

## Chapter 1

# Management of Natural Resources

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## Resources

- A resource is any means of supplying a material held in reserve which can be transformed into more valuable and useful item.  
e.g. wood used for making furniture, fibres obtained from cotton are used for weaving cloth, minerals, fossil fuels.

## Natural Resources

- Natural Resources are those living or non-living substances available in the normal environment which are being exploited for supplying life and meeting human requirements.

Resources are of two types : -

- (i) **Natural** - Natural Resources are directly obtained from nature e.g. forests, wild-life, minerals, air, water, solar energy etc.
- (ii) **Man-made** - Fertilizers, pesticides etc.

## Some common examples of Natural Resources

- **Hand and Soil Resources** : (These include mining, fertility of soil etc.)
- **Fresh Water Resources** : There include fresh water for drinking and washing, food-fish form aquaculture, river valleys projects for irrigation and hydroelectricity.
- **Marine or Ocean Resources** : There include common salts, edible algae, food fish, agar, corals, pearls etc.
- **Fossil Fuels and other Energy Resources** : There include coal, natural gas, petroleum, fuel wood, biogas etc.
- **Fossil and Wild Life Resources** :
- **Flora and Fauna** : Microorganisms, plant and animals.

## Types of Natural Resources

- Natural resources are obtained from earth and its environment (i.e. atmosphere, lithosphere and hydrosphere). Therefore, they are also known as earth resources. Natural resources are classified into three ways:-

### 1. Classification of Natural Resources based on their chemical nature

- (i) Inorganic resources - e.g., water, air and metallic minerals.
- (ii) Organic resources - e.g. Plants, animals, microorganism.
- (iii) Mixed resources - e.g. soil

## 2. Classification of Natural Resources based on their abundance and availability :-

- (i) **Inexhaustible Resources** : These resources occur in such abundance that they are not likely to be exhausted by human use. They include air, clay, sand, tidal energy, rain.
- (ii) **Exhaustible Resources** : These resources are likely to be finished due to continuous human use. e.g. minerals, fossil, fuels. They are again two types :-
  - (a) **Renewable Resources** : Maintain themselves by natural recycling and reproduction. e.g., forest, crop, domestic animals, wild life, ground water etc.
  - (b) **Non-Renewable Resources** : The non-renewable resources get exhausted with use because they are not recycled or replenished. e.g. coal, natural gas and petroleum.

## 3. Classification of Natural Resources : based on their distribution

- (i) **National Resources** : There are confined to National boundaries e.g. minerals, lands, forests etc.
- (ii) **Multinational Resources** : These resources are shared by more than one nation e.g. certain rivers, certain lakes, migratory, birds etc.
- (iii) **International Resources** : e.g. air, sunlight etc.
- (iv) **Recycle : Plastic, glass, paper, metal etc.**
- (v) **Reuse** : Plastic container, tea leaves, sweet or pickle container in kitchen.

## Forests

- Forests are important renewable resources dominated, mainly by trees. They are essential for ecological balance of all ecosystems. They maintain biological diversity, prevent floods and safeguard future of tribals.

## Use of Forests

- **Wood** : Uses in wood crates for packing, making sports goods, boats, railway sleepers etc.
- **Food and spices** : e.g. Almond, Walnut, coconut, clove, Cinnamon, cardamom etc.
- **Tannins, Gums, Resins and Dyes** : Used in inks, polish.
- **Drugs** : Medicines like quinine, aconite, belladonna etc.
- **Other products** : Honey, Camphor, Rubber, Cork etc.

## Stakeholders

- The forests produce a variety of products that cater the needs of people. For conservation of forests, we look at the stakeholders. The major stakeholders of forests resources are :
  - (i) **The local people** : These people are fully dependent on forests products.
  - (ii) **The forest dependent of the government** : They change the cultivation of trees of their choice especially in British rule. They planted pine, teak or eucalyptus trees.

## Conservation

- Conservation may be defined as the controlled utilization of natural resources for the benefit of all life so that it may yield sustainable benefit to the pulse generation as well as the future generation.

## Categories of Conservation

- There are two main categories :
  - (i) **In site conservation** : When conservation of natural resources is done in their natural habitats (= home) e.g. National parks, wild life sanctuaries, Natural monuments, cultural landscapes, biosphere.
  - (ii) **Ex situ conservation** : When conservation of natural resources is done **outside their habitats**, it is called ex. situ conservation. e.g. Botanical gardens, zoos, seed banks, pollen storage, tissue culture etc.

Q. What can friends of environment do to conserve the natural resources?

- (i) We have not wasted food, water.
- (ii) Save electricity or using CFL.
- (iii) Save petroleum products.
- (iv) Not purchase toys.
- (v) By refusing the polybags to shopkeepers.
- (vi) Try to travel by train rather than flying.
- (vii) Use certified green wood for woodwork. This wood is obtained from a system where a tree is planted for every tree which has been felled for furniture.
- (viii) There are three R's which are necessary for our saving resources.
  - (i) **Reduce** : The best thing that we can do is to use less of etc.

**The Industrialists** : Forest biodiversity suffers a great loss by industrialists who look at the forests as merely a source of raw materials for their factories.

(iv) **The Nature and Wildlife Enthusiasts** :

## Deforestation

- It is destruction, reduction or removal of forest cover.

**The main reasons for deforestation are as follows :**

1. Cutting of trees for the purpose of timber, fuel and demand of wood.
2. Over-grazing by a large livestock population.
3. Shifting cultivation for agriculture.
4. Construction of dams, reservoirs, canals, hydroelectric projects roads and railways.
5. Forest fires which can be natural or man made.

## Effects of Deforestation

- Badly affected the weather of our country.

- There is excessive heating during summers and excessive cooling during winters. The rainfall also reduced.
- Deforestation leads to the scarcity of timber wood.
- It is also important cause for soil erosion, droughts, floods, and landslides.
- Over grazing has reduced the regenerative capacity of forests.

## People's Participation

- An example of public participation in conservation of forest and wildlife is the case of **Bishnoi community** in Rajasthan. In 1731, '**Amrita Devi Bishnoi**' sacrificed the life along with 363 others for the protection of 'Khejri' tree in Khejrali village near Jodhpur in Rajasthan.

## Chipko Movements

- In March 1973, a sports good factory was to cut ten Ash trees near the village Mandal in Chamoli district. The local people prevented the same by hugging the necked trees.
- In 1974, a group of woman led by 'Gaura Devi' successfully prevented falling of trees near vilalge Reni.
- In 1978, the women of Advani village in Tehri0Garhwal face police firing and later counted arrested. The chipko movement speed slowly to all nearby under the leadership of Shri Sunderlal Bahuguna of Silyara in Tehri region and Shri Chandi Prasad Bhatt of Gopeshwar.
- One such movements reached to Karnataka is 'Appiko movements' under the leadership of Pandurang Hegde.
- In 1972, the West Bengal forest Department recognized its failure in eeviving the degraded Sal forests in the Sarkwesteen districts of the state. The season was the traditional methods of surveillance and governments policies which les clashes between villages and the forest officials. Forest officer A.K. Banerjee involved the local villagers in protection of 1,272 hectares of badly degraded sal forests.

## Wild Life Conservation

- Conservation of wild life is the management of wild forest and fauna in order to save them from their extinction as well as to get sustainable benefit for both the present and the future. Several governmental organisation as well as non-government voluntary organisations have been set up to protect the wild life. There organisation aim at :
  - Protection of Natural habits** : Natural habitats of wild animals must be protected by identification and safeguard of fooding, testing, breeding and nursing habitats of each species.
  - Maintenance of wild life in protected areas (Reserves)**
    - Biosphere reserves** : Multipurpose protected areas meant for conservation of representative wild life, traditional life styles of tribals and their domesticated animals.
    - National Packs** : Cultivation, grazing, hunting are not allowed.
    - Sanctuaris** : Protected natural habitats where hunting is not allowed but other activities are allowed.
  - Protection through legislation**

- (i) Convention on International Trade in Endangered species (CITES) : It regulates International trades of wild flora and fauna (1976).
- (ii) Indian Brand of Wild life (IBWL). It was established in 1952.
- (iii) Wild life (protection) act, 1972.
- (iv) The man and Biosphere ( MAB) Programme of UNESCO. It was stated in 1971 for studying Biosphere Reserve.
- (v) Project Tiger (1st, April 1973), Gir Lion Project (1972), Crocodile Breeding Project (1974), Project elephant (1992).
- (vi) The preservation of trees act as first introduced in 1975.

## Water for All

- Water, an essential component of the human body is crucial in regulating body temperature, eliminating body wastes, transporting materials from one part to another, helping food digestion and generation of energy. We use water in our lives in wash, cook, drink and clean and for agriculture and industries. Approximate 97% of the world's water is in its oceans, but sea water is not usable without extensive treatment. The freshwater, constituting only a very small proportion, is supplied by two major services.
  - (1) Ground water (e.g. wells and springs)
  - (2) Surface water (lakes, rivers, streams and reservoir).

## Management of ground water

- Various irrigation methods such as dams, tanks and canals have used. By establishing large dams and canals that covered large areas. Due to large scale projects, the local people lost their control over the local water sources.
- **Dams** : Dams are water-storing bodies usually built by the government agencies across the rivers to regulate the flow of water and for irrigation of fields throughout the year.

Some examples of famous dams and canals in India are :

- (i) Bhakra Dam built across the river Satluj in the state of Punjab.
- (ii) Sardar Sarovar Dam built on the river Narmada in 1940 in the State of Gujarat.
- (iii) Tehri Dam on the river Ganga in Tehri (Uttaranchal).
- (iv) Tawa Dam is a large reservoir on the Tawa river located in Hoshangabad (M.P.)
- (v) Indira Gandhi Canal, spread over a larger area of Rajasthan, has brought greenery in deserts.

## Benefits of Dams

- Store adequate amount of water for irrigation.
- Continuous water supply throughout the year.
- Flowing water from a height is used for generate electricity.

## Problem associated with Construction of Dams

- **Social Problem** : People are rendered homeless. e.g. Narmada Bachao Andolan.

- **Economic Problems** : Expensive project that involve spending of huge amount of public money.
- **Environmental Problems** : Deforestation, loss of biodiversity and displacement of poor tribals, destroy flora and fauna (plants and animals). The vegetation which is submerged into the water, creates Methani gas which is a green home gas and creates global warming.

### Water Harvesting

- Watershed Management is primarily concerned with scientific soil and water conservation to increase the biomass production. It aims to develop land and water resources so that they are used to produce secondary resources of plants and animals without causing the ecological imbalance. There are several advantages of watershed Management These are :
  - (i) It increases the crop production.
  - (ii) It increases the income of the watershed community.

### Treatment of Waste Water

- Waste water usually contains some inorganic and organic impurities which must be removed by primary and secondary treatments. The beneficial effects of the use of treated water are :-
  - (i) Conservation of water resources.
  - (ii) Low-cost method for sanitary disposal and municipal waste water.
  - (iii) Reduces pollution of surface water resources (such as rivers and canals).
  - (iv) Increases crop yield by conserving nutrients and reducing the need for artificial fertilizers.
  - (v) Provides reliable water supply to farmers.

### Storage of Water

- Dams and reservoirs are built upstream or downstream to reduce the intensity of floods. This water may be supplied to canals and rivers throughout the year.

### Coal and Petroleum

We have seen some of the issues involving the conservation and sustainable use of resources like forests, wild-life and water. These can meet our needs perpetually if we were to use them in a sustainable manner. Now we come to yet another important resource – fossil fuels, that is, coal and petroleum, which are important sources of energy for us. Since the industrial revolution, we have been using increasing amounts of energy to meet our basic needs and for the manufacture of a large number of goods upon which our lives depend. These energy needs have been largely met by the reserves of coal and petroleum.

The management of these energy sources involves slightly different perspectives from those resources discussed earlier. Coal and petroleum were formed from the degradation of bio-mass millions of years ago and hence these are resources that will be exhausted in the future no matter how carefully we use them. And then we would need to look for alternative sources of energy. Various estimates as to how long these resources will last us exist and one is that at present rates of usage, our known petroleum resources will last us for about forty years and the coal resources will last for another two hundred years. But looking to other sources of energy is not the only consideration when we look at the consumption of coal and petroleum. Since coal and petroleum have been formed from bio-mass, in addition to carbon, these contain hydrogen, nitrogen and sulphur. When these are burnt, the products are carbon dioxide, water, oxides of nitrogen and oxides of sulphur. When combustion takes place in insufficient air (oxygen), then carbon monoxide is formed instead of carbon dioxide. Of these products, the oxides of sulphur and nitrogen and carbon monoxide are poisonous at high concentrations and carbon dioxide is a green-house gas. Another way of looking at coal and petroleum is that they are huge reservoirs of carbon and if all of this carbon is converted to carbon dioxide,

then the amount of carbon dioxide in the atmosphere is going to increase leading to intense global warming. Thus, we need to use these resources judiciously.

Some simple choices can make a difference in our energy consumption patterns. Think over the relative advantages, disadvantages and environment-friendliness of the following –

- (i) Taking a bus, using your personal vehicle or walking/cycling.
- (ii) Using bulbs or fluorescent tubes in your homes.
- (iii) Using the lift or taking the stairs.
- (iv) Wearing an extra sweater or using a heating device (heater or ‘sigri’) on cold days.

The management of coal and petroleum also addresses the efficiency of our machines. Fuel is most commonly used in internal combustion engines for transportation and recent research in this field concentrates on ensuring complete combustion in these engines in order to increase efficiency and also reduce air pollution.

**Coal :** Coal is combustible fossilised 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.

**Petroleum :** Petroleum is another fossil fuel that occurs in form of liquid oil. Petroleum is mainly used as fuel for transport, agricultural operations, generators and some industries.

It reduces the menace of drought and floods.

It enhances the life of downstream dam and reservoirs.

In a country like, India, there is no shortage of water but water management is lacking.

Some of the methods of conservation of water resources are as follows :

- **Rain Water Harvesting :** For collecting water, they make digging small pits and lakes, building small earthen dams, construction dykes, sand and limestone reservoirs, and setting up roof top water-collecting units.

- (i) **Kulhs :** Streams from hill side change into canal for irrigation by villagers. (Himachal Pradesh)

- (ii) **Khadins :** In Rajasthan are traditional rain-water harvesting system for agriculture. here consist of a very long (100 – 300 m long) earthen embankment built across the lower edge of the slopping farm land.

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**ASSIGNMENTS****I. Very Short Answer 2 Type Questions :**

1. Name any two common natural resources.
2. Name any two renewable resources.
3. Define natural resources.
4. Write the expanded forms of (a) CITES (b) IBWL
5. What is the slogan of Chipko Movements?
6. Name the person who started Appik Movement in South.
7. Name any two non-renewable resources.
8. Expand CNG and PNG.
9. What is wild life?
10. Name any two endangered animal species.
11. What is coal and Petroleum?
12. What substances are derived from crude petroleum
13. What changes can we make in our habits to become more environment friendly?
14. What do you mean by Appiko movement in South?
15. Give some examples of famous dams and canals in India?
16. What are the problems associated with construction of large dams?
17. Give a diagrammatic representation of a Khadin system
18. What are the threat to wild life?
19. Differentiate between social forestry and urban forestry?
20. Describe the natural resources based on their distribution?

**II. Short Answer Type Questions :**

21. What should man do to conserve the natural resources?
22. What are the two categories of conservation?
23. What are the different uses of forests?
24. What is deforestation? Give the main reasons for deforestation?
25. What changes would you suggest in your home in order to be environment friendly?

**III. Long Answer Type Questions**

26. Briefly describes the management of natural resources on the basis of their chemical nature and abundance availability?
27. Describe forest and wild life conservation.
28. What do you know about chipko movement? Describe the movement in detail.

29. Write explanatory note on coal and petroleum conservation.
30. Describe the methods of conservation of fossil fuels?

#### IV. Objective Type Questions

31. Coal and petroleum are  
(a) Used in biogas production (b) Fossil Fuel  
(c) Fuel wood (d) Inorganic fuel resources
32. Which factor is mainly responsible for increase in demand of natural resources  
(a) Scientific advancement (b) Use of biodegradable chemicals  
(c) Increase human population (d) Environmental pollution
33. Which one of the following is exhaustible resource?  
(a) Precipitation (Rain) (b) Coal  
(c) Air (d) Tidal energy
34. Extensive planation of trees to increase forest cover is  
(a) Deforestation (b) Afforestation  
(c) Agro-forestry (d) Social forestry
35. Red Data Book  
(a) Maintains record of human populations  
(b) Maintains record of dead animals  
(c) Recomend names of biodegradable substances  
(d) Maintains the record of these creatures which are threatened with extinction
36. The Sardar Sarovar Dam built of the river in the state of  
(a) Punjab (b) Gujarat  
(c) Tamil Nadu (d) Tehri (Uttaranchal)
37. The rain water harvesting system includes  
(a) Kulhs (b) Khadins  
(c) Both (a) and (b) (d) None of these
38. The example of endangered plant species is  
(a) Drosera indica (b) Mangifera indica  
(c) Neem plant (d) Pisum sativum
39. The wild life (protection) act has been adopted in  
(a) 1952 (b) 1972  
(c) 1973 (d) 1975
40. The Agro forestry is related to those plants like  
(a) Developed in such areas meet need to villagers  
(b) Ecologically fragile areas  
(c) Plants are grown in fields alongwith crops  
(d) Open land of urban areas