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Programme: M.Sc., Environmental Science

Course Title : Environmental Impact Assessment

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Unit-I

Fundamentals of EIA

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INTRODUCTION

- EIA can be defined as the study to **predict the effect of proposed activities/Project on the environment**.
- EIA compares various alternatives for a project and seeks to identify the one of which represent the **best combination of economic and environmental costs and benefits**.
- EIA **integrates the environmental concerns** in the development activities right at the **time of initiating for preparing feasibility report.** It enables the **integration of environmental concerns and mitigation measures** in project development.
- EIA can often **prevent future liabilities or expensive alterations** in project design.

EIA

Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account **inter-related socio-economic, cultural and human health impacts**, both beneficial and adverse.

The purpose of the EIA process is to inform **decision-makers** and the public of the environmental consequences of implementing a proposed project.

It means the **identification or evaluation** of any proposed development project on our environment i.e. air, water, soil & living.

Evaluation

- The evaluation step calls for conversion of predicted values for various environmental parameters to a comparable set of units using some system of normalization. Ideally, the environmental impacts should be expressed in monetary units for easy and objective comparison with other costs and benefits of the project.

- In practice, assigning monetary values to intangible parameters is quite difficult. Therefore various methods involving numerical rating & ranking and scaling of environmental impacts are used.

History of EIA in India

- **Started in 1976-77**, when Planning Commission asked Department of Science & Technology to examine River Valley Projects from environmental angle

- **Till 1994, Environmental Clearance from Central Government was an administrative decision** which lacked legislative support.

- **On 27th January 1994**, Union Ministry of Environment & Forests, GOI under Environment (Protection) Act 1986, **promulgated EIA notification making Environment clearance mandatory for expansion or modernization of any activity or for setting up new projects listed in Schedule one of the notification**, which have been amended more than 12 times.

OBJECTIVES

- To ensure that the environmental considerations are explicitly addressed and incorporated into the **development and decision-making process.**
- To **anticipate and avoid** or minimize the adverse biophysical, social and other relevant effects of development proposals.
- To **protect** the productivity and capacity of natural systems and the ecological processes.
- To **promote development** that is sustainable and optimizes resource use as well as **management opportunities**

PRINCIPLES

CORE VALUES

1. **Integrity**

   should be Fair, Objective, Unbiased and Balanced

2. **Utility**

   should provide Balanced, Credible information for Decision-making

3. **Sustainability**

   should result in Environmental safeguards

TYPES OF EIA

1. Regional EIA
2. Strategic Environmental Assessment
3. Sectoral EIA
4. Project level EIA

1. Regional EIA

- Integrates environmental concerns into development planning for a geographic region, normally at the sub-country level.

- Facilitates adequate integration of economic development with management of renewable natural resources within the carrying capacity limitation to achieve sustainable development.

2. Strategic Environmental Assessment

- SEA represents a proactive approach to integrate environmental considerations into the higher levels of decision-making – beyond the project level, when major alternatives are still open.

3. Sectoral EIA

- Helps in addressing specific environmental problems that may be encountered in planning and implementing sectoral development projects.

4. Project Level EIA

- Refers to the developmental activity in isolation and the impacts that it exerts on the receiving environment.
- Thus, it may not effectively integrate the cumulative effects of the development in a region.

Total EIA clearance is required for 32 categories of developmental works broadly categorized into following industrial sectors:

1. **Mining**
2. **Thermal power plant**
3. **River valley**
4. **Infrastructure (Road, highway, ports, harbors, airports,**
5. **Industries including very small electroplating or foundry units)**

The EIA should **identify**, **describe** and **assess** the **direct** and **indirect** effects of a project on the following factors:

- Human Begins
- Fauna and Flora
- Air, Soil and Water
- Climate and the Landscape
- Materials Assets
- Cultural Heritage
- Interaction between all above factors

Environmental Impacts

1. Depletion of Natural Resources
2. Destruction of Habitat
3. Change in PH, Oxygen level, Toxicity of water
4. Increase in toxicity of Air
5. Global Warming and Ozone depletion

Goals of Environment Impact Assessment

The Main Aim of EIA are:

1. **Resources Conservation**
2. **Waste Minimization**
3. **Recovery of By-Product**
4. **Efficient use of equipment**
5. **Sustainable Development**

Framework of EIA

EIA takes place within the legal and/or policy and institutional frameworks established by individual countries and international agencies. EIA provision and procedure can contribute to successful implementation of project if these frameworks are adhered to.

Today, General Directorate of Environmental Impact Assessment, Permits and Control" which is designated under Ministry of Environment and Urbanization, is responsible for monitoring and inspection of projects which are within the scope of EIA.

Steps of EIA in India

1. Screening
2. Scoping and consideration of alternatives
3. Baseline Data Collection
4. Impact Analysis
5. Mitigation and Environment Impact Statement
6. Public Hearing
7. Environment Management Plan
8. Decision Making
9. Monitoring the Clearing Condition

Screening

First stage of EIA, which **determine whether the proposed project requires on EIA** and if it requires EIA, then the level of assessment required.

Screening criteria for determining the level of review required are relatively well defined.

Screening criteria are based upon:

- Scales of Investment
- Type of Development
- Location of Development

Scoping

- This stage identifies key issues and impact that should be further investigated
- This stage also defines the boundary and the time limits of the study
- It is done by consultant in consultation with the project proponent and guidance by the agency
- A process of interaction between government agencies and project proponents

Identifies:

- Spatial and temporal boundaries for the EIA
- Important issues and concern
- Information necessary for decision making
- Significant effects and factors to be considered
- Establishes terms for reference of full scale EIA

Baseline Data

Impact prediction is a way of ‘Mapping’ the environmental consequences of the significant aspects of the projects and its alternatives.

The following impacts of the projects should be assessed:

AIR

- Changes in the Ambient level and the ground level concentrations of due to emission from point, line and area source.
- Effects of soil, Minerals, Vegetations and Human health

NOISE

- Changes in the Ambient level due to noise generated from equipment and movement of Vehicles

WATER

- Availability to competing users
- Changes in the quality
- Sediment transport
- Ingress of saline water

LAND

- Changes in the Land Use and drainage pattern
- Changes in the land quality including the effect of waste disposal
- Changes in the shorelines/Riverbank and their stability

BIOLOGICAL

- Deforestation and shrinkage of Animal habitat
- Impact on flora and fauna due to pollutants
- Impact on rare and endangered species
- Impact on Breeding and nesting grounds

SOCIO-ECONOMIC

- Impact on local community including demographic changes
- Impact on economic status
- Impact on Human health
- Impact on increased Traffic

The following environmental parameters are usually considered while preparing the baseline data:

1. **Site location and topography.**
2. **Regional demography.**
3. **Regional landmarks.**
4. **Geology**
5. **Hydrology**
6. **Meteorology**
7. **Ecology**

Impact Analysis and Mitigation and Environment Impact Statement(EIA Report)

- **Impact analysis:** This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- **Mitigation:** This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
- **Reporting:** This stage presents the result of EIA in the form of a report to the decision-making body and other interested parties.

Public Hearing

After EIA report is made public must be informed and consulted on the proposed development

Summery of EIA report have to be provided to the people affected due to the proposed project:

- ✓Bonofied Local resident
- ✓Local Associations
- ✓Environmental groups active in the area

Decision Making

- The challenge of making the final decision on implementing a project is observed.
- Decision are taken at all stages during the EIA process and the outcome will be based on these decisions.
- If a large scale project falls under the jurisdiction of countries with comparable national EIA procedures, it should be feasible to be more ambitious in organizing EIA Transboundary.

Monitoring the Clearing conditions

- Monitoring should be done during both construction and operation phase of the project.
- This ensure that the commitments made are complied and the if the prediction made in the EIA report are correct.
- Corrections actions should be taken if the impact exceeds the predicted level.

Sustainable development (SD)

- Sustainable development (SD) may be defined as the development that meets the needs of the present without compromising the ability of the future generations to meet their needs.
- For **rich countries-** SD may mean steady reductions in wasteful level of consumption of energy and other natural resources through improvements in efficiency and through changes in lifestyle.
- For **poorer countries-** SD would mean the commitment of resources towards continued improvement in living standards.
- The **Supreme Court of India**, in the Narmada Case, observed, " Sustainable Development means what type of development can take place, which can be sustained by nature/ecology with or without mitigation"

Benefits of The EIA

- Potentially screens out environmentally-unsound projects
- Proposes modified designs to reduce environmental impacts
- Identifies feasible alternatives
- Predicts significant adverse impacts
- Identifies mitigation measures to reduce, offset, or eliminate major impacts
- Engages and informs potentially affected communities and individuals
- Influences decision-making and the development of terms and conditions


Thank
you!