

3. EIA Process

3.1 Flow of EIA

After identified the needs of the proposed project, EIA process required to implement screening to determine the necessary of EIA and how far each assessment should be. When these degree are decided, the process proceeds into the step of scoping to identify environmental factors considered to be affected seriously, that will distilled up the key factors for assessment. In this stage, public consultation is required. At the same time, assess the expected effects, study the mitigation measure and make the EIA report. Based on this EIA report, hold the public consultation again, and then submit the final report to the decision-makers. It is recommended to have public consultation upon needs. After decision was approved, the proposed projects will be implemented with the environmental monitoring. Figure 1 shows the whole EIA process.

3.2 Step-wise Structure of EIA

EIA Process can be itemized into the following 9 steps. (Referring the model of Ahmad and Sammy) Public disclosure and participation are the key factors throughout the EIA system, and should be implemented at the effective timing at every step. Practically, however, the timing of implementation differs by systems applied by each country/organizations.

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- 1) Preliminary Activities and Decision of Terms of Reference (TOR)
 - 2) Scoping
 - 3) Baseline Study
 - 4) Environmental Impact Evaluation
 - 5) Mitigation Measures
 - 6) Assessment of Alternative Measures
 - 7) Preparation of Final Document
 - 8) Decision-making
 - 9) Monitoring of Project Implementation and Its Environmental Impacts
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Modified Ahmad, Y.J. and Sammy G.K.(1985) Guidelines to Environmental Impact Assessment, Hodder and Stoughton, London

Description

Step 1 Preliminary Activities & TOR	Preliminary activities include the defining of the Terms of Reference (TOR) for the project and also the determining of the personnel required for the assessment. A brief summary of the project is extremely helpful at this stage. The summary should be clear and explicit and should list exactly what the development project entails.
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The existing laws and regulations that are applicable to the project should also be reviewed along with the regulating authorities. The same procedure must be adopted for technical, financial and managerial resources available for the project.

It is very important to identify the team that will carry out the EIA procedure along with a coordinator and the decision-maker who will read the final report. Members of the EIA team usually have the specialized professional expertise of different areas related to the various aspects of the project. Thus, an EIA team might include an engineer, an economist, a physical geographer and a sociologist, with a senior government official to play the role of a coordinator. All these need to be identified and declared before the actual EIA process may begin.

The composition of the EIA team varies from country to country. In the United States, the developer carries out the functions of both the EIA preparation and the decision-making with the Environmental Protection Agency (EPA) involved only in reviewing and monitoring the project. In other countries, a government organization may actually carry out the EIA process. Some countries may not have the appropriate means and facilities for this purpose, and therefore, in such cases, a team of consultants may be employed to help with the assessment. This often turns out to be an expensive proposition. A team partly of local governmental personnel and partly of consultants might serve the purpose very well in such cases. Similarly, the decision-maker may be a person, a committee, or a number of organizations, etc.

Step 2 Scoping

Scoping is a process for identifying environmental impacts of the project. At a very early stage in the preparation of an EIA, the impacts of the project on the environment are identified. When the list of the impacts is very large, only the most significant impacts are selected. This process, therefore, determines the limits and the scope of the environmental degradation involved with the project. Scoping actually controls the cost and time of the assessment in deciding the scope of the EIA and therefore is a very important step both in identifying the impacts and controlling the size of the EIA.

The following techniques are used for scoping.

- Checklist technique
- Matrix technique
- Networks technique
- Overlay technique

Step 3
Baseline Study

A baseline study is the study of the original status of the environment in the area before the development work of the project is started. This study serves the purpose of a base reference against which the changes due to implementation of the project are measured. Baseline studies are based on the experience with respect to environmental aspects and cover everything important about the environmental impacts of the project. On the other hand, a proper scoping highlights the significant environmental issues of the project with respect to its locality and regional environment. Hence, scoping and baseline studies often run into each other. Baseline studies are rather easily carried out in the countries where the required technical expertise, long-term database for environmental measures (for instance in the case of river flow) and relevant research papers and reports are available for the area concerned. Thus, the baseline studies are more easily prepared in developed countries. The local expertise, such as consulting a forester or a soil scientist, could be utilized instead to complete the baseline studies in the developing countries. In such cases, the team responsible for the EIA must have the ability to find out the appropriate personnel for the required information. Failing that, the overseas consultants can be hired but it will raise the cost of the EIA preparation. In other words, it is the price a country has to pay for not having the required database.

Step 4
Environment
Impact
Evaluation

Environmental impact evaluation actually grows out of scoping and baseline study of the project. In principle, EIA assigns various quantified values to different levels of all the impacts affecting the project. This step is generally considered as the most technical in nature and therefore is the most difficult and controversial part of the EIA. It is difficult because not every impact, especially natural and social impacts, can be quantified. For example, it is very difficult to agree on a number that can sum up all the negative impacts of deforestation. Occasionally, it is possible to use surrogate measures, such as the amount of money required to mitigate the damage or the amount of money local inhabitants are willing to pay to clean up the river. However, the accuracy and appropriateness of such techniques can be questioned. Again, an existing data set can be extremely useful for impact evaluation, but it is also costly.

Impact evaluation actually calls for very careful considerations of the most important impacts and their accurate numerical representation. This has to be done not only for the proposed project but also for all possible alternatives, so that a well-balanced final decision can be reached regarding the fate of the project. Impact evaluation is therefore dependent on the quality of the scoping that is done earlier on the project.

Step 5
Mitigation
Measures

Mitigation measures are taken after the impact evaluation. These measures are taken to reduce the magnitude or intensity of the impacts affecting the environment. This of course will incur some costs, but it is expected that such measures will, in the long run, mitigate the impacts so as to make the project both economically and environmentally viable. The EIA team has to decide between two alternatives, either having a high cost and low pollution program or having a low cost but a high pollution situation.

Step 6
Assessment of
Alternative
Measures

Assessment of alternative measures becomes possible at this stage. The proposed project and all other relevant versions have been examined for environmental impacts by now. They have also been corrected by applying the mitigation measures to minimize the adverse effects on the environment. They have also been subjected to some kind of standardization such as impact quantification so that all the relevant versions can be easily compared. The next step is to assess the environmental degradation and improvement in terms of economic losses and gains. In standard EIAs, a summary for each version of the project is given together with the comparative assessment using benefit-cost analysis (BCA). Benefit-cost analysis has a long history of use as a method for evaluating development projects and therefore is popular with a very wide range of people, such as, engineers, economists, bureaucrats, etc. However, there is a difficulty in the assessment as not everything is quantifiable. There is no exact numerical representation for a beautiful view, for instance. Although attempts have been made to describe such situations numerically. Therefore, not all assessments use net benefit criteria. The benefit-cost analysis, when used, is equally applied to all options to make the comparative assessment easy. For instance, it is more desirable to put up with limited pollution at a lower cost of mitigation than to remove the pollution completely at a much higher cost.

Step 7
Preparation of
the final
document

Preparation of the final document should meet the following two objectives. First is to prepare a complete and detailed account of the EIA. The second is to prepare a brief summarized account for a decision-maker, who may not be a technical person.

The detailed document is usually called as the *reference document*. This document is used by the technical personnel that is associate with the project. It is also referred for preparing future EIAs in the same geographical area, or for the same type of project in a different area. The referred part usually contains the technical calculations, graphs, and the results of field and laboratory measurements.

The summarized non-technical account is usually called as the *working document*, which is written clearly without using technical language to communicate to the decision-maker the findings of the EIA team. Main objective of this document is that the non-technical decision-makers must properly understand the findings and recommendations of the EIA team so that they can take a well-informed and correct decision promptly

Step 8
Decision-
making

Decision-making is the process which starts after the above-mentioned steps of EIA are completed. Usually the decision is taken by a manager or a committee, or personnel from the concerned ministry who had not been associated with the EIA during its preparation. Technical and economic aspects of project alternatives are thoroughly considered but, at times, political expediency and project feasibility control the final choice. In general, a decision-maker has three choices:

- accepting one of the project alternatives
- returning the EIA with a request for further study in certain specific areas
- totally rejecting the proposed project along with alternative versions.

As pointed out by Ahmad and Sammy (1985), EIAs are expected to aid decision-making; and therefore, preparation and drafting of an EIA should always be carried out with this clear objective in mind.

Step 9
Monitoring of
Project
Implement-ation &
its
Environmental
Impacts

Monitoring of project implementation and its environmental impacts is usually carried out while the selected project is under actual implementation. The monitoring is basically the process of inspection to make sure that the proper guidelines and recommendations stated in the EIA are faithfully followed. Such inspections may also be carried out after the completion of the project to determine as to what accuracy the environmental impacts have been predicted by the EIA. This could be a very valuable exercise for the environmental impact assessors.