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Geography

Environmental Pollution

- Environmental Pollution refers to the introduction of harmful materials into the environment.
- In other words, environmental pollution is the contamination of the physical and biological components of the environment to such an extent that normal environmental processes are adversely affected.

Pollutants

- Any harmful material that, by getting introduced into the environment, causes environmental pollution is called a pollutant.
- In other words, a pollutant is any substance that contaminates air, water, soil, etc, and damages their quality.
- Pollutants can be natural, such as volcanic ash, or created by human activity, such as trash or factory runoff.

Types of Pollutants

Pollutants can be categorised into various types based on different parameters, as shown below.

Based on Nature of Disposal

Based on the nature of disposal, pollutants are of the following two types:

Non-Biodegradable Pollutants

- Pollutants that cannot be broken down into simpler, harmless substances in nature are called non-biodegradable pollutants.
- For example, DDT, plastics, polythene, insecticides, pesticides, mercury, lead, arsenic, aluminium cans, synthetic fibres, glass objects, iron products, silver foils, etc.
- Through bioaccumulation and biomagnification, these pollutants may appear in greater concentration as we move along the higher tropics of the food chain.

Biodegradable Pollutants

- Biodegradable Pollutants can be broken down into simpler, harmless substances in nature over time.

- For example, Domestic wastes, urine, faecal matter, sewage, agriculture residues, paper, wood, cloth, cattle dung, animal bones, leather, wool, vegetable stuff or plants etc.

Based on Form of Persistence

Depending upon the form in which they persist after being released into the environment, the pollutants are categorised into the following two types:

Primary Pollutants

- Primary Pollutants are those emitted directly from the source and persist in the environment in the form in which they were added.
- Examples: ash, smoke, fumes, dust, nitric oxide, sulphur dioxide, hydrocarbons, etc.

Secondary Pollutants

- Secondary Pollutants are formed from primary pollutants by chemical interaction with some constituents present in the atmosphere.
- Examples are Sulphur trioxide, nitrogen dioxide, aldehydes, ketones, ozone, etc.

Based on Nature of Pollutants

Depending upon their existence in nature, pollutants are of the following two types:

Quantitative Pollutants

- These substances normally occur in the environment but acquire the status of pollutant when their concentration increases due to human unmindfulness.
- For example, Carbon Dioxide (CO₂).

Qualitative Pollutants

- These substances do not usually occur in nature but are added by man.
- For example, insecticides.

Causes of Environmental Pollution

The causes of environmental pollution are based on the following factors:

- **Rapid Industrialisation**
 - The concentration of industries in urban areas releases pollutants into the air, water, and soil, causing environmental pollution.

- The rapid pace of urbanisation also increases waste generation and resource consumption, exacerbating pollution and causing severe environmental pollution.
- Industries also generate hazardous wastes in many forms, including liquids, solids, gases, and sludge.
- **Rapid Urbanization**
 - The increased pace of urbanisation in recent times has led to worsening environmental pollution.
 - It creates issues such as deforestation and habitat loss, increased emissions and waste generation, etc.
- **Forest Fires**
 - The frequency of forest fires or wildfires has increased because of human actions, such as land clearing, encroachment, etc.
 - These wildfires are a huge source of environmental pollution, adding large amounts of gaseous and other pollutants to the environment.
- **Improper Agricultural Practices**
 - According to the IPCC report, the agriculture sector produces at least 23 per cent of global greenhouse gas emissions (second only to the energy sector).
 - Using chemical fertilisers, pesticides, and herbicides in agriculture contributes to soil and water pollution and environmental pollution.
 - Intensive farming practices also lead to deforestation, soil erosion, habitat destruction and environmental pollution.
- **Deforestation**
 - Deforestation refers to the decrease in forest areas worldwide that are lost for other uses, such as agricultural croplands, urbanisation, or mining activities.
 - This causes an imbalance in the local ecology and reduces nature's capability to absorb pollutants, leading to environmental pollution.
- **Other Causes**
 - Other prominent causes of environmental pollution include continued reliance on fossil fuels, vehicular emissions, and improper waste management.

Types of Environmental Pollution

- Environmental pollution can be categorised into several types based on the nature of the pollutants and the media they affect.
- Some of the major types of environmental pollution are described below.

Air Pollution

- **Air Pollution** is the contamination of the atmosphere with harmful substances that can adversely affect human health, ecosystems, and climate.

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- Air pollution is caused by releasing harmful gases and particulate matter into the atmosphere.
- Significant sources of air pollution include industrial emissions, vehicular exhaust, and burning fossil fuels, which causes environmental pollution.
- Air Pollution is linked to respiratory diseases, cardiovascular problems, and global phenomena like acid rain and climate change.