

Management Of Natural Resources

Resource : A source of supply held in reserve, which is useful to man or can be transformed into more valuable and useful item for mankind.

Natural resource: A Natural resource is a source obtained from nature.

Conservation of natural resources: Conservation is the management for the benefit of all life including human kind of the biosphere so that it may yield sustainable benefit to the present generation while maintaining its potential to meet the needs and aspiration of the future generations

Sustainable development

Development which meets the current basic human needs and preserves the resources for future generation.

Why do we need to Manage our Resources ?

- Over-exploitation and non-Judicious utilisation has become a threat to our natural resources
- Controlled utilization of natural resources so that it may yield sustainable benefit to the present generations as well as the future generations
- It can ensure equitable distribution to all the people
- It prevents exploitation of resources

Wild life resources

Life in any form, plant or animal, which exists in its natural habitat is called wild life.

Reasons for depletion of wild life :-

- (i) Deforestation for various reasons like urbanization, cultivation dam building, road construction, establishment of industries have caused a considerable loss of wild life.
- (ii) Indiscriminate hunting by man for meat skin and for sport.
- (iii) Natural calamities like flood, drought, fire, epidemic have played a major role in depletion of wild life.
- (iv) Cutting of plants for obtaining timber and fuel.

Importance of wild life:-

- The wild life can be used commercially to earn money through tourism.
- Wild life is responsible for maintaining the natural balance of the environment.
- Wild life is a symbol of national pride and represents the cultural heritage.
- Since wild life is a renewable source of large variety of commercial products like food fur, lac, musk leather, feather, ivory, medicines.

In situ conservation:- When conservation of natural resources is done in their natural habitats **e.g.:** National parks, wild life sanctuaries bio sphere.

Jim Corbett National Park, Uttaranchal (tiger).

Bharatpur Bird Sanctuary, Rajasthan (winter home of migratory birds, Siberian crane).

Gir Sanctuary, Gujarat

Ex situ conservation:- When conservation of natural resources is done outside their habitats

e.g.: Botanical gardens, zoos, seed banks, pollen storage, tissue culture.

Forests:

Forests are the wealth of a country and renewable natural resource. Forests constitute 90% of the global biomass.

Forests are uncultivated and inhabited land area managed for diverse purposes of forestry.

22.7% of total land area is covered by forest in India.

Major cause of deforestation:-

- (i) Growing food needs
- (ii) Raw materials for industrial use

- (iii) Forest fire
- (iv) Damage caused by pests.

Importance of forest:

- Production of timber, fuel, nuts, seeds, medicine, tendu leaves and sandal wood
- Prevent noise, air pollution and soil erosion
- Prevent flood
- Forest regulate rainfall and climate

Stakeholders to the forests are:

(i) People who are dependent on the forest produce for various needs. People living in forest areas need large quantities of firewood, small timber, fruits, nuts, herbs and bamboo. Implements for agriculture, fishing and hunting are largely made of wood. Their cattle also graze in forest areas.

They use resource in a way that much damage is not done to the environment.

(ii) Forest department which owns the land and controls the resources from the forests for making good source of revenue.

Himalayan National Park:

- The great Himalayan National Park contains alpine meadows which were earlier grazed by sheep in summer.
- Nomadic shepherds drove their flock from the valley every summer.
- After the formation of National Park, this practice was stopped.
- Now it is seen that the grass first grows very tall and then falls over preventing fresh growth.

(iii) Industrialists who get the raw materials for the products from the forests. Industrialists use forest product i.e. wood for furniture and paper and for making sport equipment.

(iv) The wild life and nature enthusiasts/ activists who want to conserve nature in its original form.

Case of Khejri Trees:

- Bishnoi community on border of Thar desert in western Rajasthan is a group of nature-loving people who have sacrificed lives for conserving flora and fauna.
- They have a basic philosophy that all living things have the right to survive
- Amrita Devi Bishnoi sacrificed her life in 1731 along with 363 others for the protection of Khejri trees in Khejrli village near Jodhpur in Rajasthan.
- Govt, of India instituted 'Amrita Devi Bishnoi National Award' for Wildlife Conservation in her memory.

Chipko Andolan:

- Originated in a remote village called Reni in Garhwal during the 1970s.
- There was a dispute between the local villagers and a logging contractor who had been permitted to fell trees in the forest close to the village.
- In the absence of men, women of the village reached the spot, clasped the tree trunks and thus stopped the felling of the trees.
- Chipko movement quickly spread across communities. It forced the government to change the laws in favour of people.

Peoples participation in the management of forests:

- In 1972, the West Bengal Forest Department recognised that its efforts to revive Sal forests in the south-western districts did not succeed.
- There were frequent clashes between the villages and forest officials. Forest and land-related conflicts were also a major factor in fuelling Naxalism.
- Forest officer A.K, Banerjee, the Forest Department of West Bengal involved the villagers in the protection of 1272 hectares of Sal forests.
- Villagers were given employment in harvesting and sericulture (production of silk) operation.
- They were given 25 per cent of the harvest and fuelwood and fodder on payment of a nominal fee.

- The Sal forests of Arabari recovered a lot by 1983 due to these measures.
- The value of Sal forest was 12.5 crores.

Measures for conservation of wildlife and forest

- Cutting of forest should be curbed
- Special attention should be paid to the conservation of endangered species
- National habitat should be preserved by establishing national park and sanctuaries
- Poaching should be made a punishable offence
- Laws should be forced strictly

Skin of snake is used in leather industries. Due to killing in huge number, food chain gets disrupted. Due to lesser population of predator, rats and mice increases in the crop field which ultimately damages the food grains.

Water

- Water is a renewable resource and essential for the survival .
- Water covers about three quarters of earth surface and constitutes 60-70 % of total body weight of living organisms.
- Fresh water resources range from ponds to lakes and large rivers.
- Rainfall in India during monsoon is nearly 75% of the mean annual rainfall.
- Rainwater fills lakes, ponds and rivers.
- Some rainwater seeps into ground available as ground water
- Underground water is taken out by digging well, tube well or bore well.
- Management of river water is done by constructing dams on river.
- About 93 per cent of water, in India, is used for agriculture.

Underground water availability has decreased due to :

- Loss of vegetation cover, little rain water seeps into the ground
- Diversion for high water demanding crops.
- Pollution from industrial effluents and wastes.
- Increase in population
- Discharge of untreated sewage and industrial waste into water bodies

From early times, methods of irrigation like dams, tanks and canals are in practice in India. They were used by local people in such a way that water requirements were easily available throughout the year.

IMPORTANCE OF WATER

The importance of water to the life of plants can be emphasized best by enlisting its functions :

1. Water is the main constituent of protoplasm.
2. It is the solvent through which mineral salts are transported from one part of the plant to the other.
3. Various metabolic reactions take place in medium containing water.
4. During photosynthesis, water releases oxygen.
5. The growth of the cells is mainly dependent on absorption of water.

DAMS

The construction of big dams and river valley projects, which are required for hydroelectric power generation have affected the forests.

Importance of dams

- For irrigation purposes.
- **Indira Gandhi Canal** has brought greenery to large areas of Rajasthan.
- For generating electricity
- Canal system from these canals distribute water to far away places.

Highest Dam. Tehri Dam on river Bhagirathi in Uttaranchal.

Largest in capacity. Bhakra Dam on river Sutlej in H.P.

Mismanagement of water has largely led the benefits to a few people due to the following reasons :

- (i) No equitable distribution of water.
- (ii) People near the source usually get more water.
- (iii) More discontent is particularly there in those persons who have been displaced due to building of dams etc.

Criticism of large dams

- **Social problems.** Without adequate compensation, several peasants and tribal have been displaced and rendered homeless.
- **Economic problems.** Huge expenditure is involved for construction of these dams. Proportionate benefits are comparatively few.
- **Environmental problems.**
 - Construction of dams leads to deforestation and loss of bio-diversity.
 - Frequent flood, landslide and draught.
 - It imbalances ecosystem

Save Narmada Movement

The opposition of raising the height of Sardar Sarovar Dam.

The dam is present across Gujarat, Maharashtra and Madhya Pradesh on river Narmada.

- Total area to be submerged : 1,44,731 hectares of land.
- Forest land affected : 56, 547 hectares.
- Villages to be submerged : 573.
- Destruction of wildlife. Many of the animals are affected
- It will lead to displacement of more than one million people. It affect many tribal people.

Pollution in GANGA

- The Ganga runs its course of over 2500 km from Gangotri in Himalayas to Ganga sagar in bay of Bengal.
- It is being turned into a drain by more than a hundred towns and cities in Uttar Pradesh, Bihar and West Bengal.
- Ganga's toxicity kills fish in large sections of river.

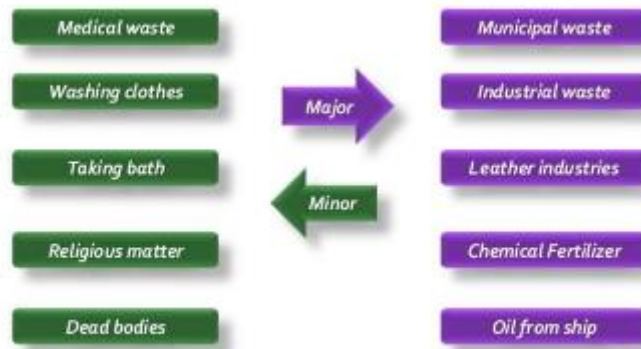


Fig: Pollution in Ganga

- Disposal of untreated sewage, garbage and excreta by more than a hundred towns and cities situated along the river in Utrakkhand, Uttar Pradesh, Bihar and West Bengal.
- Daily Human activities like bathing, washing of clothes immersion of ashes or unburnt corpses.
- Dead bodies of animals and humans
- Wallowing of cattle
- Discharge of chemical effluents by the industries

Ganga action plan: Ganga action plan is a multi crore project launched in 1985, to clean river Ganga.

- Interception and diversion
- Treatment of waste water
- Riverfront development
- Electric crematorium
- Construction of community toilets
- Conversion of dry toilets to flush toilets

Contamination of water found from two factors:

- **Presence of Coliform bacteria-**
A coliform is a group of bacteria, found in human intestines whose presence in water indicates pathogen
- **To check quality of water:** pH of water is something that can be easily checked using universal indicator. If pH is below 7 river is acidic

Rain water harvesting

Rain water harvesting is a technique of increasing the recharge of ground water by capturing and storing rain water by the construction of special water-harvesting structures.

Need for Rain water harvesting

- To cope with the growing demand, there has been rapid development of ground water supply. But increasing demand, especially in urban areas, has led to depletion of ground water
- Ground water is sinking to new depths in most of Delhi, all of Daman and Deu, nearly three-fifth of Punjab, about two-fifth of Haryana and Mehsana area of Gujarat.
- Hence conserving the water during the monsoons by water harvesting must be adopted

Significance of Rain water harvesting :

- (i) It reduces run off loss and avoids flooding.
- (ii) It meets the increasing demand of water.
- (iii) It reduces contamination of ground water and raises the water table.
- (iv) It supplements ground water supplies during lean period.
- (v) Reduces power consumption.
- (vi) It improves soil moisture and decreases soil erosion.

Methods of Rain water harvesting:

Traditional methods :

In high rainfall areas, rainwater from roof tops is collected into water storage tanks from where water is diverted to some abandoned well or lifted by using a hand pump.

- Khadins, tanks and nadis in Rajasthan.
- Bandharas and talc in Maharashtra.
- Bundhis in M.P. and U.P.
- Ahars and Pynes in Bihar
- Kulhs in H.P.
- Ponds in Kandi belts of Jammu.

Digging of small pits and lakes, building small earthen dams/ embankment or construction of sand and limestone reservoirs.

Urban area:

- Construction of percolation pits with concrete slab having holes, connected to a well through pipe
- Rain water enters the well after filtration and seeps into soil by outlet pipe
- Ground water can be taken out through tube well.

Main aim of storing water should not be to hold the surface water but to recharge the ground water.

Advantages of Ground water:

- It provides soil moisture for plant growth

- It is commonly used for human consumption.
- It is relatively protected from contamination by human and animal waste.
- It is required for irrigation purpose (agriculture).
- Ground water does not evaporate but spreads out to recharge wells and provides moisture for vegetation over a large area.
- It does not provide breeding ground for mosquitoes
- It mitigates effect of drought and flood

Fossil fuels- Coal & Petroleum:

- Fossil fuels, coal and petroleum are important sources of energy.
- Coal and petroleum were formed from the degradation of biomass millions of years ago and these resources will be exhausted in the future.
- Coal is obtained from coal mines and petroleum is obtained from oil wells deep in the earth.
- Coal is composed of carbon, oxygen, nitrogen, sulphur and hydrogen.
- It is widely used as conventional fossil fuel in home, industry, generator electricity
- It releases enormous heat after burning.
- Petrol and diesel are used as fuels in vehicles
- Kerosene and LPG used as domestic fuel in cooking
- Estimate is that at the present usage rate, petroleum will last for 40 years and coal will last for another two hundred years.

Pollution due to fossil fuels:

- Fossil fuels contain hydrogen, carbon, nitrogen and sulphur. On burning they produce poisonous oxides of carbon, nitrogen and sulphur.
- SO₂ causes bronchitis disease, acid rain. Damages trees, building and aquatic life.
- NO₂ attack breathing system and causes acid rain
- If burnt in insufficient oxygen, they produce carbon monoxide which is poisonous. CO stops RBC from carrying oxygen from lungs to rest of the body causing suffocation and death
- Carbon dioxide is not poisonous but it is a green-house gas causing global warming.

Control on consumption of energy:

- Taking public transport in place of a personal vehicle
- Wearing an extra sweater in place of using a heater or sigri on cold days.
- Solar cooker should be used for cooking
- Bicycles should be used for covering short distance
- Pressure cooker should be used to save fuel
- Use CFL instead of bulb and tube light, as it consume less electric energy
- Switch off fans, lights, appliances when not needed
- Use of biogas should be encouraged in rural areas
- Use stairs to climb instead of taking lifts
- Fuel efficient engine should be designed to reduce the consumption of petrol and diesel

Five mantras to save our environment.

(i) Refuse: To say no to things one doesn't need.

(ii) Reduce: use less of the natural resource by cutting down on those practices which lead to wastage.

- By switching off unnecessary lights and fans, repairing leaky taps etc.
- Reduce wastage of water by repairing leaking taps
- Reduce the use of LPG by making use of solar cooker

(iii) Reuse: Use the articles again and again.

- Plastic bottles in which pickles and jams are supplied can be used again for storing kitchen articles.
- Used envelopes can be reversed and used again.
- Reuse is better than recycling as energy is used to recycle old stuffs but no energy is required during reuse.

(iv) Repurpose: When a product cannot be used for its original purpose, then it should be put to use for some other purpose. For example, old crockery can be used for growing plants.

(v) Recycle: We collect plastic, paper, glass and metal items and recycle them to make articles of our need instead of making them from fresh materials.

- To achieve this, we have to segregate the waste so that the material that can be recycled does not mix with the other waste.