

Natural Resources

Introduction

All essential components that man usually exploits for better survival as well as for human welfare, are called resources. Since, all these necessary resources can be found in nature, these are called natural resources.

Categories of Natural Resource

Natural resources can be categorized into:

- Non-renewable or Conventional natural resources – These are present in fixed quantities and these resources once exhausted cannot be replenished easily. The natural process of recycling of resources takes a very long time.
- Renewable or Non-Conventional Natural resources – Renewable energy sources capture their energy from existing flows of energy, from ongoing natural processes, such as sunshine, wind, flowing water, biological processes and geothermal heat flows. Renewable energy sources are pollution free and can be recycled in nature. Most renewable energy other than geothermal and tidal power, ultimately comes from the Sun. Some forms are stored as solar energy, such as rainfall and wind power, which are considered short term solar energy storage, whereas the energy in biomass is accumulated over a period of months as in straw or roughly in many years as in wood. Capturing renewable energy by plants, animals and human beings does not permanently deplete the resources. Renewable energy resources may be used directly or used to create other more convenient forms of energy.

Nonrenewable resources

Few of the nonrenewable resources include:

- Coal – It is formed in several stages as the remains of plants are subjected to intense heat and pressure over millions of years. It is a complex mixture of organic compounds with 30% to 98% carbon by weight plus varying amount of water and small amount of nitrogen and sulfur. Three different grades of coal are commonly extracted from the earth's lithosphere – lignite, bituminous coal and anthracite. Peat, which is the first stage of formation of coal, is not actually a coal. It is used for burning in some places but it has low heat content. The most desirable type of coal is anthracite, because of its high heat content and low sulfur content. Coal is extensively used because of its high heat content, but it usually has a high sulfur content which makes it poisonous. Lignite is the poorest form of coal because of its low heat content. Reserves of lignite and sub-bituminous coal are about 30% smaller than the reserves of anthracite and bituminous coal.
- Petroleum – Crude oil or Petroleum is composed of more than a hundred different hydrocarbon compounds. The refining process separates crude oil into many different

commercial products including gases, gasoline, heating oil, diesel oil and asphalt. Crude oil also contains petrochemicals that are the compounds used in the manufacture of fertilizers, plastics, paints, pesticides, medicines, etc. Petroleum is formed by the decay of tiny marine plants and animals buried in the earth trapped between the layers of sedimentary rocks about 400 million years ago. The high temperature and pressure of the layers above for a very long time convert gradually these organic debris to what we use today – the petroleum. It is pumped out by drilling holes and by off-shore oil rigs. Petroleum products include – Petroleum Gas (LPG), Petrol, Diesel, Kerosene, Lubrication oil, Paraffin Wax, Asphalt etc.

Renewable Resources

Few of the

renewable resources include:

- Sunlight – The sun is the ultimate source for most other forms of energy. The heat of the sun can be trapped using solar panels to heat water or to convert it into electricity by means of photovoltaic cells. India receives about 6000 billion mega-watts of solar energy per year. If only one percent of this energy could be trapped at even 10% efficiency, it would be about 35 times that of India's present energy generation capacity. Until recently, the use of solar cells had been limited due to high manufacturing costs. However, the continual decline of manufacturing costs of solar cells is expanding the range of cost-effective applications. Systems with no battery that connect to the utility grid through a special inverter now makes up the largest part of the solar electric market. Solar energy can be used for a number of applications like – Domestic lighting, street lighting, village electrification, water pumping, desalinization, powering of remote telecommunication repeater stations, railway signals, and many more.
- Wind – Wind, that is air in motion can be harnessed for energy and is one of the cleanest and most versatile natural resource that nature has bestowed upon mankind. It has been used as a source of energy for thousands of years for driving sailboats, grinding grain and pumping water. Wind turbines that rotate at great speeds when wind blows over them are now used to generate electricity. The best models of electricity generation are the wind farms in Netherland. In India, wind is freely available along the coastline. India has a potential to generate about 45000 mega-watts of electricity from wind. There are however problems associated with such wind energy farms that include but are not limited to – problems of disruption of television signals, discontinuous power and suspected interference with rainfall.
- Geothermal Energy – It comes from natural heat below the surface of the earth, where hot underground steam can be tapped and brought to the surface. Such geothermal sources have potential in certain parts of the world and about 8000 megawatts of power generation capacity is in operation globally. There are also prospects in other areas for pumping underground water to very hot regions of the earth's crust and using steam thus produced to generate electricity. Examples of these geothermal provinces in India are Bakreswar in eastern India, Tattapani in central India, Puga in northern India

and Tuwa and Unai in western India. At present geothermal energy is produced in Manikaran in Himachal Pradesh.

Conclusion

These above mentioned natural resources are gifts of nature given to mankind. However, human beings in their pursuit of industrialization and progress have left no stone unturned for the indiscriminate exploitation of these resources. If this trend continues and if no checks are put on the human activities, then we are not far from a future where everything will cease to exist just like the dinosaurs had been wiped out from existence.

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