

DSE 1 : NATURAL RESOURCE MANAGEMENT

UNIT – 6

**Forest**

(Part – 1)

**Definition of forest :**

The standard definition of forest in India is as follows: "A forest is a land area of more than 0.5 ha, with a tree canopy cover of more than 10%, which is not primarily under agricultural or other specific non-forest land use. In the case of young forests or regions where tree growth is climatically suppressed, the trees should be capable of reaching a height of 5 m in situ, and of meeting the canopy cover requirement."

**Deforestation and its causes:**

Deforestation means clearing the forest or stands of trees, and using that land for other purposes.

Following are the main causes of deforestation:

- (i) Procuring land for cultivation
- (ii) Building houses and factories
- (iii) Making furniture or using wood as fuel.
- (iv) Some natural causes of deforestation are forest fires and severe droughts.

**Forest conservation:**

Forest conservation is the practice of planning and maintaining forested areas for the benefit and sustainability of future generations.

**Social forestry:**

Social forestry means the management and protection of forests and afforestation on barren lands with the purpose of helping in the environmental, social and rural development.

The term, social forestry, was first used in India in 1976 by The National Commission on Agriculture, Government of India.

## Forest Cover and its significance:

Forest cover includes all lands which have a tree canopy density of more than 10% when projected vertically on the horizontal ground, with minimum aerial extent of one hectare. Forests are a very crucial natural resource and have always been central in human life. Forests provide renewable raw materials and energy, maintain biological diversity, mitigate climate change, protect land and water resources, provide recreation facilities, improve air quality, and help alleviate poverty.

According to India state of forest report, India's Forest Cover accounts for 21.05% of the total geographical area of the country and tree cover (Tree Cover is defined as tree patches outside recorded forest areas exclusive of forest cover and less than the minimum mappable area of one hectare) accounts for 2.82% of India's geographical area.

Forests have a crucial role to play in a nation's economy and hence the Government of India emphasized their importance in conservation, restoration, stability, and ecological balance in the 1988 National Forest Policy. Better forest management practices were introduced and the Indian Forest Service, one of the three All India Services, was constituted in the year 1966 by the Government of India.

An accurate assessment of forest and tree resources in the country is essential for formulating a sound strategy for the forestry sector. Forest Survey of India (FSI) assesses the forest cover of the country by interpretation of remote sensing satellite data. The major activities of FSI include – Forest Cover Assessment, Inventory of Forest areas, Thematic Maps, Inventory of Trees outside Forests (Rural & Urban), Inventory data processing, Methodology Design, Training and Extension, Projects and Consultancies. FSI publishes all the analyzed data and results in a biennial report called 'State of Forest Report' (SFR).

Depending on the forest cover, forests are classified as follows :

- (i) **Very dense forest** : All lands with tree canopy density of 70% and above.
- (ii) **Moderately dense forest** : All lands with tree canopy density between 40% and 70%.
- (iii) **Open forest** : All lands with tree canopy density between 10% and 40%.
- (iv) **Scrub** : Degraded forest lands with canopy density less than 10%.
- (v) **Non-forest** : Area not included in any of the above classes.

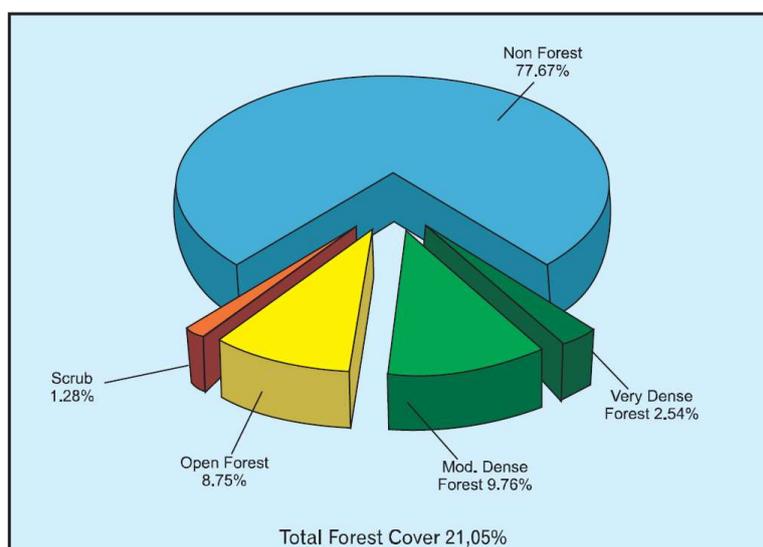


Fig. 2.5.1 : Pie-Chart showing Forest Cover of India



**Very Dense forest (2.5% of India)**



**Moderately Dense Forest (9.5%)**



**Open Forest (9% of India)**



**Scrub (1.5% of India)**

### **Ecological Importance of Forests:**

A forest is in constant interaction with its environment. The most significant environmental factors are micro climate, soil characteristics, availability of moisture and biological activities.

The forest are not only valued for the direct benefits of forest products, but also for the indirect benefits.

The ecological importance of forests has been listed here:

#### **(1) Forest helps in ameliorating climatic extremes:**

Trees shield the ground from direct exposure to the sun. Therefore, the temperature underneath the trees is lower and the ground cooler. During the day, the leaves utilise sunlight for photosynthesis. Heat is mainly given out at night during respiration. As a result, temperature on the forest floor remains low during the day and higher during the dark hours of night. This reduces loss of water due to evaporation.

## **(2) Forest tends to increase the rainfall of a locality:**

Extensive forests condense low clouds. To some extent, this increases precipitation. Therefore, afforestation measures are taken to improve arid regions.

## **(3) Forest stems wind-velocity:**

Strong winds cause serious soil erosion if the soil is dry and devoid of vegetation. Therefore wind-breaks and shelter belts are planted to protect crops.

## **(4) Forest cover checks run-off from the surface and thus reduces soil erosion:**

Forests guard the soil by putting up a wall of operation to combat the initial forces of erosion. This is done at three levels, canopy, ground and underground levels:

- (i) The canopy is often so thick that it reduces the forceful impact caused by raindrops.
- (ii) At the ground-level, there is a dense mat of leaf-litter and other vegetable matter. This obstructs the surface flow and checks the velocity of run-off.
- (iii) At the underground level, the litter and humus forms an organic blanket. This blanket performs the function of a sieve. The water slowly filters downward through it and then to the underlying soil layer. The numerous root hairs hold capillary and hygroscopic water around them.

## **Major Products of Forest:**

Major forest products are also known as timber forest products. These include :

### **(1) Timber:**

Forest provides us with both hard woods and soft woods. Tropical hard woods include sal, teak, ebony, greenheart, mahogany, ironwood, logwood, simul, sissoo etc. Soft woods include pine, blue pine, fir, spruce, cedar, poplar etc.

There are various industries that are solely dependent on timber. Saw mills, hardboard factories, chip board factories, plywood factories, match industry, window, door and furniture-making industries are a few of them. Timber is also used to make packing boxes, sports goods, wooden toys, railway sleepers etc.

### **(2) Paper Pulp:**

90% of the world's paper is manufactured from the soft wood pulp obtained from coniferous trees. Due to this reason paper industries dominate in USA, Canada, Russia,

Norway, Sweden and Finland, which account for the greatest concentration of coniferous forests.

### **(3) Cellulose:**

The cellulose obtained from soft woods is used to manufacture synthetic fibre or rayon. The wood from spruce trees yields finest quality rayon.

### **(4) Fuel Wood, Fine-wood and Charcoal:**

Forest provides fuel-wood to millions, especially in developing countries, for cooking and heating. Fine-wood is also obtained from forests. However, in doing so, forests are last being depleted.

## **Minor Products of Forest:**

Not only wood, forests provide us with a number of minor products that are essential to the industries. These products are also known as non-timber forest products. In India, these minor products are used to manufacture valuable articles for export.

The important minor products of economic value in India can be categorized as following:

### **1. Edible Products :**

- Fruits, flowers, seeds, roots, rhizomes, tubers, etc., of several forest species are edible.
- Fruits like mango, jujube, wood-apple, berries, etc and seeds of cashew, tamarind, java plum, goose berry, almond, etc; flowers of mahua, green pods of drumstick tree, etc are important edible products.
- Fungi, particularly mushrooms, are the perhaps the best known and documented edible forest products.

### **2. Grasses, bamboos and canes :**

- Some grasses like sabai (*Eulaliopsis binata*) are also used for rope and papermaking.
- The roots of khus grass are used for making cooling screens.
- Munj, a tall grass is used for making chinks, stools, chairs, etc. and the leaves are twisted into strings.
- The bamboo is used for housing, for rural agricultural works, for paper pulp, for packaging and other uses such as roofing, walling, flooring, matting, basketry etc.

- Canes grows abundantly in moist forests and is mainly used for making strings, ropes, mats, bags, baskets, furniture, walking sticks, umbrella handles, sports goods, etc.

### **3. Resins and gums :**

- Resin is mainly obtained from pine trees which grow in the Himalayan region in Arunachal Pradesh, Uttaranchal, Himachal Pradesh, Jammu & Kashmir and some parts of Punjab.
- Turpentine is mainly used as a solvent for paints and varnish, synthetic camphor, pine oil, disinfectants, pharmaceutical preparations, wax, boot polish and industrial perfumes.
- White resin is an important raw material for several industries of paper, paint, varnish, soap, rubber, water proofing, linoleum, oils, greases, adhesive tape, phenyl, plastics etc.
- Gums are exuded from the stems or other parts of different trees. The most important gum is Karaya, obtained from *Sterculia urens* or *S. villosa* trees of deciduous forests.
- It is mainly used in textiles, cosmetics, confectionery, medicines, inks, pastes, cigar, etc.

### **4. Dyes and Essential Oils**

- Some important dyes are obtained from red sander (bright red), Khair (chocolate), flowers of Palas, fruits of Kamala tree or Kumkum tree (*Mallotus philipinsis*), bark of wattle and roots of Indian mulberry (*Morinda tinctoria*).
- A large number of plants and trees which grow in Indian forests contain several types of oils which are used to manufacture soaps, cosmetics, confectionary and pharmaceutical preparations, etc. Commercially important oils are obtained from sandalwood, lemon grass, khus and eucalyptus.

### **5. Drugs, Medicines and Spices :**

- Thousands of drugs are obtained from fruits, flowers, roots, stems and leaves of different types of trees, plants and herbs. Quinine is the most important drug obtained from Indian forests.
- Roots of ashwagandha, semal, dhatura, sargandha, morphal etc; leaves of ban nimbu, dhatura, etc are used as medicinal products.

- Spices are used to add aroma or pungency to food to flavour certain dishes. The important spices are cinnamon or dalchini, lesser cardamom (chhoti ilayachi), greater cardamom (bari ilayachi), etc.

## **6. Fibres and Flosses :**

- A wide range of plants, yielding fibre occur in the forests of India. Fibres are obtained from the tissues of different parts of certain woody trees. Most of such fibres are coarse and are used for making cloth, rope and cordage. Other fibres including jute, cotton, etc.
- Flosses are obtained from certain fruits and are used for stuffing pillows, mattresses, etc.

## **7. Animal Products**

- Lac is the most important animal product obtained from the forests. It is secreted by a minute insect (*Laccifer lacca*) which feeds on the saps of a large variety of trees like palash, peepul, kusum, sissoo, sisir, kul, ber, banyan, jujuba. These trees grow extensively in the Chhota Nagpur plateau. At present it is widely used in medicines, plastics, electrical insulation material, dyeing silk, making bangles, paints, sealing wax and wood finishing, ornamental articles, etc.
- The other animal products are honey, wax, silk moths, horns and hides of dead animals, ivory, antlers of deer, etc.