

Environmental Impact Assessment

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Introduction:- Environment Impact Assessment can be defined as the study of impact on environment of proposed action like:-
Policy, Plan or Project.

It is a process of anticipating or establishing the changes in physical, ecological and Socio-economic components of the environment before, during and after an impending developmental project so that undesirable effects, if any can be mitigated.

Methods of Environmental Impact Assessment:-

Environmental impact assessment is usually conducted in three stages which optimize the resources and increase the effectiveness of the assessment.

The environmental impact assessment process has to be integrated with the development.

"The effects of a developmental activity should be examined at an early stage in the planning of the project and not after the decisions regarding its design and location have been decided".

3 stages precede every decision making step of the project - extending and intensifying itself as the project planning is elaborated.

These steps are :-

- (1) Initial Scrutiny / Screening
- (2) Rapid Assessment
- (3) Comprehensive Assessment

1. Initial Screening :- The first step is the process of EIA is to decide whether the impact assessment is actually needed for the development project being undertaken or it is simply unnecessary.

"Screening helps to clear the type of project which are not likely to cause serious environmental problems quickly."

2. Rapid Assessment :- If it is felt that the project is likely to cause some detrimental effects on the environment, it is subjected to Rapid Environment Assessment which involves:

1) Identification of the important impacts of the project on the environment.

2) Evaluation of the impact of the project on the locality or entire region; cost benefit analysis.

3) List of the issues which are unresolved and which need examination in detail.

Rapid Environmental Impact Assessment, thus attempts to identify the key issues in a particular case to that attention or resources could be directed to relevant aspects.

Issues which are not important enough to deserve further studies are omitted. This helps in optimizing our resources.

⇒ Rapid Environmental Assessment usually involves interactions and discussions between public, various private organizations and experts as well as the scientific examination of impact caused by critical elements of project on the environment.

3. Comprehensive Assessment:- Comprehensive Environmental Assessment is usually undertaken after the initial screening and Rapid Impact Assessment has been performed. The earlier work has already generated some information about the project and its likely impact on the environment and it is now a comprehensive study of the critical aspects of project which is taken-up in the Comprehensive Environmental Impacts Assessment. It usually involves collection and evaluation of the following set of information.

- 1) Base-line data about the project
- 2) Impact Identification
- 3) Impact Prediction
- 4) Evaluation of the impacts
- 5) Mitigative measures and monitoring plans
- 6) Informing the society and decision makers.

Activities Requiring Environmental Impact Assessment

In a natural ecosystem everything is related to everything else. Any change in any of its components, biotic or abiotic, may bring about a series of small or larger changes. Smaller changes are absorbed by the system or are tolerated while the larger ones may leave a permanent scar.

With rapid expansion of human influence increasing larger areas with natural habitats are being subjected to such destruction and it has become necessary to stop it. If we cannot stop it altogether at least we can slow down the pace of the degeneration of wildlife and the environments. Although, even seemingly harmless activities, like agriculture, residential establishments, villages, townships etc. may cause some adverse effect on wildlife and natural systems, their impact is rarely monitored. Important human activities which cause environmental damages on a large scale are usually subject to Environmental Impact Assessment.

These activities are:

- 1) Construction activities
- 2) Manufacturing Industries
- 3) Mining Projects
- 4) Power Generation Projects

Operational Procedures :

In accordance with the EIA notification 1994, if any person who desires to undertake any new project or expansion or modernization of any existing industry or project shall have to seek environmental clearance from Ministry of Environment & Forest, for most of the industries/projects the limit is 50 crores and for others it is one crore. Project proponent need to submit detailed EIA report to the ministry for seeking environmental clearance which is accorded through appraisal committee subject to certain conditions.

However industries/projects not falling within the ambit of EIA notification, have to approach only State pollution Control Board for seeking NOC/permission to commission it on the basis of assessment of quality and quantity the pollutants to be generated by the proposed unit as well as efficacy of the control measures proposed by investor to meet the prescribed standards. The implementation of these conditions is monitored at field level by regional offices at MOEF.

“ The procedure adopted for EIA of any project can be outlined as:-

EIA should be an integral part of all planning for major actions, and should be carried out at the same time as engineering, economic and socio-political assessments.

In order to provide guidelines for environmental impact assessments, national goals and policies should be established which take environmental considerations into account and these goals and policies should be widely promulgated.

The institutional arrangements for the process of environmental impact assessment should be determined and made public. Here it is essential that the roles of the various participants (decision-maker, assessor, proponent, reviewer, other expert advisors, the public, and international bodies) be designated.

People
in
EIA

It is also important that timetables for the impact assessment process be established, so that proposed actions are not held unduly and the assessor and the reviewer are not so pressed they undertake only superficial analysis.

An EIA should contain the following :-

- A description of the proposed action and of alternatives.
- A prediction of the nature and magnitude of environmental effects (both positive and negative)
- An identification of human concerns
- A listing of impact indicators as well as the methods used to determine their scales of magnitude and relative weights.
- A prediction of the magnitudes of the impact indicators and of total impacts, for the project and for alternatives.

→ Recommendations for acceptance, remedial action, acceptance of one or more of the alternatives or rejection.

Inspection Procedures: Environmental impact assessments should include study of all relevant physical, biological, economic, and social factors. At a very early stage in the process of EIA, inventories should be prepared of relevant sources of data and of technical expertise.

EIA should include a spatial frame of reference much larger than the area encompassed by the action, eg:- larger than the 'factory fence' in the case of an engineering project.

The following time-frames should be covered.

Environmental impacts should be assessed as the difference b/w the future state of the environment if the action took place and the state if no action occurred.

Estimates of both the magnitude and the importance of environmental impacts should be obtained.

Methodologies for impact assessment should be selected which are appropriate to the nature of action, the database, and the geographic setting.

Approaches which are too complicated or too simple, should both be avoided. The affected parties should be clearly identified together with the major impacts for each party.

Environmental managements Strategies that include estimates of long-term impacts undoubtedly challenge the traditional decision making process. The political and economic bases for action are tuned to the immediate and short-range influences of the market place. Here, cost-benefit analysis are based on interest rates related to present-day costs of investments capital, modified to account for uncertainty and risk and thus with a time-scale of 10-15 years.

“ Economic System aim to maximize gains over the short-term whereas ecological considerations suggest ways to reduce liabilities over the long-term!!”

In addition to the time-scales described above, Several Space-scales should be considered:-

The immediate surrounding; inside a factory fence or inside an area designated for pesticide control.

The neighbourhood; down stream of a large dam or tall chimney; wider areas, in extreme cases extending to the continent of the world.

Biogeophysical and Socioeconomic Impacts:- It is important to recognize the impacts on ecosystems, biogeochemical cycles, and the like are intimately related through complex feed back mechanisms to social impacts and economic considerations. The social impacts of any project that involves environmental changes should be studied in close association with studies of biosphere impacts.

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The responsibilities of individuals and groups of individuals who participate in the EIA process vary from country to country.

Decision maker - can be a head of state, a group of ministers, and elected body, or a single designated individual.

Assessor - is the person, agency or company having responsibility for preparing the EIA.

Proponent - can be a government agency or a private firm wishing to initiate the project.

Reviewer - is the person, agency or board with responsibility for reviewing the EIA and assuring compliance with published guidelines or regulations.

Other government agencies - are agencies with a special interest in the project. They may be components of the national government services or associated with states, cities,

Expert advisors :- are persons with the specialized knowledge required to evaluate the proposed action. They may come from within or outside the government service.

Special interest groups - includes environmental organizations, labour unions, professional societies and local associations.

International - refers to neighbouring countries or intergovernmental bodies and indicates the need in some cases for consultation with these bodies.

Environmental planning and Decision Making:

Steps involved: The following procedure are presented mainly to show the relationship of one function to the next, particularly the relationship the assessment procedure to the overall decision making process.

Plan 1 - establishment of goals: Governments set goals. These goals may be general for eg; economic development, a detailed five year plan, however whatever form they take and whoever sets them, goals establish the framework within which policies, programmes and actions are implemented. To receive adequate attention in the planning and implementation of actions, an EIA procedure is a way in which this can be achieved.

Plans 2 and 3 - Establishment of policy and programme:

The goal setting process must be transplanted into actions via policy and programme activities. It is important to ensure that environmental considerations are raised and taken into account by the decisions-maker as early as possible in the planning process and not, almost as an afterthought, just before a final decision is taken.

Plan 4 - Actions:

Actions may originate in several ways. Classes of actions include (a) engineering schemes such as the construction of river valley projects, pipelines or transportation system.

(b) administrative actions such as the reorganization of governmental services for management

(c) legislative actions such as laws relating to land use or assessment policies.

Plan 5 - Determination of Significant Impact: The evaluation of whether a proposal will significantly affect the environment is, in effect, a first screening of the proposal to decide whether or not a detailed EIA will be required, and to ensure that a range of alternatives is examined.

If the responsible person or group decides that a proposed action will not significantly affect the environment, then so-called negative determination is made which may involve a public notice or explanation. Plans are then taken to proceed with the proposed action.

Plan 6 - EIA: If a proposed action is believed to have potentially significant impacts on the environment, then an EIA is performed on the proposed action and on feasible alternatives.

Plan 7 - Decision Making: After review of the EIA, the decision-maker may decide that the action should proceed or that it is environmentally unsatisfactory. In the latter case, the proposed action may either be withdrawn, or be modified and fed back again into the EIA process. The decision maker may range from a president or prime minister down to designated official or a committee in a particular department or agency.

“If a penalty is to be paid for preservation of environmental quality and if it is not too great, the decision maker will probably accept the recommendations of the assessor.”

If the penalty is large, he may have considerable difficulty in reaching a decision. If such difficulty is encountered, an independent review of the assessment may be helpful.”

However, the assessor has a responsibility to bring the environmental issues into focus, providing a significant input into the development of alternative management strategies and thus into the decision-making process. The assessor should not be surprised or discouraged if economic development, balance of payments, international obligations or national prestige is overriding considerations on occasion.

Eg:- the maintenance of water quality at the expense of air quality.

The assessor will usually assign a system of weights when he makes his recommendations.

Plan-8 Implementation: Implementation involves several functions eg; detailed planning, design construction, and operation. Implementation may be carried out by a designated government agency or by others. In the case of non-governmental implementation, there is still a responsibility within government to ensure compliance with regulations and standards.

plan-9 post audit: The whole implementation process - planning, initiation, and operation should remain under review to ensure that the designated environmental quality standards are achieved.

Eg:- By continued monitoring of certain features of the environment. Such data may not only be used to verify the predictions made for the selected alternative, but also they may contribute to improvement of future assessments.

The continuing review may improve the goal-setting and decision-making process by providing information on the environmental effectiveness of each action.

Various Methods of EIA:

The assessor has a number of techniques that may use for gathering and synthesizing information:

- Field Surveys
- Monitoring
- Modelling
- Agency guidelines
- Literature Searches
- Workshops
- Interviews with Specialists
- Public opinion polls.

These techniques can be used at almost every stage in the preparation of an EIA.

Methods for Identification of Effects and Impacts:

There are three principal methods for identifying environmental effects and impacts.

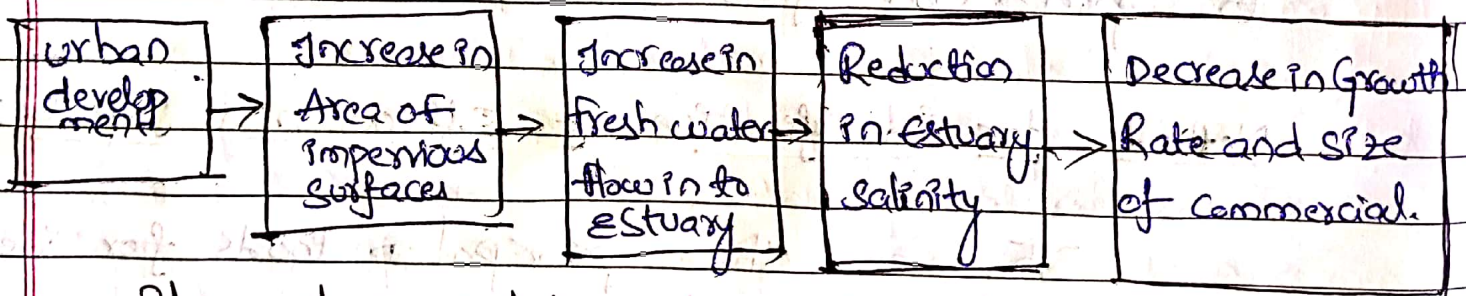
Checklists: checklists are comprehensive lists of environmental effects and impact indicators designed to stimulate the analyst to think broadly about possible consequences of contemplated actions. This strength can also be a weakness, however, because it may lead the analyst to ignore factors that are not the listed.

This of course can become a weakness of any method. Checklists are found in one form or another in nearly all EIA methods.

Matrices: Matrices typically employ a list of human actions in addition to a list of indicators. The two are related in a matrix that can be used to identify cause-effect relationships. Published guidelines may specify these relationships or may simply list range of possible actions and characteristics in an open matrix which is to be completed by analyst.

Flow diagrams: Flow diagrams are sometimes used to indemnify action-effect impact creation ships. eg:- which shows the connection between action and impact.

The method is best suited to single-project assessments, and is not recommended for large regional actions.



Flow chart used for Impact Identification.