

# **Wastewater Engineering**

## **Lecture - 10**



**Engr. Nadeem Ullah**  
**Department of Civil Engineering,**  
**Iqra National University Peshawar**

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a plain white space where the text is located.

# **Environmental Legislation and Environmental Impact Assessment**

# Environmental Legislation

- **Environmental legislation** is the collection of laws and regulations pertaining to air quality, water quality, the endangered wildlife and other environmental factors.
- The umbrella of environmental legislation covers many laws and regulations toward a common goal, which is regulating the interaction between man and the natural world to reduce threats to the environment and increase public health.
- The Pakistan Environmental Protection Act (PEPA) was enacted on 6th December 1997, repealing the Pakistan Environmental Protection Ordinance, 1983.

# Environmental Legislation

## ➤ Salient features of PEPA – 1997 are:

1. Establishment of Environmental Protection Agencies in 4 provinces under section 12.
2. Prohibition of Import of Hazardous Waste under Section 13
3. Regulation of Motor Vehicle under section 15
4. Establishment of Environmental Tribunals under section 20
5. Designation of Environmental Magistrates under section 24

# What is Environment?

➤ Environment is broadly divided into four spheres:

1. **Lithosphere** (our earth),
2. **Atmosphere** (air, gases),
3. **Hydrosphere** (water both surface and ground including oceans)
4. **Biosphere** (all living organisms including plants, animals, micro-organisms)

# What is Pollution?

- Pollution includes emissions (addition of physical, chemical and / or biological materials) into the **air** and **water**, and onto or into **land**.
- Damages the environment
- Causes a nuisance to members of community
- Looks ugly or gives unaesthetic view
- Proves harmful - or even fatal - to human beings, plants and animals

# What is Pollution?

- **Pollution can be of 5 different types**
- **Air pollution:** affects the air
- **Water pollution:** affects the water and marine life
- **Land pollution:** affects the land, destroying life and the environment
- **Noise Pollution:** that can affect our hearing
- **Visual/aesthetic** pollution

# Key Causes of Pollution

1. Burning of fossil fuels and other materials giving off dust, smoke and fumes
2. Industrial wastewater
3. Intentional/accidental release of raw sewage
4. Poor solid waste management
5. Chemicals, wash waters, waste products, trade effluents and fuels etc. entering the soil, surface water or ground water
6. Emissions from transport
7. Excessive noise, heat or vibration generated by various business activities



# Environmental Impact Assessment (EIA)

- The concept of Environmental Impact Assessment (EIA) is linked to Development.
- Development basically aims to bring about a positive change in a society. This change may be of social wellbeing and / or economical advancement.
- In the past promotion of economic growth for increased wellbeing of society was the main development goal with little sensitivity to adverse social or environmental impacts.

# Introduction to Environmental Impact Assessment (EIA)

- Although development aims to bring about a positive change, it can also lead to social conflicts and / or environmental concerns.
- The need to avoid / minimize adverse impacts and ensure long term benefits led to the concept of **sustainability**.
- Sustainability refers to an economic activity that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

# Sustainable Development



# Introduction to EIA

- 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 concept of EIA was introduced by United States in 1969 and later on by Pakistan in 1994 for all new projects.
- Environmental assessment is now accepted as an essential part of development planning and management. It should become as familiar and important as economic analysis in project evaluation.

# Introduction to EIA

- The aim of any EIA should be to facilitate sustainable development. Beneficial environmental effects are maximized while adverse effects are minimized or avoided to the greatest possible extent.
- EIA help to select and design projects, programs or plans with long term viability and therefore improve long term cost effectiveness, minimizing and / or avoiding negative impact on environment and society as a whole.

# EIA Definitions

Various definitions of EIA are as follows.

- **“a technique and a process by which information about environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming the judgement on whether the development should proceed”**

(Department of Environment, UK, 1989)

- **“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**

(International Association of Impact Assessment - IAIA, 1999);

# EIA Definitions

- **“an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed”**

**(Pakistan Environmental Protection Act, 1997);**

# **EIA Definitions**

**In simple words 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 enhance positive effects”.**

**EIA thus has three main functions:**

- **to predict problems,**
- **to find ways to avoid / mitigate them, and**
- **to enhance positive effects.**



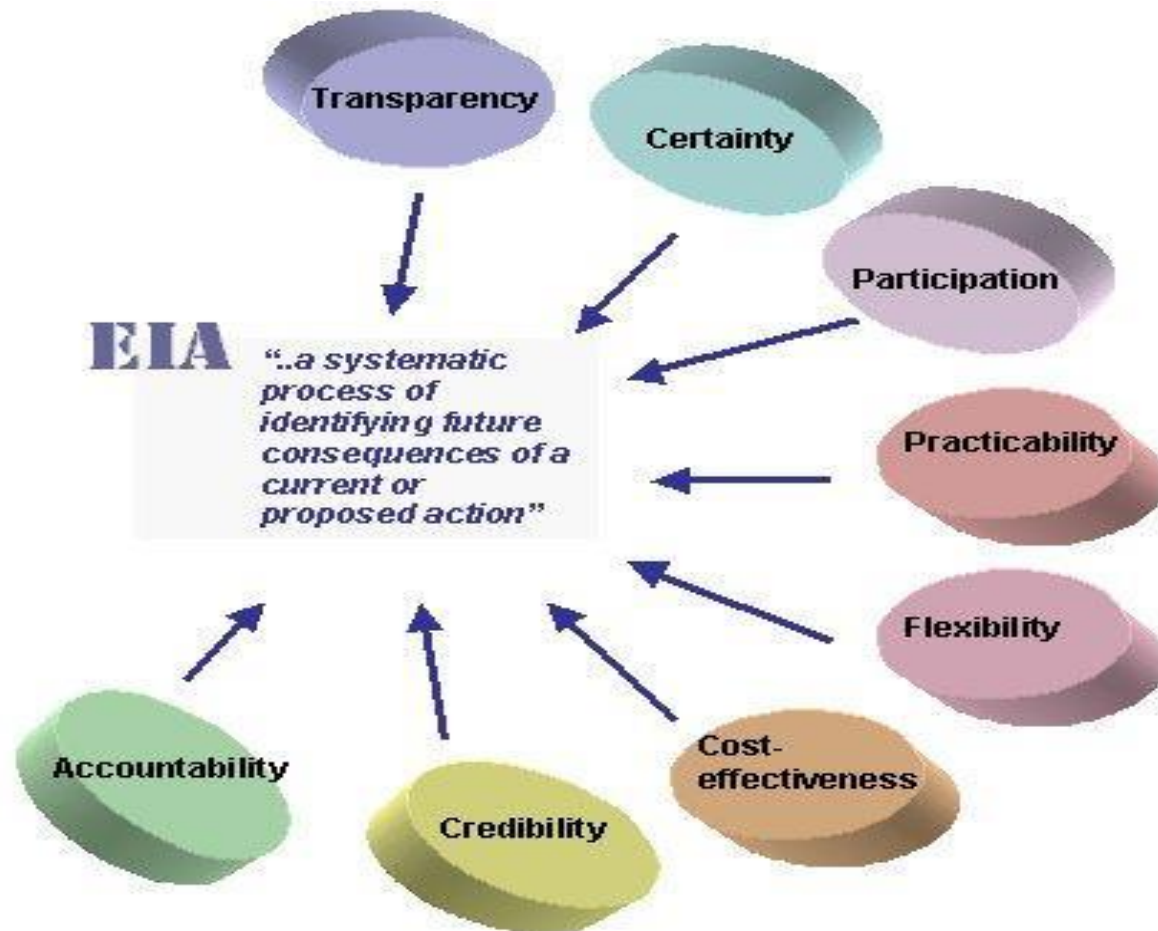
# **How EIA helps Us?**

- **EIA provides a unique opportunity to demonstrate ways in which the environment may be improved as part of the development process.**
- **EIA also predicts the conflicts and constraints between the proposed project, program or plan and its environment.**
- **It provides an opportunity for mitigation measures to be incorporated to minimize problems.**
- **It enables monitoring programs to be established to assess future impacts and provide data on which managers can take informed decisions to avoid environmental damage.**

# **Aims and Objectives of EIA**

- **To provide decision-makers with an analysis of all aspects of the environment so that decisions can be made based on as nearly complete and balanced information as possible;**
- **To improve the design of new developments and safeguard the environment through the application of measures to avoid and mitigate negative impacts.**
- **To provide information to the public on the planned development proposal;**
- **To formalize the consideration of alternatives.**

# Basic Principles of EIA



# Basic Principles of EIA

There are eight guiding principles that govern the entire process of EIA as mentioned below:

**1) Participation:** An appropriate and timely access to the process for all interested parties.

**2) Transparency:** All assessment decisions and their basis should be open and accessible.

**3) Certainty:** The process and timing of the assessment should be agreed in advanced and followed by all participants.

**4) Accountability:** The decision-makers are responsible to all parties for their action and decisions under the assessment process.

## **Basic Principles of EIA (cont...)**

- 5) Credibility:** Assessment is undertaken with professionalism and objectivity.
- 6) Cost-effectiveness:** The assessment process and its outcomes will ensure environmental protection at the least cost to the society.
- 7) Flexibility:** The assessment process should be able to adapt to deal efficiently with any proposal and decision making situation.
- 8) Practicality:** The information and outputs provided by the assessment process are readily usable in decision making and planning.

# Why EIA is conducted?

- **Global Commitment**
- **For Project Approval**
- **Mandatory for all Donors**
- **Reduces Environmental Damages**
- **Increases Environmental Benefits**
- **Ensures that Development is according to:**
  - ✓ **National Quality Standards (NEQs)**
  - ✓ **Govt. Policies**
  - ✓ **International Obligations**

**Thank You**