

ENVIRONMENTAL SCIENCE

Class-3

TOPIC: FOREST RESOURCES

- Forests are one of the most important natural resources and a part of biosphere since these are natural assets on this earth. Forests predominantly composed of trees, shrubs, woody vegetation etc...
- Approximately 1/3rd of the earth's total land area is covered by forests. Forests are important ecologically and economically. Ecologically forests are to be considered as earth's lungs because they consume CO₂ and release O₂ which is required for sustaining the life on this earth. The poisonous gas CO₂ is absorbed by the trees of forests and reduces the global warming and helps to continue hydrological cycle, reduce soil erosion. Forest ecosystems are extremely good & hold a good quantity of water. Economically forests provide timber, fodder to grazing animals, firewood (conventional fuel), bamboos, rubbers, medicines, gums, resins, food items etc.

USES OF FOREST

- A. **Commercial uses** : Man depends heavily on a larger number of plant and animal products from forests for his daily needs.
- The chief product that forests supply is wood, which is used as fuel, raw material for various industries as pulp, paper, newsprint, board, timber for furniture items, other uses as in packing articles, matches, sports goods etc.
 - Indian forests also supply minor products like gums, resins, dyes, tannins, fibers, etc.
 - Many of the plants are utilized in preparing medicines and drugs; Total worth of which is estimated to be more than \$300 billion per year.
 - Many forests lands are used for mining, agriculture, grazing, and recreation and for development of dams.

- B. **Ecological uses** : The ecological services provided by our forests may be summed up as follows:

Production of Oxygen: The main green house gas carbon dioxide is absorbed by the forests as a raw material for photo synthesis. Thus forest canopy acts as a sink for carbon dioxide thereby reducing the problem of global warming caused by green house gas CO₂

Wild life habitat: Forests are the homes of millions of wild animals and plants. About 7 million species are found in the tropical forests alone.

Regulation of hydrological Cycle: Forested watersheds act like giant sponges, absorbing the rainfall, slowing down the runoff. They control climate through transpiration of water and seed clouding.

Soil Conservation: Forests bind the soil particles tightly in their roots and prevent soil erosion. They also act as wind breakers.

Pollution moderators: Forests can absorb many toxic gases and can help in keeping the air pure and in preventing noise pollution.

FOREST FUNCTIONS

Watershed Protection :

- I. Reduce the rate of surface run-off of water.
- II. Prevent flash floods and soil erosion.
- III. Produces prolonged gradual run-off and thus prevent effects of drought.

Atmospheric regulation:

- Absorption of solar heat during evapo-transpiration.
- Maintaining carbon dioxide levels for plant growth.
- Maintaining the local climatic conditions.

Erosion control:

- Holding soil (by preventing rain from directly washing soil away).

Land bank:

- Maintenance of soil nutrients and structure.

Local use - Consumption of forest produce by local people who collect it for subsistence – (Consumptive use)

- Food - gathering plants, fishing, hunting from the forest. (In the past when wildlife was Plentiful, people could hunt and kill animals for food. Now those populations of most Wildlife species have diminished; continued hunting would lead to extinction.
- Fodder - for cattle.
- Fuel wood and charcoal for cooking, heating.
- Poles - building homes especially in rural and wilderness areas. Timber – household articles and construction.
- Fiber - weaving of baskets, ropes, nets, string, etc.
- Sericulture – for silk.
- Apiculture - bees for honey, forest bees also pollinate crops.
- Medicinal plants - traditionally used medicines, investigating them as potential Source for new modern drugs.

Market use - (Productive use)

- Most of the above products used for consumptive purposes are also sold as source of income for supporting the livelihoods of forest dwelling people.
- Minor forest produce - (non-wood products): Fuel wood, fruit, gum, fiber, etc. which are Collected and sold in local markets as a source of income for forest dwellers.
- Major timber extraction - construction, industrial uses, paper pulp, etc. Timber extraction is done in India by the Forest Department, but illegal logging continues in many of the forests of India and the world.

OVER EXPLOITATION OF FORESTS

- Forest has been known to possess huge potential for human use and they have been exploited since early times for their vast potential.
- Exploitation of forest has taken place to meet human demands in the following ways: Due to wood cutting and large scale logging for raw materials like timber, pulp wood, fuel wood etc
- Deforestation due to road construction –
Clearing of forest to create more agricultural lands to meet the food needs of growing population - Encroachment of forests leading to destruction of about 19.57 lakh hectares (2013) of forest in the country .
- About 78% of forest area is under heavy grazing –
- Mining activities leads to clearing of forests –
- Big hydro electric projects result in large scale destruction of forest In India, Joint forest management has come up as innovative approach involving community participation so that the rural economy is strengthened as well as forest resources are conserved through public involvement

DEFORESTATION

- I. Deforestation is the permanent destruction of indigenous forests and woodlands. The term does not include the removal of industrial forests such as plantations of gums or pines.
- II. Deforestation has resulted in the reduction of indigenous forests to four-fifths of their pre-agricultural area. Indigenous forests now cover 21% of the earth's land surface.
- III. Deforestation refers to the loss of forest cover (or) the aimless destruction of trees. The clearing of forests across the earth has been occurring on a large scale basis for many centuries. This process involves the cutting down, burning and damaging of forests.
- IV. Currently 12 million hectares of forests are cleared annually and the current rate of deforestation continues, the world's forests will vanish within the next 100 years about 80% of the original forests on the earth have already been cleared.

Causes for Deforestation

Agriculture: Conversion of forests to agricultural land to feed growing numbers of people.

- Commercial logging: Destroys
- The cash crop economy: Raising cash crops for increased economy.
- Mining
- Increase in population: The needs also increase and utilize forests resources.
- Urbanization & industrialization
- Mineral exploration

- Construction of dam reservoirs
- Infrastructure development
- Forest fires
- Human encroachment & exploitation
- Pollution due to acid rain

Environmental effects /Consequences of deforestation

- Food problems.
- Ecological imbalance
- Increasing CO₂
- Floods leading to soil erosion
- Destruction of resources
- Heavy siltation of dams
- Changes in the microclimate
- Loss of biodiversity
- Desiccations of previously moist forest soil
- Environmental pollution
- Global warming

MAJOR CAUSES OF DEFORESTATION:

- a) Shifting cultivation : There are an estimated 300 million people living as shifting cultivators who practice slash and burn agriculture and are supported so clear more than 5 lakh ha of forests for shifting cultivation annually. In India, we have this practice of North-East and to some extent in Andhra Pradesh, Bihar and M.P. which contribute to nearly half of the forest clearing annually.
- b) Fuel requirements: Increasing demands for fuel wood by the growing population in India alone has shot up to 300-500 million tons in 2001 as compared to just 65 million tons during independence, thereby increasing the pressure on forests.
- c) Raw materials for industrial use: Wood for making boxes, furniture, railway-sleepers, plywood, match boxes, pulp for paper industry etc. have exerted tremendous pressure on forests. Plywood is in great demand for packing tea for Tea industry of Assam while fir tree wood is exploited greatly for packing apples in J & K.
- d) Development projects: Massive destruction of forests occurs for various development projects like hydroelectric projects, big dams, road construction, mining etc.
- e) Growing food needs: In developing countries this is the main reason for deforestation. To meet the demands of rapidly growing population, agricultural lands and settlements are created permanently by clearing forests.

- f) Overgrazing: The poor in the tropics mainly rely on wood as a source of fuel leading to loss of tree cover and the cleared lands are turned into the grazing lands. Overgrazing by the cattle leads to further degradation of these lands.
- g) Conversion of forests and woodlands to agricultural land to feed growing numbers of people

MAJOR ACTIVITIES AND THREATS TO FORESTS RESOURCES :

- I. Timber Extraction: Logging for valuable timber, such as teak and Mahogany not only involves a few large trees per hectare but about a dozen more trees since they are strongly interlocked with each other by vines etc. Also road construction for making approach to the trees causes further damage to the forests. The steps in timber extraction are: a) Clear felling b) Mechanized logging c) Manual logging d) Selective logging
- II. Mining: Mining operations for extracting minerals and fossil fuels like coal often involves vast forest areas. Mining from shallow deposits is done by surface mining while that from deep deposits is done by sub-surface mining. More than 80000 ha of land of the country is presently under the stress of mining activities. Mining and its associated activities require removal of vegetation along with underlying soil mantle and overlying rock masses.
- III. This results in defacing the topography and destruction of the landscape in the area. Large scale deforestation has been reported in Mussorie and Dehradun valley due to indiscriminating mining of various minerals over a length of about 40 Km.

DAMS AND OTHER EFFECTS ON FOREST AND TRIBAL PEOPLE

- Forest are directly are indirectly effected by the forest. Hydro-electric dams are main cause for deforestation. About 40,000 large dams are currently obstructing Workloads Rivers. Destruction of forest occurs for constructing big dams, which alters ecological balance.
- In these way landslides, droughts and floods conditions may rise in area. Socio-economic problems related to tribal and native people results from big dam construction Dam construction produces a number of health hazards.
- Thousands of workers who build the dams attacked by the diseases like AIDS, measles, tuberculosis, syphilis etc.
- Dam building has resulted in wide range human rights violations. Rehabilitation policy of the government is 11 important and typical when most of the displaced persons are tribal people. Tribal life and culture are mostly associated with forest.

CONSERVATION

Conservation derived from two Latin words, con – together, servare – to keep or guard measures, i.e. an act of preservation or to keep together. Concepts in conservation • Restraining cutting of trees and submerging the forests

- Reforestation
- Afforestation
- Control forest diseases and forest fire
- Recycling forest products
- Replacing forest products

CASE STUDIES:

1. Chipko movement related to mining or quarrying opposed by SundarlalBahuguna in North India. The first Chipko action took place spontaneously in April 1973 and over the next five years spread to many districts of the Himalaya in Uttar Pradesh.
2. The name of the movement comes from a word meaning 'embrace': the villagers hug the trees, saving them by interposing their bodies between them and the contractors' axes. The Chipko protests in Uttar Pradesh achieved a major victory in 1980 with a 15-year ban on green felling in the Himalayan forests of that state by order of India's then Prime Minister, Indira Gandhi.
3. Since then the movement has spread to Himachal Pradesh in the North, Kamataka in the South, and Rajasthan in the West, Bihar in the East and to the Vindhya in Central India.
4. In addition to the 15-year ban in Uttar Pradesh, the movement has stopped clear felling in the Western Ghats and the Vindhya and generated pressure for a natural resource policy which is more sensitive to people's needs and ecological requirements.
5. Sardar Sarovar – Narmada project is a multipurpose project in Gujarat

Desertification in hilly regions of the Himalayas:

- Desertification in Himalayas, involving clearance of natural forests and plantation of monocultures like *Pinus roxburghi*, *Eucalyptus camadulensis* etc., have upset the ecosystem by changing various soil and biological properties.
- The area is invaded by exotic weeds. These areas are not able to recover and are losing their fertility.

Disappearing Tea gardens in Chhota Nagpur : Following the destruction of forest rain fall declined in Chhota Nagpur to such an extent that tea-gardens also disappeared from the region

Waning rain fall in Udhagamandalam : The rainfall pattern was found to fluctuate with wooded land area in the hills. When the Nilgiri mountains had luxuriant forest cover annual rainfall used to be much higher

MCQ

1. Write detail note on forest resources
2. Write note on deforestation
3. Write the causes of deforestation

RCP