B.A 4th semester

Paper-4016

Environmental geography and disaster management

- **Major global environmental problems**

1.POLLUTION

What is Environmental Pollution?

- Environment Pollution is the addition of contaminants into the natural environment that causes detrimental effects to nature, natural resources and mankind.
- Any unnatural and negative changes in all the dimensions like chemical, physical and biological characteristics of any component of the ecosystem i.e. air, water or soil which can cause harmful effects on various forms of life and property is called environmental pollution.

What is a Pollutant?

- Any substance which causes harmful effects or uneasiness in the organisms, then that particular substance may be called as the pollutant.

• The materials that cause pollution are of two types:

1. Persistent pollutants: Those pollutants which remain consistent in the environment for a long period of time without any change in its original form are called persistent pollutants. For example pesticides, nuclear wastes, and plastics etc.

2. Non-persistent pollutants: These pollutants are the opposite of persistent pollutant and break down in the simple form. If this process of breaking down is done by living organisms, then such pollutants are referred to as biodegradable pollutants.

According to their existence in nature:

1. Quantitative Pollutants: These substances are already present in the atmosphere but they become pollutant when their concentration level reaches to a particular level which is above a threshold limit.

2. Qualitative Pollutants: These are man-made pollutants eg. Fungicides, herbicides etc.

According to origin:

1. Man-made Pollutants
2. Natural Pollutants

According to the nature of disposal:

1. Biodegradable Pollutants
2. Non-biodegradable Pollutants

Types of pollution:

AIR POLLUTION:

• Air pollution is the presence of one or more disadvantageous content in such quantity and for such duration, as it is catastrophic, or tend to be catastrophic, to human health and welfare, animal or plant life.

• It is the contamination of air by the discharge of detrimental substances.

Sources of Air Pollution

- There are two types of sources that we will take a look, namely Natural sources and Man-made sources.

Natural Sources

- Natural sources of pollution include dust carried by the wind from locations with very little or no green cover, gases released from the body processes of living beings (Carbon dioxide from humans during respiration, Methane from cattle during digestion, Oxygen from plants during Photosynthesis).
- Smoke from the combustion of various inflammable objects, volcanic eruptions, etc. along with the emission of polluted gases also makes it to the list of natural sources of pollution.

Man-made Sources

- While looking at the man-made contributions towards air pollution, it can be further divided into:
- Outdoor pollution sources
- Indoor pollution sources

Outdoor Pollution Sources

- The major outdoor pollution sources include power generation, vehicles, agriculture/waste incineration, industry and building heating systems. Smoke features as a prominent component. The smoke emitted from various forms of combustion, like in biomass, factories, vehicles, furnaces, etc.

- Waste dumped in landfills generates methane, which is harmful in several ways. The reactions of certain gases and chemicals also form harmful fumes that can be dangerous to the well-being of living creatures.

Indoor Pollution Sources

- In low- and middle-income countries, mostly burning fuels such as dung, coal and wood in inefficient stoves or open hearths produces a variety of health-damaging pollutants. These include carbon monoxide, methane, particulate matter (PM), polyaromatic hydrocarbons (PAH) and volatile organic compounds (VOC).
- Even burning kerosene in simple wick lamps also produces significant emissions of fine particles and other pollutants. Exposure to smoke from cooking fires causes 3.8 million premature deaths each year.

Various Causes of Air pollution

1. The Burning of Fossil Fuels

- Sulfur dioxide emitted from the combustion of fossil fuels like coal, petroleum for energy in power plants, and other factory combustibles is one the major cause of air pollution.
- Billions of vehicles run on roads are powered by gasoline and diesel engines that burn petroleum for releasing energy. Petroleum is made up of hydrocarbons, and engines don't burn them cleanly.
- As a result, pollutants such as PM, nitric oxide and NO2 (together referred to as NOx), carbon monoxide, organic compounds, and lead emit from vehicles including trucks, jeeps, cars, trains, airplanes, causing a high level of pollution. These modes of transportation form part of our daily basic needs, so we rely on them heavily.

- But, their overuse is killing our environment as dangerous gases are polluting the atmosphere. Carbon Monoxide caused by improper or incomplete combustion and generally emitted from vehicles is another major pollutant along with Nitrogen Oxides, that is produced from both natural and man-made processes.
- As per the World Health Organization(WHO), exposure to outdoor air pollution contributes to as much as 0.6 to 1.4 percent of the burden of disease and 4.2 million deaths every year.

2. Agricultural Activities

- Ammonia is a very common byproduct of agriculture-related activities and is one of the most hazardous gases in the atmosphere. The use of insecticides, pesticides, and fertilizers in agricultural activities has grown quite a lot. They emit harmful chemicals into the air and can also cause water pollution.

- Farmers also set the field and old crops on fire in order to keep them clean for the next round of sowing. The burning to clean fields is said to cause pollution by releasing harmful gases in the air.

3. Waste in Landfills

- Landfills are land areas in which waste is deposited or buried. These deposited or buried wastes generate methane. Methane is a major greenhouse gas that is highly flammable and very hazardous.
- E-waste is another grave concern involving a lot of unscientific dismantlings such as chemical leaching, burning wires and others.

4. Exhaust From Factories and Industries

- Manufacturing industries release a large amount of carbon monoxide, hydrocarbons, organic compounds, and chemicals into the air, thereby depleting the quality of air.

- Manufacturing industries can be found at every corner of the earth, and there is no area that has not been affected by it. Petroleum refineries also release hydrocarbons and various other chemicals that pollute the air and also cause land pollution.

5. Mining Operations

- Mining is a process wherein minerals below the earth are extracted using large equipment. During the process, dust and chemicals are released in the air causing massive air pollution
- This is one of the reasons which is responsible for the deteriorating health conditions of workers and nearby residents.

6. Indoor Air Pollution

- Household cleaning products, painting supplies emit toxic chemicals in the air and cause air pollution. Suspended particulate matter, is another cause of pollution. Referring to the particles afloat in the air, SPM is usually caused by dust, combustion,

7. Natural Events

- There are certain natural events such as volcanoes, forest fires, and dust storms, which are nature-born and cause air pollution.

Disastrous Effects of Air pollution

1. Respiratory and Heart Problems

- The effects of air pollution are alarming. They are known to create several respiratory and heart conditions like asthma, chronic bronchitis, emphysema, heart attacks and strokes along with cancer, among other threats to the body.

2. Child Health Problems

- Air pollution is detrimental to your health even before you take your first breath. Exposure to high air pollution levels during pregnancy causes miscarriages as well as premature birth, autism, asthma and spectrum disorder in young children

3. Global Warming

- Another direct effect is the immediate alterations that the world is witnessing due to global warming.

4. Acid Rain

- Harmful gases like nitrogen oxides and sulfur oxides are released into the atmosphere during the burning of fossil fuels. When it rains, the water droplets combine with these air pollutants, becomes acidic and then falls on the ground in the form of acid rain. Acid rain can cause great damage to humans, animals, and crops.

5. Eutrophication

- Eutrophication is a condition where a high amount of nitrogen present in some pollutants gets developed on the sea surface and turns itself into algae and adversely affects fish, plants, and animal species.

6. Effect on Wildlife

- Just like humans, animals also face some devastating effects of air pollution. Toxic chemicals present in the air can force wildlife species to move to a new place and change their habitat. The toxic pollutants deposit over the surface of the water and can also affect sea animals.

7. Depletion of the Ozone Layer

- Ozone exists in the Earth's stratosphere and is responsible for protecting humans from harmful ultraviolet (UV) rays. Earth's ozone layer is depleting due to the presence of chlorofluorocarbons, hydrochlorofluorocarbons in the atmosphere.
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As the ozone layer becomes thin, it will emit harmful rays back on earth and can cause skin and eye-related problems. UV rays also have the capability to affect crops

Impressive Solutions To Air Pollution

1. Use the Public Mode of Transportation

2. Better Household Practices

- Discard fireplaces and/or wooden stoves used for heating homes

3. Conserve Energy

- Switch off fans and lights when you are going out. A large number of fossil fuels are burnt to produce electricity. We can save the environment from degradation by reducing the number of fossil fuels to be burned.

4. Understand the Concept of Reduce, Reuse and Recycle

5. Emphasis on Clean Energy Resources

- Use of Clean energy technologies like solar, wind and geothermal is on the rise these days.

6. Use Energy-Efficient Devices

- CFL lights consume less electricity than their counterparts. They live longer, consume less electricity, lead to lower electricity bills, and also help you to reduce pollution by consuming less energy.
- Source-Environmental geography,Savindra singh