining the records of any deviation.
- Proper documentation is done, including
    - Documentation of socioeconomic data
    - Preparation of DMS and micro plans
    - Documentation of consultations
    - Documentation of VLC and GRC meetings
    - IA's monthly progress reports
    - Documentation of income restoration activities
- Process documentation has to be followed in carrying out the following:
    - Verification exercise
    - Consultations
    - Identification of relocation sites
    - Relocation of PAPs and CPRs
    - Income restoration activities
    - Awareness generation for social responsibility

The external monitoring agency (EMA) is responsible for -

- Verification of reports submitted by IA, including micro plans
- Field-checking of the delivery of the following
    - Payment of compensation, including amounts and timing
    - Assessment and confirmation of replacement value, including approach and methodology adopted for arriving at the replacement value
    - All assistance and compliance with entitlement framework
    - Identification and rehabilitation (including assistance) of vulnerable groups in line with the entitlement framework
    - Relocation of PAPs & CPRs
- Survey among sample PAPs to assess their knowledge and concerns regarding the resettlement process, entitlements, and rehabilitation process.
- Observe public consultations for PAPs; review the documentation of consultations held by implementing agency; identification of gaps (if any) and suggest remedial measures (defined format for documentation).
- Observe the functioning of the resettlement operation at all levels in order to assess its effectiveness and compliance with RAP.
- Observe the GRC meeting (on sample basis); review the documentation of GRC meetings by IA.
- Check the type of grievance issues and the functioning of grievance redress mechanisms by reviewing appeals at all levels and interviewing aggrieved PAPs.
- Advice if any, regarding possible improvements in RAP implementation.

Box 35 Monitoring and Evaluation Indicators	
Physical Indicators	**Social Indicators**
➢ Total land area acquired	➢ Area and type of house and facility

Box 35 Monitoring and Evaluation Indicators

- Number of families whose land, residence, and business establishment were affected and structures totally demolished
- Number of families allotted residential structures/plots
- Number of families allotted agriculture land, commercial structure/plots
- Extent of agriculture land, and commercial plots/structures distributed
- Extent of residential plots/structures distributed
- Total area of community and government land transferred for resettlement sites and infrastructure
- Number of families that received productive asset grant (agriculture and business)
- Number of families that received house construction grant, transitional, shifting, and rental allowances
- Number of families that received economic rehabilitation grant
- Distribution of ID Cards

- Morbidity and mortality rates
- Communal harmony
- Women time disposition and decision-making power
- Literacy level, drinking water, schools, health facilities, and other community infrastructures

Economic Indicators

- Annual household income and expenditure
- Number of families living below poverty line
- Utilization of compensation
- Number of PAPs and women gainfully employed in project
- Number of families brought above the poverty line
- Number of shop sites purchased
- Skill mapping
- Selection of IRS
- Training of PAPs
- PAPs in new vocations
- Extent of agriculture land purchased by PAPs

Community Participation Indicators

- Number of meetings for dissemination of information on resettlement
- Number of meetings with affected families to finalize R&R options
- Number of families approaching the Grievance Redress Cell
- Selection of resettlement sites
- Number of families self relocated

Grievance Redress Indicators

- Number of PAPs referred to GRC
- Cases referred to GRC but pending settlement and those settled
- Number of grievance cell meetings
- Number of village-level meetings
- Number of field visits by CRRO and number of cases disposed by CRRO to the satisfaction of PAPs

Financial Indicators

- Amount disbursed for acquisition of land, structure, wells, trees, etc.
- Amount disbursed for productive assets grant (agriculture and business)
- Amount disbursed for house construction grant, transitional allowance, economic rehabilitation grant, shifting assistance, rent, assistance to tenants
- Amount disbursed for restoration of CPR, community infrastructure, conservation of religious structures
- Amount disbursed for extension of development programs, training, and capacity building
- Fees paid to NGO for RP implementation and to consultants for M&E activities
- Amount disbursed for training of implementation staff of MPWT & MRD

Attachment 2: Resettlement Activities and Targets

No.	RP implementation Activities	Total Target			Quarterly Progress (1)			Quarterly Progress (2)		
		Road A	Road B	Road C	Road A	Road B	Road C	Road A	Road B	Road C
1.	**Number of PAPs verified**									
2.	No. of non title holders									
3.	No. of title holders									
4.	Estimation of structure impact									
5.	Valuation of structure									
6.	Preparation of micro plan									
7.	Disclosure of micro plan to PAPs									
8.	Revision & finalization of micro plan after disclosure									
9.	Submission & Approval of micro plan									
10.	Preparation of ID card									
11.	Signature of PAP, NGO & ESU on ID card									
12.	Distribution of ID card									
13.	Opening of bank account									
14.	Transfer of fund									
15.	Preparation of cheques									
16.	Intimation of cheque distribution date to PAPs									
17.	Distribution of cheques									
18.	Notice to clear CoI									
19.	Restoration & relocation of CPR									
20.	Relocation of PAPs									
21.	Support to PAPs in rehabilitation									