

Environment means...

Water, air and land and the interrelationship that exists as between and amongst these media (water, air and land) and human beings, other living beings including micro-organisms and property

Environmental Pollution means...

The Alteration of the composition of the environment which will have deleterious effect on human health or quality of life, **or**

The presence of any pollutant in the environment which imparts adverse effect on the marketability of an asset, **or**

Any solid, liquid, gaseous or other substance present in such concentration which may be or tend to be injurious to the environment giving rise to adverse effect on the marketability of asset

Pollutant means...

A substance which when enters in the environment either purposefully or through some act of nature, it significantly changes the composition of the environment and shows adverse effect on human health.

Contamination means...

An alteration of physical, chemical and/or biological characteristics of the environment which may not necessarily create deleterious (harmful) due to lesser concentration but contaminant(s) in higher concentration become pollutants that may ultimately lead to degradation or deterioration of the value of assets.

Types of Environmental Pollution

The various components of environment are air, water, noise and land, and correspondingly the environmental pollution is classified as air pollution, water pollution, noise pollution and land (and soil) pollution.

Some of the pollutants include gases, metals and their salts, agro-chemicals including pesticides, biomedical waste, heat, vibration and plastic.

Air Pollution

- Any deleterious change in the composition of the clean atmospheric air is known as air pollution.
- Air pollution means presence of one or more contaminants in the atmosphere such that the contaminant's concentration, characteristics and exposure is injurious to public health or welfare.

According to The Air (Prevention and Control of Pollution) Act-1981...

'Air Pollution' means the presence in the atmosphere of any air pollutant.

'Air Pollutant' means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The sources of air pollution are...

- Stationary sources like mining and quarrying, refineries and chemical factories, power plants, industrial facilities, sewage and waste treatment,
- Community sources like heating of homes and buildings, laundry services,
- Mobile sources like diesel and gasoline-powered automobiles, trains, marine vehicles, airplanes, and
- Indoor sources are like tobacco smoking, combustion emissions, asbestos and Volatile Organic Compounds (VOCs).

The air contaminants include suspended particulate matter (dusts, fumes, mists, and smokes), gaseous pollutants (gases and vapors), odors, radio-active materials, noxious chemicals or any other material in the outdoor atmosphere.

The air pollutants prescribed by the Central Pollution Control Board (CPCB) of India include Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂), Particulate Matter (PM₁₀), Lead (Pb) and ground level Ozone (O₃).

Water Pollution

According to The Water (Prevention and Control of Pollution) Act-1974...

'Water Pollution' means such contamination of water or such alteration of physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render

such water harmful or injurious to public health or safety, or to domestic, commercial industrial, agricultural or other legitimate (lawful) uses, or to the life and health of animals or plants or aquatic organisms.

The main pollutants in water include various chemical compounds (organic and inorganic), oils and grease, silt, heated water from thermal power plants, fertilizers and pesticides, pathogens present in the domestic wastewater and gases dissolved in rain water.

The sources of water pollution are...

- Sewage, storm water, direct discharge of effluents from industries,
- Pesticides brought through agricultural runoff,
- Runoff from the solid waste disposal sites,
- Corrosion of material used in distribution of water including plumbing systems,
- Oil spills,
- Development of algae in rivers due to presence of nutrients and sunlight,
- Application of certain chemical agents such as chlorine and aluminum in water treatment processes,
- Discharge of toxic substances,
- Discharge / dumping of waste materials into water bodies,
- Sediments from soil erosion,
- Surface runoff from contaminated land and leaching from landfill sites,
- Pollutants from the solid wastes dissolve in rain water and ultimately get mixed with underground water (ground water) through percolation in the soil system

Thermal pollution occurs when water bodies are degraded in terms of altering their temperatures. It commonly happens when people or industries (power plant) undertake activities that suddenly decrease or increase the temperature of a natural water body which may include lakes, rivers, oceans or ponds.

Noise Pollution

- Noise pollution is an environmental phenomenon but a non-physical contamination as it does not directly affect the various media like air-water-land.
- Noise is undesired sound and an unwanted disturbance.

- Transmission of noise which is capable of producing physiological impact in an individual is defined as noise pollution.
- Noise pollution may interface with various activities of humans like work, recreation, communication and rest/sleep. It may create annoyance and stress.

Land Pollution

- Land pollution is the destruction or decline in quality of the earth's land surfaces in term of use, landscape and ability to support life forms.
- Many times, it is directly and indirectly caused by human activities and abuse of land resources.
- Land pollution takes place when waste and garbage is not disposed off in the right manner and as such, introduces toxins and chemicals on land.

Land pollution can be broadly classified as:

- Contamination of land due to uncontrolled storage & disposal/dumping of solid and hazardous chemicals/wastes onto soils in the form of herbicides, fertilizers, pesticides, or any other form of the consumer by-products, e.g. the past use of site for storing chemicals might have resulted in contamination of soils and groundwater with arsenic and organo-chlorine compounds.
- Alteration of land due to land uses like deforestation, farming, mining, developmental works like transport and communication.

Environmental Degradation & Steps to Restore Environmental Damage

Environmental changes are based on many factors including Urbanization, Industrialization, Over-population, Economic growth, Deforestation, Intensification of agriculture, Increase in energy use, Increase in transportation, etc.

Steps to Restore Environmental Degradation...

1. Reform Current Systems: By strict laws
2. Promote Green Jobs
3. Abandon 'Cap and Trade' System: Set limits on carbon emissions
4. Promote Renewable Energy
5. Phase out, stop or shifting environmentally harmful subsidies
6. Trusts: A Tool to Manage the Commons

7. Set up Systems for Voluntary Co-operation

Outlines of Environmental Legislations

The major legislations are...

1. The Water (Prevention and Control of Pollution) Act, 1974
2. The Water (Prevention and Control of Pollution) Cess Act, 1977
3. The Air (Prevention and Control of Pollution) Act, 1981
4. The Environment (Protection) Act, 1986.

The Water (Prevention & Control of Pollution) Act, 1974

The government formulated this act in 1974 to prevent the pollution of water by industrial, agricultural and household wastewater that can contaminate water sources. Wastewaters with high levels of pollutants that enter wetlands, rivers, lakes, wells as well as the sea are serious health hazards.

- This Act provides for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water.
- For carrying out above objects, the Act contemplates the constitution of **Central Pollution Control Board (CPCB)** at the National level and **State Pollution Control Boards** at State level.
- The CPCB apart from functioning as a coordinating national level body also acts as a State Board in respect of the Union Territories.
- This Water Act defines water pollution and prescribes penalties besides establishing administrative machinery like CPCB and SPCB.
- The Boards are given comprehensive powers to advise, coordinate and provide technical assistance in the prevention & control and abatement of water pollution.
- These Boards are entrusted with the task of monitoring the state of water pollution in the country and laying down standards of permissible level of pollution.
- Any person who wants to locate an industry has to check whether the area in which he wants to locate an industry is in the areas declared under Section 19 of the Water Act or not.
- In the absence of any notification excluding that area, the Water Act applies throughout the State and therefore the proponent has to conform to the provisions of the Act.

- In so far as the Union Territory of Delhi is concerned, there is no such exclusion and therefore the Water Act can be enforced in the whole of the Union Territory of Delhi.
- Further, under the amended Section 25 of the Water Act & Section 26, unlike the non-amended sections, it requires previous consent of the State Board to establish or to take any steps to establish any industry.
- The Boards control sewage and industrial effluent discharges by approving, rejecting or conditioning (like the location, construction and use of the outlets as well as nature and composition of new discharges) the application seeking consent to discharge.

The Air (Prevention & Control of Pollution) Act, 1981

It makes provisions, inter alia (among other things), for Central and State Boards, power to declare pollution control areas, restrictions on certain industrial units, authority of the Boards to limit emission of air pollutants, power of entry, inspection, taking samples and analysis, penalties, offences by companies and Government and cognizance of offences etc.

According to this Act, no person can operate certain types of industries including the asbestos, cement, fertilizer and petroleum industries without consent of the State Board.

The Government passed this Act in 1981 to clean up air by controlling pollution. It states that sources of air pollution such as industry, vehicles, power plants, etc., are not permitted to release particulate matter, lead, carbon monoxide, sulfur dioxide, nitrogen oxide, volatile organic compounds (VOCs) or other toxic substances beyond a prescribed level.

Powers and Functions of the Boards

a. Central Pollution Board

- The main function of the Central Board is **to implement legislation** created to improve the quality of air and to prevent and control air pollution in the country,
- The **Board advises the Central Government** on matters concerning the improvement of air quality,

- Also **coordinates activities**, provides technical assistance and guidance **to State Boards** and lays down standards for the quality of air.
- It **collects** and **disseminates (distribute) information** in respect of matters relating to air pollution and performs functions as prescribed in the Act.

b. State Pollution Control Boards

- The State Boards have the power **to advise the State Government** on any matter concerning the prevention and control of air pollution,
- They have the **right to inspect** at all reasonable times any control equipment, industrial plant, or manufacturing process and give orders to take the necessary steps to control pollution,
- They are expected to **inspect air pollution control areas** at intervals or whenever necessary,
- They are empowered to provide **standards for emissions** to be laid down for different industrial plants with regard to quantity and composition of emission of air pollutants into the atmosphere,
- A State Board may establish or **recognize a laboratory** to perform this function.
- The State Governments have been given **powers to declare air pollution control areas** after consulting with the State Board,
- Give instructions to ensure **standards of emission from automobiles** and restriction on use of certain industrial plants.

Sections

- Under Section 19, the Central Board is given powers mainly to coordinate the activities of State Boards.
- Section 19 of the Act contemplates **declaration of air pollution control areas**.
- The State Government may, after consultation with the State Board, by notification in the Official Gazette declare any such area for the purposes of the Act. **For example**, the entire Union Territory of Delhi having been so declared is in air pollution control area for the purposes of this Act.
- The Board may prohibit the use of any fuel other than approved fuel in the area causing air pollution.

- Under Section 21 of the Air Act, only with the **previous consent of the State Board** a person shall **establish or operate any industrial plant** in air pollution control area.
- Under Section 22 of the Air Act, any person carrying on any industry or operating any industrial plant in any air pollution control area is **prohibited from discharging** or causing or permitting to be discharged the emission of any air pollutants in **excess of the standards** laid down by the State Board.
- Section 21 or Section 22, is imprisonment for a term which shall not be less than one year and six months but which may extend to six years and with fine, and in case the failure continues, with an additional fine which may extend to five thousand rupees for every day during which such failure continues even after the conviction for the first such failure.

The Environment (Protection) Act, 1986

- This Act passed by Parliament on 23rd May, 1986 authorizes the central government to protect and improve environmental quality, control and **reduce pollution from all sources**, and prohibit or restrict the setting and/or operation of any industrial facility on environmental grounds.
- It also provides protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property.
- Section 3(2)(v) confers powers on the Central Government to restrict the area in which any industry, operation or process or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.
- By virtue of this Act, the Central Government is empowered to take all needful actions for prevention, control and abatement of environmental pollution.
- The powers include coordination of actions by states, planning and execution of nationwide programmes and laying down environmental quality standards.
- The Central Government is also empowered to make rules which may provide for the prohibition and restrictions on the location of industries and carrying on the processes and operations in the different areas.
- Section 8 of the Act clearly provides that no person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed.

The Forest Act, 1927

- It was enacted to 'consolidate the previous laws relating to forests that were passed before the 1920s, the transit of forest produce, and the duty livable on timber and other forest produce'.
- The Act gave the State Government the power to create **Reserved Forests**, and the right to use Reserved Forests for Government use alone.
- It also created **Protected Forests**, in which the use of resources by local people was controlled.
- Some forests were to be controlled by the village community, and these were called **Village Forests**.
- The Act remained in force till the 1980s when it was realized that protecting forests for timber production alone was not acceptable.
- The other values of protecting the services that forests provide and its valuable assets such as biodiversity began to overshadow the importance of their revenue earnings from timber.
- This led to the Forest Conservation Act of 1980 and its amendment 1988.

Laws related to Industrial Health & Safety

- The basic aim of the concerned law making and amending authorities is to devise laws which provide safety standards to protect the basic needs of workers and take care of their welfare.
- Legislation on occupational health and safety has existed in India for several decades.
- The principal health and safety laws are based on the British Factories Act.

Various Laws related to Industrial Health & Safety are...

The Factories Act 1948, The Mines Act 1952, The Dock Workers (Safety, Health & Welfare) Act 1986 and The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 are some of the laws which contain provisions regulating the health of workers in an establishment whereas the Employees' State Insurance Act 1948 and the Workmen's Compensation Act 1923 are compensatory in nature.

Environment and Valuation

General Effects of Contaminated Property on Valuation are...

- Fall of demand

- Fall of price
- Assets off the market: not sale
- Risk of law suits
- Reduced market value
- Difficulty in getting finance
- Difficulty in getting funds for remediation

Cost to Cure

Cost is defined as a resource sacrificed or forgone to achieve a specific objective. Cost is considered as monetary amount that must be paid to acquire goods and services. Thus for combating the problem of contamination, some 'costs' are attached to acquire that objective.

The cost comprises of Direct Costs and Indirect Costs.

Direct costs are those related to the particular cost object that can be traced to it in an economically feasible way.

Indirect costs are those related to the particular cost object but cannot be traced to it in an economically feasible way.

Broadly, costs arising from contamination are those costs which are related to either controlling the contamination or repairing the contaminated part of the property. Other costs are associated while the part property is under remediation and part is in use like operating, disruption, utility, stigma and so on.