

The atmosphere of the earth is heated by radiations which are mainly

- (a) radiated by the sun
- (b) re-radiated by land
- (c) re-radiated by water
- (d) re-radiated by land and water

☐ If there were no atmosphere around the earth, the temperature of the earth will

- (a) increase

- (b) go on decreasing
- (c) increase during day and decrease during night
- (d) be unaffected

☐ What would happen, if all the oxygen present in the environment is converted to ozone?

- (a) We will be protected more
- (b) It will become poisonous and kill living forms
- (c) Ozone is not stable, hence it will be toxic
- (d) It will help harmful sun radiations to reach earth and damage many life forms.

☐ One of the following factors does not lead to soil formation in nature

- (a) the sun
- (b) water
- (c) wind
- (d) polythene bags

☐ The two forms of oxygen found in the atmosphere are

- (a) water and ozone
- (b) water and oxygen
- (c) ozone and oxygen
- (d) water and carbon-dioxide

☐ The process of nitrogen-fixation by bacteria does not take place in the presence of

- (a) molecular form of hydrogen
- (b) elemental form of oxygen
- (c) water
- (d) elemental form of nitrogen

☐ Rainfall patterns depend on

- (a) the underground water table
- (b) the number of water bodies in an area
- (c) the density pattern of human population in an area
- (d) the prevailing season in an area

☐ Among the given options, which one is not correct for the use of large amount of fertilisers and pesticides?

- (a) They are eco-friendly
- (b) They turn the fields barren after some time
- (c) They adversely affect the useful component from the soil
- (d) They destroy the soil fertility

☐ The nitrogen molecules present in air can be converted into nitrates and nitrites by

- (a) a biological process of nitrogen fixing bacteria present in soil
- (b) a biological process of carbon fixing factor present in soil
- (c) any of the industries manufacturing nitrogenous compounds
- (d) the plants used as cereal crops in field

☐ One of the following processes is not a step involved in the water-cycle operating in nature

- (a) evaporation
- (b) transpiration
- (c) precipitation
- (d) photosynthesis

☐ The term “water-pollution” can be defined in several ways. Which of the following statements does not give the correct definition?

- (a) The addition of undesirable substances to water-bodies
- (b) The removal of desirable substances from water-bodies
- (c) A change in pressure of the water bodies
- (d) A change in temperature of the water bodies

☐ Which of the following is not a green house gas?

- (a) Methane
- (b) Carbon dioxide
- (c) Carbon monoxide
- (d) Ammonia

☐ Which step is not involved in the carbon-cycle?

- (a) Photosynthesis
- (b) Transpiration
- (c) Respiration
- (d) Burning of fossil fuels

☐ ‘Ozone-hole’ means

- (a) a large sized hole in the ozone layer
- (b) thinning of the ozone layer
- (c) small holes scattered in the ozone layer
- (d) thickening of ozone in the ozone layer

☐ Ozone-layer is getting depleted because of

- (a) excessive use of automobiles
- (b) excessive formation of industrial units
- (c) excessive use of man-made compounds containing both fluorine and chlorine
- (d) excessive deforestation.

☐ Which of the following is a recently originated problem of environment?

- (a) Ozone layer depletion
- (b) Green house effect
- (c) Global warming
- (d) All of the above

☐ When we breathe in air, nitrogen also goes inside along with oxygen. What is the fate of this nitrogen?

- (a) It moves along with oxygen into the cells
- (b) It comes out with the  $\text{CO}_2$  during exhalation
- (c) It is absorbed only by the nasal cells
- (d) Nitrogen concentration is already more in the cells so it is not at all absorbed.

☐ Top-soil contains the following

- (a) Humus and living organisms only
- (b) Humus and soil particles only
- (c) Humus, living organisms and plants
- (d) Humus, living organisms and soil particles.

☐ Choose the correct sequences

- (a)  $\text{CO}_2$  in atmosphere  $\rightarrow$  decomposers  $\rightarrow$  organic carbon in animals  $\rightarrow$  organic carbon in plants
- (b)  $\text{CO}_2$  in atmosphere  $\rightarrow$  organic carbon in plants  $\rightarrow$  organic carbon in animals  $\rightarrow$  inorganic carbon in soil
- (c) Inorganic carbonates in water  $\rightarrow$  organic carbon in plants  $\rightarrow$  organic carbon in animals  $\rightarrow$  scavengers
- (d) Organic carbon in animals  $\rightarrow$  decomposers  $\rightarrow$   $\text{CO}_2$  in atmosphere  $\rightarrow$  organic carbon in plants

☐ Major source of mineral in soil is the

- (a) parent rock from which soil is formed
- (b) plants
- (c) animals
- (d) bacteria

☐ Total earth's surface covered by water is

- (a) 75%
- (b) 60%
- (c) 85%
- (d) 50%

☐ Biotic component of biosphere is not constituted by

- (a) producers
- (b) consumers
- (c) decomposer
- (d) air
- ☐ An increase in carbon dioxide content in the atmosphere would not cause
  - (a) more heat to be retained by the environment
  - (b) increase in photosynthesis in plants
  - (c) global warming
  - (d) abundance of desert plants
- ☐ Oxygen is returned to the atmosphere mainly by
  - (a) burning of fossil fuel
  - (b) respiration
  - (c) photosynthesis
  - (d) fungi
- ☐ Low visibility during cold weather is due to
  - (a) formation of fossil fuel
  - (b) unburnt carbon particles or hydrocarbons suspended in air
  - (c) lack of adequate power supply
  - (d) none of these
- ☐ Growth of Lichens on barren rocks is followed by the growth of
  - (a) moss
  - (b) ferns
  - (c) gymnosperms
  - (d) algae
- ☐ Marked temperature changes in aquatic environment can affect
  - (a) breeding of animals
  - (b) more growth of aquatic plants
  - (c) process of digestion in animals
  - (d) availability of nutrients.
- ☐ Soil erosion can be prevented by
  - (a) raising forests
  - (b) deforestation
  - (c) excessive use of fertilizer
  - (d) overgrazing by animals
- ☐ What happens when rain falls on soil without vegetation cover?
  - (a) Rain water percolates in soil efficiently
  - (b) Rain water causes loss of surface soil
  - (c) Rain water leads to fertility of the soil
  - (d) Rain water does not cause any change in soil
- ☐ Oxygen is harmful for

- (a) ferns
- (b) nitrogen fixing bacteria
- (c) chara
- (d) mango tree

## Answers to Multiple Choice Questions

1. (d)	2. (c)	3. (b)	4. (d)	5. (c)
6. (b)	7. (b)	8. (a)	9. (a)	10. (d)
11. (c)	12. (d)	13. (b)	14. (b)	15. (c)
16. (d)	17. (b)	18. (d)	19. (b)	20. (a)
21. (a)	22. (d)	23. (d)	24. (c)	25. (b)
26. (a)	27. (a)	28. (a)	29. (b)	30. (b)

1. The micro-organisms which helps in formation of soil is
  - a. Bacteria
  - b. Moss
  - c. Lichen
  - d. B and c
2. Burning of fossil fuels add
  - a. CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub>, gases in air
  - b. C, SO<sub>2</sub>, N<sub>2</sub>, gases in air
  - c. CO, SO<sub>3</sub>, NO<sub>3</sub>, gases in air
  - d. CH<sub>4</sub>, CO<sub>2</sub>, NO<sub>2</sub>, gases in air
3. Greenhouse gases are
  - a. Industries
  - b. Rhizobium
  - c. Lightening
  - d. All of the above
4. Nitrogen fixation can be done by
  - a. Industries
  - b. Rhizobium

- c. Lightening
  - d. All of the above
5. Atmosphere maintain the temperature of earth because
- a. It contains water vapor
  - b. It hold air, which is bad conductor of heat
  - c. It reflects the heat rays
  - d. It absorbs the heat rays
6. Molecules of proteins contain
- a. Carbon
  - b. Nitrogen
  - c. Oxygen
  - d. All of these
7. Life cannot sustain on Mars and Venus because major component in atmosphere is
- a. Oxygen
  - b. Carbon dioxide
  - c. Nitrogen
  - d. Ozone
8. On moon the temperature ranges from  $-190^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ . This is due to
- a. No water bodies present
  - b. Water bodies present
  - c. No bio geo chemical cycle
  - d. No atmosphere
9. Depletion of ozone molecules in the stratosphere is due to
- a. Chlorine compound
  - b. Fluorine compound
  - c. Halogen compound
  - d. None of these
10. The life supporting zone of the earth is
- a. Lithosphere
  - b. Hydrosphere
  - c. Atmosphere
  - d. Biosphere

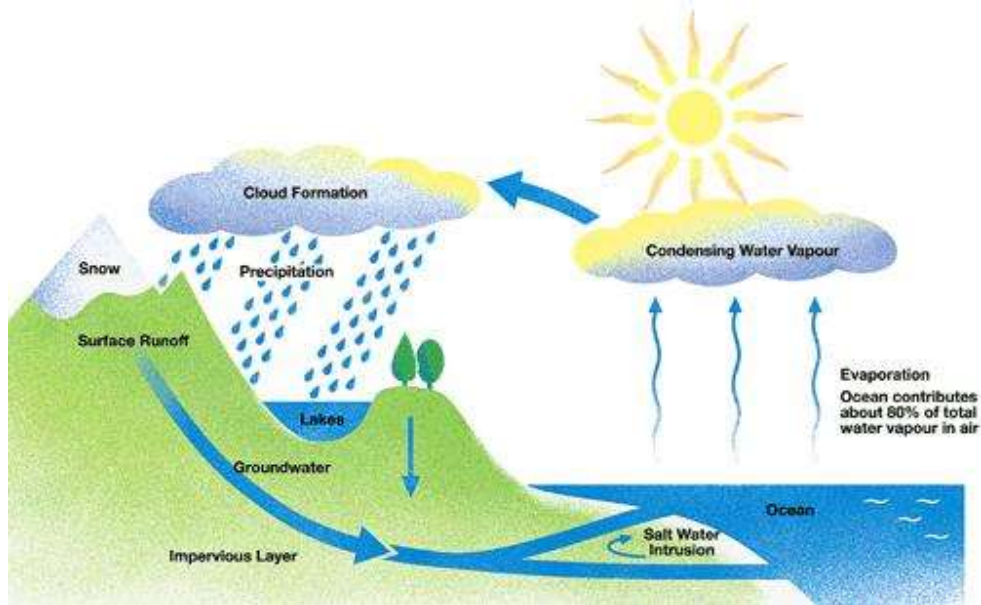
**Answers**

- 1. C
- 2. A
- 3. D
- 4. D
- 5. B
- 6. D

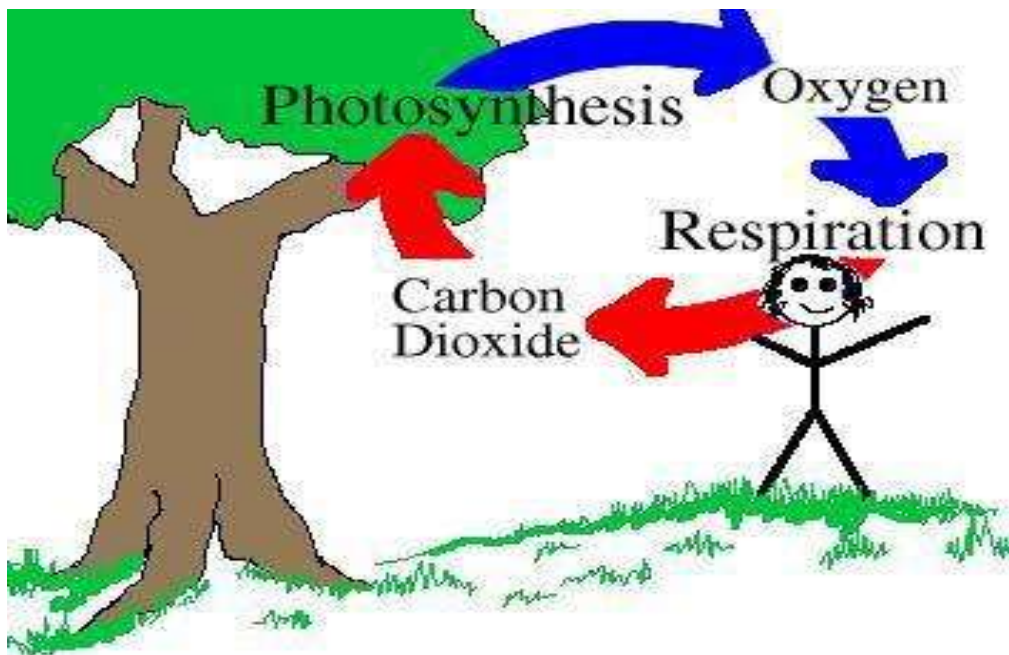
- 7. B
- 8. D
- 9. C
- 10. D

# NATURAL RESOURCES

Q1. Prepare a diagrammatic representation of water cycle.

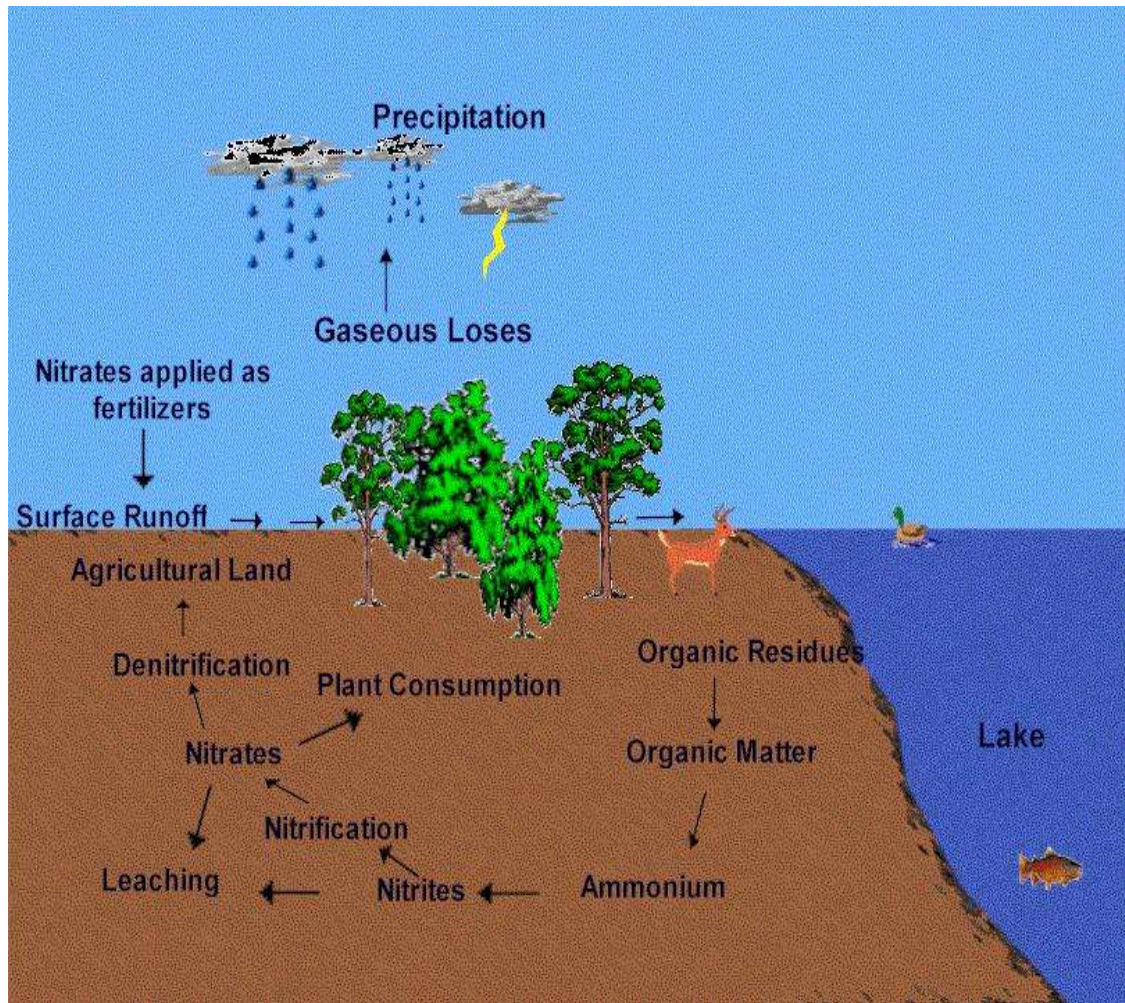


Q2. Show the recycling of oxygen in nature.

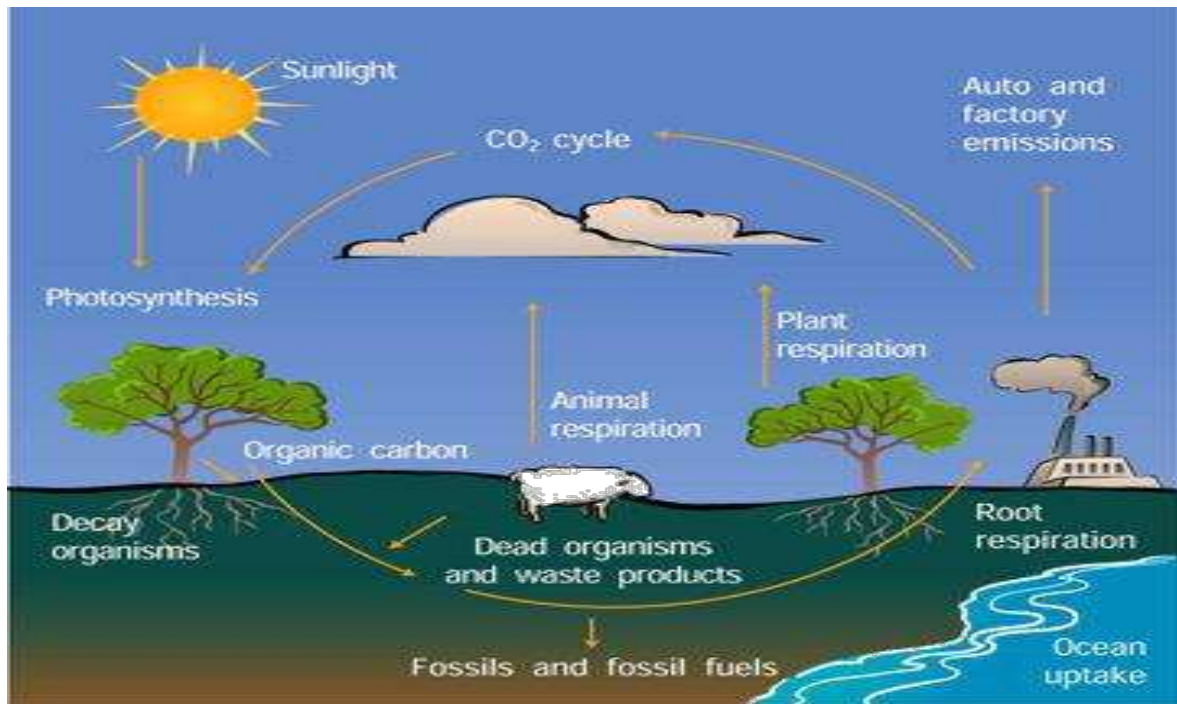




Q3.Explain the nitrogen cycle in nature with the help of a diagram.



Q4. Explain the recycling of carbon in nature.



Q5. What is ozone hole? What is its cause?



The discovery of a hole in the ozone layer above Antarctica was announced by a team of British scientists in 1985. The cause of the hole was attributed to ozone-depleting chemicals like chlorofluorocarbons (CFCs), which were primarily used in cooling units and propellants. When CFCs reach the ozone layer, they

release chlorine atoms that rip ozone apart and peel away layers of Earth's natural sunscreen.

Q6. What can be the consequences of ozone depletion?

The stratosphere (the second layer of the Earth's atmosphere, just above the one in which we dwell, the troposphere) contains 90 percent of the Earth's ozone at altitudes between 6 and 31 miles (9.6 and 50 kilometers) above us, where it traps most of the sun's harmful ultraviolet (UV) rays before they can reach the Earth's surface. These high energy radiations can cause skin cancer, harm eyesight, weaken immune system etc..

Q7. Name the green house gases

Carbon dioxide, nitrous oxide, methane and CFC'S.

Q8. What can be the consequences of global warming?

- melting of glaciers and polar ice
- climatic changes
- diseases
- low plant yield

Q9. What is the importance of nitrogen?

Nitrogen (N) is an essential component of DNA, RNA, and proteins, enzymes, Vitamins, amino acids and other building blocks of life. All organisms require nitrogen to live and grow.

Q10 Why can't the living organisms use atmospheric nitrogen directly

Although the majority of the air we breathe is N<sub>2</sub>, most of the nitrogen in the atmosphere is unavailable for use by organisms. This is because the strong triple bond between the N atoms in N<sub>2</sub> molecules makes it relatively inert. In fact, in order for plants and animals to be able to use nitrogen, N<sub>2</sub> gas must first be converted to more a chemically available form such as ammonium (NH<sub>4</sub><sup>+</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), or organic nitrogen (e.g. urea - (NH<sub>2</sub>)<sub>2</sub>CO).

Q11. Define nitrogen fixation.

It is the conversion of inert nitrogen gas into biologically acceptable form. Its of 3 types –

Biological, atmospheric and industrial.

Q12. What are biogeochemical cycles.

The repeated circulation of nutrients between biotic and abiotic components of environment is called biogeochemical cycling.

Q13. Name the main ozone depleting substances.

CFC'S, halons, carbon tetrachloride, methyl bromide, nitrogen oxides and chlorine.

Q14. What is ODS?

Ozone depleting substances

Q15. What is denitrification?

Process of reduction of nitrates into gaseous nitrogen , which escapes into atmosphere.

Q16. Explain the role of rhizobium in nitrogen fixation.

#### **Nitrogen fixation**

$N_2$   $NH_4^+$  Nitrogen fixation is the process wherein  $N_2$  is converted to ammonium, essential because it is the only way that organisms can attain nitrogen directly from the atmosphere. Certain bacteria, for example those among the genus *Rhizobium*, are the only organisms that fix nitrogen through metabolic processes. Nitrogen fixing bacteria often form symbiotic relationships with host plants. This symbiosis is well-known to occur in the legume family of plants (e.g. beans, peas, and clover). In this relationship, nitrogen fixing bacteria inhabit legume root nodules (Figure 2) and receive carbohydrates and a favorable environment from their host plant in exchange for some of the nitrogen they fix. There are also nitrogen fixing bacteria that exist without plant hosts, known as free-living nitrogen fixers. In aquatic environments, blue-green algae (really a bacteria called cyanobacteria) is an important free-living nitrogen fixer.

Q17. Explain some other ways of nitrogen fixation.

In addition to nitrogen fixing bacteria, high-energy natural events such as lightning, forest fires, and even hot lava flows can cause the fixation of smaller, but significant amounts of nitrogen (Figure 3). The high energy of these natural phenomena can break the triple bonds of  $N_2$  molecules, thereby making individual N atoms available for chemical transformation. Within the last century, humans have become as important a source of fixed nitrogen as all natural sources combined. Burning fossil fuels, using synthetic nitrogen fertilizers, and cultivation of legumes all fix nitrogen.



Q18. What is the difference between nitrification and denitrification?

Nitrification converts ammonia to nitrates and denitrification converts nitrates to free Nitrogen.

## Summary

### **Natural resources**

Materials provided by nature on earth which can be used by living organisms are termed to be natural resources. Three different regions of earth are lithosphere, hydrosphere and atmosphere.

- The solid outermost layer of the earth's crust and the rigid upper part of its mantle is called the lithosphere.
- The water that is found on the earth's surface, above it as clouds and below it as groundwater, is called the hydrosphere.
- The air which includes gases that cover the earth like a blanket, is called the atmosphere.

### **Biosphere**

The region on earth comprising of both biotic and abiotic components is called as biosphere.

- Biotic components include all the living organisms.
- Abiotic components include air, water and the soil.

Biotic components interact with all the abiotic components such as air, water and soil to sustain their life.

### **Air**

Air is a mixture of gases like nitrogen, oxygen, carbon dioxide and water vapour.

- Nitrogen is used to produce a number of organic molecules like proteins. Nitrogen is fixed in plants and is transferred to animals through food chain.
- Oxygen is used by plants and animals in the process of respiration. The combustion of fossil fuels also requires oxygen.
- Carbon dioxide is used by plants in the process of photosynthesis. Marine animals absorb atmospheric carbon dioxide to form carbonic acid. These carbonate ions are used by marine animals to make shells.

### **Functions of Air:**

- It helps to maintain a steady temperature on Earth during the day
- It controls the climate.
- It helps in the formation of rain.
- The atmosphere on earth prevents the increase of temperature during day time. Atmosphere slows down the heat from escaping to outer space during night time.

**Sea breeze and land breeze:**

During the day, air moving from the high pressure area over the sea to the low pressure area over land creates sea breeze. During night, since soil cools faster than water, the air above the land is cooler than the air above the sea. Now, the air moving from the high pressure area over land to the low pressure area over the sea creates land breeze.

**Formation of rain:**

Water bodies get heated during the day and evaporate into the air. As the vapour rises, it cools. This causes the vapour to condense into tiny water droplets, which fall down as rain by the process of precipitation.

**Wind:**

Air moving from an area of high pressure to an area of low pressure causes winds. Rains are brought by seasonal winds called as monsoons. Based on rainfall pattern, regions of India can be classified into three types, namely heavy rainfall regions, moderate rainfall regions and low rainfall regions. Regions receiving heavy rainfall exhibit high biodiversity.

**Air pollution:**

The contamination of air with chemicals, smoke, dust particles and disease-causing agents is called air pollution.

**Water**

Water is essential for the survival of plants and animals, as cellular processes take place in a water medium. Water is found on the Earth's surface, under the ground and in the atmosphere as water vapour. Maximum amount of water available is marine water which is salty. Most of the fresh water available on the earth is in the form of frozen ice.

**Water pollution:**

The contamination of water by sewage, chemicals, detergents, fertilisers and other harmful substances is called water pollution. Increase in water temperature due to

pollutants decreases the amount of dissolved oxygen. Dissolved oxygen is the source of oxygen for aquatic organisms. Reduction of dissolved oxygen results in the death of many aquatic organisms.

## **Soil**

Soil is another important natural resource that supports life. Soil contains soil particles, humus and living organisms. It also contains some amount of water in the form of droplets or air in between the soil particles.

### **Formation of soil:**

Soil is formed by many factors like sun, water, wind and living organisms.

- Uneven contraction and expansion of rocks, cracks and breaks them into smaller particles of soil.
- Frozen water logged in the cracks of rocks, cracks and breaks the rocks into soil.
- Lichens growing on the surface of rocks release chemicals which powder the rocks into soil.
- Flowing water in rivers breaks hard rocks into soil particles.
- Strong winds erode rocks and carry sand particles.

### **Soil pollution:**

The addition of substances that adversely affect soil fertility is called soil pollution. Use of fertilisers killed lot of useful microorganisms and reduced soil fertility. Deforestation has lead to erosion of topmost fertile layer of the soil. Overgrazing by animals also led to the soil erosion. Fine particles of water are also carried away by wind and water