

Environmental Resource Management

The environment includes all biotic and abiotic factors that affect the life of an organism or a plant or human beings. All life on earth needs food and energy for survival, growth and reproduction. Energy is a basic requirement for growth, based on which the biomass is produced.

What is an Environment?

Simply said, an environment is a system made up of all biotic and abiotic elements that have an effect on human life. All types of flora and fauna are categorized as biotic, or living, elements, in contrast to the abiotic categories of water, sunlight, air, climate, etc.

Any product, service, or element that benefits people and society can be categorized as an environment's resource. Anything that satisfies a person's daily needs qualifies as one of them. Food produced by living things and plants, energy used for heating and cooking, wind, and oil are only a few examples of environmental resources.

Numerous products and services that are necessary to sustain life are provided by the environment. Each resource is priceless and holds a particular amount of significance. A piece of land might be turned into a park, a housing complex, a retail space, etc. Additionally, it can be used as a trash container.



It Generates Resources ?

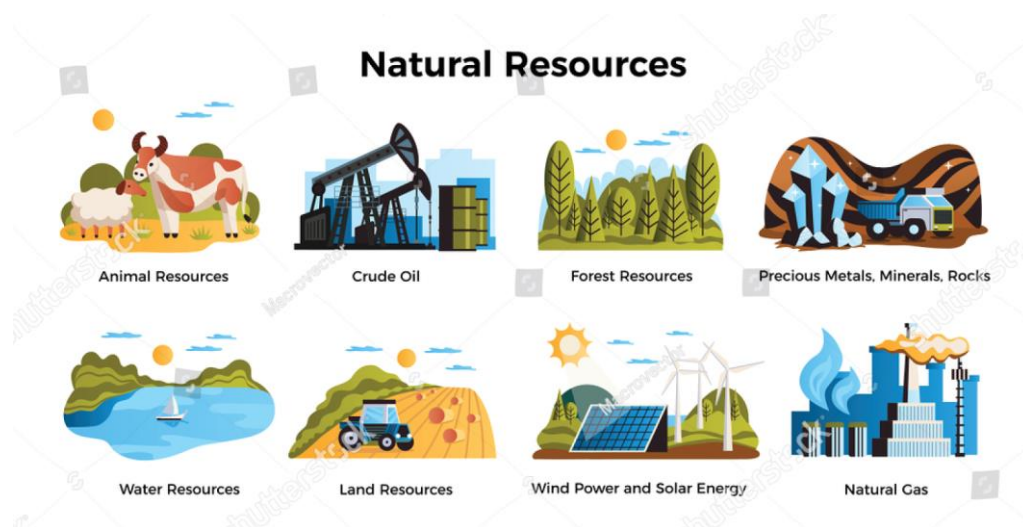
All natural resources, including both renewable and non-renewable energy sources, come from the environment. Most of them are essential to survival. Organisms utilize both biotic and abiotic sources. We get our food and animal products from plants and animals. Fossil fuel is made from organic materials that are dead or in the process of decay.

Freshwater, wind, and even metals additional ecosystem components are also provided by the environment.

Definition and types of resources

Environmental resources are the living and non-living constituents of the earth together comprising the biophysical environment that may provide benefits to humanity. Environmental resources include: subsoil resources (mineral and energy), soil resources, biological resources, water resources and land. They can be naturally renewable (timber, water) or non-renewable (minerals).

A resource is anything that an organism uses and consumes from the environment. Some resources are directly available for use, while the other resources must be extracted at some cost to the organism. Normally, the extraction of a resource by an organism has an effect on the environment. The type of effect which is negative versus positive and its magnitude is determined by a number of factors. In human societies, cultural beliefs can determine what is classified as a resource. Current human societies on the Earth use many non-essential resources in their daily lives. Resources are to be used only for essential activities, since they have a value in life. Resources are classified into many types.



Throughout human time scale, resources like Solar energy, wind energy and tidal energy are expected to be available. These are virtually inexhaustible resources for human consumption. Such types are called as perpetual resources. We can say that these are the everlasting resources of the earth. Whereas, coal, oil and mineral deposits are non-renewable or exhaustible resources. Once used such materials will not come back again. These are available in a fixed amount. Out of which, some nonrenewable resources can be recycled or reused to meet certain requirements. A renewable resource is one that is available over a period of time and space. These can be used and produced by human involvement. Even if they are depleted in the short run they can be replaced through

natural processes. Forest wealth, marine food, energy for water, wind, biogas, timber, herbs and cattle are all considered to be under this category.

One can use these resources under an optimum level. Over use of these may create shortage. Over production may increase pollution on the environment. The highest rate at which a renewable resource can be used without decreasing its potential for renewal is called its sustained yield.

Exceeding the sustained yield can cause a resource to become nonrenewable or nonexistent. This will induce a resource crunch and depletion. This is called as environmental degradation.

Typical examples are:

- a) Oil crisis due to shortage of oil resources
- b) Fuel for domestic use, due to shortage of coal and natural gas
- c) Over grazing of land and its impact on cattle population
- d) The reduction in the nutrient level of soils due to intense agricultural production
- e) Over-exploitation of groundwater and declining water tables in aquifers

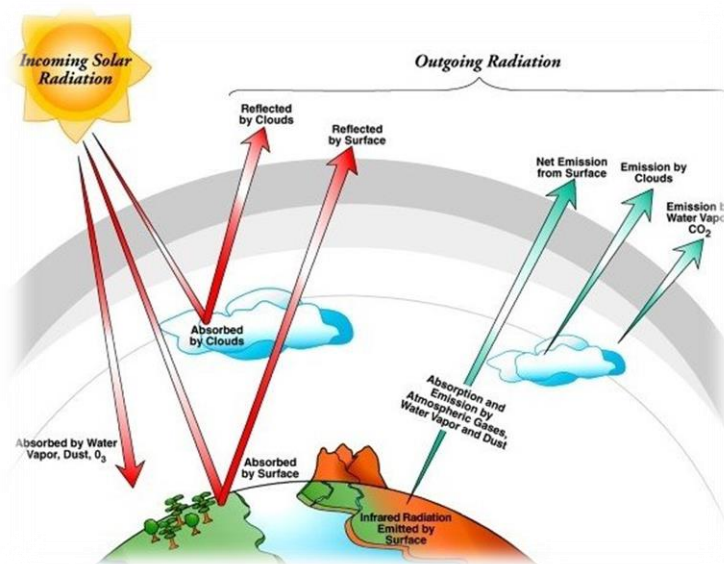
Earth's Atmospheric natural resources

Air present in the atmosphere, is a mixture of gases, smokes and dust. Atmosphere contains 5000 million tones of gases. Nitrogen amounts to 78%, oxygen to 21%, carbon-dioxide to 0.33% and argon to 0.93%.

Almost all of these gases are needed in one way or the other, for the life to survive and to maintain the balance of these in the atmosphere. The water vapour present in the atmosphere is a major contributor for condensation and cloud formation. It ultimately leads to precipitation. Of the eleven gases present in the atmosphere, nitrogen, oxygen, water vapor, carbon dioxide, methane, nitrous oxide, and ozone are extremely important to the health of the Earth's biosphere. Nitrogen and oxygen have very important associations with life. The addition of nitrogen to the Earth's surface soils and various water bodies supplies much needed nutrition for plant growth. Sun's Solar radiation is a major source of energy for all life support activities. Air has to be in circulation for maintaining an equilibrium. The distribution of heat in the atmosphere is responsible for the difference in pressure and also for the movement of the air. Wind is a major agent for a set of natural processes. It has the potential to help in producing wind energy also. Trade

winds are responsible for the monsoons and the convection currents. Weather and climatic depends on the flow of winds.

Temperature of the atmosphere is a major asset to the natural processes. Some gases present in the atmosphere can change the heating rates. The amount of moisture present in the air is known as the humidity. The more moisture there is in the air, the higher is the humidity. The humidity of the air depends on temperature and location. Humidity controls the weather conditions. Monsoons are generated by the difference in the heating and cooling of air over land and sea. The global hydrologic resources are dependant on the atmospheric clouds. Condesning clouds provide the much needed rain and snow. Rainfall is the ultimate source of all life on earth. Global climate and atmospheric conditions form the basis for monsoons. Fresh air is a blessed gift of nature for every life. When the air inside the house is warm and polluted with smokes and dusts, people come out of the house for breathing fresh air. Human beings can never survive without the air. Hence air is considered to be the primary natural resource of life on earth. Air will take on the shape of whatever thing it gets a chance to go into. Air has weight. Air goes in and out of our lungs everyday. The unique properties of air are used for many industrial applications. The compressibility, pressure and dynamics of air are useful in running pistons, ginning of soft and friable materials, cooling and controlling equipment. The movement of air as wind blow is also used to dry objects and cleaning floors.

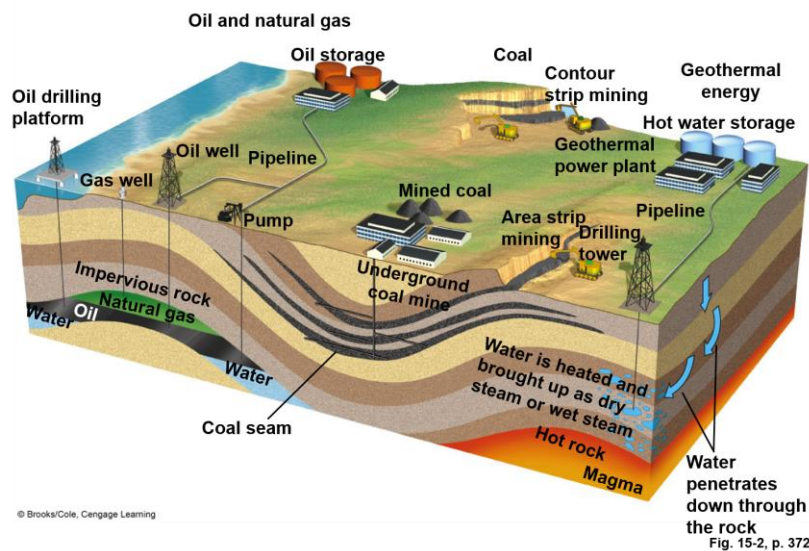


Earth's Lithospheric natural resources

Land resources include all the terrestrial ecosystems including mountains, forests, grasslands, range lands, mangroves, floodplains, meadows and deltas. Earth's lithosphere is the storehouse of various rocks and innumerable mineral resources, groundwater and fossil fuels. The Heat of the Earth's interior is a good source for geothermal energy. Soil

is the primary natural resource of the ecosystems helpful to grow all vegetation. Soil is the home for all microbes. Soil fertility encourages agricultural productivity. Soils, their physical and chemical properties are more helpful in many human activities. Soils are used for making bricks, pottery and in earthen structures. Productivity from agriculture depends on soil resources. Man has first started to use minerals and rocks for his needs far back in ancient times. Stone has played a large role in the primitive society. The stone age man used stones and clays to prepare things which were necessary for his defense, hunting and household articles as well as ornaments. People used soil, mud and rocks for construction. 4 Valuable metallic ores, non-metallic substances and gemstones were identified for various works. Aristotle was the first naturalist to classify the stones. Mining for copper, lead and silver began in the sixth and seventh centuries. Large mining enterprises were started during the fifteenth century. Utilization of mineral resources greatly increased during the eighteenth century.

Due to the progress in industrial growth more and more natural resources are being used in one way or the other. Minerals are naturally occurring inorganic substances having a set of definite physical properties and chemical composition. Many minerals are of very high practical and economic value.



They are classified into

- A. Metallic Minerals which include both ferrous and non-ferrous minerals.
- B. Non-metallic minerals support on various activities.
- C. Atomic Minerals are helpful in generating atomic energy and also in nuclear studies.

Extraction of various metals are done from the ore minerals of metallic category. Much of the minerals are used in many of the industries today. They are all classified as industrial minerals. Minerals form the raw materials in many industries. They are the backbones of modern industrial society and life. The list of minerals used in different industries are:

1. Mineral Fuels like Coal, Petroleum and Natural gas.
 2. Refractories using Fire clay, Kaolin and magnesite
 3. Abrasives using diamond, corundum, emery, garnet
 4. Paints from Ochres and orpiments and plasters from gypsum
 5. Cement from Limestone and dolomites.
 6. Glass from Quartz and Feldspar
 7. Ceramics from Kaolin (china clay) and Feldspar
 8. Insulators from asbestos, Mica and Fire clay
 9. Paper and pulp industries using Kaolin, barite and gypsum
 10. Optical and scientific instruments using calcite, Fluorite, Gypsum, agate, Quartz, mica and tourmaline.
 11. Radioactive minerals : Pitchblende, monazite, etc.
- Slates, Talc, asbestos, salt, mica and many minerals are used directly or indirectly in industries.

In addition to these, lithosphere contains a good number of building and ornamental stones. Rock type, color, Grain size, texture, hardness, durability, porosity, density, strength, sonic velocity and permeability are the characteristics determining the suitability of a stone (or) a rock for construction purposes. Granite family of rocks are available in plenty in the region of India. They have been used in the construction of most of the temples and public edifices.

Charnockite which is the black variety of granite and dolerites exported to other countries from India. Sandstones of older geological formations have been extensively used as a building material in several regions. Limestone, Marble, slates and laterite are the normal building stones. Lithosphere contains a good number of gemstones. These are commercial valuable unique natural resources of the globe. Most of the jewelry works based on the available native elements like gold, silver and copper. Gemstones like Diamond, Garnet, Topaz, Ruby, sapphire corundum, Beryl, Olivine, amethyst, Jasper, Tourmaline, Agate and Emerald are the notable gem resources of the globe.