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ENVIRONMENTAL IMPACT ASSESSMENT

Every country strives to progress ahead one aspect of progress is economic development through manufacturing and trading. Every country builds industries which provide employment, serve the consumers needs and help to generate revenue.

Development projects in the past were undertaken without any consideration to their environmental consequences. As a result rivers and lakes got polluted, air pollution reached at threatening level and pilling of industrial wastes resulted in land degradation. Industrialization and economic growth provided material comforts and luxuries of life but at the same time deteriorated the quality of life.

In view of the colossal damage to environment by developmental activities people are now concerned about the environmental impact of developmental projects. EIA enables the decision makers to analyse the effect of developmental activities on the environment, if any well before the developmental project is implement.

In this lesson, you shall learn about Environmental Impact Assessment (EIA) which is a tool for preventing adverse environmental impact of developmental activities, significance , methodology and practice.



OBJECTIVES

After completing this lesson, you will be able to:

- *explain the importance of protecting the environmental side by side with industrial development (need for EIA);*
- *define the concept and legal aspect of EIA;*
- *enumerate how undesirable impacts of developmental projects can be anticipated and also overcome;*



- *describe the methods of EIA;*
- *outline the procedures of EIA followed in India;*
- *list the methods for environmental clearance and forestry clearance process;*
- *state about alternate scenario of evaluation of EIA;*

24.1 IMPORTANCE OF EIA IN RESPECT OF ENVIRONMENTAL PROTECTION

Unfortunately industrial development has had adverse impact on the environment. Most of the developmental activities such as building of dams, roads, airports, industries, railway tracks, cities etc. use enormous amounts of natural resources as raw material and they may generate waste, which is disposed off into the environment. Waste disposal causes damage to air, soil and water, and brings about depletion of natural resources.

The protection of the global environment is in the interest of all of us living on this planet. Various measures have been taken at national and international levels to correct a number of environmental problems as you have already learnt in the previous lesson.

In light of the above it is important to anticipate the likely environmental problems and threats that may arise out of the proposed developmental activities and human actions. Such an anticipation is termed “Environmental Impact Assessment” (EIA).

EIA is tool that improves decision making and ensures that the project under consideration is an acceptable option.

24.2 CONCEPT AND LEGAL BASIS OF ENVIRONMENTAL IMPACT ASSESSMENT

24.2.1 Concept of Environmental Impact Assessment (EIA)

After reading the previous lessons, you must be convinced that sustainable development and environmental conservation are necessary for survival and well being of future generations.

This is Environmental Impact Assessment (EIA). EIA is a tool which helps to evaluate environmental impact of proposed developmental projects or programs are visualized clearance accorded after mitigation strategies are included in the plan. EIA thus proves to be a tool which improves decision making and ensures that the project under construction is environmentally sound and within limits of the capacity of assimilation and regeneration capacities of the ecosystem. Environmental clearance of developmental projects is mandatory for the new project. (Fig. 24.1a and 24.1b)



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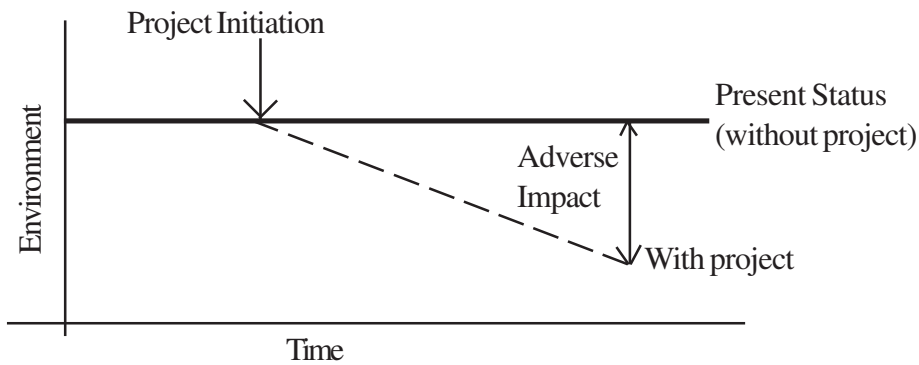


Fig. 24.1: (a) Anticipated environmental impact of developmental project.

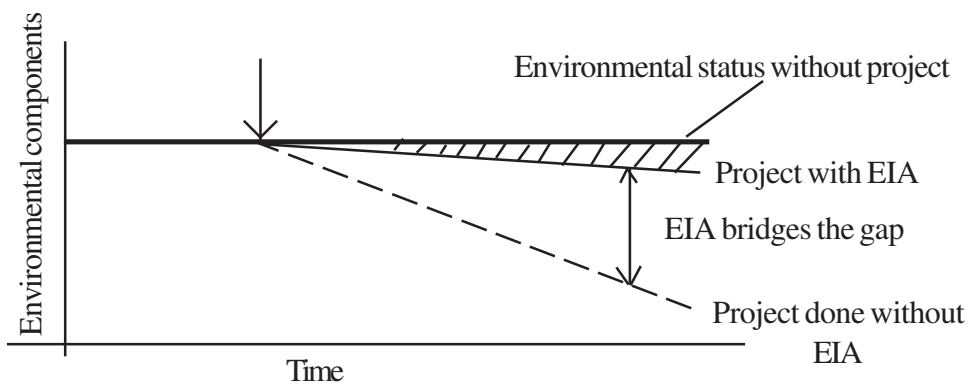


Fig. 24.1: (b) Environmental impact rectification after EIA

The important aspects of EIA are:

- risk assessment,
- environmental management and
- post product monitoring.

EIA provides a cost effective method to eliminate or minimize the adverse impact of development projects.

24.2.2 Legal bases of environmental impact assessment

The EIA process will be designed such that its guidelines follow basic legal and policy equipments. For example: EIA is to-

- (1) serve as a primary environmental tool with clear provisions.
- (2) apply consistently to all proposals with potential environmental impacts.
- (3) use scientific practice and suggests strategies for mitigation.
- (4) address all possible factors such as short term, long term, small scale and large scale effects.

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- (5) consider sustainable aspects such as capacity for assimilation, carrying capacity, biodiversity protection.
- (6) lay down a flexible approach with and provides for public involvement.
- (7) have in built mechanism of follow up and feedback for comply into mandatory requirements.
- (8) include mechanisms for monitoring, auditing and evaluation.

EIA was introduced in India in 1978, with respect to river valley projects. Later the EIA legislation was enhanced to include other developmental sections since 1941. EIA is now mandatory for 30 categories of projects, and these projects get Environmental Clearance (EC) only after the EIA requirement are fulfilled.

EIA appraises the environmental health and social implications of planned developmental projects. It thus links environment with development. The goal of EIA is to ensure environmentally safe and sustainable development.



INTEXT QUESTIONS 24.1

1. Expand EIA and define the term.

2. Why is EIA necessary? Answer in one or two sentences.

3. What are the important aspects of EIA.

24.3 ENVIRONMENTAL CLEARANCE

Environmental clearance or the 'go ahead' signal is granted by the Impact Assessment Agency in the Ministry of Environment and Forests, Government of India.

All projects that require clearance from central government can be broadly categorized into the following:-

- (1) Industries
- (2) Mining
- (3) Thermal power plants
- (4) River valley projects



- (5) Infrastructure and CRZ (Coastal Regulation Zone)
- (6) Nuclear power projects.

24.4 WHAT ALL IS ASSESSED IN ENVIRONMENTAL IMPACT ASSESSMENT

In order to carry out an environmental impact assessment, the following are essential:

- (i) assessment of existing environmental status.
- (ii) assessment of various factors of ecosystem (air, water, land, biological).
- (iii) analysis of adverse environmental impacts of the proposed project to be started.
- (iv) impact on people in the neighborhood.

24.5 ENVIRONMENTAL COMPONENTS OF EIA

The EIA process looks into the following components of the environment.

Air environment

- Quality of ambient air.
- Wind speed, direction, humidity etc.
- Quantity of emission likely from project.
- Impact of the emission on the area.
- Pollution control desires / air quality standards.

Noise

- Levels of noise present and predicted
- Strategies for reducing noise pollution.

Water environment

- Existing ground and surface water resources, their quality and quantity within the zone.
- Impact of proposed project on water resources.

Biological environment

- Flora and fauna in impact zone.
- Potential damage (likely) due to project, due to effluents, emissions and landscaping.

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- Biological stress (prediction).

Land environment

- Study of soil characteristics, land use, and drainage pattern, and the likely adverse impact of the project.
- Impact on historical monuments and heritage site.

Assessment of expected economic benefits arising out of the project have to be compared to the all the above mentioned factors.

Thus we can say that environmental concerns have to be made a part of the decision to set up a project.



INTEXT QUESTIONS 24.2

1. What is meant by environmental clearance?

2. Name any three projects requiring such clearance.

3. Name any two environmental components of EIA.

24.6 EIA PROCESS AND PROCEDURES

EIA process and procedure have several components. Each one is separately mentioned below:

24.6.1 Method of carrying out EIA

Preparation of EIA report comprises the following steps:

- (1) Collection of baseline data from primary and secondary sources;
- (2) Prediction of impacts based on past experience and mathematical modelling;
- (3) Evolution of impacts versus evaluation of net cost benefit; preparation of environmental management plans to reduce the impacts to the minimum;
- (4) Quantitative estimation of financial cost of monitoring plan and the mitigation measures;
- (5) Preparation of environmental management plans to reduce the impacts to the minimum;



(6) Quantitative estimation of financial cost of monitoring plan and the mitigation measures.

24.6.2 Steps in EIA process

EIA involves the steps mentioned below. However, EIA process is cyclical with interaction between the various steps.

- **Screening:** The project plan is screened for scale of investment, location and type of development and if the project needs statutory clearance.
- **Scoping:** The project's potential impacts, zone of impacts, mitigation possibilities and need for monitoring. The EIA agency has to follow the published guidelines by the Ministry of Environment and Forest (MoEF) of government of India.
- **Collection of baseline data:** Baseline data is the environmental status of study area.
- **Impact prediction:** Positive and negative, reversible and irreversible and temporary and permanent impacts need to be predicted which presupposes a good understanding of the project by the assessment agency.
- **Mitigation measures and EIA report:** The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probable environmental damage or loss.
- **Public hearing:** On completion of the EIA report, public and environmental groups living close to project site may be informed and consulted.
- **Decision making:** Impact Assessment (IA) Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping mind EIA and EMP (Environment Management Plan).
- **Monitoring and implementation of environmental management plan:** The various phases of implementation of the project are monitored.
- **Risk assessment:** Inventory analysis and hazard probability and index also form part of EIA procedures.

24.6.3 Composition of the expert committees for EIA

1. The Committees will consist of experts in the following disciplines:
 - (1) Eco-system management
 - (2) Air/ water pollution control
 - (3) Water resource management
 - (4) Flora/ fauna conservation and management
 - (5) Land use planning



- (6) Social Sciences/ Rehabilitation
 - (7) Project appraisal
 - (8) Ecology
 - (9) Environmental Health
 - (10) Subject Area Specialists
 - (11) Representatives of NGOs/persons concerned with environmental issues.
2. The Chairman will be an outstanding and experienced ecologist or environmentalist or technical professional with wide managerial experience in the relevant development.
 3. The representative of Impact Assessment Agency will act as a Member- Secretary.
 4. Chairman and members will serve in their individual capacities except those specifically nominated as representatives.
 5. The membership of a committee shall not exceed 15 members.

24.7 ENVIRONMENTAL APPRAISAL PROCEDURE IN INDIA

An Appraisal Committee constituted by the Ministry of Environment and Forests to first scrutinized a project. This committee evaluates the impact of the project based on the data presented by the project authorities. If necessary, the Ministry of Environment and Forests may also with the investors and hold consultations with experts on specific issues as and when necessary.

After considering all the facets of a projects, environmental clearance is accorded subject to implementation of the stipulated environmental safeguards. In case of projects where the project proponents have submitted complete information, a decision is taken within 90 days. The six regional offices of the Ministry functioning at Shillong, Bhubaneshwar, Chandigarh, Bangaluru, Lucknow and Bhopal undertake monitoring of cleared projects. The primary objectives of this procedure is to ensure adequacy of the suggested safeguards and also to undertake mid-course corrections required. If any. Any changes in the scope of project are identified to check whether review of earlier decision is called for or not.

Coastal Zone Management Plans (CZMPs) are prepared by coastal states or Union Territories as per rules set by CRZ notification 1991. This is prepared based on identification and categorization of coastal areas for different activities and then submitted to the MoEF for approval. The ministry then forms a task force for examining their plans. Some times one or more natural resources becomes limiting resource in a given region and that restrict the scopes of development portfolios. MoEF has been sponsoring carrying capacity studies for different regions. The studies involves:-

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1. a list of natural resources available.
2. preparation of existing environmental settings;
3. perspective plans and their impact on natural resources through creation of 'Business As Usual Scenario';
4. identification of 'Hot Spots' requiring immediate remedial action to overcome air, water or land pollution;
5. formulated of a developed plan which should be for the betterment and a comparison between 'Business as Usual' and the improved plan for betterment would indicate the future course of action to be adopted for development of the region after it has discussing with the local people and the planners.

24.8 ISSUES OF ENVIRONMENTAL CLEARANCE/ REJECTION LETTER

Single window clearance

When a project requires both environmental clearance as well as approval under the Forest (Conservation) Act, 1980, proposals for both are required to be given simultaneously to the concerned divisions of the Ministry. The processing is done simultaneously for clearance or rejection, although separate letters may issue. If the project does not involve diversion of forestland, the case is processed only for environmental clearance. (For more details on forest clearance, See Fig. 24.2).

Time frame

Once all the requisite documents and data from the project authorities are received and public hearings (where required) have been held, assessment and evaluation of the project from the environment angle is completed within 90 days and the decision of the ministry shall be conveyed within 30 days thereafter.

Post project monitoring

It is to be noted that whenever a project is given environment clearance, a set of recommendations and conditions are stipulated by the Appraisal Committee on a case to case basis, which have to be complied with by the project proponent once the project is commissioned. The project authorities are required to submit a half- yearly compliance report to the Ministry about the compliance of conditions stipulated in the environmental clearance order by the Ministry. To monitor the implementation of the recommendations and conditions stipulated by the Appraisal Committee subject to which the environmental clearance has been given. The six regional offices of the Ministry located at Shillong, Bhubneshwar, Chandigarh, Bangloru, Lucknow and Bhopal, help the Ministry in post-project monitoring of the cleared projects.



Cases of non-compliance of the recommendations and conditions by cleared projects/units are brought to the notice of the Ministry, which may then initiate action against the project authorities as described under section 24.10 as well as in Flow Chart No. 3 (Obtaining environmental clearance flow chart)



INTEXT QUESTIONS 24.3

1. State the various steps in EIA.

2. Name six regional offices of India those undertake monitoring of cleared projects.

3. What are the steps included for issuing environmental clearance or rejection letter?

24.9 THE MAIN PARTICIPANTS OF EIA

EIA applies to public and private sections. The six main players (Fig. 24.2) are:

- (i) Those who propose the project
- (ii) The environmental consultant who prepare EIA on behalf of project proponent.
- (iii) Pollution Control Board (State or National).
- (iv) Public has the right to express their opinion.
- (v) The Impact Assessment Agency.
- (vi) Regional centre of the Ministry of Environment and Forest.

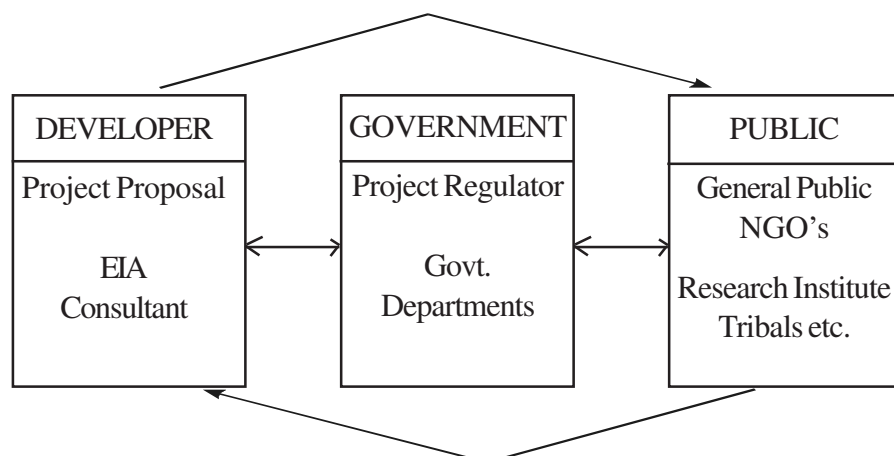


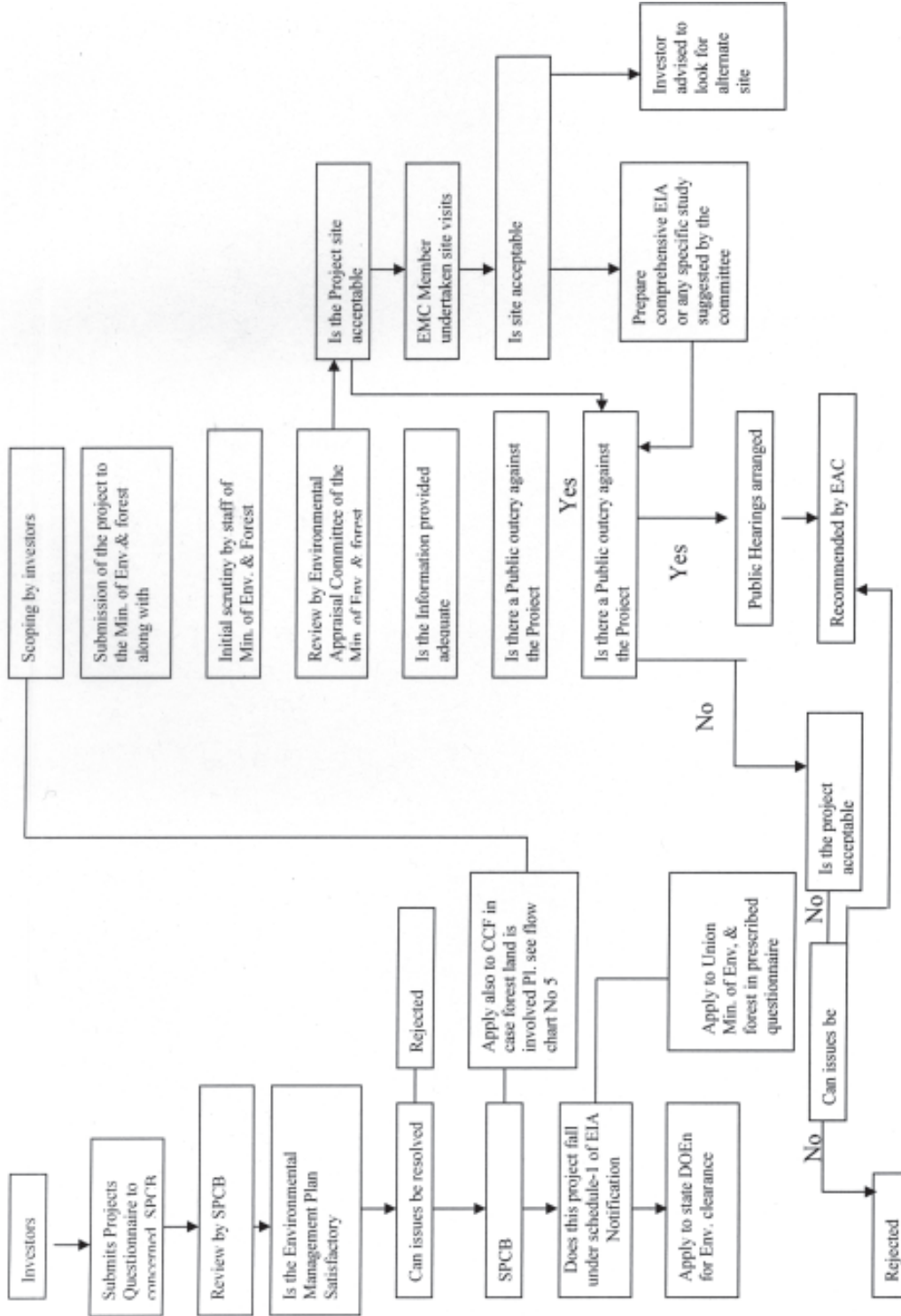
Fig. 24.2: Participants for EIA

24.10 ENVIRONMENTAL CLEARANCE

The entire EIA process upto obtaining environmental clearance are summarised in the following flow chart:



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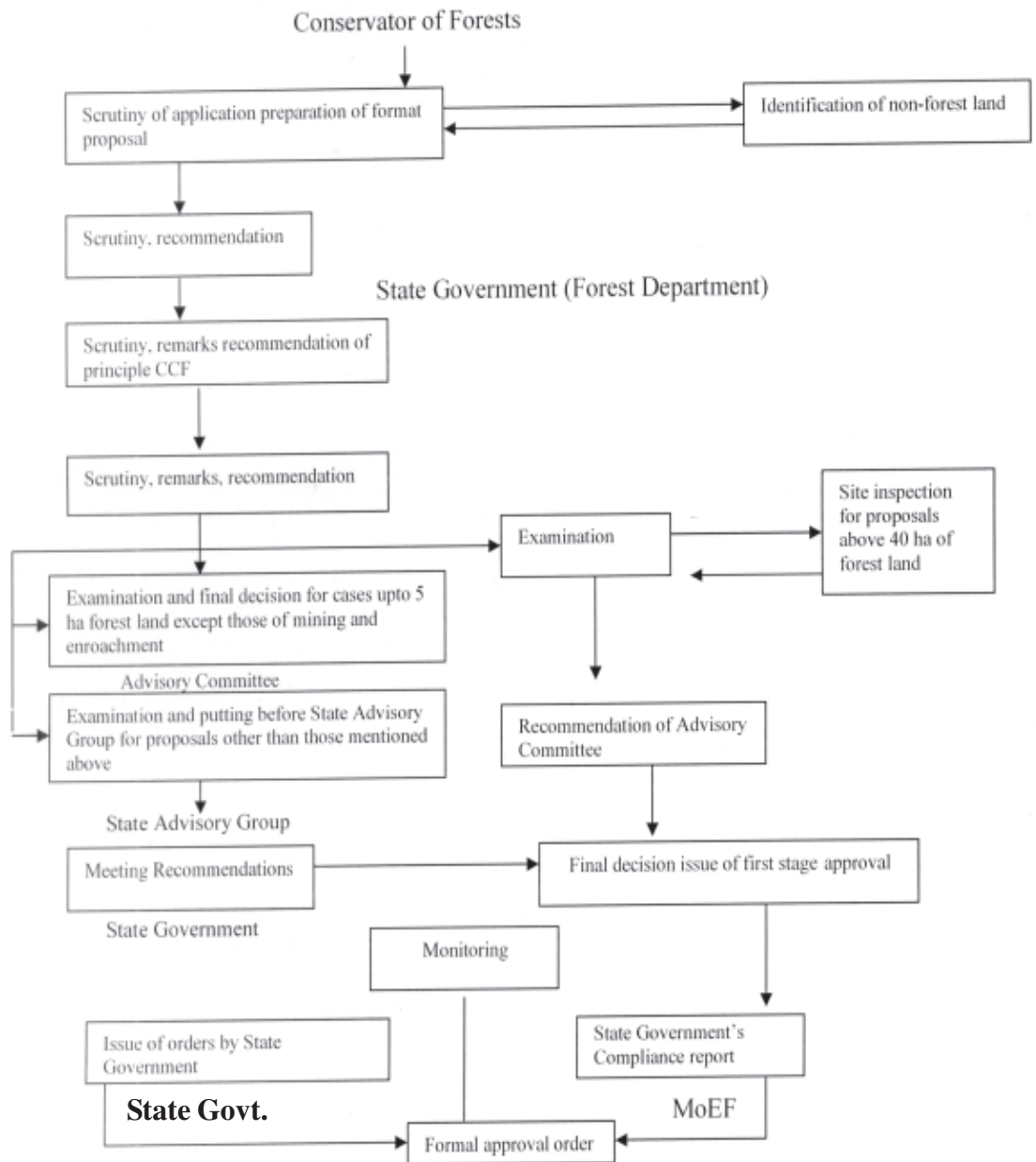
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24.11 FORESTRY CLEARANCE

The methods for clearance process given in the following flow chart are self explanatory.

Obtaining forest clearance

Flow chart showing various steps involving in examination of cases received under FC Act





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24.12 ALTERNATE SCENARIO OF EVALUATION OF EIA

An effective EIA exercise is focussed, time bound, cost effective and makes assessment understandable.

The sole objective is to erase any situations of environmental damage during construction and implementation of the developmental project. It should also be keep in mind the general public and people in the local and neighborhood of the project.

The evaluation of EIA is possible only when (a) there is public awareness of those responsible for protecting environmental quality and enforcement; (b) The EIA report and information contained therein is reliable.

**INTEXT QUESTIONS 24.4**

1. Who gives the clearance for foresting projects?

2. Apart from the government, two other's are participants for EIA, name them.

3. What does the statement, "evaluation of EIA is possible only if EIA report is reliable", mean?

List of projects requiring environmental clearance from the central government

1. Nuclear power and related projects such as heavy water plants, nuclear fuel complex, rare earths.
2. River valley projects including hydel power, major irrigation and their combination including flood control.
3. Ports, harbours, airports (except minor ports and harbours).
4. Petroleum refineries including crude and products pipelines.
5. Chemical fertilisers (nitrogenous and phosphatic other than single superphosphate).
6. Pesticides (technical).
7. Petrochemical complexes (both olefinic and aromatic) and petrochemical intermediates such as DMT, Caprolactam, LAB etc, and production of basic plastics such as LDPE, HDPE, PP, PVC.

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8. Bulk drugs and pharmaceuticals
9. Exploration for oil and gas and their production, transportation and storage
10. Synthetic rubber
11. Asbestos and asbestos products
12. Hydrocyanic acid and its derivatives
13. Primary metallurgical industries (such as production of iron and steel, aluminium, copper, zinc, lead, and ferro-alloys)
14. Chlor alkali industry
15. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints
16. Viscose staple fibre and filament yarn
17. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloy
18. All tourism projects between 200m-500 metres of High Water Line and at locations with an elevation of more than 1000 metres with investment of more than Rs. 5 crore
19. Thermal power plants
20. Mining projects (with lease more than 5 hectares)
21. Highway projects except projects relating to improvement work including widening and strengthening of roads with marginal land acquisition along the existing alignments provided it does not pass through ecologically sensitive areas such as National Parks, Sanctuaries, Tiger Reserves, Reserve Forests
22. Tarred roads in the Himalayas and forest areas
23. Distilleries
24. Raw skins and hide
25. Pulp, paper and newsprint
26. Dyes
27. Cement
28. Foundries (Individual)
29. Electroplating
30. Meta aminophenol

**WHAT YOU HAVE LEARNT****Notes**

- Developmental projects are an essential component of economic development and progress of a country.
- To prevent adverse impacts of developmental projects and programmes an environment, Environmental Impact Assessment or EIA is carried out before the implementation.
- While development is important, more important is environmental protection so that there is sustainable development and the environmental resources remain available to future generations.
- EIA is tool for anticipating any harmful effects or developmental activities on the environment. As it clears the project plans only after mitigating all probable damaging effects on the environment.
- As a tool EIA improves decision making and ensures environmental safety.
- With EIA, a project is implemented with minimal damage to the environment.
- Important aspects of EIA are (i) risk assessment, (ii) environmental management and (iii) post product monitoring.
- Integrity, utility and sustainability are the core values of EIA.
- There are several legal bases of EIA as it not only appraises environmental health but also the social implications of planned developmental projects.
- In India the projects that require clearance for the government are related to industries, mining power plants, river valley projects, nuclear power projects and coastal regulation zone (CRZ).
- The environmental components of EIA are associated with air, water, organisms, noise, and land.
- The EIA report is prepared after the following are carried out:
 - collection of baseline data
 - prediction of impact
 - evaluation of net cost benefit versus evolution of impacts
 - monitoring strategies and mitigation strategies and their quantities estimation.
 - environmental monitoring plans
- EIA processes are screening, scoping, collection of baseline data, impact prediction, mitigation measures, public hearing, decision making, monitoring and implementing EMP and risk assessment



- Experts from ecosystem management, pollution control, resource management, land use planning, rehabilitation project appraisal, ecology, and NGOs concerned with environmental issues
- Procedure for Environmental appraisal in India stepwise are
 - (1) submission of documents by investor.
 - (2) scrutiny by multidisciplinary staff or Ministry of Environment and Forests.
 - (3) placement before experts and evaluation by them.
 - (4) recommendations from Appraisal Committees are their passed by Ministry of Environment and Forests.
 - (5) ministry accepts or rejects proposal.
- Clearance or rejection issues are (a) single window clearance (b) time frame and (c) post project monitoring.
- The participants in EIA are (i) developer who proposes the project, (ii) government departments which regulate the projects and (iii) the general public
- There are various steps in forestry clearance or for obtaining environmental clearance for various projects.
- An effective EIA is focused, time bound, cost effective and reliable.
- There are 30 projects which require environmental clearance.

**TERMINAL EXERCISE**

1. What is EIA?
2. Why is EIA important?
3. Give an account of the importance of development as against environmental protection.
4. Explain the three core values of EIA
5. Numerate the legal bases of EIA.
6. What is meant by environmental clearance?
7. For which projects is environmental clearance mandatory?
8. What all is assessed under EIA?
9. What is the composition of the expert committee for EIA.
10. Describe the various components of process of EIA

11. Where are experts drawn from for EIA.
12. Describe stepwise the procedure for environmental appraisal.



ANSWER TO INTEXT QUESTIONS



Notes

24.1

1. Environmental Impact Assessment. It is a tool to anticipate the likely environmental problems and threats due to a particular developmental activity.
2. To prevent environmental damage due to developmental activities
3. Risk Management, environmental management, post product monitoring

24.2

1. Go-ahead signal from the government of India for carrying out developmental activity
2. Industries / Mining / Thermal power plants / River Valley Project / Nuclear Power Projects (any three)
3. Air / Land / Water / Biological / Noise (any two)

24.3

1. Screening, scoping, collection of baseline data, impact prediction, mitigation measures and EIA report, public hearing, decision making, monitoring and implementation of environmental management plan, risk management.
2. Shillong, Bhubaneswar, Chandigarh, Bangaluru, Lucknow and Bhopal.
3. Single window clearance, time frame, post project monitoring.

24.4

1. Government of India, Ministry of Forest
2. Developer and Public
3. The EIA report has to be exactly in keeping with the process and procedure laid down for EIA.