

CONTENT AND FORMAT ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

Introduction

EIA is an important tool for incorporating environmental concerns at the project level. EIA should be carried out as early as the project planning stage as part of feasibility thus it can assure that the project will be environmentally feasible. The general objectives of the EIA study are to provide;

- (i) baseline information about the environmental, social, and economic conditions in the project area;
- (ii) information on potential impacts of the project and the characteristic of the impacts, magnitude, distribution, who will be the affected group, and their duration;
- (iii) information on potential mitigation measures to minimize the impact including mitigation costs;
- (iv) to assess the best alternative project at most benefits and least costs in terms of financial, social, and environment. In addition to alternative location of the project, project design or project management may also be considered; and
- (v) basic information for formulating environmental management plan.

EIA requires an in-depth analysis because of the potential significance of environmental impacts from the project. EIAs demand: (i) comprehensive analysis of the potential impacts; (ii) works to be carried out to formulate practical mitigation measures; (iii) in-depth economic valuation of impact to screen and evaluate the best alternative; and (vi) in-depth analysis to prepare an adequate environmental management plan.

The Process in Preparing EIA

Scoping should be conducted to develop the terms of reference (TOR) for an EIA. The scoping procedure should at least produce the following outputs:

- (i) identify the likely environmental impacts or other environmental concerns and consideration that need to be further investigated in EIA study,
- (ii) identify environmental components that need detailed further study,
- (iii) determine the general approach and methodology required to carry out the EIA study,
- (iv) identify in general all affected interest to be consulted in carrying out EIA study, and
- (v) identify the need to fit the outputs of EIA into the project context especially on environmental management plan.

The next step is undertaking EIA study, and the following are key important activities:

1. Describing Environmental Condition of the Project Area

Collection of baseline information on biophysical, social and economic aspects of the project area is the most important reference for conducting EIA study. The description of environmental settings includes the characteristic of area in which the activity of proposed project would occur and it should cover area affected by all impacts including potential

compensation area, and potential area affected by its alternatives. Normally, information is obtained from secondary sources when there is a facility of maintaining database, or other existing documentation, and through field sampling. Collection of baseline data should be designed to satisfy information requirements and should focused on relevant aspects that are likely to be affected by the proposed project. Therefore, the level of detail in this description of study area should be sufficient to convey to readers the general nature of environmental and social resources condition of the affected areas.

2. Assessing Potential Impacts

The "technical heart" of the EIA process involves the prediction of changes over time in various environmental aspects as a result of a proposed project. The prediction of the nature, extent, and magnitude of environmental changes likely to result from a proposed project is aided by various tools and techniques, the choice of which depends upon the impacts of concern, data availability or lack thereof, and the appropriate specificity of quantitative models. However, the choice of the appropriate method for conducting an EIA can only be guided by certain criteria, but no single method will meet all the necessary criteria. In addition, the prediction has to be based on established scientific knowledge that is still very limited in ecosystems in most DMCs. For this reason, the prediction of ecological changes and their impacts often does not generate concrete conclusions on the magnitude of the impacts.

3. Formulating Mitigation Measures

Once the impacts have been analyzed, their significance will be determined, i.e., whether they are acceptable, require mitigation, or are unacceptable. Subsequently, measures will be devised to mitigate anticipated environmental changes and consequential impacts during project implementation and operation, or further reduce the residual environmental changes inherent in the selected project design. They normally include technical, social, and institutional measures to be implemented as integral elements of the project. Examples are sound operating rules of a reservoir to ensure minimum impacts on downstream water users, and installation of an electrostatic precipitator to remove fly ash in a coal-fired power plant project, and adequate drainage system in an irrigation project.

4. Preparing the Environmental Management Plan

The major output of environmental assessment for proposed project is an EIA report, which includes environmental management plan. In view of the increasing importance in improving the quality of project implementation and to ensure compliance with required mitigation and monitoring measures identified, EIA report will include, as part of EMP, concerned government or related agency undertaking the activities included in environmental management and monitoring plan which will be reflected in the relevant loan covenants.

Environmental management involves the implementation of environmental protection and mitigation measures and monitoring of significant environmental impacts. Environmental protection measures are taken to (i) mitigate environmental impacts, (ii) provide in-kind compensation for lost environmental resources, or (iii) enhance environmental resources. These measures are usually set out in an EMP, which covers all phases of the project from pre-construction through decommissioning, and outlines mitigation and other measures that will be undertaken to ensure compliance with environmental regulations and reduce or eliminate adverse impacts (see Table 1). The EMP will also cover a proposal for recommending the proposed project to use goods and products that are environmentally friendly as well as

proposal for environmental loan covenants.

Table 1: Contents of an EMP

Contents of an EMP	
1.	Summary of Potential Impacts
2.	Description of Planned Mitigation Measures
3.	Description of Planned Environmental Monitoring
4.	Description of Planned Public Consultation Process
5.	Description of the Responsibilities and Authorities for Implementation of Mitigation Measures and Monitoring Requirements
6.	Description of Responsibilities for Reporting and Review
7.	Work Plan including staffing chart, proposed schedules of participation by various members of the project team, and activities and inputs of various government agencies
8.	Environmental Responsible Procurement Plan
9.	Detailed Cost Estimates
10.	Mechanisms for feedback and adjustment

Environmental monitoring involves (i) planning a survey and sampling program for systematic collection of data/information relevant to environmental assessment and project environmental management; (ii) conduct of the survey and sampling program; (iii) analysis of samples and data/information collected, and interpretation of data and information; and (iv) preparation of reports to support environmental management. Environmental monitoring is normally carried out before and during planning to establish baseline data needed for environmental assessment and evaluating environmental impacts during project implementation. It continues through project operation to detect changes in the key environmental quality parameters, which can be attributed to the project. The results of the monitoring program are used to evaluate the following: (i) extent and severity of the environmental impacts against the predicted impacts; (ii) performance of the environmental protection measures or compliance with pertinent rules and regulations; (iii) trends in impacts; and (iv) overall effectiveness of the project EMP.

Environmental monitoring should have clear objectives, and the survey and sampling program custom-designed to focus on data/information actually required to meet the objectives. In addition, the design of the monitoring program has to take into account its practicability considering the technical, financial, and management capability of the institutions that will carry out the program and period of monitoring that will be needed to achieve the objectives (see Table 2). The monitoring program should include action or emergency plans so that appropriate action can be taken in the event of adverse monitoring results or trends. It should also be constantly reviewed to make sure that it is effective, and determine when it can be stopped.

Table 2: Features of an Effective Environmental Monitoring Plan

- Realistic sampling program (temporal and spatial)
- Sampling methods relevant to source
- Collection of quality data
- Comparable new data with other relevant data used in environmental assessment
- Cost-effective data collection
- Quality control in measurement and analysis
- Innovations (e.g., in tracing contaminants and automated stations)
- Appropriate databases
- Multidisciplinary data interpretation to provide useful information
- Reporting for internal management and external checks
- Allowance for, and response to, input from third parties
- Presentation in the public arena (external assessment)

Both the environmental management and monitoring plans need to include who will implement them, when, and where. The capacity of the executing agency, local government, and community organization should be reviewed to identify feasible approach for implementing the plans. The project lifecycle should be taken into account in setting the timing of implementation. For example, the EMP should identify environmental mitigation measures that should be implemented in the engineering design for the contract documents, and materials to be avoided in procurement, among others. On the other hand, the location for monitoring should be selected based on where the impacts would occur, and the areas to be affected. To ensure that the environmental management and monitoring plans will be implemented, it is necessary to identify the key management issues to be included as a requirement either as a loan covenant or conditions for implementing the project.

Documenting EIA Studies

EIA reports and their summaries (SEIA) should be presented in certain way to meet the requirements of ADB and the DMC. However, wherever possible, ADB requests that the Borrower follow ADB-prescribed format for EIA. This is to ensure that environmental assessment results are presented in a clear and concise fashion to contribute most effectively to decision-making. However, if several other financial institutions fund the proposed Project in the form of co-financing modality, it is necessary for ADB to come up with an agreement with those institutions on EIA reporting requirement. In this context, it is necessary to ensure that the content of the EIA reports cover all issues required by ADB. Although the presentation of the EIA report may not follow ADB's standard, it is necessary to ensure that the SEIA should be formulated and presented in accordance to ADB's guideline.

1. Environmental Impact Assessment Report

The standard EIA report format address such issues as exploration of various alternatives, evidence of public consultation and social acceptability, economic analysis of impacts, and direct and indirect impacts. The suggested outline of the EIA report is in Table 3, and the main sections are annotated in the following sections.

Table 3: Outline of an EIA Report

A.	Introduction
B.	Description of the Project
C.	Description of the Environment
D.	Alternatives
E.	Anticipated Environmental Impacts and Mitigation Measures
F.	Economic Assessment
G.	Environmental Management Plan
H.	Public Involvement and Disclosure
I.	Conclusions

a. Introduction

This section usually includes the following:

- (i) purpose of the report, including (a) identification of the project and its proponent, (b) brief description of the nature, size, and location of the project and its importance to the country, and (c) any other pertinent background information;
- (ii) stage of project preparation (i.e., pre-feasibility study, feasibility study, detailed engineering design preparation);
- (i) 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
- (ii) 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 Project

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

- (i) Type of project
- (ii) Need for project
- (iii) Location (use maps showing general location, specific location, project boundary and project site layout)
- (iv) Size or magnitude of operation including any associated activities required by or for the project
- (v) Proposed schedule for approval and implementation
- (vi) Description of the project including drawings showing project layout, components of project, etc. This information should be of the same type and extent as is

included in feasibility reports for proposed projects, in order to give a clear picture of the project and its operations.

c. Description of the Environment

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.
 - atmosphere (e.g. air quality and climate)
 - topography and soils,
 - surface water
 - groundwater
 - geology/seismology.

- (ii) **Ecological Resources:** (e.g.)
 - fisheries
 - aquatic biology
 - wildlife
 - forests
 - rare or endangered species
 - protected areas
 - coastal resources

- (iii) **Economic Development:** (e.g.)
 - industries
 - infrastructure facilities (e.g. water supply, sewerage, flood control)
 - transportation (roads, harbors, airports, and navigation)
 - land use (e.g. dedicated area uses)
 - power sources and transmission
 - agricultural development, mineral development, and tourism facilities

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

d. Alternatives

The consideration of alternatives is one of the more proactive sides of environmental assessment - enhancing the project 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 project 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.

Examining alternative means of carrying out a project 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.

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.

Alternatives to the project. In some instances it will be necessary to consider "alternatives to" the project. This situation should not arise if the project 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 project fits into this larger strategic planning context. This context helps justify the project and demonstrates the requirements that may constrain the alternatives that are feasible or permitted.

However, in the case of potentially controversial projects, there may public concern that the project 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 project, or the preferred alternative is proceeding based on flawed assumptions. Therefore, if controversy is expected surrounding the fundamental reasons for the project, the EIA report should include a discussion of alternatives to the project.

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

e. Anticipated Environmental Impacts and Mitigation Measures

Review Characteristics of Each Environmental Impact. This section will evaluate the project'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) project location; (ii) caused by possible accidents; (iii) related to design; and (iv) during construction, regular operations, and final decommissioning or rehabilitation of a completed project. 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 project 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 project due to the utilization, alteration, and impairment of the natural resources affected by the project, so that fair evaluation of the net worth of the project could be made.

Mitigating Adverse Effects. For each significant adverse environmental impact, the report will carefully explain how the project plan/design minimizes the adverse effects and in addition how the project 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.

Irreversible and Irretrievable Impacts. The EIA report will identify the extent to which the proposed project 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, projects 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 project area's social and economic character.

Temporary Effects During Project Construction. In the event the construction phase of the project involves special environmental impacts (to be terminated on completion of construction), these will be separately discussed including proposed remedial measures.

f. Economic Assessment

This section may be drawn from the economic analysis conducted as part of the project feasibility study. It should include the following elements which should be integrated into the overall economic analysis of the project: (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

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 (see Table A2.1 for contents of EMP): (i) implementation of mitigation measures during project 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 project contingencies; and (v) environmental management and monitoring costs including mitigation costs.

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.

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

h. Public Consultation and Information Disclosure

This section will (i) describe the process undertaken to involve the public in project 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 project-related documents; (iv) describe compliance with relevant regulatory requirements for public participation; (v) if possible summarize public acceptance or opinion on the proposed project; 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 of summary of information disclosed to date and procedures for future disclosure.

i. Conclusions

The EIA report will present the conclusions of the study including: (i) gains which justify project 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.

2. Summary Environmental Impact Assessment Report

The summary EIA (SEIA) report is the executive summary of the EIA report. It describes the critical facts and significant findings of the EIA report, and their resolutions in sufficient detail. The reader should be able to understand the issues' importance and scope, and the appropriateness of the approach taken to resolve them. The SEIA report should be presented clearly and concisely as a stand-alone document (see Table 4) for submission to the Board and disclosure to the public.

Table 4: Outline of SEIA Report

A. Introduction (1/2 page)

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 Project (1/2 page)

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

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

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

D. Alternatives (1-2 pages)

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

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

Environmental impacts, both direct and indirect, on different environmental resources or values due to project 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)

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 project.

G. Environmental Management Plan (1-2 pages)

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)

This section will describe the process undertaken to involve the public in project 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 project 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 .

I. Conclusions (1 page)

This section will describe the gains which justify implementation of the project; 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.