



3

EARTH AND ITS NATURAL RESOURCES

Dear student, the Earth is one of the five great elements. In this lesson, we will learn about the Earth. You see various things around you, such as houses, animals, trees, plants, birds, soil, rocks, mountains, rivers and streams, ponds, lakes, moon, stars and so many other things. You also may see many events, such as water flowing, sunrise and sunset, chicks coming out of their eggs, spider weaving web, birds making their nests, stars not being visible at sunrise, butterfly sucking pollen from flowers etc. Whatever is around us and happening on its own, are all natural phenomena. There are many events and things that we cannot see, but only experience, such as heat, cold, wind, humidity, light etc. You can also make a long list of such natural phenomena. All the things and events mentioned above, which can be seen or experienced, are collectively called nature. The origin of this nature is possible only on Earth. Just as trees, plants, sun, moon, stars etc. are part of nature, similarly we humans are also a part of nature. Both living and non-living things come



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under nature. Animals, trees, plants etc. are the living parts (components) of nature, because they contain life. Whereas air, water, soil, sunlight, stones etc. are non-living parts (components) of nature as they have no life. But do you know that both living and non-living components are dependent on each other.

Let us learn about Earth in this lesson and see how Earth and its resources are useful to us.



OBJECTIVES

After reading this lesson you will be able to:

- get to know about our natural resources;
- get to know about the resources in nature which are useful to us (humans);
- understanding the dependence of plants and animals on each other; and
- understanding of how humans affects the natural balance.

3.1 RESOURCES ON EARTH

We see many types of things around us. Whatever is in nature is useful to humans in some form or the other. These are called natural resources. Some of these objects or animals are currently useful to humans, such as soil, cow dung, wood, water, trees, etc. But there are some things that are not currently useful to humans, such as flies, mosquitoes etc. Resources that are not currently useful to humans in nature are called non-resources. It is especially worth noting here that the non-resources that are in



nature today can be converted into resources in the future. For example, elements were non-resources for the early men, while they were still available in nature. Early men did not know how to obtain and use them, but elements are very important resources for today's humans. Therefore, we must conserve all natural resources.

In our ancient knowledge tradition, there was a lot of emphasis for the preservation of the earth. It is said in the Vedas that “**माता भूमिः पुत्रोऽहंपृचिव्याः**” meaning that the earth is our mother, it is as nutritious as mother and I am its protector like a son.

In the Aranyani Sukta of the Rigveda, the sage says that “**न वा अख्यानिहन्त्सन्श्चत्रभिगच्छति**” meaning that those who love and know the importance of forests never destroy the forests nor do any other violence towards such forest lovers. Here the sage of the Rigveda is saying that we should conserve our natural resources.

The Atharva sage in the Atharvaveda has set a unique example for the earth -

“यत्रे भूमि विखनामि क्षिप्रं तदपु रोहतु।

मा ते मर्म विमृग्वरि मा ते हृदयमर्पिपम्

(12.1.35)

That is, O land! I wish whichever of your part I dig, that should fill itself again. O discoverable earth! I should never harm your heart nor make your heart sad.



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Renewable and Non-Renewable Natural Resources

Such resources, which can occur frequently and in short duration in nature, are called renewable natural resources, such as plants, wood, air, water, etc.



Fig. 3.1

The resources on our earth, which once exhausted, take a very long time to regenerate in nature, from millions to millions of years, are called non-renewable natural resources, such as petrol, coal, kerosene, water, etc.



Fig. 3.2



Some renewable resources are available in such large quantities that we may never lack them. Oxygen is a renewable resource, as plants add fresh oxygen to the atmosphere every day through photosynthesis. Similarly, we get wood from trees. A new tree can grow up fully in a few years. Hence, wood is a renewable resource. But many resources can be exhausted if used in large quantities. For example - coal. In the process of making coal, wood remains buried in the depths of the earth for millions of years. So once it ends, it may not be available to humans in the near future. Hence wood is a renewable natural resource whereas coal is a non-renewable resource.

Bio and Abiotic natural resources

The natural resources of the earth, which contain life, are called bio natural resources, such as trees, plants, humans, animals etc. And those natural resources which do not have life, are called abiotic natural resources such as wood, soil, air etc.



Fig. 3.3



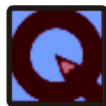
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**ACTIVITY 3.1**

Make a list of some resources that you can find in your house or around the house according to the following sections:

1. Two objects that are capable of moving on their own.
2. Two objects that move with an external force (eg, bicycle).
3. Two things that you eat.
4. Two things that feed.

Now make two groups out of all these resources in such a way that only the living resources are in one group, meaning those which are born and die and the other group has all the non-living resources.

**INTEXT QUESTIONS 1.1**

1. Fill in the blanks:
 - A) Resources that are generated in nature continuously and in a short period of time are called as
 - B) Oxygen in air is a resource.
2. Write the names of any two such natural resources which were non resources long ago.
3. Choose the natural renewable resources from the following:
Plants, wood, air, coal, water, petrol
4. Choose the bio-natural resources from the following:
human, animal, water, forest, iron, elephant, bicycle and soil.

3.2 SOIL - A NATURAL RESOURCE

Soil is an important and very useful natural resource. Soil is necessary for any food production, so the forests that grow on it are also very important for us. Let's read about them in a little detail.

Soil is a naturally dispersed unorganized material, forming the outer thin layer of the earth. It is a natural resource, which forms the base (medium) for farming and it helps in the growth of plants on the surface of the earth. The nature of the soil depends on its basic substances from which it is produced. Sometimes layers of soil are removed or swept away due to air, water or other reasons. This is called soil erosion. To avoid this, a large number of trees are planted, so that soil erosion can be prevented.

The top surface (layer) of the earth is made up of soil, which forms a base for growing plants. Have you ever wondered how this soil is made? Soil is formed as a result of the physical process of rocks. Due to temperature fluctuations, cracks occur in the rocks and their pieces are broken down into small parts by strong wind. This is due to a chemical process, i.e., the minerals found in rocks are converted into other substances. Rocks also turn into small particles due to weather, moisture, plants, animals and other means, this is called soil impermeability. A major constituent of soil is humus, which is made up of rotten parts of plants and animals. Humus helps in keeping the soil fertile and in good condition. Due to this, the fertility of soil increases and helps in plant growth.



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Many substances are found in the soil, due to their proper amount, the soil becomes fertile. If the amount of sand in the soil is high, then the soil will be dry and if the amount of clay is high, the soil will be very wet and it will be very difficult to grow anything in that soil.

Types of soil

Depending on the geographical area, the type of soil depends on its colour, its texture and the elements found in it. There are mainly six types of soil found in India.

1. Red soil - As the name suggests, the colour of this soil is red. This red colour is due to the presence of iron oxide in the soil. Humus is found in this soil only in very small quantity. Chemical fertilizers are added to this soil, then it becomes cultivable.

2. Black soil - The nature of this soil is preserved (perforated) and is rich in iron and magnesium. This soil is particularly useful for the cultivation of sugarcane and cotton.

3. Alluvial soil - This soil is very fertile, arable and humorous. This soil is brought by the rivers and released into the plains. It is clayey loam in nature and particles of all sizes are found in it. There is a good yield of wheat, mustard etc. in this soil.

4. Sandy soil - The particles in this soil are thick. This soil is dry, sandy and compact and contains sufficient amount of minerals. Humus is less in this soil because it contains less amount of rotten guts of trees and plants.

5. Mountain soil - This soil is very fertile and humus is also found in large quantity in it.

6. Laterite soil - It is clayey and also red in colour. This soil is good for growing tea, coffee and coconut.



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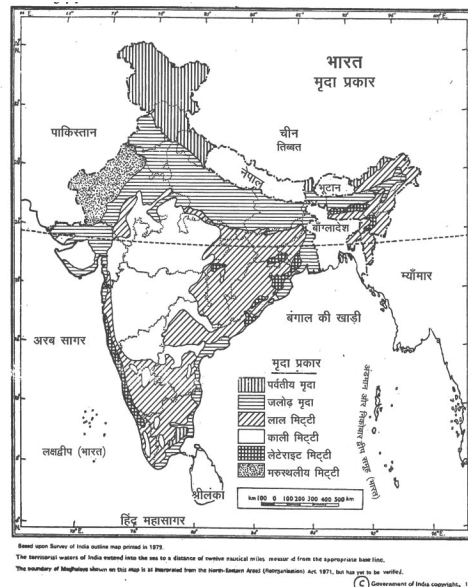


Fig. 3.4



ACTIVITY 7.2

To understand properly about the different varieties of soil, go to the areas around you. Collect samples of different types of soils there. After this, based on the qualities mentioned above, tell us what kind of soil is found there.

Soil-erosion

When there is a very strong wind, then you must have noticed that soil (dust) particles keep blowing in the air. The same particles



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also get into your eyes. You will also experience dust storms during summer. What is this dust? Actually, dust is the particles of soil found in air. Even during the first rains in the rainy season, you see that a lot of dust gets washed away with water. The sky and the land are cleared. Soil erosion is the moving of soil from one place to another due to strong wind flow or running water.

Soil erosion reduces the fertility of the land and consequently reduces the production. Soil erosion is caused by rain, wind, deforestation, over-harvesting of animals and use of wrong farming methods.

Soil pollution

For us both land and soil are very important and useful. Soil forms the basis of life. But there are many of our activities, due to which the soil is becoming poisonous and its production capacity is also decreasing. This is called soil pollution. Any substance which, if found in the soil, reduces its production capacity or becomes toxic in some way, is called soil pollutant. Following are the major factors of soil pollution:

- use of pesticides.
- Soil waste materials released from industries.
- The mixing of dirt and water from the houses in the soil.
- Open defecation.



INTEXT QUESTIONS 3.2

1. How is soil formed?
2. How many types of soil are found in India?
3. How can soil erosion be prevented?
4. What are the consequences of soil erosion?
5. Describe the two ways in which soil pollutants occur?

3.3 FORESTS AND THEIR IMPORTANCE

Our second important natural resource is forests. Forests have a lot of significance in our lives. We get a wide variety of things from forests and wild animals also live in them. But due to many reasons like increasing human population, setting up of industries, building houses, traffic, forests are being cut. As a result of this, the number of forests as well as wildlife is ever decreasing.



Fig. 3.5



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Forests are natural areas, which include naturally grown trees and freely living wildlife. Forests can be replanted.

This means that forests are renewable resources. Forests serve as a producer as well as a protector. Forests prevent flooding. Do you know that we get many useful substances from forests? Yes, wood is the first thing that comes to our mind, but apart from this, there are many other things that we get from forests, such as lac, tendu leaf, different kinds of medicines, gum, rhizomes, perfume etc.

In Vedic culture, small components of the environment have been considered superior in specific condition. And it has been said that just as parents nurture their children, so do the land and solar system-

-द्योष्पितः पृथिवि मातरघ्नगन्ने-

-भातर्वसवोमूलता नः।

(Rigveda 6.51.5)

Deforestation (cutting down forests)

Nowadays due to increase in human population, there has been a problem of places for people to live, which has become a very common cause to cut forests. Cutting trees and forests in this way is called deforestation. There are many reasons for deforestation, some of which are -



- For construction of road, dam and rail tracks.
- For mining and quarrying process.
- To obtain raw material for industries.
- To meet the demand of increasing land for farming.
- To meet the increasing demand for fuel and timber.

Conservation of Forests

Now, the question arises: why do we need to conserve forests? As we know, forests are our natural resources. It is a place for many animals to live. Forests are not only an important part of



Fig. 3.1

our environment, but they also contribute to our economic condition. Forests prevent soil erosion and air pollution and provide shelter to wildlife. If you eliminate the place of living of



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wildlife, then the number of wildlife will decrease, due to which the natural balance deteriorates. Therefore, there is a need to save forests and to plant new forests.

Wildlife Resources

Wild animals are animals that are not directly used by humans in general. These include thousands of species of mammals, reptiles, birds, fish and amphibians. Indian wildlife includes lion, cheetah, elephant, deer, reindeer, duck, leopard, rhinoceros, son bird, crocodile, tortoise etc. National park is the place where all types of wildlife get protection. But apart from the forest area, the area or place where wild animals and birds are kept in their natural environment (atmosphere) is called wildlife sanctuary.



INTEXT QUESTIONS 3.3

1. Name two useful substances obtained from forests?
2. Give two reasons for deforestation.
3. State two harmful effects of deforestation.
4. Name the four animals included in the wildlife.



WHAT HAVE YOU LEARNT

- Natural Resources on Earth
- Soil - a natural resource
- Forests and their importance



TERMINAL QUESTIONS

1. Write the difference between renewable and non-renewable resources by giving examples.
2. Why should we conserve forests?



ANSWERS TO INTEXT QUESTIONS

3.1

1. a. Innovative Resources
b. innovative resources
2. b. Metals, Oil
3. Plants, wood, air, water
4. Human, animal, elephant

3.2

1. by physical process of rocks.
2. 6 types
3. preventing rainwater, planting trees, with good farming methods.
4. the fertility of the land is reduced.
5. proper use of pesticides, release of water from industries.



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3.3

1. Gum medicines.
2. demand of land for farming and timber
3. air pollution, reduced rainfall, global warming
4. lion, cheetah, elephant, rhinoceros

