

# Environmental Assessment Report

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Environmental Assessment and Review Framework  
Project Number: 42145  
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## Armenia: North–South Road Corridor Investment Program

Prepared by Ministry of Transport and Communications (MOTC) of Armenia for the Asian Development Bank.

The environmental assessment and review framework is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

## ABBREVIATIONS

ARD	Armenia Roads Department
ADB	Asian Development Bank
EARF	environmental assessment and review framework
EIA	environmental impact assessment <sup>1</sup>
EMP	environmental management plan
EA	executing agency
IEE	initial environmental assessment
MNP	Ministry of Environmental Protection and Natural Resources
MOTC	Ministry of Transport and Communication
MFF	multitranche financing facility
NPE	Nature Protection Expertise
NGO	nongovernment organization
PMU	Program Management Unit
RAMSAR	Ramsar Convention on Wetlands
REA	Rapid Environmental Assessment Checklist
RA	Republic of Armenia
SEI	State Environmental Inspectorate
SNCO	State Non-commercial Organizations
SEIA	summary environmental impact assessment
SIEE	summary initial environmental assessment
TOR	terms of reference

### NOTE

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

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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<sup>1</sup> In this document, environmental impact means negative, or adverse, environmental impact

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## Environmental Assessment and Review Framework

### A. Introduction

1. The mandatory requirements applicable to the multitranche financing facility (MFF) necessitate that the proposed subprojects of the first tranche and the subprojects of subsequent tranches follow adequate environmental assessment processes. To ensure that future components are evaluated in a manner consistent with the requirements of the Ministry of Nature Protection (MNP), the national environmental agency of the Republic of Armenia (RA), and the ADB, this Environmental Assessment and Review Framework (EARF) has been prepared. The EARF will guide the Armenia Roads Directorate (ARD) of the Ministry of Transport and Communication (MOTC) of the RA in carrying out the environmental assessment of the subprojects to be financed under the MFF: “North-South Road Corridor Investment Program”. This EARF sets forth the following:

- (i) general principles, selection criteria, procedure of organization of and conducting environmental expert assessment of the subproject documents under this MFF;
- (ii) requirements on the type of subproject documents and the procedure of submitting thereof for environmental expert assessment; and
- (iii) a list of environmentally hazardous types of activities subject to mandatory environmental impact assessment (EIA) on the subproject approval stage.

2. The implementation arrangements are as follows:

- (i) The Executing Agency (EA) will be the MOTC.
- (ii) The MOTC will be monitored by the Subproject Governing Council of Armenia, whose other key functions include guiding the overall policy and strategic direction of the MFF Program, reviewing and evaluating its performance, and coordinating with other external aid agencies.
- (iii) The ARD will set up a Program Management Unit (PMU) to manage day-to-day coordination, implementation, monitoring, and administration activities of individual subprojects.
- (iv) The PMU will include a Safeguards Team comprising expertise in, *inter alia*, social and environmental safeguards.

### B. Overview of the Subprojects to be Assessed

3. Identification of subprojects through the MFF is in progress. So far, two tranches have been identified: (i) repavement of 18.4 km 4-lane section of the Ashtarak to Yerevan road and improved safety for the Yerevan to Ararat road, and (ii) widening the 88-km 2-lane road from Ashtarak to Gyumri to four lanes and a feasibility study and subproject preparation for subsequent tranche subprojects that improve border infrastructure and procedures, upgrading the remaining north-south road corridor, and may include the construction of a new road between Goris and Kapan.

4. The sections of road proposed to be improved under Tranche 1 of the North-South Roads Corridor Program are the Yerevan to Ashtarak and Yerevan to Ararat sections of the Corridor. These sections are both existing 4-lane divided roads within a semi-arid zone devoid of any unique or sensitive areas, forests, and protected areas within one km of the alignment for which environmental impacts can be expected to be minor, standard, and easily prevented or mitigated. Consequently, the ADB assessed this road section as a Category B subproject,

requiring only an initial environmental examination (IEE). The IEE report was prepared in accordance with ADB's *Environment Policy* (2002) and *Environmental Assessment Guidelines* (2003) and was subsequently uploaded on ADB's website on 9 September 2009.

5. Tranches 2 and 3 have been defined conceptually, and further tranches may be considered also, but they have not progressed to the environmental assessment stage, which will be guided by this EARF.

### **C. Country's Environmental Assessment and Review Foundation**

6. The relevant national laws on environmental protection and assessment are:

- (i) Law on the Principles of Environmental Protection of 1991
- (ii) Law on Environmental Impact Assessment (EIA) of 1995

These two laws are the main laws administered by the MNP. Other pieces of pertinent environmental legislation to be considered are:

- (iii) Land Code of 1991, updated in 2001
- (iv) Water Code of 1992, updated in 2002
- (v) Law on Specially Protected Natural Areas of 2006

7. The key departments within the MNP that have administrative authority over EIA and the subproject approval process are two State Non-commercial Organizations (SNCOs):

- (i) The SNCO "Nature Protection Expertise (NPE)" responsible for reviewing and approving EIA reports and subprojects for implementation and adding conditions when necessary to protect the environment, and
- (ii) The SNCO "State Environmental Inspectorate (SEI)" responsible for inspecting subprojects to ensure compliance with conditions imposed by the NPE and with the subproject Environmental Management Plan (EMP) and Monitoring Program.

8. The EIA process and the SEI's power to inspect are the principal tools used by the MNP to achieve compliance with environmental management principles.

### **D. Specific Procedures to be Used for Subprojects under MFF**

#### **1. Responsibilities and Authorities**

9. Responsibilities of the implementing and executing agencies (ARD and MOTC respectively) include:

- (i) Prepare environmental screening checklist and classify subprojects in consultation with MNP and other departments.
- (ii) Based on the environmental classification of subprojects, prepare terms of reference to conduct IEE or EIA studies.
- (iii) Hire an environmental consultant to prepare IEE or EIA reports including EMP and summary EIA/IEE for public disclosure.
- (iv) Ensure that an IEE or EIA is prepared in compliance with the requirements of the Government and ADB, and that adequate consultation with affected people is undertaken in accordance with ADB requirements.

- (v) Undertake review of the IEE or EIA, summary EIA/IEE, and EMP reports to ensure their compliance with the requirements of the Government and ADB.
- (vi) Obtain necessary permits and/or clearance, as required, from MNP and other relevant government agencies, ensuring that all necessary regulatory clearances are obtained before commencing any civil work on the relevant sections.
- (vii) Submit to ADB the IEE or EIA, summary EIA/IEE, and EMP reports and other documents, as necessary.
- (viii) Ensure that any EMP, including relevant mitigation measures that need to be incorporated during the construction stage by the contractor, are included in the bidding and contract documents.
- (ix) Ensure that contractors have access to the EIA or IEE and EMP reports of the subprojects.
- (x) Ensure that contractors understand their responsibilities to mitigate environmental problems associated with their construction activities.
- (xi) Ensure and monitor that an EMP, including an environmental monitoring plan, will be properly implemented.
- (xii) In case unpredicted environmental impacts occur during the subproject implementation stage, prepare and implement as necessary an environmental emergency program in consultation with MNP, other relevant government agencies, and ADB.
- (xiii) In case a subproject needs to be realigned during implementation, review the environmental classification, revise it accordingly, and identify whether a supplementary IEE or EIA study is required. If yes, prepare the terms of reference for undertaking a supplementary IEE or EIA and hire an environmental consultant to carry out the study.
- (xiv) Submit semi-annual reports on implementing EMPs, including implementation of an environmental emergency program, if any, to MNP and ADB.
- (xv) Submit subproject completion environmental monitoring report to ADB after three years of completion of construction summarizing the overall environmental impacts from the subprojects.

10. ADB is responsible for the following:

- (i) Review EIA and SEIA reports prepared under supervision of EA;
- (ii) Review of IEE and SIEE reports if it requires ADB's no objection approval;
- (iii) Undertake annual environmental review missions for category A and B subprojects; and
- (iv) Public disclosure of SEIA and SIEE (for category B subprojects) through ADB website.

## **2. Environmental Criteria for Subproject Selection**

11. Considering the potential environmental impacts of the future subprojects and the relevant environmental requirements of ADB and the Government of Armenia, the following criteria was agreed upon (by the Government and ADB) for selection of the future subprojects to be included in the Subregional Road Corridor Investment Program:

- (i) The subprojects shall only involve activities that follow all the applicable Government regulations;

- (ii) The subprojects should not pass through any wildlife sanctuaries, national parks, nature reserves, and protected areas designated by national and international regulations;
- (iii) The subprojects should not pass through any ecologically sensitive and significant as recognized by the Government or any area that is internationally significant (such as protected wetlands and mangroves); and
- (iv) The subproject should as much as possible not include any stretch that passes through any cultural heritage and archaeological sites designated by UNESCO and the Ministry responsible for culture.

### **3. Procedures for Environmental Assessment of Subprojects**

12. ADB categorizes road subprojects into two environmental categories, A and B. Subprojects with potential for significant adverse environmental impacts are category A, for which an EIA is required to address significant impacts. Subprojects judged to have some adverse impacts, but of lesser degree and/or significance than category A are category B, for which an IEE is required to determine whether or not significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report. The guidelines to prepare environmental assessment reports for a category A subproject (EIA and SEIA) and for a category B subproject (IEE and SIEE) in compliance with the ADB's *Environment Policy* (2002) and *Environmental Assessment Guidelines* (2003) are given in the following sections.

#### **a. Screening**

13. Every future subprojects to be included in this MFF Program will be screened to determine its environmental category based on the ADB's Rapid Environmental Assessment Checklist (REA). A template of the REA is given in Annex 1. Classification is to be based on the most environmentally sensitive component, which means that if one part of a subproject has the potential for significant adverse environmental impacts, then the subproject is to be classified as category A regardless of the potential environmental impacts of other aspects of the subproject. In general, a subproject will be classified as 'category A' if it:

- (i) is a new road alignment;
- (ii) a complex mitigation measure needs to be prepared through an in-depth assessment of the impacts and detailed study for preparing mitigation measures;
- (iii) will adversely impact an ecologically sensitive area, particularly if the subproject is located less than 500 meters from a designated wildlife or other sanctuary, a national park, a botanical garden, an area of international significance (e.g., an IUCN or RAMSAR site), or from cultural heritage and archaeological sites designated by UNESCO; and
- (iv) passes through any ecologically sensitive areas (hilly or mountainous, forested, nearby estuarine, or other area with important ecological function).

14. Road upgrading and rehabilitation subprojects that do not fall into the above category are classified as B.

#### **b. Scoping**

15. Before conducting any environmental studies, a scoping document consisting of the scope of the environmental surveys, methods of data collection and outputs anticipated from the

study is to be prepared. In case of category A subprojects, the scoping document is to be approved by the EA before detailed environmental studies are undertaken. Scoping should focus on identifying those components of the environment that are likely to be significantly affected by the subproject based on subproject location, past documented experience, the likely geographic and time-related extent of the effects, and the measurements or thresholds to be used to assess significance. A topographic map of the study area showing the subproject road(s), water courses, settlement areas, and preferably landuse should be part of the scoping document. A sample scoping document is in Annex 2.

### **c. Identifying Baseline Conditions and Impacts**

1. With the screening and scoping results in hand, planning of the field program becomes relatively easy; however, it does require the involvement of an experienced environmental assessment practitioner.

2. The first step is to establish the baseline conditions against which any change is measured for the components of the environment likely affected by the subproject. This will usually be carried out through site visits and review of spatial databases for all available environmental parameters such as terrain, soils, rivers, forest, protected areas, and landuse. This will also include collection and analysis of background noise, and air and water quality. These data must be collected in such a manner that their source can be traced by anyone who picks up the document.

3. The second step is to predict likely changes as a result of construction activities and operation of the road, by relating cause and effect such as changes in traffic volume, fleet makeup, and traffic patterns to air quality and noise levels. The locations where based data were collected and where ongoing monitoring takes place should be well documented to facilitate analysis and provide credibility. While following strict scientific method in EIA is far too costly and time consuming, every effort should be made to make the entire study transparent and traceable.

### **d. Public Consultations/Hearing**

4. The third step is to present the findings on impacts and benefits during a consultation and information session to inform key stakeholders and affected communities of the issues identified and to invite comments. For a category A subproject, consultation is required at least twice during the EIA:

- (i) First, as part of the scoping stage to define the subproject and to get feedback in options, and
- (ii) Secondly, after the draft EMP has been prepared and prior to loan appraisal by ADB.

5. Public consultations include newspaper advertisements in the regional and national news papers 50 to 60 days before the intended consultations giving brief subproject description, location, and specific contact data (including telephone numbers). Often a subproject website is created and link information is provided. Further, the proponent, working with the consultant, should prepare a list of important participants and send emails or letters of invitation providing details including dates for both consultations.

6. Consultations must have meeting notes and attendance sheets prepared, which are included as part of the EIA documentation.

7. For Category B subprojects, nearly all conditions as defined above are the same except there is only one consultation session required, which generally takes place as the EMP is being prepared.

**e. Preparation of the Environmental Management Plan**

8. The Fourth Step is the preparation of the EMP, the most important output of an environmental assessment. The EMP must be practical, specific, and systematic such that it can easily facilitate mitigating and monitoring actions by contractors and proponents and that can form the basis of environmental clauses in bidding and contract documents. Each mitigation measure should be matched with a monitoring activity.

9. Good EMPs not only identify the source of the impact, the effect in the biophysical environment, and the monitoring action to be taken, but also where, when, how often, and by whom each mitigation and monitoring action should be performed. This applies to EIAs and IEEs.

10. The PMU of ARD is required to review and update the EMP as soon as the contractor has been appointed and the mobilization date is established and periodically thereafter as appropriate.

**f. Assessing Institutional Capacity for EMP Implementation**

11. The Fifth Step involves the identification of the agencies and units at the national and sub-national level that will likely be involved in the implementation and supervision of the mitigation and monitoring actions as well as the general management of the EMP from preconstruction through the operating period. The EMP is also useful in that it identifies the lead implementing and supervising agencies (ARD, MOTC, and MNP and their provincial/regional departments) involved in all mitigation and monitoring actions. The assessment, using mostly the interview approach, should be short and focused, identifying needs based on obvious gaps, such as lack of experience in international-level assessments or lack of experience with preparation and implementation of EMPs. Careful interviews will almost always result in those needing assistance identifying what they need. Finally, the needs are assessed in terms of longer-term capacity building and short-term training and workshops in relation to realistic budgetary limits and a capacity building and training program is proposed. Since the contractors play such an important role in EMP implementation, their safeguards skills must also be assessed with a view to strengthening them.

**g. Estimating Mitigation, Monitoring, and Training Costs**

12. The Sixth Step involves costing of each of the mitigation and monitoring actions as well as the institutional capacity building. Costing details must be systematic and include rates and unit costs and an indication of actions that, while referred to as environmental, are normally found in other budget items, for example slope stabilization, revegetation, fuel handling and storage protocols, and work camp waste management.

## **h. Reporting**

13. The Seventh Step is preparation of the assessment document according to a prescribed format and level of details. The templates of the reports for preparation of EIA/IEE and SEIA/SIEE reports are in Annexes 3 to 6 and can also be found in ADB's website at [www.adb.org/documents/guidelines/environmental\\_assessment/default.asp](http://www.adb.org/documents/guidelines/environmental_assessment/default.asp).

## **E. Compliance with ADB's Environmental Policy—Due Diligence**

14. ARD, MOTC, and MNP have the responsibility to undertake environmental due diligence and monitor implementation of environmental mitigation measures for all subprojects under each respective mandate. The due diligence report as well as monitoring of EMP implementation (described in the annual report) need to be documented systematically. ADB must be given access as needed to undertake environmental due diligence for all subprojects.

15. An EMP will be part of the overall subproject monitoring and supervision, and will be implemented by the contractor with oversight from the supervision consultant and PMU. Progress on the preparation and implementation of an EMP will be included in the periodic subproject progress reports. Specific monitoring activities defined in the IEEs or EIAs and EMPs will be carried out by the contractors and monitored by the PMU. ARD will submit reports on EMP implementation to ADB every six months for category A and selected<sup>2</sup> category B subprojects and annually for other category B subprojects.

16. The PMU, with assistance from the environmental consultants, will review the IEE or EIA and corresponding EMP for each subproject to ensure that mitigation measures and monitoring plans proposed in those documents are in compliance with ADB's and Government's requirements. According to the reports and reviews during its missions, ADB, in consultation with the Government, will confirm compliance. For this purpose, the PMU will provide ADB with access to information on any subprojects. The information on implementation of an EMP, as well as that on environmental and social safeguard compliance, will be systematically documented and reported to ADB as part of the regular progress reports.

## **F. Public Disclosure**

17. ARD is responsible for ensuring that all environmental assessment documents, including the environmental due diligence and monitoring reports, are properly and systematically kept as part of the subproject record of each subproject under its responsibility. All environmental documents are subject to public disclosure. These documents should be made available to the public, if requested. In case there are category A and selected category B subprojects, the summary EIA/IEE will be disclosed to the public through ADB's website at least 120 days before the subproject is approved. The SEIA/SIEE shall be reviewed by ADB before it is disclosed to the public. ARD will also ensure that public consultations, particularly with subproject affected persons, are undertaken adequately during the IEE or EIA preparation in consistent with ADB requirements.

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<sup>2</sup> Selected environmentally sensitive category B subprojects include those that are near environmentally sensitive areas, or that involve deforestation; loss of biodiversity; involuntary resettlement; the processing, handling, or disposal of toxic and hazardous substances; or activities that may be of concern to a wide group of external stakeholders.

**G. Staffing Requirements and Budget**

18. ARD and MOTC will recruit environmental consultants as a part of engineering design consultants to prepare environmental assessment reports for each subproject consistent with this EARF. Terms of reference for consultants along with the budget are given in Annex 7. The estimated cost for preparation of each IEE and EIA are about \$100,000 and US\$160,000 respectively. Adequate funding resources must be provided under each subproject for environmental monitoring and mitigation measures for each subproject.

## Rapid Environmental Assessment (REA) Checklist Roads and Highways

**Instructions:**

- This checklist is to be prepared to support the environmental classification of a subproject. It is to be attached to the environmental categorization form that is to be prepared and submitted to the Chief Compliance Officer of the Regional and Sustainable Development Department.
- This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- Answer the questions assuming the “without mitigation” case. The purpose is to identify potential impacts. Use the “remarks” section to discuss any anticipated mitigation measures.

**Country/Subproject Title:** Armenia / [Name of subproject]

**Sector Division:** Roads & Highways

**Conducted by / date:** [Name(s) of Environmental Specialist(s)], [Date]

SCREENING QUESTIONS	Yes	No	REMARKS
<b>A. SUBPROJECT SITING</b>			
IS THE SUBPROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?			
▪ CULTURAL HERITAGE SITE			
▪ PROTECTED AREA			
▪ WETLAND			
▪ MANGROVE			
▪ ESTUARINE			
▪ BUFFER ZONE OF PROTECTED AREA			
▪ SPECIAL AREA FOR PROTECTING BIODIVERSITY			
<b>B. POTENTIAL ENVIRONMENTAL IMPACTS</b>			
WILL THE SUBPROJECT CAUSE...			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?			
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?			
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people			
▪ other social concerns relating to inconveniences in living conditions in the subproject areas that may			

SCREENING QUESTIONS	Yes	No	REMARKS
trigger cases of upper respiratory problems and stress?			
<ul style="list-style-type: none"> <li>▪ hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ creation of temporary breeding habitats for mosquito vectors of disease?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ dislocation and compulsory resettlement of people living in right-of-way?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ increased noise and air pollution resulting from traffic volume?</li> </ul>			
<ul style="list-style-type: none"> <li>▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?</li> </ul>			

## SAMPLE SCOPING DOCUMENT

### Scoping Framework for the Environmental Impact Assessment of ‘Ajara Bypass Roads Development Subproject’

#### A. Introduction

1. This scoping framework has been prepared to carryout detailed environmental impact assessment (EIA) for the ‘Ajara Bypass Roads Development Subproject’ in accordance with ADB’s Environment Policy (2002) and Environmental Assessment Guidelines (2003) and relevant laws and regulations in Armenia. The subproject involves new construction and widening of roads, bridges, overpasses, tunnels, and protection structures. The study will identify potential environmental impacts on physical, ecological, social, cultural, and economic resources of subproject areas during design (for different alignments), construction and operation. An EIA report will be prepared along with environmental management and monitoring plan to address all identified environmental impacts as per the work plan provided in **Error! Reference source not found..** The study will be carried out by Consultant and the draft EIA report will be submitted along with the Final Report of the Subproject.

#### B. Scope of Work

##### 1. Baseline Studies

##### a. Output 1: Memo on Armenian Legal and Administrative Procedures

2. **Activity 1.1:** Collection and review of relevant information regarding environmental legislation, statutory orders, by-laws, etc. connected to preparation and approval of the EIA report by Armenian Authority, and draft the memo. The memo will also consider the requirements of ADB Guidelines for ‘Category A’ Subproject.

3. **Activity 1.2:** Conducting a series of meetings with the senior staff of ministries responsible for environment protection, natural resources, culture, archeology to discuss appropriate legal and administrative procedures. Discussions also include issues such as basis for further approval / disapproval of EIAs by Armenian authorities and on the issuance. Review of other relevant environmental laws, regulations, Norms, and Standards on Air, Noise, Water, Waste, and Wildlife.

4. **Activity 1.3:** Discussions with the ARD of the MOTC on the issuance of construction permits and environmental clearance certificates in accordance with RA’s applicable laws and regulations.

##### b. Output 2: Preparation of Baseline Assessment

5. **Activity 2.1:** Review of reports and field data collected from the subproject’s pre-feasibility study; and other road subprojects carried out under the World Bank, JBIC, EBRD, and MCC’s funding.

6. **Activity 2.2:** Collection of baseline information on existing environmental condition along the subproject road alignments and identification of the environmental components that need detailed further study. Baseline assessment will be done based on the available secondary

information, field visits, sampling and environmental monitoring including but not limited to the following:

- (i) Physical resources: topography, climate, soils, geology, landuse, coastal resources, and surface and groundwater resources;
- (ii) Natural hazards: seismicity, floods, landslides, and volcanic activity;
- (iii) Ecological Resources: landscape and natural ecosystem, flora and fauna, wildlife and wetland habitats, nature reserve and protected areas;
- (iv) Environmental quality: Air quality (PM, CO, NO<sub>x</sub>, Sox, etc.), noise quality and water quality (DO, TPH, pH, total nitrogen, BOD, total phosphorus, and suspended solid, etc.); and
- (v) Cultural resources and archaeological sites: structures or sites that are of historical, archaeological, paleontological, or architectural significance.

## 2. Detailed Field Investigation to Screen Environmental Impacts

### c. Output 3: Field Investigation and Analysis of Results

7. **Activity 3.1:** Preparation of layout plan of the subproject road including, but not limited to, the following information:

- (i) Road alignments
- (ii) Sampling location for environmental parameters (air, noise, water)
- (iii) Construction camp including storage of petroleum products and explosives
- (iv) Asphalt and batch mixing plants, construction sites and camps, quarry sites and borrow pits
- (v) Water sources, waste disposal sites, environmentally sensitive areas

8. **Activity 3.2:** Collection of a cadastral land use map showing the subproject locations and descriptions of the surrounding activities. This is to ensure that the subproject road is compatible with the national regulation specified for construction sites.

9. **Activity 3.3:** Initiation of necessary investigations and fieldwork for gathering of following additional information about ecological and environmental parameters in the subproject area.

- (i) **Landscape, Geohazards and Slope Stability.** Identification of natural landscape along the subproject road. Assessment of geological and geomorphologic features of the subproject area, as well as any violent interference in the natural processes. Investigation and evaluation of results to predict rock falls, landslide, mudflow and debris flow, erosion, ground subsidence, floods, and banks washing-off (lateral erosion) and seashore erosion.
- (ii) **Soil Erosion and Slope Stability.** Analysis of soil characteristics, moisture contents, vegetation cover etc., in conjunction with the above activity, to predict possible soil erosion and landslides due to subproject activities.
- (iii) **Terrestrial Flora and Fauna.** Investigation of the composition of plant species and migratory birds in the Subproject area. Attention should be paid to the distribution of protected plant and animal/birds species in order to ensure favorable conservation status for these species.
- (iv) **Wetland habitats and Aquatic Flora and Fauna.** Investigations of occurrence of species (flora and fauna) in the identified wetlands along the subproject area

and assess the potential influence of the proposed road alignment. Attention should be paid to the distribution of protected species in order to ensure favorable conservation status for these species.

- (v) **Protected Areas and Sensitive Environmental Receptors.** Collection of protected and sensitive area maps and exact coordinates showing the boundaries and buffer zones of protected areas and subproject alignments and descriptions of the habitats. This is to ensure that the locations of sensitive areas and subproject alignment are sufficiently distant enough to maintain harmonization and avoid any potential disturbances on the habitats. Investigation will also be done for other sensitive sites along the subproject alignment, viz. wetlands, seashore, tourism, etc.
- (vi) **Traffic Flow.** Traffic counts and historical traffic flow to predict the future traffic growth and the load on the subproject road.
- (vii) **Air Quality and Noise Level.** Collection and analysis of air (PM, CO, NO<sub>x</sub>, SO<sub>2</sub>) and noise quality along the subproject road.
- (viii) **Water Quality.** Collection and analysis of water quality (DO, turbidity, pH, TOC, and dissolved solid) of the major rivers along the subproject road. Investigation of water quality impacts during construction and operations stages in selected river sites.
- (ix) **Monuments and Archaeological Site.** Investigation of the impact of the subproject on monuments and archaeological sites along the subproject corridor.
- (x) **Quarry and Borrow Sites.** Estimation of effects on the ecological resources in the area connected to quarry and borrow pit operations needed for construction.

### 3. Analysis of Alternatives and Economic Assessment

#### d. Output 4: Analysis of Alternative Options

10. **Activity 4.1:** Comparative environmental analysis of all available subproject alignments, including “No Subproject” scenario.

#### e. Output 5: Economic Assessment

11. **Activity 5.1:** Economic analysis of all alternatives in accordance with ADB’s Handbook on Economic Evaluation of Environmental Impacts for: (i) costs and benefits of environmental impacts; (ii) costs, benefits, and cost-effectiveness of mitigation measures; and (iii) discussion of impacts that have not been expressed in monetary values, in quantitative terms where possible.

### 4. Forecast Future Impacts and Mitigation Measures

#### f. Output 6: Forecast of Impacts

12. **Activity 6.1:** Forecasting of air and noise quality based on predicted traffic estimates using computer modeling software and recommendation of mitigation measures.

13. **Activity 6.2:** Evaluation of the subproject impact on all physical and ecological resources described in Activity 3.3 and recommendation of mitigation measures.

14. **Activity 6.3:** Evaluation of socio-economical and cultural impacts, such as:

- (i) Assessment of the status of livelihoods (agriculture, business, etc.) in the context of socio-economical impact.
- (ii) Assessment of the impact on objects or areas with known archeological values in the subproject area.
- (iii) Assessment of impacts on culturally and religiously sensitive locations (church, cemetery, etc.)
- (iv) Assessment of impacts in tourism sector
- (v) Assessment of traffic safety.

15. **Activity 6.4:** Assessment of impact on human health and estimation of possible health impacts on construction workers and roadside residents (such as safety, HIV/AIDS, STDs, human trafficking) due to construction camps and other subproject activities.

#### **g. Output 7: Environmental Management and Monitoring Plan**

16. **Activity 7.1:** Preparation of Environmental Management and Monitoring Plan (EMP) for all phases of the subproject for effective implementation of environmental protection and mitigation measures and monitoring of significant environmental impacts. Preparation of environmental protection measures to (i) mitigate environmental impacts, (ii) provide in-kind compensation for lost environmental resources, or (iii) enhance environmental resources. Prepare cost estimates for each mitigation measure proposed in the EMP and include all the mitigation measures in the engineering design of the Subproject.

17. **Activity 7.2:** Setting up of environmental criteria for several variables such as:

- (i) Air quality, noise level, water quality, accidental spills of hazardous substances; and
- (ii) Naturally protected areas.

### **5. Institutional Assessment and Monitoring Mechanism**

#### **h. Output 8: Institutional Assessment**

18. **Activity 8.1:** Assessment of institutional capacity of the implementing agencies for effective implementation of environmental management and monitoring plan. Identification of responsible institutes for implementation and supervision of the EMP. Assess training needs of these agencies and propose capacity building measures and institutional arrangements to strengthen these agencies along with the cost estimates.

#### **i. Output 9: Monitoring Mechanism**

19. **Activity 9.1:** Elaboration and specifying of “feed back monitoring” program, a tool to be used by implementing authorities in order to be able to interfere and respond quickly to activities, which during the construction and operation turn out to have a negative effect to the environment. The tool will specify the parameters, location, frequency and means of monitoring.

## 6. Public Consultations and Disclosure Plan

### j. Output 10: Conduct Public Consultations and Document Them

20. **Activity 10.1:** Assisting ARD to conduct two public consultations (one during the inception stage and the second one after finalization of EIA report) according to ADB's Public Communications Policy (2005) for Category A subprojects and the pertinent clause in RA's Law on Environmental Impact Assessment (1995). This will ensure that the consultation process will involve affected people, key agencies, NGOs, and other stakeholders and they are provided with opportunities to participate in the decision-making process and to influence decisions that will affect them. Address all the comments in the engineering designs.

21. **Activity 10.2:** Agreement by the appropriate authorities of specific zones where minor temporary and/or permanent impacts to the environment can be accepted during the construction and operation phase of the bypass road. The ranges of the zones will be determined on the basis of results of investigations and local conditions.

### k. Output 11: Disclosure Plan

22. **Activity 11.1:** In consultation with the stakeholders, preparation of information disclosure plan for dissemination of safeguard documents to the affected community and general public.

## Outline of an Environmental Impact Assessment (EIA) Report

### A. Introduction

1. This section usually includes the following:
  - (i) purpose of the report, including (a) identification of the subproject and its proponent, (b) brief description of the nature, size, and location of the subproject and its importance to the country, and (c) any other pertinent background information;
  - (ii) stage of subproject preparation (i.e., pre-feasibility study, feasibility study, detailed engineering design preparation);
  - (iii) extent of the EIA study, including the scope of the study, magnitude of effort, and persons/expertise or agency performing the study and corresponding person months; and
  - (iv) brief outline of the contents of the report, including any special techniques or methods used for identifying issues, assessing impacts, and designing environmental protection measures.

### B. Description of the Subproject

2. The subproject should be described in terms of its basic activities, location, layout, and schedule (in terms of the subproject cycle). This section of the EIA report should provide sufficient details on the following:

- (i) Type of subproject;
- (ii) Need for subproject;
- (iii) Location (use maps showing general location, specific location, subproject boundary and subproject site layout);
- (iv) Size or magnitude of operation including any associated activities required by or for the subproject;
- (v) Proposed schedule for approval and implementation; and
- (vi) Description of the subproject including drawings showing subproject layout, components of subproject, etc. This information should be of the same type and extent as is included in feasibility reports for proposed subprojects, in order to give a clear picture of the subproject and its operations.

### C. Description of the Environment

3. This section contains a description of the study area to provide a clear picture of the existing environmental resources and values within which the impacts must be considered. Detailed methodology to gather information, including data sources, should also be briefly described. As much as possible, the baseline information should be presented in maps, figures, and tables. The baseline environmental information area should include:

- (i) **Physical Resources:** e.g.
  - (a) atmosphere (e.g. air quality and climate)
  - (b) topography and soils,
  - (c) surface water
  - (d) groundwater
  - (e) geology/seismology.

- (ii) **Ecological Resources:** (e.g.)
  - (a) fisheries
  - (b) aquatic biology
  - (c) wildlife
  - (d) forests
  - (e) rare or endangered species
  - (f) protected areas
  - (g) coastal resources
  
- (iii) **Economic Development:** (e.g.)
  - (a) industries
  - (b) infrastructure facilities (e.g. water supply, sewerage, flood control)
  - (c) transportation (roads, harbors, airports, and navigation)
  - (d) land use (e.g. dedicated area uses)
  - (e) power sources and transmission
  - (f) agricultural development, mineral development, and tourism facilities
  
- (iv) **Social and Cultural Resources:** (e.g.)
  - (a) population and communities (e.g. numbers, locations, composition, employment);
  - (b) health facilities;
  - (c) education facilities;
  - (d) socio-economic conditions (e.g. community structure, family structure, social well being);
  - (e) physical or cultural heritage;
  - (f) current use of lands and resources for traditional purposes by Indigenous Peoples; and
  - (g) structures or sites that are of historical, archaeological, paleontological, or architectural significance.

## D. Alternatives

4. The consideration of alternatives is one of the more proactive sides of environmental assessment - enhancing the subproject design through examining options instead of only focussing on the more defensive task of reducing adverse impacts of a single design. This calls for the systematic comparison of feasible alternatives for the proposed subproject site, technology, and operational alternatives. Alternatives should be compared in terms of their potential environmental impacts, capital and recurrent costs, suitability under local conditions, and institutional, training and monitoring requirements. For each alternative, the environmental costs and benefits should be quantified to the extent possible, economic values should be attached where feasible, and the basis for the selected alternative should be stated.

5. Examining alternative means of carrying out a subproject involves answering the following three questions: (i) what are the alternatives? , (ii) what are the environmental impacts associated with each alternative? , and (iii) what is the rationale for selecting the preferred alternative? For example, a road connecting two points can follow a number of different routes. In this case, the EIA report must describe the process taken to select the most appropriate route based on a set of pre-determined criteria. The consideration of alternatives and the selection criteria used to identify the preferred alternatives must include environmental factors. The

information going into the decision and the decision-making process must be documented in the EIA report. For example, if "alternative means" refers to site selection for a large hydroelectric dam, the location of each alternative would have to be described, the environmental impacts of each alternative defined and the criteria and analysis of site selection presented.

6. Since the selection of alternatives can involve detailed technical analysis that includes more than just environmental factors, it may be preferable to present the details of this analysis as an appendix and include only the results and summary of this selection process in the body of the report. For example, a table listing the alternatives on one axis, and the criteria, such as reliability, cost, performance, inherent environmental effects and necessary mitigation measures, on the other axis may provide an effective summary.

7. **Alternatives to the Subproject.** In some instances it will be necessary to consider "alternatives to" the subproject. This situation should not arise if the subproject is consistent with DMC's development strategy, ADB's Country and Strategy Program, and has been developed based on a sector strategy and roadmap. The EIA report should describe how the subproject fits into this larger strategic planning context. This context helps justify the subproject and demonstrates the requirements that may constrain the alternatives that are feasible or permitted.

8. However, in the case of potentially controversial subprojects, there may public concern that the subproject does not represent the best way to achieve stated development objectives. In addition, segments of the public may react negatively if they perceive that the EIA report has not considered alternatives to the subproject, or the preferred alternative is proceeding based on flawed assumptions. Therefore, if controversy is expected surrounding the fundamental reasons for the subproject, the EIA report should include a discussion of alternatives to the subproject.

9. One alternative that should receive special attention is the "no go" alternative. In some cases, this may be the only alternative to the subproject that can be realistically considered.

## **E. Anticipated Environmental Impacts and Mitigation Measures**

10. **Review Characteristics of each Environmental Impact.** This section will evaluate the subproject's expected impacts (in as quantified terms as possible) on each resource or value, and applicable sectoral environmental guidelines wherever any significant impact is expected (including environmental risk assessment, where appropriate. Environmental impacts to be investigated will include those due to (i) subproject location; (ii) caused by possible accidents; (iii) related to design; and (iv) during construction, regular operations, and final decommissioning or rehabilitation of a completed subproject. Where adverse effects are indicated, discuss measures for minimizing and/or offsetting these, and opportunities for enhancing natural environmental values will be explored. Both direct and indirect effects will be considered, and the region of influence indicated. This analysis is the key presentation in the report and if not sufficiently completed it may be necessary to delay the subproject until the analysis can be completed. It is necessary to present a reasonably complete picture of both the human use and quality of life gains to result from the subproject due to the utilization, alteration, and impairment of the natural resources affected by the subproject, so that fair evaluation of the net worth of the subproject could be made.

11. **Mitigating Adverse Effects.** For each significant adverse environmental impact, the

report will carefully explain how the subproject plan/design minimizes the adverse effects and in addition how the subproject plan/design, to the extent feasible, includes provision for offsetting or compensating of adverse effects and for positive enhancement of benefits or environmental quality. Where substantial cost of mitigation measures is involved, alternative measures and costs will be explored.

12. **Irreversible and Irretrievable Impacts.** The EIA report will identify the extent to which the proposed subproject would irreversibly curtail the potential uses of the environment. For example, highways that cut through stream corridors, wetlands, or a natural estuary can result in irretrievable damage to those sensitive ecosystems. Other impacts that may be irreversible include alteration of historic sites, and expenditure of construction materials and fuels. Also, subprojects through estuaries, marshes, etc., may permanently impair the area's natural ecology; or elimination of recreation areas and parklands can precipitate drastic changes in the subproject area's social and economic character.

13. **Temporary Effects during Subproject Construction.** In the event the construction phase of the subproject involves special environmental impacts (to be terminated on completion of construction), these will be separately discussed including proposed remedial measures.

#### **F. Economic Assessment**

14. This section may be drawn from the economic analysis conducted as part of the subproject feasibility study. It should include the following elements which should be integrated into the overall economic analysis of the subproject: (i) costs and benefits of environmental impacts; (ii) costs, benefits, and cost-effectiveness of mitigation measures; and (iii) discussion of impacts that have not been expressed in monetary values, in quantitative terms where possible (e.g. weight of volume estimates of pollutants).

#### **G. Environmental Management Plan**

15. The EMP describes how the mitigation and other measures to enhance the benefits of environmental protection will be implemented. It explains how the measures will be managed, who will implement them, and when and where they will be implemented. The following elements should be described in the EMP: (i) implementation of mitigation measures during subproject design; (ii) implementation of mitigation measures by contractors, and how impacts prevention will be incorporated in the materials procurement; (iii) social development program (e.g., resettlement plan, community training); (iv) contingency response plan for natural or other disasters, and subproject contingencies; and (v) environmental management and monitoring costs including mitigation costs.

16. The environmental monitoring plan describes the monitoring activities to ensure that adverse environmental impacts will be minimized, and the EMP implemented. The environmental monitoring plan will cover selected parameters to indicate the level of environmental impacts. It also describes how, when, and where the monitoring activities will be undertaken; who will carry them out; and who should receive the monitoring report. More importantly, it includes a proposal to carry out environmental compliance monitoring activities.

17. The present capacity of the executing agency to implement EMP should be described and implementation costs clearly identified.

## **H. Public Consultation and Information Disclosure**

18. This section will (i) describe the process undertaken to involve the public in subproject design and recommended measures for continuing public participation; (ii) summarize major comments received from beneficiaries, local officials, community leaders, NGOs, and others, and describe how these comments were addressed; (iii) list milestones in public involvement (e.g., dates, attendance, topics of public meetings), and recipients of the report and other subproject-related documents; (iv) describe compliance with relevant regulatory requirements for public participation; (v) if possible summarize public acceptance or opinion on the proposed subproject; and (vi) describe other related materials or activities (e.g., press releases, notifications) as part of the effort to gain public participation. This section will provide a summary of information disclosed to date and procedures for future disclosure.

## **I. Conclusions**

19. The EIA report will present the conclusions of the study including: (i) gains which justify subproject implementation; (ii) explanation of how adverse effects could be minimized or offset, and compensated to make these impacts acceptable; (iii) explanation of use of any irreplaceable resources; and (iv) provisions for follow-up surveillance and monitoring. Simple visual presentations of the type and magnitude of the impacts may aid the decision-maker.

## **Outline of Summary Environmental Impact Assessment (SEIA) Report**

### **A. Introduction (1/2 page)**

1. This section will include the purpose of the report, extent of the EIA study and brief description of any special techniques or methods used.

### **B. Description of the Subproject (1/2 page)**

2. This section will include the type of and need for subproject, location, size or magnitude of operation and proposed schedule for implementation.

### **C. Description of the Environment (2-3 pages)**

3. This section will include the physical and ecological resources, human and economic development and quality of life values in the area affected by the subproject. Where available, environmental standards will be used as the baseline for comparative purposes.

### **D. Alternatives (1-2 pages)**

4. For each alternative, a summary of the probable adverse impacts and its relation to the subproject, and other alternatives will be discussed determine whether the subproject minimizes the environmental impact over all other alternatives and is within acceptable environmental impact limits. In most cases, environmental impacts "with" and "without" subproject alternatives should be examined.

### **E. Anticipated Environmental Impacts and Mitigation Measures (4-6 pages)**

5. Environmental impacts, both direct and indirect, on different environmental resources or values due to subproject location, as related to design, during construction and regular operation will be discussed and mitigation, offsetting or enhancement measures will be recommended.

### **F. Economic Assessment (1-2 pages)**

6. This section will include: (a) costs and benefits of environmental impacts; (b) costs, benefits and cost effectiveness of mitigation measures; and (c) for environmental impacts that have not been expressed in monetary values, a discussion of such impacts, if possible, in quantitative terms (e.g. weight or volume estimates of pollutants). This information should be integrated into the overall economic analysis of the subproject.

### **G. Environmental Management Plan (1-2 pages)**

7. The EMP will describe the impacts to be mitigated, and activities to implement the mitigation measures, including how, when, and where they will be implemented. The environmental monitoring plan will describe the impacts to be monitored, and when and where monitoring activities will be carried out, and who will carry them out.

**H. Public Consultation and Disclosure (1-3 pages)**

8. This section will describe the process undertaken to involve the public in subproject design and recommended measures for continuing public participation; summarize major comments received from beneficiaries, local officials, community leaders, NGOs, and others, and describe how these comments were addressed; list milestones in public involvement such as dates, attendance, and topics of public meetings; list recipients of this document and other subproject related documents; describe compliance with relevant regulatory requirements for public participation; and summarize other related materials or activities, such as press releases and notifications. This section will provide a summary of information disclosed to date and procedures for future disclosure.

**I. Conclusions (1 page)**

9. This section will describe the gains which justify implementation of the subproject; explain how significant adverse environmental impacts will be mitigated or offset and compensated for; explain/justify use of any irreplaceable resources and; describe follow-up surveillance and monitoring.

## Outline of an Initial Environmental Examination (IEE) Report

### A. Introduction

1. This section usually includes the following:
  - (i) purpose of the report, including (a) identification of the subproject and subproject proponent; (b) brief description of the nature, size, and location of the subproject and of its importance to the country; and (c) any other pertinent background information; and
  - (ii) Extent of the IEE study: scope of study, magnitude of effort, person or agency performing the study, and acknowledgement.

### B. Description of the Subproject

2. Furnish sufficient details to give a brief but clear picture of the following (include only applicable items):
  - (i) type of subproject;
  - (ii) category of Subproject;
  - (iii) need for subproject;
  - (iv) location (use maps showing general location, specific location, and subproject site);
  - (v) size or magnitude of operation;
  - (vi) proposed schedule for implementation; and
  - (vii) description of the subproject, including drawings showing subproject layout, and subproject components.

3. This information should be of the same type and extent as is included in feasibility reports for proposed subprojects to give a clear picture of the subproject and its operations.

### C. Description of the Environment

4. Furnish sufficient information to give a brief but clear picture of the existing environmental resources in the area affected by the subproject, including the following (to the extent applicable):

- (i) **Physical Resources:** (e.g.)
  - (a) atmosphere (e.g. air quality and climate)
  - (b) topography and soils,
  - (c) surface water
  - (d) groundwater
  - (e) geology/seismology.
- (ii) **Ecological Resources:** (e.g.)
  - (a) fisheries
  - (b) aquatic biology
  - (c) wildlife
  - (d) forests

- (e) rare or endangered species
- (f) protected areas
- (g) coastal resources

(iii) **Economic Development:** (e.g.)

- (a) industries
- (b) infrastructure facilities (e.g. water supply, sewerage, flood control)
- (c) transportation (roads, harbors, airports, and navigation)
- (d) land use (e.g. dedicated area uses)
- (e) power sources and transmission
- (f) agricultural development, mineral development, and tourism facilities

(iv) **Social and Cultural Resources:** (e.g.)

- (a) population and communities (e.g. numbers, locations, composition, employment)
- (b) health facilities
- (c) education facilities
- (d) socio-economic conditions (e.g. community structure, family structure, social well being)
- (e) physical or cultural heritage
- (f) current use of lands and resources for traditional purposes by Indigenous Peoples
- (g) structures or sites that are of historical, archaeological, paleontological, or architectural significance.

## **D. Screening of Potential Environmental Impacts and Mitigation Measures**

5. Using the checklist of environmental parameters for different sector subprojects, this section will screen out “no significant impacts” from those with significant adverse impact by reviewing each relevant parameter according to the following factors or operational stages. Mitigation measures, where appropriate, will also be recommended environmental problems due to subproject location, and related to subproject design, construction, and operations. Potential environmental enhancement measures and additional considerations will also be covered.

## **E. Institutional Requirements and Environmental Monitoring Plan**

6. This section should state the impacts to be mitigated, and activities to implement the mitigation measures, including how, when, and where they will be implemented. Institutional arrangements for implementation should be described. The environmental monitoring plan will describe the impacts to be monitored, and when and where monitoring activities will be carried out, and who will carry them out. The environmental management and monitoring costs should also be described.

## **F. Public Consultation and Information Disclosure**

7. This section will describe the process undertaken to involve the public in subproject design and recommended measures for continuing public participation; summarize major comments received from beneficiaries, local officials, community leaders, NGOs, and others,

and describe how these comments were addressed; list milestones in public involvement such as dates, attendance, and topics of public meetings; list recipients of this document and other subproject related documents; describe compliance with relevant regulatory requirements for public participation; and summarize other related materials or activities, such as press releases and notifications. This section will provide of summary of information disclosed to date and procedures for future disclosure.

### **G. Findings and Recommendations**

8. This section will include an evaluation of the screening process and recommendation will be provided whether significant environmental impacts exist needing further detailed study or EIA. If there is no need for further study, the IEE itself, which at times may need to be supplemented by a special study in view of limited but significant impacts, becomes the completed environmental assessment for the subproject and no follow-up EIA will be needed. If an EIA is needed, then this section will include a brief terms of reference (TOR) for the needed follow-up EIA, including approximate descriptions of work tasks, professional skills required, time required, and estimated costs. The Bank's Environment Guidelines provides a guide for preparing the TOR for different subprojects.

### **H. Conclusions**

9. This section will discuss the result of the IEE and justification, if any, of the need for additional study or EIA. If an IEE, or an IEE supplemented by a special study, is sufficient for the subproject, then the IEE with the recommended institutional and monitoring program becomes the completed EIA.

## **Outline of Summary Initial Environmental Examination (SIEE) Report**

### **A. Introduction (1/2 page)**

1. This section will include the purpose of the report, extent of the IEE study and brief description of any special techniques or methods used.

### **B. Description of the Subproject (1/2 page)**

2. This section will include the type of and need for the subproject; and subproject location, size or magnitude, operation, and proposed schedule for implementation.

### **C. Description of the Environment (2 pages)**

3. This section will include the physical and ecological resources, human and economic development, and quality of life values.

### **D. Forecasting Environmental Impacts and Mitigation Measures (2-4 pages)**

1. This section will identify "no significant impacts" from those with significant adverse impacts and will discuss the appropriate mitigation measures, where necessary.

### **E. Institutional Requirements and Environmental Monitoring Plan (1 page)**

5. This section will describe the impacts to be mitigated, and activities to implement the mitigation measures, including how, when, and where they will be implemented. The environmental monitoring plan will describe the impacts to be monitored, and when and where monitoring activities will be carried out, and who will carry them out.

### **F. Public Consultation and Disclosure**

6. This section will describe the process undertaken to involve the public in subproject design and recommended measures for continuing public participation; summarize major comments received from beneficiaries, local officials, community leaders, NGOs, and others, and describe how these comments were addressed; list milestones in public involvement such as dates, attendance, and topics of public meetings; list recipients of this document and other subproject related documents; describe compliance with relevant regulatory requirements for public participation; and summarize other related materials or activities, such as press releases and notifications. This section will provide of summary of information disclosed to date and procedures for future disclosure.

### **G. Findings and Recommendations (1-2 pages)**

7. This section will include an evaluation of the screening process, and recommendation will be provided whether significant environmental impacts exist needing further detailed study or EIA. If there is no need for further study, the IEE itself, which at times may need to be supplemented by a special study in view of some small significant impacts, becomes the completed EIA for the subproject and no follow-up EIA will be needed. If further additional study is needed, then this section will include a brief terms of reference (TOR) for the needed follow-up EIA, including approximate descriptions of work tasks, professional skills required, time

required, and estimated costs. The Bank's Environment Guidelines provides a guide for preparing the TOR for different subprojects.

#### **H. Conclusions (1/2 page)**

8. This section will discuss the result of the IEE and justification if any of the need for additional study or EIA. If an IEE or an IEE supplemented by a special study is sufficient for the subproject, then the IEE with the recommended institutional requirements and monitoring program become the completed EIA.

## Outline Terms of Reference for Consulting Services for Environmental Assessment

### A. Objectives

1. The objective of the services are (a) to conduct environmental impact assessment (EIA)/ initial environmental examination (IEE) of the proposed subproject to identify potential environmental impacts on physical, environmental, ecological, social, cultural and economic resources, and (b) to prepare EIA/IEE report along with environmental management plan. The duration of an EIA study is 5 months and an IEE study is 3 months.

### B. Scope of Work

2. The consultant's scope of work will include the following tasks:

- (i) reviewing prevailing government regulations and donor guidelines governing the assessment and management of environmental impacts of road subprojects;
- (ii) prepare a scoping document for the environmental studies to be carried out under the subproject;
- (iii) undertake the EIA/IEE study to assess the direct and in-direct environmental impacts of the Subproject such as: (a) ecological impacts (plants and wildlife); (b) soil erosion and desertification; (c) protection of wetland habitat; (d) impact of quarry sites; (e) impact of construction camps on local environment (natural and social); (f) operational traffic safety measures; (g) areas with known archeological value; and (h) potential spills of hazardous or toxic chemicals and an appropriate response plan for the Subproject;
- (iv) prepare the EIA/IEE report and its summary in accordance with ADB's Environmental Policy (2002) and related Environmental Assessment Guidelines (2003) as well as ADB's Public Communications Policy (2005);
- (v) the EIA/IEE study should address all potential direct and indirect environmental impacts of the subproject. The assessment of environmental impact should be presented in the order of subproject cycle: pre-construction, construction and operation. This EIA/IEE report should include the detailed environmental management plan that should be included in the bidding document; Analyze the likely impacts during construction and operation and suggest appropriate mitigation measures;
- (vi) conduct formal public consultations with affected people (two consultations for EIA and one consultation for IEE). The first consultation aims to gather environmental concerns from affected people and the final consultation aim to share the result of the assessment and the proposed mitigation measures. The list of people attended the consultation, time and locations; subject discussed during consultation should be recorded in systematic manner and should be attached in the EIA/IEE report as an appendix;
- (vii) solicit and incorporate comments on the draft EIA and summary EIA reports from ADB, MPW, NGOs, civil society, and other stakeholders. Finalize the report to accommodate inputs from all the stakeholders; and
- (viii) submit the reports to MNP and make presentation as required by MNP to obtain an environmental impact clearance certificate or equivalent.

### C. Organization and Staffing

3. The services are expected to be provided a team comprising one international and one national consultant.

4. **The International Environmental Specialist** shall have at least 15 years experience and familiarity with all aspects of environmental management and with significant experience in environmental management and monitoring of subprojects, environmental assessment and / or implementation of environmental mitigation measures on construction subprojects. The specialist shall also have experience working in teams of multi-discipline experts and leading a national team of consultants. Candidates with higher degrees in environmental engineering or environmental science or environment management are preferred.

5. **The National Specialists** shall at least be graduates in environmental science, environmental engineering, geological science, engineering hydrology, biology or related discipline with significant experience in environmental management and monitoring of subprojects, environmental assessment and/or design and implementation of environmental mitigation measures.

### D. Budget

6. The estimated cost for preparation of each IEE and EIA are provided in Table 1 and Table 2, respectively. A team of International and national specialists are recommended for these studies. Generally for government funded subprojects, the environmental assessment team would include an environmental specialist, a geologist, and a biologist.

**Table 1: Estimated Cost of IEE Preparation for each Subproject**

Item	Unit	Quantity	Unit Cost (\$)	Total
International Environmental Specialist	Person-month	3	25,000	75,000
National Environmental Specialist	Person-month	3	3,500	10,500
Land Transportation	Months	3	1,250	3,750
Data collection, sample analysis	Lump sum	1	4,000	4,000
Communication	Months	3	500	1,500
Report production and distribution	Lump sum	1	2,000	2,000
Public Consultation	Lump sum	1	2,000	2,000
<b>Total</b>				<b>98,750</b>

**Table 2: Estimated Cost of EIA Preparation for each Subproject**

Item	Unit	Quantity	Unit Cost (\$)	Total
International Environmental Specialist	Person-month	4	25,000	100,000
National Environmental Specialist	Person-month	4	3,500	14,000
National Hydrologist	Person-month	2	3,500	7,000
National Geologist	Person-month	2	3,500	7,000
National Biologist	Person-month	2	3,500	7,000
Land Transportation	Months	5	1,250	6,250
Communication	Months	5	500	2,500
Data collection and sample analysis	Lump sum	1	7,000	7,000
Report production and distribution	Lump sum	1	2,000	2,000
Public Consultation	Lump sum	2	2,000	4,000
<b>Total</b>				<b>156,750</b>

**E. Supervision**

7. The team will work in association with the PMU/ARD, reporting to the subproject director of the PMU/ARD on a day-to-day basis.

**F. Outputs**

8. The team's outputs will include: (i) an inception report reviewing the available environmental reports and prepare preliminary assessment of impacts associated with the proposed subproject, (ii) an interim report; (iii) a draft final report, containing a description of subproject environment, anticipated environmental impacts for various alternatives and proposed environmental management, monitoring and mitigation plan, and (iv) final report incorporating comments from ADB and other stakeholders.