

Lesson-1

Natural Resource



I5G6T4

Learning outcomes :

The students will–

- ✦ have an idea about land, water, vegetation, wild life and energy as resource.
- ✦ understand the importance of land, water, forest resource and energy resource in terms of economic and social development.
- ✦ have an idea about management and conservation of resources.
- ✦ generate awareness on conservation of resources.

You have acquired some knowledge about resource and its type in your previous class. In this lesson, the importance of natural resource, its use, management and conservation will be discussed briefly.

Every natural element having utility for man can be called natural resource. Land, water, air, minerals, vegetation, wildlife, etc. are valuable natural endowments. All these are very useful for man.

Land Resource :

Land covers 29 percent of the earth's surface.

It is the basis of living world. Land resource is responsible for providing man with food, clothing, shelter and fuel. Similarly, the existence and development of plants and animals are dependent on land resource. Agriculture, craft, transport and communication, etc., are also developed based on land. This means the role of land or soil is most significant in terms of human civilization, culture, economy, etc. However, this land or soil is not unlimited, it is limited. There was no shortage of land when the population of the world was less. But there has been a shortage of usable land with the gradual increase in population.

Human settlement is not uniformly distributed over the earth's surface primarily due to the variations in the climatic and soil conditions. Generally human settlement is absent or very thin in uneven rocky places, steep mountain slopes, low-lying swamps, desert regions, polar regions, dense forests, etc.

Formation of soil :

Due to the weathering of rocks, a thin layer of material covering the earth's surface is formed. In such geological process, it takes hundreds of years to form a layer of one centimetre soil.

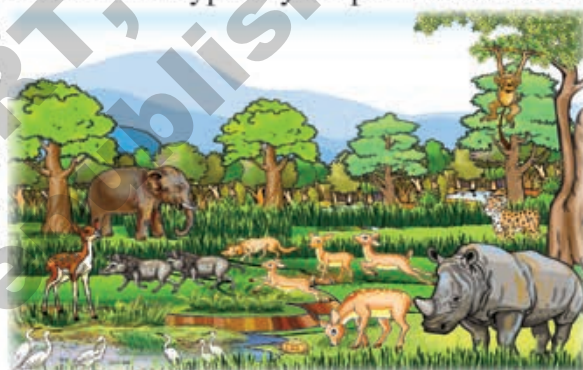


Fig. 1.1 Wild animals and vegetation.

Soil formation and soil decadence continues in the course of time.

Land use :

In general, land is used for agricultural activities, industry, extraction of minerals, afforestation, housing, construction of roads, etc. Utilization of land depends on location, climatic type, soil category, source of water, forest resource, mineral resource, etc. as well as other natural factors. More people move into places which are naturally in advantageous position. In this way, gradual increase in population leads to shortage of usable land. India's Ganges-Brahmaputra valley region may be cited as an example. This region is suitable for agricultural activities and settlement. It is densely populated. On the other hand, hilly areas are comparatively very sparsely populated due to lack of permanent cultivation, industry, transport, etc.

At present the demand for usable land has increased due to increase in population and economic competition. Consequently, there has been excessive use or misutilisation of land. For such reasons there has been a loss of Ecological Balance. If a forest is destroyed to create a town or to set up an industry on a plot of fertile land suitable for cultivation then the natural environment of that place is destroyed. Human settlement on hilly areas through rigorous cutting of land results in landslides causing environmental damage. A major portion of India's land area is covered by hills and mountains and desert. According to 2018, World Bank report, 60.43% of India's land is used for agricultural activities. Similarly, the portion of land used for settlement is also increasing.

Land use in Rural Areas :

In rural area, land is the source of living for a cultivator. They make a living by cultivating the land. For cultivation, many people clear forests, grasslands etc. or transform marshy lands, swamps, grazing fields, etc. into cultivable land. While doing so, the impact on environment is not taken into account. As a matter of fact, land should be utilised considering social, economic and environmental factors.

Land use in Urban Areas :

Population growth rate is higher in urban areas. More land is required for such an increasing population. Due to the spread of trade and commerce, industry, road-network and various other facilities, the neighbouring agricultural lands, marshy lands or forest lands are transformed into townships.

With the increase in demand for land, a decrease in the availability of usable land is being observed. Landslides, erosion, desertification, land degradation and human activities are posing threat to land resource.

Activity

- ✦ What do you mean by natural resource?
- ✦ Why is the demand for usable land resource increasing day by day?



Land degradation :

Due to various reasons soil loses its natural characteristics, qualities and structure resulting in land degradation. Unplanned agricultural practice, industrialisation, excessive use of forests and grasslands, etc. causes transformation in soil qualities. Greater application of chemical fertilizer, pesticides, etc. during cultivation pollutes the land. Setting up of brick industries etc. in the agricultural fields also damages the land.

Land slide :

Landslide is a hazard that occurs due to natural factors as well as human activities. Because of incessant rains, earthquake tremors etc., large mass of land slides downwards from higher places. In hilly areas, landslide occurs due to the digging of earth and deforestation etc. by human.



Fig. 1.2 Landslide

Soil erosion :

Soil gets eroded due to the actions of wind, rain, river, glacier etc. Soil may get eroded because of human activities as well. Intense ploughing of soil results in the washing away of soil along with the flow of water.

Bank erosion :

Erosion of soil along both the banks of a river due to the actions of the river is called bank erosion. It results in loss of soil. The magnitude of bank erosion increases after the occurrence of flood.

Desertification :

Extension of desert due to natural or human factor or creation of a new desert is called desertification. Conducting cultivation repeatedly on the same plot of land by applying greater quantity of fertilizers, chemicals, irrigation for enhancing productivity destroys soil fertility, reduces the moisture holding capacity and the ground water table recedes. Consequently, the entire area might become dry or desert like. Deforestation along the surrounding areas of a desert and intensive grazing of animals may also cause spreading of the desert area.

Land Conservation :

A number of steps can be adopted to check land degradation and its conservation, like—



Fig. 1.3 Terraced cultivation

1. Plantation of trees and grasses as per soil quality.
2. Adapting suitable method of agriculture considering the type of prevailing environment.
3. Terrace cultivation in high altitude areas.
4. Checking deforestation and cutting of earth in hilly areas.

5. Planting of trees in rows in the surrounding of cultivable grounds.
6. Afforestation in fallow lands etc.

Write Answer:

- ✦ How is soil formed?
- ✦ What are the reasons for land degradation?
- ✦ What are the steps for land conservation?

Activity :

- ✦ Have you noticed soil erosion, landslide etc., in your locality? Observe and write on it. (You may take help of your teacher)



Fig. 1.4 Plantation of trees in rows to prevent the flow of wind.

Water Resource :

Water is indispensable for the existence of our earth. Water is a renewable resource. About 2/3 rd of the earth surface is covered with water. In spite of that, the amount of water that can be utilised in our day to day activities is very less. It amounts to 2.5 percent of the total water available. Wastage of this valuable water means misutilisation of resource. At various points of time, different disputes relating to water resource can be observed at local, regional, national or international level. For example, mention may be made to the Cauvery water dispute between Karnataka and Tamil Nadu regarding utilisation of the water from the river. For such reasons greater emphasis is laid on the utilisation, management and conservation of water resource.

Utilisation of water :

Major portion of the total water available on the earth is not suitable for human activities. Even a small drop of water from the seas or oceans cannot be consumed by man because it is saline. 70 percent of the available water is not easily accessible. They are found in the form of ice in the high altitude mountains, and in Antarctica, etc. Only about 1 percent of the fresh water available from rain, underground, rivers, lakes, etc., can be used by us. Although the total amount of water available remains the same it is not found uniformly everywhere. Water gets stored in the sources through the process of evaporation, precipitation and run off. Water resource is mainly used for irrigation, navigation, industry and domestic purpose. Water resource is also used to a great extent for generation of hydel power. Demand for water has increased considerably with the increase in population. However, the supply of usable water has not increased proportionately. There has also been a shortage of usable water due to pollution at the source.

Problems of Water :

At present, problems of water could be seen in different parts of the world like Qatar, Israel, Lebanon, Iran, etc. Many areas in Africa, South Asia, East Asia, Mexico, etc., are presently facing

shortage of fresh water supply. Generally, developed countries use more water than the poor countries. An average Indian uses around 25 litres of water as compared to 300 litres of water used per day by a citizen in western developed nations. Due to lack of sufficient rainfall in the places like Rajasthan, Gujarat etc. people of these regions depend on the ground water. But the level of the same is going down gradually. Amount of rainfall is more in the North-East during summer season while it is less during winter. That is why amount of water fluctuates in the area.

Use of chemical fertilizer, pesticides etc. in agricultural activities get mixed with water and pollutes the water in various places. Water also gets polluted due to discharge of industrial wastes and other chemical products into rivers and ponds. Have you ever noticed such discharge of wastes into rivers, drains, streams, lakes and ponds, etc.? You might have observed that the river Bharalu flowing through the city of Guwahati is getting polluted because of the waste products thrown by the people.

Activity:

- ✦ What is the reason for scarcity of usable fresh water?
- ✦ What steps should be taken to control water pollution?

Let us know :

According to the report of UNICEF, world's 2/3rd population (around 4 million people) face water crisis for at least one month in a year. If this crisis continues, world's half of the population will face scarcity of usable water within 2025.

Conservation of water management :

In order to solve the problems related to water, awareness on water conservation has to be generated. Few steps to conserve water are given below—

1. necessary steps have to be taken to stop water pollution.
2. forests and grasslands help to increase the amount of groundwater by checking surface run-off. That is why afforestation should be encouraged.
3. surface run-off can also be checked through terrace cultivation. It saves water.
4. excessive water should not be supplied while irrigating the fields. Watering the fields when the sun is not high reduces the rate of evaporation.
5. rain water can be tapped for utilising in various activities.
6. the water once used can be conserved again. Reutilisation of water once used through filtering is known as recycling of water.
7. rate of evaporation is more in open spaces. This can be reduced by planting trees.
8. everyone should be aware regarding the utilisation of water. To create awareness on water conservation steps should be undertaken at all levels— home, schools and society.

Activity :

- ✦ What steps should be undertaken for conservation of water? Discuss in group and write.

Forest Resources :



Fig. 1.5 Grassland

Forest resources have given our earth a beautiful environment. Apart from food, forests provide us with a variety of commodities for our daily use. As a result of this age-old relationship between man and these invaluable natural elements, specific environments developed area wise.

Forests cover less than one third of the total land surface of the earth. It favours the habitat for the smallest micro organisms to the largest species of animals. As such, it has got economic, cultural and aesthetic values.

Use :

Forest resources are used in two ways- Commercial and Ecological. We get bamboos, wood, fire wood, raw materials, medical herbs and variety of food from the forests. Even the paper we use for writing are developed from forest resources. These are all commercial utilities of forest resources. Similarly, plants supply oxygen, give shelter to wild animals, help in soil conservation, help to raise the level of ground water table and reduce global warming. This is called ecological use. You have learnt in your previous class that the living world exist in the biosphere and each element maintains an interrelationship that creates an ecological balance. As such, increase or decrease in any of these elements will lead to an imbalance in the environment. Even a tiny ant or microbe can be of great use to us. For eg. we get honey from bees. Butterfly helps to increase number of plants. Vultures clean the environment by consuming the dead. In addition, trees, creepers, flowers, fruits and various types of life forms give us pleasure. In this way, every element helps us in one way or the other. Hence it is wrong to destroy the forests or wild animals.

Distributions :



Fig.1.6 Cactus

Forest resources are generally dependent on moisture, rain, water vapour for their growth and development. Forest is a naturally renewable resource. Dense and tall forest cover can be seen in places experiencing more rainfall and moisture. Places with medium amount of rainfall have extensive grasslands. Sparsely located shrubs can be seen in the forests of dry climates. Few

plants with thorns are also seen.

Forests can be mainly divided as Evergreen and Deciduous. Tropical evergreen forests are also known as rain-forests. These forests are located in areas of high rainfall and moisture. Even sunlight cannot penetrate through these dense forests. Dihing-Patkai in Assam is a rainforest. In this region tall trees like Hollong,



Fig. 1.7 Local Orchid of Assam

Source : <https://images.app.goo.gl/>



Fig 1.8 Tropical evergreen forest

Makai, etc., are found in addition to some other small trees. A variety of creepers, bamboo, orchids, etc., are also found. The trees are too valuable for the existence of animals and innumerable species of birds, etc. However, the number of trees are decreasing for various reasons and consequently, the animals and birds have become vulnerable to extinction. According to one estimate, in the last 2000 years around 160 animal species and 88 bird species have become extinct from the earth. Forest resources are also damaged due to destruction of forests, bank erosion, forest fire, tsunami, landslide, flood, etc.

At present, conservation of wildlife resources has become very important. But for the livelihood of growing population, man has been clearing forest areas for agricultural land. We must be more responsible and generate awareness to conserve the forest resources. Apart from national parks, reserved forests, wildlife sanctuary, etc. we should take steps to conserve forest reserves at individual levels also.

Activity :

- ✦ Why should we conserve forest resources ?
- ✦ Identify forest resources available in your place and make a list of them. What steps will you adopt to prevent destruction of these resources?

Energy Resource :

The need for energy resource is unlimited in industry, agriculture, transport, communication, defence etc. Energy resources can be divided into two types— conventional and non-conventional energy resource.

Conventional Energy Resource :

Fuel wood and other organic fuel traditionally used since the past are the source of conventional energy. Coal, petroleum and natural gas are organic fuel. Such fuel cannot be recreated. The more people use these fuel energy, the sooner they will become extinct.

Coal :

Coal is an organic fuel. Apart from being used as domestic fuel, it is also used in iron and steel industry, steam engine, thermal power plant etc. Raniganj, Jharia, Dhanbad, Bokaro etc. are important coal producing places in India. Some amount of coal is also found in Ledo, Makum, Joipur etc. in Assam and Cherrapunji in Meghalaya.

Petroleum :

Petroleum is a type of liquid organic fuel found within rock layers underneath the earth's surface. Petrol, diesel, kerosene etc. are produced by extracting crude oil from the oil fields and are refined in the refineries. It is also called 'liquid gold' because of its high value. Major petroleum

producing countries of the world are Iran, Iraq, Saudi Arab, USA, Russia etc. Digboi, Naharkatia, Moran in Assam and Bombay High in Maharashtra. are places for petroleum drilling. LPG (Liquified Petroleum Gas) used for cooking purpose is a form of petroleum gas.

Natural Gas :

Natural Gas is present with petroleum in the earth's interior. Natural gas is extracted from the oilfield at the time of extracting crude oil. Natural gas is used as a domestic as well as industrial fuel. In India natural gas is found in Jaisalmer, deltaic region of Krishna-Godavari etc. It is also found in Assam, Tripura, Rajasthan and coastal areas of Maharashtra.

Conservation :

The quantities of organic fuel is fast decreasing as a result of excessive use. Use of coal is increasing with increasing productivity in industries in addition to domestic use. Use of petroleum too has increased with growing use of vehicles and other means of transport and machineries. As such, it is time that we should go for sustainable use of organic fuel and emphasize on their conservation for future. Otherwise amount of organic fuel stored in the earth's interior will get exhausted.

Activity

- ★ What is meant by energy resource?
- ★ State the reason why organic fuel will not exist forever.

Non-Conventional Energy :

Before the organic fuels get exhausted, it is important that man should try to generate energy from other sources. That is why, nowadays emphasis is given to non conventional sources of energy such as solar energy, hydel power, wind energy, tidal energy etc. which are also renewable energy. Another advantage of using such energy is the reduced rate of pollution. However, there are certain disadvantages as well.

You can see the advantages of using non-conventional energy in the adjacent table.

Solar energy :

The sun is the source of infinite energy. We receive heat and light from the sun everyday. This energy of the sun is tapped to produce electricity. Solar cooker, solar heater, etc. are being run with the help of this energy. Solar power is generated with the help of solar cells. Solar energy is also used to operate watches, calculator etc., lightening the villages which have no electricity supply as well as in space crafts and artificial satellites.

Wind energy :

Wind is a form of inexhaustible resource. Wind energy is generated by setting up windmills in areas experiencing fast blowing winds such as coastal areas and mountain pass, etc. This energy is used to run water pump, flour mill, electricity, generator, etc. Netherland, Denmark, Germany,

USA etc. are wind energy generating countries. The projects in the Runn of Kutch in Gujarat and Tuticorin in Tamil Nadu are worth mentioning in this regard. The 1,600MW Jaisalmer wind park is India's biggest wind farm

Nuclear Energy

Nuclear energy is derived from the energy contained in the atoms and molecules of radioactive elements. Nuclear projects are located in the developed countries of North America and Europe. In India, Kalpakkam (Tamil Nadu), Narora (U.P.) Tarapore (Maharashtra), Ranapratap Nagar (Rajasthan) are important.

Geo thermal energy :

The energy emitted from the radioactive elements prevail along with the rocks in the earth's interior is known as geo thermal energy. This can be transformed into electricity. Electricity can be generated from hot steam, molten lava or gaseous heat. Such energy is tapped in countries like USA, Mexico, Japan, etc. Such power projects are in Manikaron (Himachal Pradesh), Pogat in Laddakh (Jammu and Kashmir), Tatapani (Chattisgarh), Surajkund (Jharkhand) and Cambay (Gujarat)

Tidal energy :

Power can be generated from the tidal waves. Energy is generated from rise and fall of water at the time of high tide with the help of turbines. Such systems can be seen in Russia, France, etc. In India, such power is produced in the Gulf of Kutch.

Bio-gas :

Dead remains of plants and animals, agricultural waste products, dung etc. can be transformed into gaseous fuel. Power can be generated for lighting bulb and domestic cooking from the gas emitted from the wastes stored in the gas container.

Let us learn :

Energy source	Advantage	Disadvantage
Solar energy	1. Non exhaustible 2. Pollution free	1. Production is expensive
Wind energy	1. Non-pollutant 2. Production is cheaper 3. Safe and clean	1. Harmful to birds. 2. Some amount of sound pollution
Tidal energy	1. Pollution free 2. Inexhaustible resource	1. Interrupts wildlife habitat. 2. Generation of electricity is difficult
Nuclear energy	1. Large amount of energy is received	1. Emission of Radioactive wastes 2. Expensive
Biogas energy	1. Less expensive 2. Wastes can be recycled	1. Green house effect
Geo thermal energy	1. Clear, environment-friendly 2. Available at all time	1. Transmission of power becomes expensive because of long distance.

Hydel power :

Electricity can be generated mechanically from the rain water or river dams. One fourth of the total electricity generated in the whole world is produced in this manner. Bhakra Nangal, Damodar Valley, Gandhi Nagar etc. in India are important hydro power projects. In the recent time, it is apprehended that large river dams will lead to destruction of ecology of the river basin.

Conservation :

It can be assumed that the energy resources are distributed over all parts of the earth. However, factors such as expenditure, time, labour etc. are involved in generating power from them. No resource can be easily derived and as such, resources should not be wasted. Resources cannot be conserved if they are not used economically. It means resource can be preserved for the future if wastage is avoided. More consumption of commodities means more production and as a result more resources and power are required. Pollution too occurs proportionately. Hence it is the duty of every citizen to be aware of resource conservation and economic use of resources.

Write Answer:

- ✦ What do you mean by conventional energy ?
- ✦ Why is non-conventional energy important as an alternative source of energy ?
- ✦ Why do we need to conserve energy resource ?

Let us remember :

- ✦ Any things that can be used to satisfy human needs is a resource.
- ✦ Land resource is very important as the main basis for living world.
- ✦ It takes hundreds of years to form a layer of one centimetre soil.
- ✦ Land related problems arise due to population growth, unplanned use and various natural reasons.
- ✦ Land can be conserved in different ways.
- ✦ Water resource is an invaluable natural endowment for us.
- ✦ Water related problems are created due to lack of utilisation, management and conservation of water resources.
- ✦ Drinking water problems have arisen in various places.
- ✦ Everyone should be aware of the utilisation, conservation and management of forest resources.
- ✦ An inter relationship exists amongst the elements of nature. It helps man in various ways.
- ✦ Every resource is indispensable for human development.
- ✦ Conservation of conventional and non conventional sources of energy has become very important.
- ✦ Since the quality of organic fuel is decreasing day by day, emphasis should be given to use alternative sources of energy.
- ✦ Conservation of all types of resources is necessary.

Exercise

1. Give short answers—
 - (a) Give two reasons for increasing demand for land.
 - (b) Why do you think the density of population is thick in certain places. (Give two reasons).
 - (c) State two causes of land degradation
 - (d) Mention two reasons why problems related to water have given rise to in different places.
2. Tick ☒ the correct answers—
 - a) Which one of the following helps in water conservation?
 - (i) When the water tap is left open. ii) Excessive use of ground water. iii) Storing rain water.
 - b) In order to get pure water-
 - (i) One should throw the wastes into the rivers.
 - (ii) Mix chemical fertilizers in the water.
 - (iii) Sources of water should be kept pollution free.
 - c) Which of the following does not help in conservation of energy?
 - (i) Increasing use of organic fuel.
 - (ii) Proper use of non-conventional energy.
 - (iii) Economical use of energy resources.
3. Write about the importance and use of land resources (In about 80 words)
4. What changes have taken place with respect to land resource in your place? Prepare a note taking help from elders in your family or resourceful persons from neighbouring place.
5. What role should be taken while using forest resource and water resource ?
6. What steps should be taken for conservation of energy resource?
7. Write short notes on
 - a) Wildlife, b) Organic fuel, c) Desertification, d) Solar energy, e) Landslide.
8. Write the difference—
 - a) Use of land in rural areas and urban areas.
 - b) Conventional and non-conventional energy.
9. Mention some measures to be adopted for conservation and growth of forest resources in and around your place or locality.
10. What are the non-conventional energy resources? Make a list of how we get or collect these resources.

