NATURAL VEGETATION

Natural Vegetation refers to the plant cover that has not been disturbed over a long time, so as to allow its individual species to adjust themselves fully to the climate and soil conditions. Thus, grasses, shrubs and trees, which grow on their own without any human interference, constitute the natural vegetation of an area.

Flora refers to plants of a particular region or period, listed as species and considered as a group.

Vegetation refers to the assemblage of plant species living in association with each other in a given environmental set up.

Forest refers to a large tract of land covered with trees and accompanying undergrowth of shrubs, herbs and sustaining thousands of life forms, which include both plants and animals.

IMPORTANCE OF FORESTS

(i) Productive Functions: Various trees provide us with products such as fruits, leaves, roots and tubers of plants. **Wood** is used for making furniture in houses as well as industrial units. Wood and bamboo pulp are used for manufacturing paper and paper boards. Wood is used indiscriminately as a source of energy for cooking and for providing warmth.

Forest products, other than timber and firewood, include fibres, essential oils, oil seeds and edible plants. **Bamboos** provide a means of livelihood for the tribals who make mats, baskets, ropes, etc., using bamboo. It is also used in the manufacture of rayon (yarns and artificial silk fibres).

(ii) Protective Functions: Forests control the water flow. The thick layer of humus in the forests prevents evaporation of water. The humus acts as a natural sponge and helps to soak the rain water in the soil. It increases the fertility of the soil. The forest with its

complex root system binds the soil thereby preventing soil erosion and loss of nutrients.

(iii) Regulatory Functions: The trees absorb carbon dioxide and release oxygen during photosynthesis. They also regulate the water cycle. The trees absorb water from the ground, release water into the atmosphere which helps to form clouds and precipitation, which brings water again into the soil, thus completing the Water Cycle.

(iv) Accessory Functions: Accessory functions of the trees means that the forests provide habitat for the wildlife. Forests also provide aesthetics and recreation to human beings through National Parks, Wildlife Sanctuaries and Biosphere Reserves.

TYPES OF VEGETATION

The country can be divided into five major vegetation regions, which are: (i) Tropical Evergreen; (ii) Tropical Deciduous; (iii) Tropical Desert; (iv) Littoral; and (v) Mountain.

1. TROPICAL EVERGREEN OR RAIN FORESTS

(a) Climatic Conditions: These forests are found in the areas where the annual rainfall is more than 200 cm, average annual temperature is between 25°C and 27°C and average annual humidity exceeds 77 per cent.

(b) Distribution: These forests are chiefly distributed in the heavy rainfall areas of the western slopes of the Western Ghats, hills of

north-eastern region and the island groups of Lakshadweep, the Andaman and Nicobar and Tamil Nadu coast.

(c) Characteristic Features:

(i) It has a luxuriant vegetation of all kinds - trees, shrubs and creepers giving it a multi-layered structure.

(ii) Trees reach great heights of more than 60 m.

(iii) The carpet layer of herbs and grasses cannot grow because of the dense canopy of trees which do not allow enough sunlight to reach the ground.

(iv) The trees in these forests do not have a fixed time to shed their leaves, to flower or for fruition. That is why these forests appear green all the year round.

The main variety of trees found in these forests include rosewood, ebony, mahogany, toon, chaplas, sissoo, gurjan, telsur, etc.

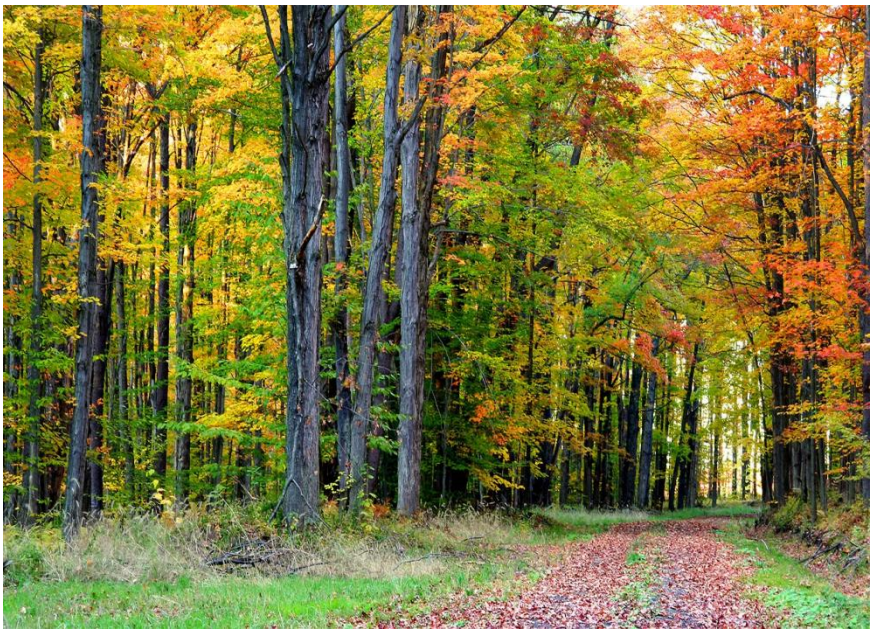
(d) Economical Value: Tropical Evergreen forests produce various plant species of high economic value.

2. TROPICAL DECIDUOUS FORESTS

These forests are also known as the monsoon forests. They are the most widespread forests in India. Based on the availability of water, these forests are further categorised into two types:

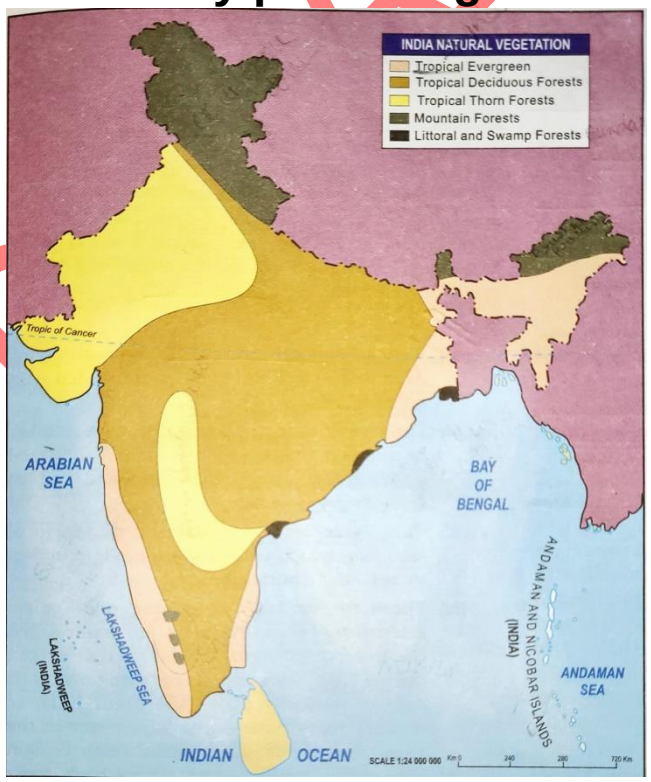
(i) the moist deciduous forests; and

(ii) the dry deciduous forests.



(i) The Moist Deciduous Forests

(a) Climatic Conditions: Such forests are found in areas with moderate or low annual rainfall of 100 cm to 200 cm and the mean annual temperature of 24°C and 27°C and humidity percentage of 50 to 80.



(b) Distribution: These forests occur in the north-eastern part of the Peninsula, along the foothills of Himalayas and eastern slopes of the Western Ghats. They occupy a sizeable area in Uttar Pradesh, Maharashtra, Karnataka and Tamil Nadu and have an area bigger than the Evergreen forests.

(c) Characteristic Features:

(i) The trees in these forests shed their leaves from six to eight weeks during spring and early summer when the storage of water is acute.

(ii) A particular species can be found over a large area.

(iii) They are commercially most exploited forests of India.

The common trees of such forests are sal, teak, arjun, shisham, mahua, mulberry, palas, semul and sandalwood.

(d) Economical Value: Tropical Deciduous Forests are commercially the most exploited. Besides providing valuable

timber, they provide various other products. *Sandalwood* found in these forests is in great demand in India and abroad.

(ii) Dry Deciduous Forests

(a) Climatic Conditions: These forests are found in areas having a mean annual temperature of 23°C to 27°C, annual rainfall between 70 cm to 100 cm and humidity between 51 to 58 per cent.

(b) Distribution: These forests are found in the rainier parts of the Peninsular Plateau and the plains of Bihar and Uttar Pradesh.

(c) Characteristic Features: These forests thrive between moist deciduous forests (in the east) and tropical thorn forests (in the west). During the dry season, the trees in these forests shed their leaves completely and give the forests a look of a vast grassland with naked trees.

The common trees of these forests are teak, tendu, sal, rosewood, amaltas, bel, khair, axlewood, etc.

(d) Economical Value: The trees of these forests provide timber, fruits and other useful products. Large tracts of these forests have been cleared for agricultural activities.

3. TROPICAL DESERT FORESTS

These are also known as Tropical Thorn Forests.

(a) Climatic Conditions: **These forests are found in the areas which receive rainfall less than 50 cm, the mean annual temperature ranges between 25°C to 27°C and has humidity below 47 per cent.**

(b) Distribution: **These forests are chiefly distributed in south-western Punjab, Haryana, Uttar Pradesh, central and eastern Rajasthan, Madhya Pradesh, Chhattisgarh, Gujarat, parts of Maharashtra, Karnataka and Andhra Pradesh.**

(c) Characteristic Features

(i) These forests have Xerophytic vegetation. Due to scarcity of rainfall, the trees are stunted with large patches of coarse grasses.

(ii) These forests have trees which have adapted themselves to survive in drought like conditions and are called xerophytes. For example, the acacia or babool trees have developed long tap roots that can reach deep, ground water resources and therefore, can survive drought like conditions.

(iii) In these forests, plants remain leafless for most part of the year and look like scrub vegetation.

The important trees found here include babool or acacia, date palm, ber, khair, neem, khejri, kanju, cacti, kokko, etc.

(d) Economical Value: **Ber fruit is eaten raw or made into pickle or beverages. Its timber is hard, strong, tough and durable. It is used to make legs for bedsteads, boat ribs, agricultural implements,**

charcoal, etc. Babool bark and gum have medicinal value. Date Palm is eaten raw and also used as an astringent, as a decoction, syrup or paste for sore throat, cold, fever, etc. Neem bark and roots have medicinal properties. Neem oil, leaves and neem extracts are used to manufacture health and beauty products. It is also used as an insecticide.

4. LITTORAL OR TIDAL FORESTS

(a) Climatic Conditions: These forests are found in wet marshy areas, in river deltas, in tidal or other swampy areas and along the sea coasts.

(b) Distribution: These forests are chiefly distributed in the deltas of large rivers on the eastern coast and in pockets on the western coast in saline swamps of Sunderbans in West Bengal and coastal areas of Andhra Pradesh and Odisha.

(c) Characteristic Features:

(i) They have mainly evergreen species of varying density and height, usually associated with wetness.

(ii) The tree trunks are supported by a number of stilt like roots which remain submerged under water during high tide and can be seen during low tide.

(iii) They have profuse growth with tangle of climbers, which is an adaptation for survival in soft and shifting mud.

(iv) These forests have breathing roots called pneumatophores. Because of waterlogged conditions, the roots are deprived of oxygen during high tides. These vertical roots have pores which

enable the trees to breathe when other roots remain sub merged under water during high tide.

The important trees include keora, amur, bhara, rhizophora, screw pines, canes and palms, sundari, agar, etc. Mangrove forests grow along the coasts in the salt marshes, tidal creeks, mud flats and estuaries. They are found in the Andaman and Nicobar Islands and West Bengal, Mahanadi, the Godavari and the Krishna deltas.

These forests have **Sundari trees**, after the name of which these forests are known as **'Sunderbans'** in the Ganga Delta.

(d) Economical Value: Mangrove trees are utilised for fuel whereas sundari trees provide hard durable timber.

5. MOUNTAIN FORESTS

In the mountain regions temperature decreases with altitude. This has a corresponding effect on the natural vegetation of the mountain regions.

(a) Climatic Conditions: These forests are found in areas where annual temperature is 12°C to 13°C, rainfall is between 100 and 300 cms and annual humidity is between 56 and 65 per cent.

(b) Relief: These forests occur at an altitude between 1000m to 4000m.

(c) Distribution: These forests cover the entire Himalayan zone. In the Peninsular region they are found in the Vindhyas, Nilgiris and the Western Ghats.

(d) Characteristics Features:

(i) These forests contain mixed species of broad leafed evergreen trees and conifers. They also contain scrubs, creepers and ferns.

(ii) At the foothills of the Himalayas deciduous forests are found.

(iii) At an altitude of 1000m to 2000m they are the moist temperate forests.

(iv) In the hilly areas of West Bengal and Uttarakhand, evergreen broad leaf trees like chestnut and oak are found.

(v) Between the altitude of 1500m and 1750m, coniferous trees like Chir pine is an important tree. At an altitude of 2250m and 3000m blue pine and spruce are found.

The important trees found in these forests include magnolia, laurel, cinchona, wattle, jamun, plum, etc.

CORRELATION OF THE FORESTS WITH ENVIRONMENT

Forests have close interrelationship with the environment. Forests play a vital role in protecting the environment by performing the following functions:

- Forests are the moderators of climate. They play an effective role in controlling humidity, temperature and precipitation.
- Forests play dominant role in carbon cycle. They absorb atmospheric Carbon dioxide and help in maintaining the purity of air and controlling atmospheric pollution.
- Forests help in controlling soil erosion, soil degradation and floods. That is why they are very helpful in land reclamation and flood control.
- Forests help in water percolation and thereby maintain underground water table.
- Decay of plant leaves provides humus to the soils and increases their fertility.

FOREST CONSERVATION

Man has been overexploiting the forests to satisfy not only his needs but also his greed. This has led to a decline in the forest cover.

Causes of Deforestation: factors that led to the decline in forests

- **Due to rapid population growth and the demand for more food, forests have been cleared to convert them into agricultural land.**
- **Forests have been converted into pasture land for expanding dairy farming and cattle ranching.**
- **Overgrazing in the forests by animals in the tropical and sub-tropical regions has resulted into large-scale degradation of natural vegetation.**
- **Ever increasing demand for timber for various purposes due to industrial expansion and urbanisation has added to the problem of deforestation.**
- **Construction of multi-purpose river valley projects has led to submergence of land and destruction of forested riversides.**

Effects of Deforestation

(i) Decline in the forests have led to the decline in forest productivity.

(ii) Absence of forest cover leads to soil erosion which increases load of the rivers. Siltation causes floods which destroy property, crops and living beings.

(iii) Lack of forest cover reduces precipitation, thus causing droughts.

(iv) The absence of forests increases the concentration of carbon dioxide in the atmosphere. Thus, *increasing greenhouse effect in the atmosphere*.

Hence, conservation of forest is of vital importance for the survival and prosperity of human kind.

CONSERVATION MEASURES

Following conservation practices must be undertaken:

(i) Increasing the Area Under Forests: Loss of forests can be remedied by a massive programme of tree plantation. Planting trees on degraded lands and land that is unfit for agriculture will not only help in improving the environment but will also relieve harvesting pressure on these forests.

(ii) Afforestation around Industrial Units: To prevent industrial pollution, trees are planted around the cities having Iron and Steel Plants. The trees act as a barrier for the dust and purify the air.

(iii) Stopping Indiscriminate Felling of Trees: There should be a strict ban on felling of naturally growing trees. If a tree has to be cut, necessary permission has to be obtained. Besides, proper replacement of trees by planting saplings at least in the ratio of 1:10 (1 tree to 10 saplings) should be undertaken.

(iv) Establishing Corridors between Different Reserved Forests: Wide corridors should be established in different reserved forests to allow the migration of wild animals.

(v) Using Alternative Sources of Energy: We must use non-conventional or renewable sources of energy, like solar energy, tidal energy, hydel energy, etc. in place firewood.

(vi) Proper Legislation and its Implementation: Strict laws should be made to its check deforestation. Proper care should be taken to see that these laws are strictly implemented.

(vii) People's Participation: Participation of the local community is of utmost significance if any plan has to be enforced since the local inhabitants are the ultimate users.

(viii) Developing badlands and barren lands into vegetation belts.

DRAFT NATIONAL FOREST POLICY 2018

Draft National Policy 2018 aims at sustainable forest management by incorporating elements of ecosystem security, climate change, forest hydrology, robust framework *to monitor and develop forest cover and strengthening the overall environmental balance*.

- The overall **objective and goal** of the policy is to safeguard the ecological balance and livelihood of people, of the present and future generations, based on sustainable management of the forests.
- The country should have a minimum of *one-third of the total land area under forest and tree cover and two-thirds in the hills and mountainous regions*. This will help to prevent soil erosion and land degradation and ensure the stability of the fragile eco-systems.
- Reverse the degradation of forest by taking up rehabilitation without compromising its natural profile.
- Checking denudation and soil erosion in the catchments of rivers and the wetlands through integrated watershed management techniques and practices.
- Maintenance of the health of forest vegetation and forest soils for enhancing water supplies through recharge of underground aquifers and regulation of surface water flows.

• Increase substantially the tree cover outside forests by promoting agro-forestry and farm forestry.

• Integrate climate change mitigation and adaptation measures in forest management through the mechanism of REDD+(Reducing Emissions from Deforestation and Forest Degradation plus) so that the impacts of the climate change is minimised.

• Managing and expanding green spaces in urban and peri-urban areas (outskirts or hinter land) to enhance citizens' wellbeing.

Based on this Conservation Policy, the Government has initiated the following measures:

Social Forestry: It refers to the management and protection of forests and afforestation on barren lands with the purpose of helping in the environmental, social and rural development.

Social forestry is people-oriented, value based joint management of forests with the major objective of satisfying the needs, wants and aspirations of both the people and the government. It embraces almost a limitless range of activities on uncultivated land and thus, reduces the pressure on the nation's forest resources.

Social Forestry is also known as *extension forestry, mined forestry, urban forestry, tree farming, Vanamahotsava, recreation forestry, recreation forestry, livestock forestry,* etc. Most of these names indicate utility of the forest features of Social Forestry.

Social forestry is forestry for community development. It consists of:

• restoration, reallocation, reorganisation of existing forest lands for the total development of the land and the people living on it;

• joint management of the forest and its production processes; and

• developing the socio-economic structure.

OBJECTIVES OF SOCIAL FORESTRY

The main objectives of Social Forestry, as recommended by the National Commission on Agriculture, include the following:

(i) Providing fuel wood, fodder for cattle, timber and minor forest products to rural people.

(ii) Utilising the available land according to its productive capacity.

(iii) Developing local cottage industries by providing raw materials.

(iv) Providing efficient conservation of soil and water.

(v) Providing employment opportunities to the rural people.

(vi) Increasing agricultural production by using cow dung as manure.

(vii) Fulfilling the recreational needs of the people.

(viii) Improving the aesthetic scene of the area.

(ix) Achieving all-round rural development as a part of integrated rural development programme.

Agro-Forestry: Agro-forestry is a part of social forestry and represents the intermediate stage between forestry and agriculture. Agro-forestry refers to "the sustainable system of managing a piece of land through combined production of agricultural crops and forest crops and animal rearing, to ensure the most efficient land use under a management system in accordance with socio-cultural practices of the local people."

Agro-forestry aims to provide conservation of the land and its improvement in order to achieve a combined produce of forest and agricultural crops.

OBJECTIVES OF AGRO-FORESTRY

(i) To reduce pressure on natural forests for obtaining timber as well as non-timber forest produce.

(ii) To check soil erosion and to maintain the natural fertility of the soil.

(iii) To maintain ecological balance along with proper utilisation of farm resources.

(iv) To make the best use of all the available resources like land, manpower, livestock, ecological factors, etc., to obtain a variety of forest products such as food, fuel, fodder, livestock, recreation and a variety of forest products sustainably from the same land.