

Natural Resources and their interlinking Management

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Abstract

Natural resources are the wealth of any countries. They are the essential part of ecosystem and maintain the food chain. They are regularly consumed by human as well as fauna. They are formed by nature and also controlled by nature. They are categorized into two groups such as non renewable and renewable resources. The non renewable resources cannot be replaced after their use. Coal, petroleum, iron, natural gases are the examples of non renewable resources. The renewable resources are replenished after their use. Water, aqua food, forest, grassland, plants; animals are the example of renewable resources. Due to greedy nature of human being the non renewable resources decreases day by day which is a danger alarm for human being. Considering all these facts present investigation is planned to interlinking management between renewable resources and non renewable resources. So, they can continue for long time.

Key words: *Natural resources, non renewable resources, renewable resources, inter linking, management*

Introduction

Natural resources are the wealth of the earth. They are the raw material available in nature and useful to human beings, animals and plants. The natural resources are of two types, namely Non renewable and renewable resources.

Non renewable resources- The non renewable resources cannot be replaced after their use. Coal, petroleum, iron, natural gases are the examples of non renewable resources.

Renewable resources- The renewable resources are replenished after their use. Water, aqua food, forest, grassland, plants; animals are the example of renewable resources.

On the basis of chemical nature, natural resources are classified into inorganic resources and organic resources.

Inorganic resources- The inorganic resources do not contain carbon. They include air, water, minerals, sunlight etc.

Organic resources- The organic resources contain carbon. They include coal, petroleum, natural gases, forest, aqua food etc.

All the natural resources are classified into four spheres, namely

1. **Atmosphere (air)-**

The atmosphere forms the air. It is a protective shell over the earth. It is the gaseous envelope of the earth. It presents around the earth and extends up to 20, 000 km. It consists of gases and some solid and liquid particles suspended in it (Kulshreshtha, 2025). Nitrogen is the most predominant gas in the atmosphere and its constituents 78.09% of the total gases. The atmosphere also contains oxygen (20.94%), argon (0.93%), carbon dioxide (0.032%), helium (5.2 ppm), methane (1.3 ppm), hydrogen (0.5 ppm), Nitrous oxide (0.25 ppm), carbon monoxide (0.1 ppm), ozone (0.02 ppm), sulphur dioxide (0.0002 ppm) and NO₃ (0.0001 ppm). The atmosphere is divided into the following five layers on the basis of vertical distribution of temperature:

a. **Troposphere**- The lowest layer of the atmosphere in which the temperature decreases with increases altitudes is called troposphere. Clouds are formed and carried by winds in this layer. It extends from 6 to 8 km at the poles and about 17 km at the equator. It contains 90% of the air of the atmosphere. Seasonal variations are so common.

b. **Stratosphere**- The layer of atmosphere above the stratosphere, in which the temperature increases with increasing altitudes is called stratosphere. It extends to a height of 50 km. The thickness of stratosphere therefore 50 km. Here the air is much thinner. Long distance aircrafts fly in the lower part of the stratosphere. The top of this layer contains ozone.

In the atmosphere, about 30 km above the surface of the earth, ozone molecules are concentrated in the stratosphere. The concentrated layer of ozone is called ozone layer. It screens off UV light of the Sun. It is often called ozone umbrella. It protects the life of the earth from the damaging effect of UV light.

It is now feared that there is danger of appearing holes on the ozone umbrella. This is caused by freons and other chloro-fluoro carbons (CFC). The appearance of skin cancer will be the result of ozone depletion (Liu *et al.*, 2002).

c. **Mesosphere**- Mesosphere lies above 50 km up to 100 km. It is characterized by decrease of temperature.

d. **Thermosphere**- it lies beyond the mesosphere. Here the temperature rises sharply attaining 1000C. It extends to a height of 400 km.

e. **Exosphere**- It lies above thermosphere beyond 400 km. The increase in temperature ceases at this layer. The density of the atmosphere is very low here.

Atmosphere management-

2. **Hydrosphere** (water)-

The hydrosphere is the water. 70% of the earth's surface is occupied by water. Water is the mother of life. It is the liquid gold. It is the universal solvent. Water is very important for drinking, agricultural and domestic purposes. Hence, river banks are the world's most popular regions. Man, animals and plants cannot live without water. It is an inorganic compound formed of hydrogen and oxygen. The water may be soft water and hard water. Hard water does not give foam with soap but soft water give foam with soap. The water may be fresh water, sea water or brackish water. Few important constituents of hydrosphere are following-

a. **Hydrologic cycle**- the flow of water between atmosphere and earth is called hydrologic cycle. It is also called water cycle. It involves precipitation, evaporation, transpiration, cloud formation etc.

b. **Water budget**- 70% of earth surface is occupied by water. Only 3% is fresh water. 2% is polar ice caps and only 1% water is usable in the rivers, lakes, dams, ponds and underground water. Only a fraction of these is used. At the global level 70% of water is used for agriculture, 25% for industry and 5% for domestic purposes.

A person needs 20-40 litres of water every day. At present more than 1 billion people worldwide have no access to have clean water? The world's annual fresh water need is 38000 cubic kilometres (Nathaniel *et al.*, 2021).

c. **Water problems**- human beings meet the following water problems-

- The Over utilization of water is leads to shortage of water in future. Already 31 countries face water shortage. In India expected to face a critical water scarcity in the year 2030. At that time 48 countries will have severe water shortage.
- Uncontrolled use of water.
- Wastage of water.

- Water pollution.
- Floods.
- Drought.
- Industries throw away their effluents into the water without effluent treatment.
- Air pollution, climatic changes which lead to delay and failure of rains.
- Conflicts develop between states or countries in sharing water.

d. Water management- Water management is essential for sustainable supply of water.

- Limited utilization of water.
- Prevention of wastage of water.
- Using treated sewage water for agriculture, aquaculture etc.
- Rain water harvesting.
- Watershed management.
- Construction of small check dams in slopes and canals.
- Construction of dams.
- Construction of small catchment dams.
- Prevention of leakage from dams and canals.
- Prevention of loss of water from pipelines.
- Adopting drip irrigation for crops.
- Soil management.
- Afforestation helps recharging of underground water.

3. **Lithosphere (land)** - The land is the upper weathering layer of the solid earth crust. It is the lithosphere. Soil is the common term for land. It is a complex physical-biological system providing support, water, nutrients and oxygen for plants.

Soil is the natural substratum for all forms of life in the world. It provides the fundamental needs of living organisms such as shelter, attachment and nourishment. The organisms also add something to the soil. Thus, there is an exchange of energy and matter between the soil and the organisms. Hence, land is known as an open system.

Land has following components-

a. Texture of soil- the various size groups of soil particles is called the texture of the soil. The soils are classified as gravel, coarse sand, fine sand, silt and clay.

b. Soil formation- soil formation refers to the process of production of unconsolidated materials from consolidated rocks. The overall process of soil formation takes place in two distinct stages. The first stage is called weathering and the second stage is called soil development or pedogenesis.

c. Soil profile- the vertical section of soil shows many layers which are arranged one below the other. The sequential arrangement of different horizontal layers in the soil is called soil profile. Each horizontal layer is said to be horizon.

d. Soil porosity- the total volume of space unoccupied by soil particles in the soil is called soil porosity. The space between the soil particles is called soil pores. There are two kinds of porosity in the soil capillary and non capillary porosity.

e. Soil water- the water present in the soil pores is called soil water. Soil water plays the most important role in the life of plants, animals and microbes. The main source of soil water is rainfall.

f. Soil organisms- soil is inhabited by a variety of organisms. The soil organisms include microflora, microfauna, mesofauna and macrofauna. All these organisms together constitute a biological community in the soil. The microflora constitutes soil bacteria, soil fungi, actinomycetes and soil algae. The microfauna include protozoa, polyclads and nematodes. The mesofauna includes small animals between 200 μ m and 1 mm. The macrofauna includes animals more than 1 mm length.

g. Soil erosion- the removal of the top layer of the soil from its original place by water, wind and glaciers is called soil erosion. Soil erosion disturbs the original structure of soil profile. The soil profile disturbed by erosion is called truncated profile. As the fertility of soil lowers due to erosion, it is also known as creeping death of the soil (Ford and McConnell, 2001).

h. Soil management-

The protection, maintenance, improvement and proper use of soil are together called soil conservation. The loss of soil is generally caused by two agencies, water and wind. So, control measures will have to be evaluated to protect the soil mainly from the severe actions of wind and water (Smith et al., 2015). The various ways by which land as a resource-

- Land is the home of man.
- Land is a renewable resource.
- Plants take root on land.
- Land provides shelter for all land animals.
- Land provides fresh water for human drinks.
- Forests, mountains, grassland, wet lands, rivers, plains remain on land.
- Man constructs houses, industries, roads on land.
- Agriculture is practiced on land.
- Marble and granites are obtained from rocks.
- Minerals are obtained from land.
- Gold is mined from land.
- Coal is mined from land.
- The water gets minerals and nutrients from the land.

4. **Biosphere (plants and animals)** - Biosphere is the life of the earth. It is formed of plants, animals and microbes. It is found in the atmosphere, hydrosphere and in the lithosphere. It is the living natural resource. The biosphere has the following uses-

- The biosphere supplies food.
- Plants supply oxygen by photosynthesis.
- The crops supply plant food.
- The animals supply animal food.
- Tree supply fire wood.
- Timber is used for making furniture.
- Rubber, on which cycles, cars, buses run is supplied by trees (Stucki and Smith, 2010).

Interlinking management of natural resources- All the natural resources is interlinked. They depend on each other. Disturbing one will affect the other. The water is absorbed by plants through the root system. The plants release water through transpiration. The transpired water forms clouds. The clouds produce rain which reaches the land. Thus water is cycling between hydrosphere, biosphere, atmosphere and lithosphere. This cycling of water is called water cycle or hydrologic cycle.

Similarly, Carbon, sulphur, phosphorus and oxygen move between various spheres. These movements are called biogeochemical cycles. The cyclic movement of carbon between the resources is called carbon cycle.

Carbon is present in the air as carbon dioxide. It is used by plants for photosynthesis. Inside the plant, carbon is stored as starch in the leaves; fruits etc. when the animals eat plants, the carbon enter the body of animals. When animals respire, they release carbon dioxide which returns to the air.

We use natural resources in our day today life. Almost all products, we use in our day today life are the by product of natural resources. Let us take the bread or chappathi or a pencil or a note book as an example. Trace it back to its natural resources. The chappathi is prepared out of wheat. Wheat is a plant product. It is a crop plant. The crop produces wheat by using water, carbon dioxide, and mineral nutrients taken from the natural resources (Mondol and Patil, 2022). The note book consists of papers. The paper is prepared from pulp. Pulp is prepared by grinding plant products and adding water which are natural resources.

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