

Management Topic in Environmental Studies)  
B. Tech 7<sup>TH</sup> Semester



**Forest Resources**

Unit 2  
Natural Resources

Department: Chemistry  
Subject: MTES (CHM2049)



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# Forrest Resources

- Forests are one of the most important natural resources on this earth
- 1/3rd of the worlds land area is forested
- Former USSR accounts for about 5<sup>th</sup> of the worlds forests,
- Brazil for about a 7th and Canada and USA each for 6-7%.
- Natural forests has declined over the years.

The greatest loss in tropical Asia where 1/3 of the forest resources have been destroyed

# Direct benefits from forests

**(a) Fuel Wood:** Wood is used as a source of energy for cooking purpose and for keeping warm.

**(b) Timber:** Wood is used for making furniture, tool-handles, rail sleepers, matches, ploughs, bridges, boats etc.

**(c) Bamboos:** These are used for matting, flooring, baskets, ropes, rafts, cots etc.

**(d) Food:** Fruits, leaves, roots and tubers of plants and meat of forest animals form the food of forest tribes.

**(e) Shelter:** Mosses, ferns, insects, birds, reptiles, mammals and microorganisms are provided shelter by forests.

**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.



## Direct benefits from forests

- (f) **Paper:** Wood and Bamboo pulp are used for manufacturing paper  
(Newsprint, stationery, packing paper, sanitary paper)
- (g) **Rayon:** Bamboo and wood are used in the manufacture of rayon (yarns, artificial silk-fibres)
- (h) **Forest Products:** Tannins, gums, drugs, spices, insecticides, waxes, honey, horns, musk, ivory, etc. are all provided by the flora and fauna of forests.

## The indirect benefits from forests

- (a) **Conservation of Soil:** Forests prevent soil erosion by binding the soil with the network of roots of the different plants and reduce the velocity of wind and rain which are the chief agents causing erosion.
- (b) **Soil-improvement:** The fertility of the soil increases due to the humus which is formed by the decay of forest litter.

## Indirect benefits from forests

- **(c) Reduction of Atmospheric Pollution:** By using up carbon dioxide prevent global warming and giving off oxygen during the process of photosynthesis, forests reduce pollution and purify the environment.
- **(d) Control of Climate:** Transpiration of plants increases the atmospheric humidity which affects rainfall and cools the atmosphere.
- **(e) Control of Water flow and Regulation of Hydrological Cycle:** In the forests, the thick layer of **humus** acts like a big sponge and soaks rain water **preventing run-off**, thereby preventing flash-floods. **Humus prevents quick evaporation** of water, thereby ensuring a perennial supply of water to streams, springs and wells.
- About 50-80 % of the moisture in the air above tropical forests comes from their **transpiration** which helps in bringing rain

## Over exploitation of forests

- Humans depended heavily on forests for food, medicine, shelter, wood and Excessive use of fuel wood and charcoal,
- Raw material like timber, pulp, minerals, fuel wood etc.
- large scale logging, mining, road-building, Industry, Dam and hydropower
- National economy. The international timber trade alone is worth over US \$ 40 billion per year.
- Rapid Urbanization, agricultural and industrial areas and overgrazing

# Deforestation

- The total forest area of the world in 1900 was 7,000 million hectares  
in 1975 reduced to 2890 million ha  
by 2000 drop down to 2,300 million ha
- Deforestation rate is relatively less in temperate countries, but alarming in tropical countries 40-50 percent
- The rate at which deforestation is occurring is a matter of great concern. Currently, 12 million hectares of forests are cleared annually.
- At this rate all moist tropical forest could be lost by the year 2050, except for isolated areas in -Amazonia, the Zaire basin (Congo), as well as a few protected areas within reserves and parks.
- Some countries such as Ivory Coast, Nigeria, Costa Rica, and Sri Lanka are likely to lose all their tropical forests if no conservation steps are taken.



# Deforestation

- The forested area in India seems to have stabilized since 1982 with about 0.04% decline annually between 1982-90.
- FAO (1983) estimated that about 1.44 m ha of land was brought under afforestation
- The target forest area 33% But at present 19.27 % of our land area ,(63.38m ha) covered by forests based on satellite data (MoEF, 1998)

# Causes of Deforestation

## (1) Population Explosion:

- **i)** Vast areas of forest land are cleared of trees to reclaim land for human settlements (factories, housing, roads, railway tracks etc.).
- **ii) Development projects:** Massive destruction of forests by development projects like hydroelectric projects, big dams, road construction, mining etc
- **iii) Raw materials for industrial use:** Wood for making boxes, furniture, railway-sleepers, plywood, match-boxes, pulp for paper industry. Plywood for packing tea for Tea industry fir tree for Apple
- **iv) Fuel requirements:** like timber, firewood, paper and other valuable products of industrial importance, all necessitating felling of trees.
- **v) Shifting cultivation:** slash and burn for agriculture clear more than 5 lakh ha of forests annually. This practice in North- East and to some extent in Andhra Pradesh, Bihar and M.P
- **vi) Growing food needs:** To meet the demands of rapidly growing population, agricultural lands and settlements are created permanently by clearing forests.

# Forest Fires

## 2. Fires in the forests may be due to natural calamities or human activities:

- (a) **Smoldering** (burning slowly without flame) of the **humus and organic matter** forming a thick cover over the forest floor (i.e. ground fires).
- (b) **Dried twigs** and leaves may catch fire (i.e. surface fires).
- (c) In densely populated forests, **tree tops** may catch fire by heat produced by constant rubbing against each other (i.e. crown fires).
- (d) **Human activities** like clearing forest for habitation, agriculture, firewood, construction of roads, railway tracks and carelessness (throwing burning cigarette stubs on dried foliage).
- Fire destroys fully grown trees, results in killing and scorching of the seeds, humus, ground flora and animal life.

- **(3) Grazing Animals:**

Trampling of the forest soil in the course of overgrazing by livestock has effects such as loss of porosity of soil, soil erosion and desertification of the previously fertile forest area.

- **(4) Pest Attack:**

Forest pests like insects etc. destroy trees by eating up the leaves, boring into shoots and by spreading diseases.

- **(5) Natural Forces:**

Floods, storms, snow, lightening etc. are the natural forces which damage forests.

# Effects of Deforestation

- Forests are closely related with climatic change, biological diversity, wild animals, crops, medicinal plants etc.
- **Large scale deforestation has many far-reaching consequences:**
  - (a) Habitat destruction of wild animals (tree using animals are deprived of food and shelter.)
  - (b) Increased soil erosion due to reduction of vegetation cover.
  - (c) Reduction in the oxygen liberated by plants through photosynthesis.
  - (d) Increase in pollution due to burning of wood and due to reduction in CO<sub>2</sub> fixation by plants.



- (e) Decrease in availability of forest products.
- (f) Loss of cultural diversity
- (g) **Loss of Biodiversity**: along with that genetic diversity is eroded.
- (h) Scarcity of fuel wood and deterioration in economy and quality of life of people residing near forests.
- (i) **Lowering of the under ground water table** due to more run-off and increased use resulted the frequency of droughts.
- (j) **Rise in CO<sub>2</sub> level**: cause global warming and enhance melting of ice caps and glaciers and consequent flooding of coastal areas.

# Deforestation due to Mining activity

- Mining operations for extracting minerals and fossil fuels like coal often involves **removal of vast forest and vegetation** areas.
- More than 80,000 ha of land under the stress by mining activities
- This results **ruining the topography** and destruction of the landscape in the area.
- Large scale **deforestation in Mussorie and Dehradun valley** due to mining declined at an average rate of 33%
- Mining in forests of Goa since 1961 has destroyed more than 50,000 ha of forest land.
- Coal mining in Jharia, Raniganj and Singrauli areas have caused extensive deforestation in Jharkhand.
- The rich forests of Western Ghats are also facing the same threat due to mining projects for excavation of copper, chromite, bauxite and magnetite.

# Dams and their Effects on and Tribal People

- India has more than 1550 large dams, Maharashtra (more than 600), Gujarat (more than 250) and Madhya Pradesh (130). The highest one is Tehri dam, on river Bhagirathi in Uttarakhand and the largest in terms of capacity is Bhakra dam on river Satluj in H.P.
- For building big dams, large scale devastation of forests takes place which breaks the natural ecological balance of the region.
- Floods ,droughts and landslides become more prevalent in such areas.
- Loss flora fauna, medicinal plant
- Lost wild life habitat
- Tribal people displaced, Vector borne disease increases , Vulnerable of earth quake



I thank  
you!

