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Unit – V
Natural Resources and Related Environmental Issues

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NATURAL RESOURCES

Our environment provides us with a variety of goods and services necessary for our day to day lives.

These **natural resources** include, air, water, soil, minerals, along with the climate and solar energy, which form the non-living or **'abiotic'** part of nature.

The **'biotic'** or living parts of nature consists of plants and animals, including microbes.

Plants and animals can only survive as communities of different organisms, all closely linked to each in their own **habitat**, and requiring specific abiotic conditions.

WATER RESOURCES

Water Resources refers to the available fresh water that can be used for human consumption, agriculture, industry, and other essential purposes.

Water resources are essential for the survival of ecosystems and human societies, but they are finite and need to be managed carefully.

These resources can be divided into two main categories

Renewable
Non-renewable Water Sources.

TYPES OF WATER RESOURCES

Surface Water

Groundwater

Desalinated Water

Rainwater

FOOD RESOURCES

Food Resources refer to the various sources from which humans obtain the nutrients and energy required for survival.

These resources come from different environments and systems, ranging from natural ecosystems to human-managed agricultural systems.

Ensuring a sustainable and diverse food supply is crucial for addressing global hunger, nutrition, and food security.

TYPES OF FOOD RESOURCES

Plant-Based Resources

- Crops
- Staple Crops
- Vegetables and Fruits
- Herbs and Spices

Animal-Based Resources

- Livestock
- Fish and Seafood
- Dairy Products
- Insects

Aquatic Resources

- Wild Fisheries
- Aquaculture

LAND RESOURCES

Land Resources refer to the natural resources found on the Earth's surface that are used for a variety of purposes, including agriculture, housing, industry, and conservation.

These resources are finite, and their management is crucial for sustaining ecosystems, maintaining biodiversity, and supporting human activities.

The sustainable use and preservation of land resources are fundamental to addressing challenges like climate change, population growth, and urbanization.

TYPES OF LAND RESOURCES

Agricultural Land

- Arable Land
- Pastureland
- Forestland

Forest Resources

- Timberland
- Non-Timber Forest Products (NTFPs
- Ecological Functions

Mineral Resources

- Metallic Minerals
- Non-Metallic Minerals
- Energy Resources

Water Resources on Land

- Rivers and Lakes
- Groundwater
- Wetlands

POLLUTIONS

Pollutants are generally grouped under two classes:

Biodegradable pollutants

Biodegradable pollutants are broken down by the activity of micro-organisms and enter into the biogeochemical cycles. Examples of such pollutants are domestic waste products, urine and faucal matter, sewage, agricultural residue, paper, wood and cloth etc.

Non- Biodegradable pollutants

Non-biodegradable pollutants are stronger chemical bondage, do not break down into simpler and harmless products. These include various insecticides and other pesticides, mercury, lead, arsenic, aluminum, plastics, radioactive waste etc.

AIR POLLUTION

Primary Pollutants

Pollutants that are emitted directly from identifiable sources are produced both by natural events (for example, dust storms and volcanic eruptions) and human activities (emission from vehicles, industries, etc.).

Secondary Pollutants

Pollutants that are produced in the atmosphere when certain chemical reactions take place among the primary pollutants. Eg: sulfuric acid, nitric acid, carbonic acid, etc.

AIR POLLUTION

Air pollution can come from both natural and anthropogenic (human-made) sources:

a) Natural Sources

- Wildfires
- Volcanic Eruptions
- Dust Storms
- Biological Sources

b) Human-Made (Anthropogenic) Sources:

- Vehicle Emissions
- Industrial Activities
- Agriculture
- Burning of Fossil Fuels
- Waste Disposal and Landfills

WATER POLLUTION

Water Pollution refers to the contamination of water bodies (such as rivers, lakes, oceans, groundwater, and aquifers) by harmful substances, chemicals, waste products, or pathogens that degrade water quality and pose risks to human health, aquatic life, and ecosystems.

Water pollution is one of the most critical environmental issues facing the world today, as clean water is essential for drinking, sanitation, agriculture, industry, and maintaining biodiversity.

WATER POLLUTION

Industrial Activities

Agricultural Activities

Urban and Domestic Waste

Mining Activities

Oil and Gas Extraction:

Climate Change:

SOIL POLLUTION

Soil Pollution refers to the contamination of soil by harmful substances, such as chemicals, waste products, and heavy metals, which degrade the quality of the soil and disrupt the natural balance of its ecosystem.

This pollution can result from both natural processes and human activities, and it can have severe consequences for agriculture, human health, wildlife, and the environment.

SOIL POLLUTION

Agricultural Activities

Industrial and Urban Waste

Urbanization and Infrastructure Development

Oil and Petrochemical Spills

Mining and Mineral Extraction

NOISE / SOUND POLLUTION

Sound Pollution, also known as Noise Pollution, refers to the excessive or disturbing levels of sound that disrupt the normal acoustic environment.

It is an unwanted or harmful sound that can have detrimental effects on human health, wildlife, and ecosystems.

Noise pollution is typically caused by human activities, although natural sources of sound can also contribute to noise levels.

RADIATION

Radiation Pollution refers to the presence and release of harmful levels of radiation into the environment, which can pose significant risks to human health, ecosystems, and the atmosphere.

Unlike other forms of pollution (such as air or water pollution), radiation pollution is invisible, but its effects can be long-lasting and devastating.

THERMAL POLLUTION

Thermal Pollution refers to the degradation of water quality caused by the discharge of heated water or air into natural water bodies or the atmosphere.

This increase in temperature disrupts the balance of aquatic ecosystems, affecting both plant and animal life.

Thermal pollution is most commonly associated with human industrial activities, particularly those related to power generation and manufacturing processes.

ROLE OF POLLUTION CONTROL BOARD

Pollution control boards in India play a crucial role in protecting the environment and public health by regulating and managing pollution levels across various sectors.

These boards operate at both the national and state levels, ensuring compliance with environmental laws, monitoring pollution sources, and implementing pollution control measures.

In India, the two primary pollution control bodies are:

Central Pollution Control Board (CPCB)

State Pollution Control Boards (SPCBs)