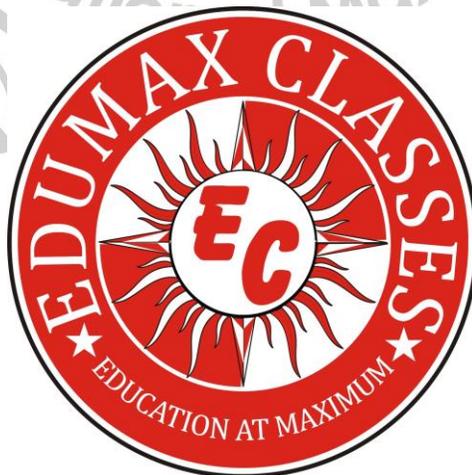


MANAGEMENT OF NATURAL RESOURCES



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Anything in the environment which can be used is called a natural resource.

Natural Resources includes total natural environment that support human life and contribute to the production of necessities and comforts to mankind. So natural resources are the components of atmosphere, hydrosphere and lithosphere.

Types of Natural Resources: On the basis of abundance and availability, the natural resources are of two types

- Inexhaustible.
- Exhaustible.

(a) Inexhaustible: These are in plenty and cannot be exhausted by man's consumption. For example; air, sand, clay etc. It gets affected by the over-population of mankind.

(b) Exhaustible: These are limited and can get exhausted over a period of time, i.e., coal, petroleum etc.

Management of Natural Resources: A system of controlling the use of natural resources in such a way, as to avoid their wastage and to use them in the most effective way is called management of natural resources.

Why do we need to Manage Our Natural Resources?

We need to manage our natural resources because of the following reasons:

- The resources of the earth are limited. Because of the rapid increase in human population, the demand for resources is increasing day-by-day. The proper management can ensure that the natural resources are used judiciously, so that they fulfill the needs of present generation and also last for the generations to come. –
- The proper management of natural resources takes into consideration long-term perspective (or view) and prevents their exploitation to hilt for short-term gains.
- The proper management can ensure equitable distribution of natural resources so that all the people can benefit from the development of these resources.
- The proper management will take into consideration the damage caused to the environment during the 'extraction' or 'use' of the natural resources and find ways and means to minimise this damage.

Conservation of Wildlife: It is very important to conserve wild-life to maintain the ecological balance in nature and to preserve the gene pool. Some of the measures (or steps) to be taken for the conservation of wildlife are given below:

- Laws should be made to impose a total ban on the poaching (killing) or capturing of any animal or bird belonging to an endangered species.
- The natural habitats of wild animals and birds should be preserved by establishing National Parks and Sanctuaries throughout the country.
- The Government Department connected with the conservation of wildlife should conduct a periodic survey in all the forests, National parks and Sanctuaries to have knowledge of the population of all species of wild animals and birds.
- Special attention should be paid to the conservation of endangered species of wild animals and birds to prevent their extinction altogether.
- The unauthorized felling (cutting) of forest trees for timber trade and fuel-wood should be curbed (stopped) immediately.

Forest and wild life conservation: Forests are biodiversity hot spots. Biodiversity of an area is the number of species of different life forms like bacteria, fungi, powering plants insects, birds, etc.

Hotspot means an area full of biological diversity.



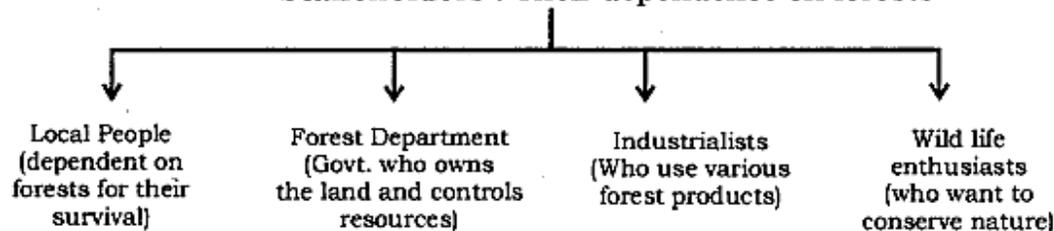
Stake holders: A person having interest or concern for something is called as a stakeholder.

Stakeholders who are-

- They are the people living around the forests are dependent on forest and its products.
- Forest department of the government owns the land and also control the resources from forests.
- Industries that use forest produce .**For Example** Timber, Paper, Resin, Gum medicines, Sports equipment industries.
- Wildlife and natural enthusiast who want to conserve the nature.

Bamboo is used to manufacture huts, baskets and also for food storage. Implements used in agriculture, fishing is largely made up of wood. The government of India has recently instituted an Amrita devi bishnoi national award for wildlife conservation in the memory of an Amrita Devi bishnoi who sacrificed her life to protect the trees in 1731.

Stakeholders : Their dependence on forests



Sustainable Management: Management of forest resources wisely to make it available for future generations.

To consider the conservation of forests, we need to look at the stakeholders who are:

- The people who live in or around forests are dependent on forest products for various aspects of their life.
- The Forest Department of the Government which owns the land and controls the resources from forests.
- The industrialists – from those who use ‘tendu’ leaves to make bidis to the ones with papermills who use various forest produce.
- The wild life and nature enthusiasts who want to conserve nature in its pristine form.

A major program called silvi culture has been started to replenish the forests by growing more trees and plants.

Conservation of forests: It is carried out by the following methods

- **Afforestation:** It is growing of forests on unprotected barren lands. Van Mahotsava is a tree plantation movement carried out twice a year (February and July) by both government and voluntary agencies.
 - **Reforestation:** It is developing forest cover in the area which has been damaged or cleared during exploitation.
 - **Separation of Commercial Forestry:** Useful plants required by industry should be planted separately preferably on waste land. Growing industry required plants is called production plantation.
 - **Grazing:** Grazing should be regulated according to the availability of pasturage.
- Deforestation: Removal, decreases or deterioration of forest cover of an area is called deforestation.

Effects of Deforestation

- **Soil Erosion:** Removal of plant cover exposes the fertile soil to wind and water. The latter remove the top soil and make the area infertile.
- **Desertification:** Removal of forest cover in the plains makes the area dry. In hot season, the soil becomes loose. Air currents take away the fine soil particles leaving behind sand.
- **Floods:** In rainy season many temporary rivulets are formed due to loss of absorption capacity by unprotected soil. The rivulets produce floods in low land causing loss to agriculture, property and life.
- **Destruction of wildlife:** Deforestation leads to destruction of natural habitats of wild animals and plants. Wildlife is, therefore, destroyed.
- **Climatic Changes:** In the absence of forest cover, the summer becomes hotter while the winters become extra cool. The frequency of rainfall decreases.

National Award for Wildlife Conservation: The Govt, of India, has recently instituted an 'Amrita Devi Bishnoi National Award for wildlife conservation in the memory of Amrita Devi, who in 1931 sacrificed her life along with 363 other for the protection 'Khejri Trees' in Kherali Village near Jodhpur in Rajasthan.

Chipko Andolan: Movement originated in Garhwal in early 1970's that was the result of a grassroot level effort to end the alienation of people from their forest.

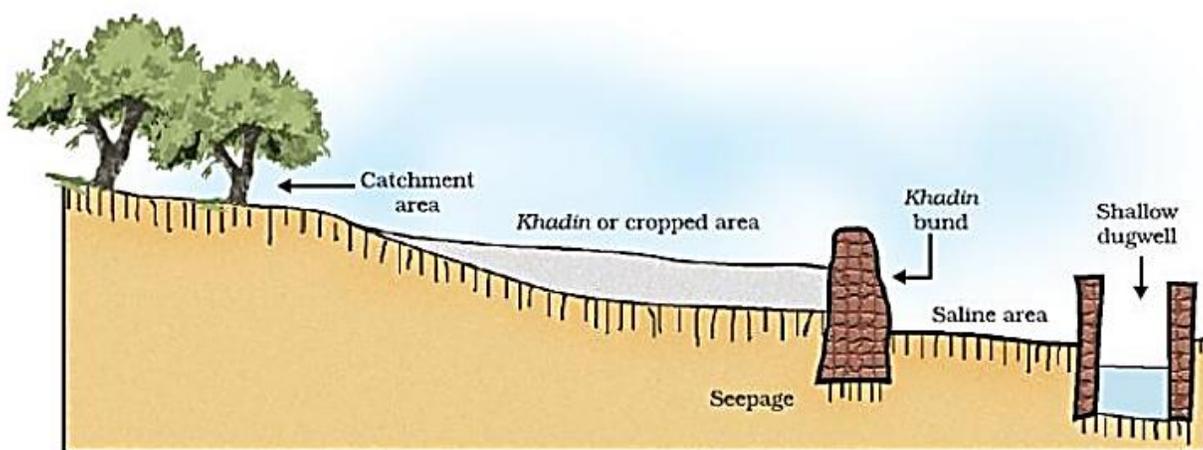


Thus, Chipko Movement (i.e., chipko Andolan) is the tree hugging movement, in which the villagers compel the axeman to stop tree felling by embracing and forming ring (circle) around the marked trees. Example : Protection of Sal Forest in West Bengal in 1972.



Water as a Resource

- Water is a basic necessity for all terrestrial forms of life. Regions of water scarcity are closely related to the regions of acute poverty.
- Failure to sustain water availability has resulted in loss of vegetation cover, diversion for high water demanding crops and pollution from industries and, urban wastes and less rain.
- Irrigation methods like dams, tanks should be used in various part of India.



Advantages of Dams

- Water from a dam is used for irrigation in fields through a network of canals. Dams ensure round the year water supply to the crop fields and help raise agricultural production.
- Water from a dam is supplied to the people in towns and cities through pipelines after suitable treatment. In this way, construction of dams ensures continuous water supply in the region.
- The falling water (or flowing water) from the dam is used for generating electricity. The water rushing down the dam turns turbines which run electric generators.

Disadvantages of Dams

- **Social Problems:** Due to the construction of high-rise dams, a large number of human settlements (or villages) are submerged in the water of large reservoir formed by the dam and many people are rendered homeless. This creates a social problem.
- **Environmental Problems:** The construction of high-rise dams on the rivers contributes to deforestation and loss of biodiversity. This is because a vast variety of flora and fauna (plants and animals) get submerged in the water of large reservoir formed by the dam and disturb the ecological balance.
- **Economic Problems:** Some people say that the construction of high-rise dams involves the spending of a huge amount of public money without the generation of proportionate benefits.

Forests: Forests are important renewable natural resources dominated mainly by trees forming a sort of canopy, they are essential for the ecological balance of all ecosystems. They maintain the biological ecosystem.

Water Harvesting: Aim is to develop primary resources of land and water and to produce secondary resources of plants and animals for use in a manner which will not cause ecological imbalance.

Various ancient methods of water harvesting

Methods	State
Khadin, tanks, nadis	Rajasthan
Banderas, tals	Maharashtra
Bundhis	Madhya Pradesh and U.P.
Pyhes and Pynes	Bihar
Kulhs	Himachal Pradesh
Ponds	Jammu Region
Eris (tanks)	Tamilnadu

Baylis - Old method of water harvesting in Delhi and nearby region.

These techniques are local specific to ensure the mismanagement and over-exploitation of these resources.

Advantages of Water Harvesting System

- Water does not evaporate.
- Recharge wells and moisture for vegetation.
- Does not provide breeding grounds for mosquitoes.
- Ground water is protected from contamination by human and animal waste.

Pollution of Water: The pollution of water is caused by the dumping of untreated sewage and industrial wastes into it.

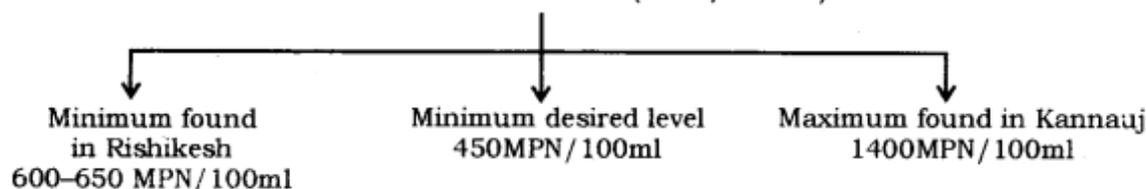
The contamination of river water can be usually found from two factors :

- the presence of coliform bacteria in river water, and
- Measurement of pH of river water.

Ganga Action Plan (GAP): Muticrore project came in 1985 to improve the quality of Ganga. Ganga Action Plan (GAP) was formulated to reduce the pollution load of river Ganga by more than 75%. The water quality has been tested from time-to-time by checking coliform (a group of harmless bacteria in human intestine) number/100 ml.

Accordingly, a survey was conducted and data was collected for total coliform (a group of bacteria found in human intestine) between 1993-1994 which was as below:

1993-94 Total Coliform (MPN/100ml)



MPN - Most Probable Number.

Advantages of Water Stored in the Ground

- The water stored in the ground does not evaporate.
- The water stored in the ground spreads out to recharge wells and provides moisture for crops over a wide area.
- The water stored in the ground does not promote the breeding of mosquitoes (unlike stagnant water collected in ponds or artificial lakes).
- The water stored in the ground is protected from contamination by human and animal waste.

Coal and Petroleum Conservation: Coal and petroleum are fossil fuels found in earth's crust. They are non-renewable and exhaustible resources.

1. Coal: Coal is combustible fossilized rock derived from a large accumulation of plant remains that is gradually compressed. Coal is used for cooking, heating, in industry and thermal power plants.

2. Petroleum: Petroleum is another fossil fuel that occurs in the form of liquid oil. It has been formed in the past (about 10 to 20 crore years old) from plant and animal remains and occur in the form of mineral oil in sedimentary rocks. Petroleum is mainly used as fuel for transport, agricultural operations, generators and some industries.

Methods of Conservation of Fossil Fuels

- Burning of coal causes air pollution. Thus direct use of coal for the purpose or burning should be avoided. Coal may be converted into liquid fuel and compressed natural gas (CNG) through coal gasification.
- Techniques should be developed to recover maximum fossil fuel that lies in deep mines and wells. Wastage during extraction and transportation should be avoided.
- Both oil wells and coal mines are prone to catch fire. Therefore, these should be well protected from fire to avoid wastage pollution and loss of life and property.
- Over-consumption of oil in automobiles should be checked. We must save oil for future use because only a few years are left for its depletion.
- Alternative sources of energy, such as hydroelectric, nuclear, solar, wind power and biogas plants should be encouraged.

Steps for Conservation of Energy Resources

- **Refuse:** Say no to things that are offered to an individual. For Example, an individual say no to buy plastic products.
- **Reduce:** Minimize the use of anything. For Example, minimize the use of fans, tubelights etc.
- **Reuse:** To use the things again and again is defined as reuse.
- **Repurpose:** When a particular thing cannot be used for a purpose, it can be used for another purpose.
- **Recycle:** When the material can be used to make the needed things.
- Save electricity, water, etc. by not using when not required.
- Use energy efficient electrical appliances to save electricity.
- Use pressure cooker for cooking food.
- Use solar cookers.
- Encourage the use of biogas as domestic fuel.
- Fuel efficient motor vehicle should be designed to reduce consumption of petrol and diesel.