**Séance N°09**

**AIR POLLUTION**

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the environmental components.

World Health Organisation (WHO)

Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.

A chemical agent is a chemical compound that has toxic effects on human health. The term includes dusts, mixtures (solutions), paints, fuels, and solvents.

Physical agents are sources of energy that may cause injury or disease. Examples include noise, vibration, radiation, and extremes in temperature, electromagnetic radiation, electricity, optical radiation (UV radiation, light, infrared radiation).

A biological agent is a bacterium, virus, parasite, or fungus (yeast, mushrooms). that can be used purposefully as a weapon in bioterrorism or biological warfare.

WHO data show that almost all of the global population (99%) breathe air that exceeds WHO guideline limits and contains high levels of pollutants, with low- and middle-income countries suffering from the highest exposures.

**Clean, dry air consists primarily of:**

Nitrogen 78 percent and oxygen 21 percent, by volume.

The remaining 1 percent is a mixture of other gases, mostly argon (0.9 percent), along with trace (very small) amounts of carbon dioxide, methane, hydrogen, helium, and more.

Water vapour is also a normal component of the atmosphere, normally ranging from 0.01 to 4 percent by volume; under very humid conditions the moisture content of air may be as high as 5 percent.

Sources of air pollution

1. Man-made (Artificial)

* These are mostly linked to the combustion of several kinds of fuel.
* Sources entail clouds of smoke from power plants, industrial facilities, incinerators, and other sorts of fuel-burning heating devices. traditional biomass embraces wood, crop leftovers and excrement.
* Controlled burning in forest management, agriculture, prairie re-establishment.
* Fumes from hair spray, paint, aerosol sprays, varnish, and other solvents
* Waste deposits in landfills create methane. Methane is extremely combustible and may form an explosive and volatile concoction with air.
* Military resources, such as nuclear weapons, toxic gasses, germ warfare and rocketry

2. Natural sources

* Dirt from natural sources, typically big areas of land with little or no plant life.
* Methane, discharged by the breakdown of food (digestion) by animals, for example, cattle
* Smoke and CO from jungle fires.
* Volcanic activity, which emits sulphur, chlorine, and ash particulates

Major Effects of Air Pollution

**Respirational and cardio complications:**

Air pollution causes numerous respirational (pneumonia and asthma) and cardiac conditions accompanied by Cancer, midst other threats to our body.

**Global warming:**

The increase in (greenhouse gases especially water vapour (H2O), carbon dioxide (CO2), nitrous oxide(N2O), methane (CH4), ozone (O3)) water vapour (H2O) leads to the increase in temperatures worldwide.

The increase in temperatures generates an increase in sea levels and melting of ice from cold areas and icebergs, displacement and loss of habitats.

**Acid Rain:**

Dangerous gasses like NO2 and SO2 are released into the atmosphere during the incineration of fuels. When it rains, the droplets combine with these pollutants, become acidic and then fall on the ground in the form of acid rain. Acid rain is a source of great harm to human beings, wildlife, and crops.

**Eutrophication:**

It is a process where a high amount of nitrogen present in some contaminants gets in surface waterbody and develops itself into algae and harmfully affect fish, plant life and animal species.

**Diminution of Ozone layer:**

Ozone is present in the Earth’s atmosphere (Stratosphere) and is responsible for shielding humans from injurious ultraviolet (UV) rays. Earth’s ozone layer is diminishing because of the presence carbons in the atmosphere.

**Prevention of Air Pollution (air pollution control)**

**measures to control air pollution:**

* **Avoid Using Vehicles and rather encourage the Usage of public modes of transport.** **This prevents pollution and conserves energy.**
* **Energy Conservation: fossil fuels are burnt to generate electricity. Therefore, do not forget to switch off the electrical appliances when not in use.**
* **Use of energy-efficient devices such as CFLs (compact fluorescent light) also controls pollution to a greater level.**
* **Use of Clean Energy Resources (renewable energy)**

**The use of solar, wind and geothermal energies reduce air**

 **pollution at a larger level.**

* **By minimising and reducing the use of fire and fire products.**
* **Since industrial emissions are one of the major causes of air pollution, the pollutants can be controlled or treated at the source itself to reduce its effects. For example, if the reactions of a certain raw material yield a pollutant, then the raw materials can be substituted with other less polluting materials.**
* **Fuel substitution is another way of controlling air pollution. Petrol and diesel are being replaced by CNG – Compressed Natural Gas fuelled vehicles.**
* **Another way of controlling air pollution caused by industries is to modify and maintain existing pieces of equipment so that the emission of pollutants is minimised.**
* **A very effective way of controlling air pollution is by diluting the air pollutants.**
* **Vegetation: Plants and trees reduce many pollutants in the air.**