Course Name: ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT

Course Code: OCE351

Regulation: 2021

Year: III

Semester: VI

Academic Year: 2023-2024

SYLLABUS

UNIT– I: INTRODUCTION

Impacts of Development on Environment – Rio Principles of Sustainable Development Environmental Impact Assessment (EIA) – COURSE OBJECTIVES : – Historical development – EIA Types – EIA in project cycle –EIA Notification and Legal Framework– Stakeholders and their Role in EIA– Selection & Registration Criteria for EIA Consultants

UNIT–II: ENVIRONMENTAL ASSESSMENT

Screening and Scoping in EIA – Drafting of Terms of Reference, Baseline monitoring, Prediction and Assessment of Impact on land, water, air, noise and energy, flora and fauna - Matrices – Networks – Checklist Methods - Mathematical models for Impact prediction – Analysis of alternatives.

UNIT–III: ENVIRONMENTAL MANAGEMENT PLAN

Plan for mitigation of adverse impact on water, air and land, water, energy, flora and fauna – Environmental Monitoring Plan – EIA Report Preparation – Review of EIA Reports – Addressing the issues related to the Project Affected People -Environmental Clearance Post Project Monitoring

UNIT–IV: SOCIO ECONOMIC ASSESSMENT

Baseline monitoring of Socio economic environment – Identification of Project Affected Personal – Rehabilitation and Resettlement Plan- Economic valuation of Environmental impacts – Cost benefit Analysis.

UNIT–V: CASE STUDIES

EIA case studies pertaining to Infrastructure Projects – Real Estate Development - Roads and Bridges – Multi-storey Buildings Mass Rapid Transport Systems - Ports and Harbor – Airports - Dams and Irrigation projects - Power plants – Water supply and drainage projects- Waste water treatment plants, STP – Mining Projects

1.INTRODUCTION

1.1 Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a planning tool generally accepted as an integral component of decision making in Sustainable Development. The course is aimed at providing comprehensive information, on Environment (physical and biological), its degradation due to developmental activities, methods of determining consequences or impacts and possible methods of mitigation, to a group of post graduate, students in Arts, Science and Management. The students who have undergone studies both in theory and practice in respective disciplines and are knowledgeable in specific subjects may not be fully aware on the consequences of developmental projects being planned and executed in the vicinity. They are also anxious to know the world offuturology, so that they are able to visualize the dreams of next generation.

The rapid growth of population, improvements in standards of living and concomitant growth of infrastructure have altered the environment, sometimes beyond its power of resilience. These changes have resulted in ecological crisis and have become a matter of grave concern to managers and decision makers throughout the world. The issues both at national and global levels are focussing concern of nodal agencies (Regulatory Departments, Ministries and Boards) to support sustainable development and curb and restrain such acts which tend to produce adverse impacts on living conditions of human, animals, plants and geographical environment.

In India, Ministry of Environment and Forests (MOEF) has been recognized by Govt. of India as the nodal agency to regulate through its functionaries the provision of water Act, 1974, Air Act, 1981 and

Environmental Protection Act of 1986 and provide guidelines for its implementation.

As per the procedures outlined, EIA is required to provide a comprehensive account of the state of existing environment, the stresses produced by diverse activities and the impacts these will have on various components of environment. The proponents of the development projects also need to suggest and provide the measures to mitigate the adverse effects.

The EIA has been defined (David P Lawrence, 2003, EIA Practical Solutions to Recurrent Problems) as:

> "Determining and managing (identifying, describing, measuring, predicting, interpreting, integrating, communicating, involving and controlling) the, Potential (or real) impacts (direct and indirect, individual and cumulative, likelihood of occurrence) of, Proposed (or existing) human actions (projects, plans, programs, legislation, activities) and their alternatives on the, Environment (Physical, Chemical, biological, human health, cultural, social, economic, built and interactions)"

Environment will cover, the existing condition in or/and around the area is as much as:

(i) Physical environment to include:

- (a) Land and Climate: Weather conditions to include temperature (ambient), humidity, wind velocity, precipitation, land use, topography, geology and seismic considerations.
- (b) Atmospheric conditions: Ambient air quality at the site and around specially in down wind direction
- (c) Water bodies: Lakhs, rivers, ponds and canals. Hydrology and existing quality. Ground water availability and flow regime.
- (d) Noise level

(ii) Chemical Environment to include:

(a) Industrial activities, types of industries at the site and around (10 km radius), types of wastes produced and methods of treatment and disposal of effluents.

(b) City dumping sites, land fill sites

(iii) Infrastructure: Public, Services, Water Supply, Waste Treatment Plants, Energy resources, distribution system, Transport system, communication, important buildings, heritage, sites etc.

(iv) Biological environment: Vegetation, forests, flora, fauna. Natural vegetation, parks, cultivated land, crops, threatened and endangered species.

Environment Impacts

Having visualized the composition, structure and quality of various components of environment and their likely deterioration, it is prudent to assess which of the multitudes of attributes influences the environment in relation to the execution of a planned project. The projects could be of various types. However, World Bank (1989) have categorized them into:

i) Projects related to highway construction
ii) Large Water Resources Developmental Projects
iii) Construction of Thermal Power Plants
iv) Residential construction projects
v) Petrochemical and fertilizer projects and
vi) Mining and metallurgical projects.

Environmental Impacts involves the study of various attributes, their complex interrelationship and consequent changes in the attributes. Jain, Urban and Stacey in the book on EIA (1977) have listed the **attributes** as:

Air

1. Diffusion factor
2. Particulates
3. Sulfur oxides
4. Hydrocarbon
5. Nitrogen oxide
6. Carbon mono oxide
7. Photo chemical oxidants
8. Hazardous oxidants
9. Odor

Water

10. Aquifer yield
11. Flow variations
12. Oil
13. Radio activity
14. Suspended solids
15. Thermal pollution
16. Acid and Alkali
17. Biochemical oxygen demand
18. Dissolved oxygen
19. Dissolved solids
20. Nutrients
21. Toxic compounds
22. Aquatic life
23. Faecal coli

Land

24. Soil stability
25. Natural hazard
26. Land use patterns

Ecology

27. Large animals (Wild and domestic)
28. Predatory birds
29. Small game
30. Fish, shellfish and water fowl
31. Field crops
32. Threatened species
33. Natural vegetation
34. Aquatic plants

Noise

35. Physiological effects
36. Psychological effects
37. Communication effects
38. Performance effects
39. Social behaviour effects

Human Aspects

40. Life styles
41. Psychological needs
42. Physiological systems

43. Community needs

Economics

44. Regional economic stability

45. Public sector review

46. Per capita consumption

Resources

47. Fuel resources

48. Non fuel resources

49. Aesthetics

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