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ICSE GEOGRAPHY

Class 9

Chapter 16: Pollution -- Types and Sources

Any undesirable change in the biotic or abiotic components of our environment, which is harmful to living organisms, is called **pollution or environmental pollution**.

The pollution can be of air, water (fresh and marine) or soil. The harmful radiations or very loud noise are also harmful to the living organisms. The damage due to environmental pollution can be short-term or long-term. It can be temporary or permanent.

POLLUTANTS

The substances which cause pollution are called **pollutants**. Pollutants can be created by natural processes or by human activities or both.



Dust storm causes pollution



Burning of crackers causes pollution

The pollutants are classified in the following ways:

On the Basis of their Origin

1. The **Primary Pollutants** are those which enter the environment directly from various sources, such as carbon monoxide, sulphur dioxide, hydrocarbons.

2. The **Secondary Pollutants** are those which are formed by chemical interactions between the primary pollutants and the atmospheric gases, such as sulphuric acid, nitric acid, etc.

On the Basis of their Physical State

1. The **Solid Pollutants** are those which originate from mining, agricultural, industrial and commercial wastes.
2. The **Liquid Pollutants** are those which originate from industries, sewage, toilets and agricultural run-off (having pesticides and insecticides).
3. The **Gaseous Pollutants** are those which originate from metallurgical and chemical industries, pharmaceuticals, etc.

On the Basis of Degradation

1. The **Biodegradable Pollutants** are mostly the organic matter, such as domestic garbage, crops and vegetable residues, animal dung, human excreta, remains of animals, sewage, etc.
2. The **Non-biodegradable Pollutants** are mostly the inorganic substances and organic polymers, such



Biodegradable pollutants



Non-biodegradable pollutants

TYPES OF POLLUTION

In the present age, environmental pollution is increasing and it can interfere with human activities. The main types of pollution are as under:

1. Air Pollution
2. Water Pollution
3. Soil Pollution
4. Radiation Pollution
5. Noise Pollution

AIR POLLUTION

The presence of undesirable solid, liquid and gaseous matter in the air, which can be harmful to the biotic and abiotic parts of the environment, is called **air pollution**.



Air pollution

WATER POLLUTION

Water pollution may be defined as the presence of undesirable substances (organic, inorganic, biological or radioactive) in water which can make it unfit for use by the human beings, animals and marine life.



Pollution of lake water



Pollution of marine water

Water pollution can be studied under two headings – **pollution of fresh water** and **pollution of marine water**.

SOIL POLLUTION

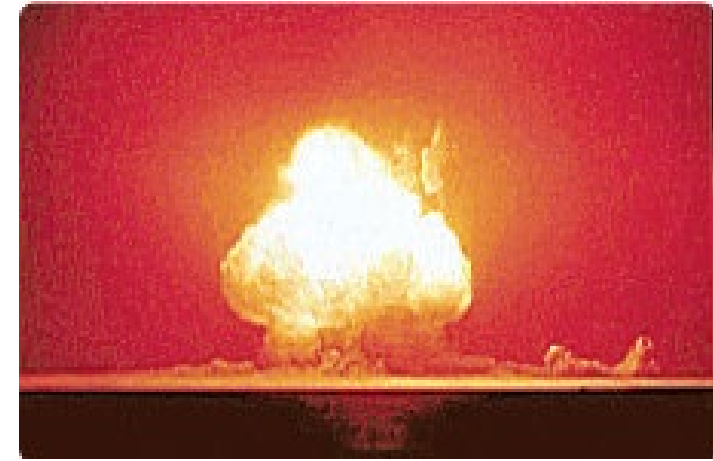
Soil pollution is defined as the change in the physical, chemical and biological conditions of soil due to the presence of various toxic materials in it. Harmful substances are added to the soil through the surface runoff or through leaching. The pollutants remain in the soil for a longer period of time.



Soil pollution

RADIATION POLLUTION

Radiation is defined as the release of energy from atoms of some elements. It is also the movement of energy in the form of invisible waves through space. The emission of these invisible radiations is known as **radioactivity**. The release of radiations, which can degrade the quality of environment and create danger for the living organisms, is called **radiation pollution**.



Radiation pollution

NOISE POLLUTION

Sound is measured in decibel (dB). Any sound, which is unwanted or unpleasant to our ears is called **noise**. Thus any undesirable sound which adversely affects the physical and mental health of its recipient, is called **noise pollution**.

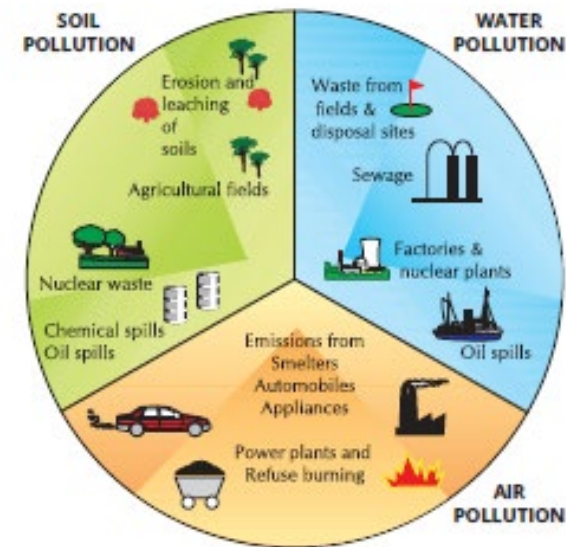


Noise pollution

SOURCES OF POLLUTION

The environmental pollution is rapidly increasing and it is adversely affecting the agricultural systems, the industrial processes, living conditions, physical environment and cultural assets.

The **sources of environmental pollution** can be natural, such as volcanic eruptions, forest fires, landslides, dust storms, floods, etc. and human activities such as transport vehicles, industries, burning garbage, brick kilns, urbanisation, mining and extraction of oil, agricultural processes, deforestation, etc.



Sources of pollution

SOURCES OF AIR POLLUTION

Air is the most important component of our environment. Clean and pure air is the first necessity for the health and survival of human beings and other organisms. The main sources of air pollution are due to natural processes and human activities.



Air pollutants from vehicles



Mining causes air pollution

Many types of industries, such as metallurgical, chemical, cement, sugar, pulp and paper, cotton textiles, synthetic rubber, oil refineries, coal based thermal power plants emit smoke, toxic gases (oxides of carbon, nitrogen and sulphur) and suspended particulate matter.

The oxides of nitrogen and sulphur are produced due to the burning of coal. They can form nitric acid and sulphuric acid, which may fall as **acid rain**.



Air pollutants from industries



Air pollution from burning of garbage

SOURCES OF WATER POLLUTION

A variety of pollutants arising from natural processes and human activities have polluted most of the water bodies on the Earth.



Water pollutants from sewage



Water pollutants from domestic waste



Water pollutants from sewage

SOURCES OF SOIL POLLUTION

During the last 50 years, human activities such as the use of agrochemicals, mining, urbanisation, dumping of wastes, etc. have resulted in the degradation of soil fertility and its composition. **Soil pollution** is the decrease in soil quality and fertility due to the presence of toxic chemicals from various sources. The main sources of soil pollution are:

1. Chemical fertilizers
2. Biomedical waste
3. Pesticides and insecticides



Biomedical waste



Soil pollutants from pesticides

SOURCES OF RADIATION POLLUTION

Radiation pollution refers to the presence of high energy radiations in land, water or air. The main sources of radiation pollution can be natural, such as solar rays and natural radioactivity, or human made such as X-rays, nuclear waste, nuclear accidents, etc.



Pollutants from nuclear power plants

X-rays

It helps in diagnosing various types of ailments and skeletal disorders. The X-rays are high energy rays and can easily penetrate through the soft tissues of the body. Excessive and indiscriminate use of X-rays can cause damage to the internal organs of



X-ray radiations

Nuclear fallout

The nuclear power plants take all possible safety measures for their smooth working and are considered to be quite safe, but there have been technical failures due to human errors, such as in the case of nuclear power plant in Chernobyl (Soviet Union) in 1986.



Fallout from nuclear power plant

Nuclear waste

The main sources of nuclear waste are the nuclear power plants, industries, research laboratories and the institutions using radioactive materials. These wastes keep on emitting radiations regularly in the environment.

SOURCES OF NOISE POLLUTION

Noise is essentially the feature of advanced modern lifestyle. It is mainly a problem of city dwellers and industrial workers. Noise has become a part of our environment, which is increasing in volume everyday. It is the leading cause of stress today. The main sources of noise pollution can be natural or man-made.



Noise pollution due to social functions.



Noise pollution by aeroplane

**THANK
YOU**