

## Components of the Environment and Interrelationships

Earth is the only planet in the solar system, that has received the gift of natural environment. If environment had not been there, we would not have existed. Human life is throbbing because of the environment. Environment is the driving force of survival, development and progress.

The word environment means surrounding cover. The environment is the cover of natural components around the earth. The environment is made up of Lithosphere, Hydrosphere, Atmosphere, and Biosphere.



### Components of The Environment

The environment is made up of four main components. These four components include lithosphere, hydrosphere, atmosphere and biosphere. We have studied about these four components in Std 6. Let us briefly understand about it :

**Lithosphere :** Lithosphere is the solid crust or hard top layer of the earth. It is composed of rocks and minerals and is covered by thin layer of soil. Lithosphere has multiple utility like it provides land for human settlement, agriculture and raw material for industries.

**Hydrosphere :** The low lying area of earth surface is surrounded by water, it is known as hydrosphere. It is comprised of various sources of water like Oceans, seas, lakes, rivers etc. It is essential for all the living organisms. Oceans are also rich in of various resources.

**Atmosphere :** Atmosphere is the layer of air that surrounds the earth. Atmosphere is made up of various gases, water vapour, dust particles, alkali etc. It protects life of on the earth by absorbing sun's harmful ultraviolet rays. We can hear sound through atmosphere. We are thankful to atmosphere, for making us able to hear sound through means of communication/broadcasting like radio, television and mobile phones.

**Biosphere :** The part of lithosphere, hydrosphere and atmosphere where life is pervasive is called Biosphere. It includes flora, fauna, micro-organisms and human beings. Living beings obtains food and other necessities from biosphere.

There are two main types of environment : Natural environment and man-made environment. Natural environment includes biological (biotic) components like flora, fauna and human beings. Inorganic (abiotic) components are like land, water, air etc. Man-made environment is created by human intellect by interacting with biotic and abiotic components.

### Man-Made Environment

Man interacts with surrounding environment. He makes changes in it according to his need. In ancient times man lived a nomadic life and adapted the environment according to his own needs. His life was simple and his needs were limited, so all his needs were met from the surrounding environment. As the time passed, changes occurred and needs also increased. Man learnt how to use and change the environment. As a result, production increased in agriculture, animal husbandary due to invention of wheel and industrial revolution. This man-made environment is also known as cultural environment.





## Our Environment

### Distribution of Water

The area of water on earth is more on than land area. It occupies about 71% of the earth's surface. An ocean is a water body that has huge reserves of water. There are four oceans on the earth : (1) Pacific (2) Atlantic (3) Indian (4) Arctic. All these oceans are connected to one another. These oceans are very wide and deep. In the Pacific ocean there is a trench which is 10 to 11 kms deep.

Mostly of the water on the earth is saline. It is mainly found in oceans and seas. The main sources of fresh water are glaciers, ground water, lakes of fresh water, rivers, etc.

### Sea Waves

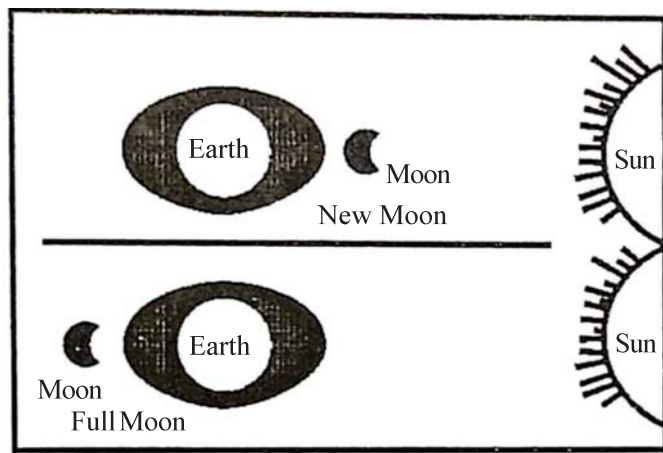
Sea Waves arise from various forces. Normal Waves are created by the wind blowing over the sea surface. High waves are formed by whirlwind or storm. When these waves reach the coast, they cause heavy damage.

### Tides-Ebbs

Twice a day sea-level rises and falls periodically.

#### Know This

Oceans	97.3
Glaciers/Icebergs	2 .0
Ground water	0 .68
Fresh water lake	0 .009
Saline water lake	0 .009
In atmosphere	0 .0019
Rivers	0 .0001
<b>Total</b>	<b>100:00</b>



This phenomenon of rising and falling of sea is called tide and ebb. At the time of high tide sea water bulges towards the shore while at the time of ebb the sea water returns to the sea from the shore. The time interval between two tides is about 12:25 hours.

Tide occurs on the earth due to gravitational force of the sun and the moon. The mass of the sun is more than the moon but is far away from the earth so the gravitational force of moon is more on the earth. Different parts of the earth face the sun

and the moon at different times so tides also come at different time.

On the day of New moon and Full Moon, the sun, the earth and the moon come almost in a straight line. This condition results in high tide. But when the moon is in its first and last quarter, the gravitation pull reduces resulting in low tides.

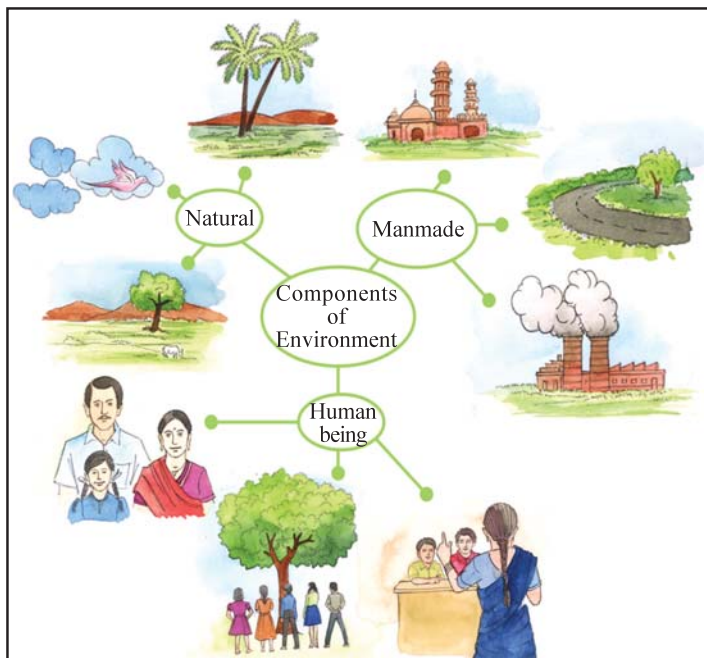
### Ocean Currents

Like the rivers on the Earth, the oceans also have huge amount of water flowing in certain direction for thousands of years, these currents are called ocean currents. These currents are hot and cold. The main causes of currents are solar energy, wind, salinity of sea-water and rotation of the earth. Mostly hot currents move from the equator to the poles and cold currents move from the poles to the equator.

### Interrelationship among the components of the Environment

Man is at the center of all components of environment. The different components of the environment are connected with one another by some physical cycles. These cycles are influenced by human activities. Man does excavation in lithosphere to obtain minerals. The huge pits are formed due to excavation, these pits get filled with water resulting in formation of hydrosphere. As the temperature in the atmosphere increases, the water in the hydrosphere evaporates, and mixes with the atmosphere. As the moisture in the atmosphere condenses, clouds form and rain falls. The flow of that water causes erosion of soil; as a result various landforms are formed.

Moreover various human activities are interconnected with the ecosystem due to components of natural environment.



Components of environment

### Pollution

Human beings use their intellect to use various components of the environment to satisfy their needs. Mahatma Gandhi said that pollution is the act of polluting the natural environment through human activities.



Components polluting the environment are called pollutants. The environment is polluted when resources are used unrestrictedly and indiscriminately. The sharp zest of human development, industrialization and mechanization are responsible for pollution of environment.

At present land pollution, water pollution, air pollution and noise pollution are increasing very fast. Pollution causes an adverse effect on the environment, human life and living things. We need to take immediate steps to preserve the environment, and prevent its harmful effects.

**Land Pollution :** A change in soil quality or its nutrients is called land pollution. Land pollution is not easily felt. Land pollution is on rise around the world. Disposal of household solid waste or water, setting up of industries on fertile or agricultural land, discharge of contaminated water used in industries on open land, disposal of industrial solid waste on land, excavation



**Pirana Dumping**

activities, construction activities, use of chemical fertilizer for agriculture, over-irrigation and over usage of insecticides along with it as well as use of plastic are responsible for land pollution.

#### **Know This**

Pollution has occurred in Punjab due to excessive use of nitrogenous chemical fertilizers. Due to excessive use of chemical fertilizer in Hoshiarpur, Bhatinda districts of Punjab and Rohtak district of Haryana, the water of the wells has been contaminated to a dangerous level. As a result, the people living there have become victim to various diseases. There is a high prevalence of cancer, intestinal and urinary diseases.

#### **Measures to Prevent Soil Pollution :**

- Instead of pesticides and chemical fertilizers, organic and indigenous fertilizer, green manure should be used.
- Pesticides should be used sparingly.
- Solid waste should be sorted and reused.
- Plastic/Solid waste should be recycled and reused.
- Drip and Sprinkler irrigation system should be used in agriculture.

**Water Pollution :** When water becomes unsuitable for its intended use and external impurities are mixed with it, it is called water pollution. Sewage water, water polluted by industries, leakage of mineral oil carriers, chemical fertilizers and pesticides used in the agriculture are responsible for water pollution.



### Water Pollution

#### Measures to prevent water pollution :

- Water polluted by household activities and industries should be disposed off after purification process only.
- Strict control should be maintained on disposal of waste water without processing.
- Consumption of substances that pollute the water should be controlled.

**Air pollution :** Emission of gas or fumes from industries, factories, thermal power plants etc into the atmosphere cause air pollution. Airborne particles such as coal particles used as fuel, carbonaceous compounds obtained from factory fumes result in air pollution. Moreover, the fumes of petrol and diesel emit air pollutants such as nitrous oxide, carbon monoxide, benzopyrene and carbon dioxide. Pollutants increase in the air due to mining and construction activities. Incineration (burning) of solid agricultural waste also increase air pollution.



### Air Pollution

#### Measures to control Air pollution :

- To prevent air pollution, the government should form laws and strictly enforce them.
- Equipment for filtering smoke and toxic gas should be developed

- Coal, petrol, diesel etc. should be used as per requirement only.
- The use of pollution free CNG, PNG, Solar energy etc. should be encouraged.
- Awareness should be spread to travel in public transport.
- PUC should be strictly enforced for vehicles.

**Noise Pollution :** Unnecessary, excessive, unbearable sound means 'noise'. We know this noise as noise pollution. Sound is pertinent to everyone. The person who loves light music; rock music is 'noise' for him while it is melodious for a rock music fan.

Excessive noise pollution is caused by machines of factories, loud noise of vehicles and honking of horns, cinemas, T.V. etc. The roar of jets and warplanes, the sound of various sirens-increase pollution. Loudspeakers used for social occasions, band, drums. DJ's, festivals and inauguration fireworks, public events, election rallies, advertisements also cause noise pollution.

Noise pollution causes deafness in a person, adverse effect on mental health, irritability in nature, reduces the ability to work. Excessive noise kills many insects and micro organisms.



### Noise Pollution

#### Measures to Prevent Noise Pollution :

- Sound proof systems and curtains should be installed in cinemas and public halls.
- Unnecessary noise should be avoided in social occasions, festivals, inaugural functions etc.
- More trees should be planted around industries and airports.
- In the places like schools, hospitals etc. 'No horn' 'Silence Zone' rules should be strictly followed.
- Use of fireworks in celebrations should be avoided.
- The volume of radio, television, mobile phones etc. should be kept low.
- Machines and vehicles should be serviced (repaired) regularly.
- The above mentioned various activities of human beings pollute the land, water, air and sound. In addition to this other activities like satellites launched into the space, waste abandoned by astronauts



in the space, artificial rain with the use of different chemicals as well as radioactive pollution due to nuclear power also affect the environment. Some natural disasters such as volcanic eruption, earthquakes, floods also pollute the environment. To maintain the environment and to save the environment, man himself has to make firm resolutions.

### Activity

Arrange a discussion of how to prevent pollution around you.

### Exercise

#### 1. Answer the following questions in one sentence :

- (1) State the components of environment.
- (2) Which are the main sources of fresh water ?
- (3) How much is the time period between two tides ?
- (4) Which pollution induces irritability in the nature of man ?
- (5) What is land pollution ?

#### 2. Answer the following questions :

- (1) What is man-made environment ?
- (2) Write the measures to prevent land pollution.
- (3) Which steps should be taken to prevent air pollution ?
- (4) Mention the steps taken by you to prevent noise-pollution.

#### 3. Give Reasons :

- (1) Tides occur in the sea.
- (2) High tides occur on the New moon day and Full moon day.

#### 4. Fill in the following blanks with appropriate words :

- (1) The atmosphere absorbs ..... sun rays and protect living beings.
- (2) Noise pollution is also called ..... .
- (3) Rushing of sea water towards the shore, is called ..... .