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## UNIT-I

**Concept of EIA: Introduction of EIA, Utility and scope of EIA, Significant Environmental Impacts, Stage of EIA, Environmental Inventory, Environmental Impact Statement (EIS)**

Introduction of EIA - change is inherent to development. Whilst development aims to bring about positive change it can lead to conflicts. In the past, the promotion of economic growth as the motor for increased well-being was the main development thrust with little sensitivity to adverse social or environmental impacts. The need to avoid adverse impacts and to ensure long term benefits led to the concept of sustainability. This has become accepted as an essential feature of development if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for this and future generations. In order to predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts, the environmental impact assessment (EIA) procedure was developed in the 1970s.

An EIA may be defined as: A formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects.

EIA thus has three main functions:

- To predict problems,
- To find ways to avoid them, and
- To enhance positive effects.

**Characteristics of EIA:**

The EIA gives a clear-cut picture of important environmental considerations which are to be incorporated in the decision-making process while setting up of the major projects.

It has many important characteristics:

1. It provides a systemic evaluation of almost all significant environmental consequences of a developmental project
2. EIA is a structured, systemic and comprehensive approach
3. All EIA processes draw driving force by legislation
4. EIA is one of the most valuable and interdisciplinary decision-making tools
5. EIA can force the policy-makers to reconsider the project proposals
6. It can be used to ensure regional planning for sustainable development
7. It ensures the accountability of decision- makers to the public
8. It provides possible alternate development options against identified environmental impacts
9. EIA document should be circulated for objective review of its results by others
10. EIA cannot be taken in isolation, rather, it is related with other factors, viz., Environmental Statement, Environmental Audit and New System of National Accounts etc.
11. It seeks public participation in decision -making.

## Components of EIA:

The key steps in EIA process are:

### **(I) Project Definition and Identification:**

During project identification and definition, the project proponent conducts feasibility studies, defines the usefulness of the study, considers alternatives, files a notice of intention to seek EIA clearance and, ideally, initiates an inter-agency and public consultation process.

### **(II) Screening:**

At this stage, the EIA agency determines whether the project may proceed as planned or it should be modified partially or completely. For this, the EIA agency consults the proponent and other agencies and public participants to determine the requirements of further studies.

### **(III) Scoping:**

This is also an early planning stage and deals with a more detailed plan of study for the project to identify major concerns and key impacts and to decide assessment methods and models to be used.

### **(IV) Agencies:**

Agencies and public representatives concerned with the project or the project area are consulted.

### **(V) Baseline Data Collection:**

Baseline data collection and analyses are very important in project planning. They play an important role in primary monitoring of the environment in the project area.

### **(VI) Identification of Impact:**

Impact prediction and assessment are the most important parts of the technical process. This can be achieved by employing suitable models and a careful evaluation of inputs and outputs of environmental impacts.

### **(VII) Alternative Evaluation Criteria:**

They include legally-mandated criteria, technical/ scientific criteria, and social acceptability criteria. Alternative sites and design process should be critically examined to maximize the positive environmental impacts, socio-economic benefits, profitability, and minimize the temporary adverse impacts.

**(VIII) Management Plan:**

After the identification of environmental impacts, the mitigation measures are now needed to be defined. A good management plan should have flexible project planning so that it can adopt the modified or entirely new project alternatives. It should aim to minimize adverse environmental impacts.

**(IX) Publication of EIA Report:**

Circulation/ Publication of EIA report is an important step. It brings public comments, which would be definitely helpful for primary stages of EIA like screening and scoping.

**(X) Formal Approval (With or Without Conditions):**

The decision on the EIA report is put forward in a written record with conditions that the project proponent must comply with the provisions mentioned in the document.

**(XI) Monitoring and Compliance:**

A careful monitoring ensures the compliance of provisions mentioned in the management plan. It not only provides confidence to workers, public agencies, and communities involved in dealing with negative impacts, but also gives useful feedback on the accuracy of the EIA's impact predictions.

**Utility and scope of EIA-**

Environmental assessment (EA) is the assessment of the environmental consequences (positive and negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action. In this context, the term "environmental impact assessment" (EIA) is usually used when applied to actual projects by individuals or companies and the term "strategic environmental assessment" (SEA) applies to policies, plans and programmes most often proposed by organs of state. Environmental assessments may be governed by rules of administrative procedure regarding public participation and documentation of decision making, and may be subject to judicial review.

The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made". EIAs are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts.

Environmental Impact Assessment (EIA) may be defined as a systematic integrated evaluation of both the positive and negative impacts of a project on the natural environment; on beneficial uses of the environment, including man-made structures, amenities and facilities; and on the socio-cultural environment.

The objective of EIA is (i) to identify, predict and evaluate the economic, environmental and social impact of development activities (ii) to provide information on the environmental consequences for decision making

and (iii) to promote environmentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures.

### Significant Environmental Impacts-

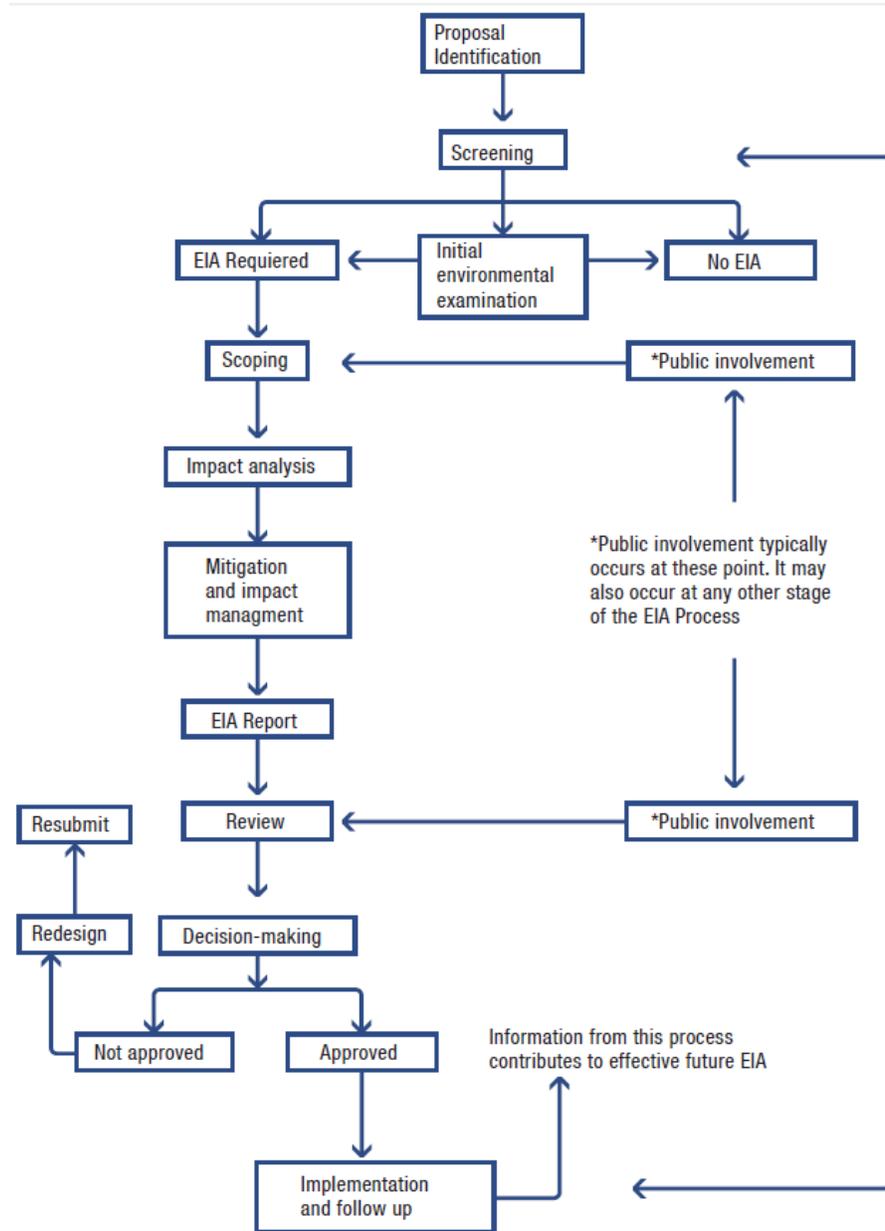
Stage of EIA-The EIA process makes sure that environmental issues are raised when a project or plan is first discussed and that all concerns are addressed as a project gains momentum through to implementation. Recommendations made by the EIA may necessitate the redesign of some project components, require further studies, and suggest changes which alter the economic viability of the project or cause a delay in project implementation. To be of most benefit it is essential that an environmental assessment is carried out to determine significant impacts early in the project cycle so that recommendations can be built into the design and cost-benefit analysis without causing major delays or increased design costs. To be effective once implementation has commenced, the EIA should lead to a mechanism whereby adequate monitoring is undertaken to realize environmental management. An important output from the EIA process should be the delineation of enabling mechanisms for such effective management.

The way in which an EIA is carried out is not rigid: it is a process comprising a series of steps. These steps are outlined below and the techniques more commonly used in EIA are described in some detail in the section Techniques.

### Stages of EIA

1. Screening
2. Scoping
3. Impact analysis
4. Impact mitigation
5. Reporting
6. Review
7. Decision making
8. Monitoring





**Fig. 1 Stages of EIA**

1. **Screening:** To determine which projects or developments require a full or partial impact assessment study.
2. **Scoping:** To identify which potential impacts are relevant to assess (based on legislative requirements, international conventions, expert knowledge and public involvement), to identify alternative solutions that avoid, mitigate or compensate adverse impacts on biodiversity (including the option of not proceeding with the development, finding alternative designs or sites which avoid the impacts, incorporating safeguards in the design of the project, or providing compensation for adverse impacts), and finally to derive terms of reference for the impact assessment.
3. **Assessment and evaluation of impacts and development of alternatives:-** To predict and identify the likely environmental impacts of a proposed project or development, including the detailed elaboration of alternatives.
4. **Reporting the Environmental Impact Statement (EIS) or EIA report:-** Including an environmental management plan (EMP), and a non-technical summary for the general audience.

5. **Review of the Environmental Impact Statement (EIS):-** Based on the terms of reference (scoping) and public (including authority) participation.
6. **Decision-making:-** On whether to approve the project or not, and under what conditions.
7. **Monitoring: -** Compliance, enforcement and environmental auditing. Monitor whether the predicted impacts and proposed mitigation measures occur as defined in the EMP. Verify the compliance of proponent with the EMP, to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion.

**Environmental Inventory-**The environmental inventory serves as the basis for evaluating the potential impacts on the environment, both beneficial and adverse, of a proposed action. It is included in an environmental impact statement (EIS). Development of the inventory represents an initial step in the environmental impact assessment process. The scope of the environmental inventory or baseline data acquisition includes a detailed characterization of the environment in an area of 10 Km radius around the proposed facility for environmental components viz., air, noise, water, land, ecology and socio-economic environment.

“Environmental inventory” is a complete description of the environment as it exists in an area where a particular proposed action is being considered. The inventory is compiled from a checklist of descriptors for the physical – chemical, biological, cultural, and socioeconomic environments. The “physical-chemical environment” includes such major areas as soils, geology topography surface-water and groundwater resources, water quality, air quality, and climatology. The “biological environment” refers to the flora and fauna of the area, including species of trees, grasses, fish, herpetofauna, birds, and mammals. Specific reference must be made to any threatened and/or endangered plant or animal species. General biological features such as species diversity and overall ecosystem stability should also be presented. Items in the “cultural environment” include historic and archaeological sites, and aesthetic resources such as visual quality.

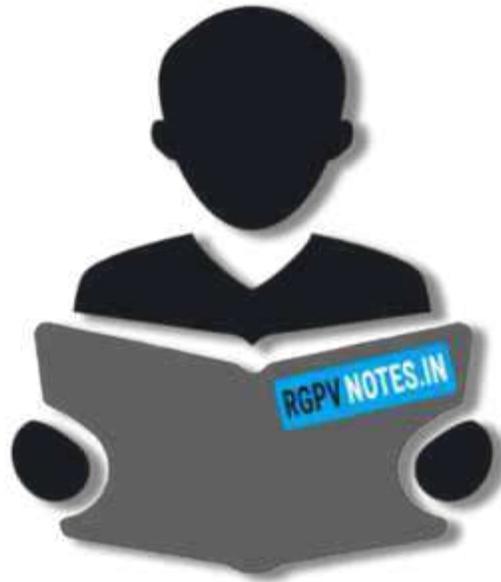
The “socioeconomic environment” refers to a range of considerations related to humans in the environment, including population trends and population distributions; economic indicators of human welfare; educational systems; transportation networks and other infrastructure concerns such as water supply, wastewater disposal, and solid-waste management; public services such as police and fire protection and medical facilities; and many others. The physical-chemical and biological environments can be referred to as the “natural environment,” or the “biophysical environment,” while the cultural and socioeconomic environments represent the “man-made environment.”

**Environmental Impact Statement (EIS)-**An Environmental Impact Statement (EIS) is a document prepared to describe the effects for proposed activities on the environment. "Environment," in this case, is defined as the natural and physical environment and the relationship of people with that environment. This means that the "environment" considered in an EIS includes land, water, air, structures, living organisms, environmental values at the site, and the social, cultural, and economic aspects. An "impact" is a change in consequence that results from an activity. Impacts can be positive or negative or both. An EIS describes impacts, as well as ways to "mitigate" impacts. To "mitigate" means to lessen or remove negative impacts.

Therefore, an Environmental Impact Statement, or EIS, is a document that describes the impacts on the environment as a result of a proposed action. It also describes impacts of alternatives as well as plans to mitigate the impacts.

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