

Types of Resources

The things available in our environment that can be used to satisfy our needs are called resources.

Things available in our environment become resources only when human beings find a way to transform them into a useful form. For a thing to become a resource:

- Suitable technology must exist to transform it into some useful form.
- Its use must be financially viable and culturally acceptable.

Resources can be classified based on their origin, exhaustibility, ownership and status of development. Resources can be living or non-living. All resources that come from living things, like forests, land and sea animals, insects and human beings, are called biotic resources.

Resources in the form of non-living things, like rocks, minerals and metals, are called abiotic resources. Resources can also be classified based on whether they can be regenerated or lost forever once used. Resources like solar and wind energy, reversible chemical reactions and physical power, which can be regenerated once used, are called renewable resources.

Fossil fuels like coal, natural oil and gas cannot be reproduced once used are examples of non-renewable resources. Resources like private houses, shops, farms and plantations are owned by individual persons, and are called individual resources. Resources like public parks, places of worship, schools and hospitals which are open to all members of a community are examples of community-owned resources.

All resources, biotic or abiotic, individual or community-owned, ultimately belong to the country and are called national resources. Resources found on land and the vast stretches of oceans, which are not owned by any particular nation, are called international resources, and are managed by institutions related to the United Nations.

Resources like mines, where minerals have already been discovered and production is on to utilise their full capacity, are called developed resources.

Resources that are known to exist, but are not being fully utilised, are called potential resources. Stock is a type of resource that cannot be used due to the unavailability of suitable technology, but may be used in the future. Resources that can be used today, but are preserved to meet future requirements, are called reserves.

Development and Planning of Resources

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Sustainable development means using resources wisely without damaging the environment and keeping in mind the need of future generations. Indiscriminate use of resources leads to:

- A rapid depletion of resources
- An economic divide in the society,
- Environmental and ecological problems like pollution, land degradation, global warming and ozone layer depletion.

The first Earth Summit was held in Rio de Janeiro in Brazil in June 1992 where leaders from over 100 countries signed the Declaration on Global Climatic Change and Biological Diversity, approved the global forest principles and adopted Agenda 21.

Agenda 21 aims to prevent environmental damage and fight poverty and diseases through global cooperation. It also aims to encourage local governments to form their own Agenda 21 based on local issues.

The resources in a country are not distributed uniformly across all its regions. The mere presence of resources is not enough for the development of a region.

Resource planning involves:

- The identification and inventory of resources
- Planning with the appropriate technology, skilled human resources, setting up of suitable institutions for the implementation of resource development plans, and equitable distribution of available resources for sustained economic development
- Matching these with national development plans

The different activities involved in resource planning are:

- Identifying and estimating the resources available by surveying and mapping
- Evolving technology, skilled personnel and institutions to implement resource development plans
- Continuously monitoring and guiding resource development plans to match the overall national development goals.

The availability of resources is limited. Irresponsible and over-use of resources can lead to several social, economic and environmental problems. We must plan for the future and start conserving our resources at all levels.

Land Resources

India is the 7th largest country in the world with a geographical area of about 3.28 million square kilometres.

Land in India can be divided into three main relief features. Around 30% of our land is occupied by

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mountains, 43% is plain and 27% is in the form of plateau. Depending on their use, our land resources can be classified as forests, net sown area or total area under cultivation, fallow lands, other uncultivated land and land not available for cultivation.

Fallow land can be further divided into current fallow, which is land not cultivated for one or less than one year, and other than current-fallow, which is land that has remained uncultivated for one to five years. Uncultivated land other than fallow land is divided into permanent pastures, land under miscellaneous tree crops and land left uncultivated for more than five years.

Land not available for cultivation is either barren wasteland or land used for non-agricultural purposes.

The area under forests is way below the required 33% as planned in the National Forest Policy formulated in 1952. Permanent pastures and grazing grounds decreased during the period. Continuous and indiscriminate use of land resources results in land degradation. Deforestation removes the green cover required to protect soil erosion.

Overgrazing by cattle has converted permanent pastures into barren land, leading to land degradation. Indiscriminate deforestation and excavation done as part of mining activity and quarrying also causes land degradation.

Over-irrigation of cultivated land in some parts of India leads to water logging. This increases the saline and alkaline levels in the soil, leading to land degradation. Disposal of solid and liquid waste by industries on surrounding land or water bodies has also become a major cause of land degradation and water pollution. Industrial activities like grinding of limestone, calcite and soapstone, which release dust, retards water infiltration into the soil.

Some steps for land conservation are:

- Afforestation,
- Controlled grazing and mining activity,
- Stabilisation of sand dunes by growing thorny bushes,
- Proper disposal of industrial effluents after treatment and
- Continuous monitoring of soil conditions

Soil As a Resource

Soil is formed over millions of years by weathering of rocks and minerals and also by natural agents like variation in temperature, climate, wind, glaciers and running water. The important factors that influence soil formation are Relief, Parent rock, Vegetation and other life forms and Time.

Soil is a natural, abiotic, renewable resource containing inorganic and organic matter, like humus. Soil is an essential resource that supports a majority of plant and animal life on the Earth. Based on their physical and chemical properties, age, texture, and colour, soils in India can be classified as: alluvial,

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black soil, red and yellow soil, laterite, arid and forest soil.

The northern plains of India are made of fertile alluvial soils, extending to Gujarat and Rajasthan, the Ganga and the Brahmaputra river systems. Alluvial soils are also found in the eastern coastal plains and deltas of the Godavari, the Mahanadi, the Krishna and the Kaveri.

Alluvial soil is a mixture of sand, silt and clay. The new alluvial soils called Khadar found in the Gangetic plains have small particles and a fine texture. The old alluvial soils called Bangar found near the river valleys are coarser and contain more pieces of rocks called Kanker. The fertile alluvial soils are rich in potash, phosphoric acid and lime and are ideal for growing sugarcane, wheat, rice, pulses and cereal crops.

Black soil (also called regur) is found in the Deccan plateau spread over Maharashtra, Saurashtra, Malwa, Madhya Pradesh and Chhattisgarh. Black soil is rich in calcium carbonate, potash, magnesium, lime and good water retention properties. It is ideally suited for the cultivation of cotton.

Red and yellow soils are found in southern and eastern parts of Deccan plateau, southern Gangetic plains, along the Western Ghats and some parts of Orissa and Chhattisgarh. The high iron content makes this type of soil good for cultivating various types of grams, groundnuts and castor seeds. Laterite soils are found in Kerala, Karnataka, Madhya Pradesh, Tamil Nadu and parts of Orissa and Assam. Laterite soil is good for cultivation of tea, coffee and cashewnuts.

Arid soil is found in western Rajasthan and parts of Kutch region in Gujarat that receive very little rainfall. Arid soil is low in moisture and organic content and has high salt content. Arid soil is being used for cultivation of bajra and wheat crops in some places of western Rajasthan where irrigation facility is available.

Forest soils are found in the mountainous regions of the Himalayas from Kashmir to Arunachal Pradesh. Wheat, rice, sugarcane, and oil seeds are cultivated in forest soils of many parts in Jammu and Kashmir and Arunachal Pradesh.

Soil Erosion and Conservation

Soil is an essential natural resource that supports a majority of plant and animal life on the earth. It is a renewable resource.

The loss of soil cover due to natural agents like wind and running water is called soil erosion. The roots of plants and trees keep the soil moist and hold the soil particles together. Humans destroy vegetation cover by deforestation, overgrazing, construction and mining activities.

Without vegetation cover, soil becomes dry and loose, and gets easily eroded. Defective farming

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methods, like ploughing up and down a slope, increase the speed of water flowing down the slope increase the rate of soil erosion.

Running water carves deep channels through clayey soils, called gully erosion, which converts the land into bad-land making it unsuitable for cultivation.

When flowing water washes away the entire sheet of top soil in a region, it is called sheet erosion. Wind erosion occurs generally in areas of little or no vegetation. It happens in places that receive scanty rainfall.

The prevention of soil erosion is called soil conservation and the ways can be:

- Terrace farming is one way to do so and involves cutting terraces along a slope. These terraces reduce the speed of water flowing down the slope and help in soil conservation.
- Contour ploughing is also beneficial in reducing the flow of water down the slope and involves ploughing at right angles to the natural slope of land.
- Effective farming techniques further help in soil erosion. In plain areas, strip cropping can be used for soil conservation where strips of grass are allowed to stand between crops in large fields. These strips of grass reduce the force of wind and thus prevent soil erosion.

Planting rows of trees along farmland also help break the force of wind and help in soil conservation. Shelter belts of trees, when planted along sand dunes, help stabilise them and prevent the desert from extending into land available for cultivation.