RAMA UNIVERSITY

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FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

Forest

Forest:

- General: 'An area set aside for the production of timber and other forest produce or maintained under woody vegetation for certain indirect benefits which it provides e.g., climatic or protective is forest.'
- Ecological: It is defined as a plant community predominantly of trees and other woody vegetation usually with closed canopy.
- Legal: An area of land proclaimed to be forest under a forest law.

Stand:

- Stand is defined as an aggregation of trees occupying a specific area sufficiently uniform in composition, age, arrangement and condition to be distinguishable from the forest on adjoining areas.

Classification of Forests: Forests can be classified on the basis of:

- Method of regeneration,
- Age,
- Composition,
- Object of management,
- Ownership and legal status,

- Growing stock.

Method of regeneration:

- High forest: Forest regenerated from seed
- Coppice forests: Forests regenerated by vegetative means such as coppicing shoots or root suckers

Age:

- Even aged or regular forests: Forest composed of even-aged woods and applied to a stand consisting of trees of approximately the same age. Differences up to 25% of the rotation age may be allowed.
- Uneven aged or irregular forest: Forest composed of trees of markedly different ages and applied to a stand in which individual stem vary widely in age: age difference more than 25% of the rotation.

Composition:

- Pure forest is defined as a forest composed of almost entirely of one species usually to the extent of not less than 80%.
- Mixed forest is defined as a forest composed of trees of two or more species intermingled in the same canopy.

ObjectsofManagement:

- Production forest: Forest managed primarily for its produce'. It is also sometimes referred to as national forest, i.e., a forest which is maintained and managed to meet the needs of the defence, communication, industry, and other general purposes of public importance'.
- Protection forest: An area wholly or partly covered with woody growth, managed primarily to regulate stream flow, prevent erosion, hold shifting sand or to exert any other beneficial influence'.
- Farm forest: Forest raised on farms and its adjoining area either as individual scattered trees or a collection of trees to meet the requirement of fuel and fodder of the farmers and to have a beneficial influence on agriculture.
- Fuel forest: Forest raised on village waste land to supply fuel, small timber, fodder, etc., to the village communities living far away from Government forest.
- Recreational forest: Forest which is managed only to meet the recreational needs of the urban and rural population.

Ownership and Legal Status:

- State forest is a 'forest owned by state'. On the basis of legal status, state forests are further classified as:
  - Reserved forest is 'an area so constituted under the Indian forest Act 1927 or other forest law'.

- Protected forest: An area subject to limited degree of protection under the provision of chapter IV of the Indian Forest act 1927'.
- Village forest: State forest assigned to a village community under the provision of the Indian Forest Act 1927'.
- Communal forest: Forest owned and generally managed by a community such as a village, town, tribal authority or local government, the members of which share the produce'.
- Panchayat forest: Any forest where management is vested in a village panchayat (i.e., a body of men elected by the villagers from among themselves for specific administrative or other purposes pertaining to the village)'.

Growing Stock:

- Normal forests: Forest which for a given site and given objects of management is ideally constituted as regard growing stock, age class distribution and increment and from which the annual or periodic removal of produce is equal to the increment can be continued indefinitely without endangering future yield.
- Abnormal forest: is the one in which the quantity of material in the growing stock is in deficit or in excess or in which the relative proportion of the age or size classes are defectives.

Present Status of Indian Forests (2009)

1. The forest cover of the country as per 2007 assessment is 690,899km2/69.09 mha which is 21.02 percent of the geographical area of the country.
2. Very dense forest constitutes 83,510 km2/ 8.35 million ha (2.54%),
3. The moderately dense forest 319,012 km2/ 31.90 million ha (9.71%) and
4. Open forest constitutes 288.377 km2/28.84 million ha (8.77%)
5. The scrub accounts for 41,525 km2/4.15 million ha (1.26%).
6. Mangrove: 4639 km2/0.46 million ha (0.14%)
7. Excluding the area (18.31 million ha) above tree line, the forest cover of the country comes of 22.26 per cent
8. Reportedly, hills and tribal districts, especially the North-Eastern (NE) states, contributed significantly to this increase.
9. Madhya Pradesh has largest area under forest cover followed by Arunachal Pradesh, Chattisgarh, Orissa and Maharashtra
10. Mizoram has maximum proportion of geographic area under forest cover followed by Nagaland
11. North-East region accounts for 25.11 per cent of forest cover
12. Native forests in India are disappearing at a rate of up to 2.7 per cent per year
13. Very dense forest - All lands with tree cover of canopy density of 70% and above
14. Moderately dense forest - All lands with tree cover of canopy density between 40% and 70%
15. Open forest - All lands with tree cover of canopy density between 10% and 40%

16. Scrub - Degraded forest lands with canopy density less than 10%
17. Non-forest – Any area not included in the above classes

Forests Types of India

- Champion and Seth (1967) classified forests of India into 5 major groups and further it is classified into 16 type groups/ groups
- Major Groups:
- 1. Tropical Forests
  2. Montane Subtropical Forests
  3. Montane Temperate Forests
  4. Sub-alpine Forests
  5. Alpine scrub
  1. Tropical Forests: This group has seven group type such as
- a) Wet Evergreen Forest
  b) Semi-evergreen Forest
  c) Moist Deciduous Forest
  d) Littoral and Swamp Forest
  e) Dry Deciduous Forest
  f) Thorn Forest
  g) Dry Evergreen Forest
- 2. Montane Subtropical Forests: This group has three group type
- a) Broad-leaved Hill Forest
  b) Pine Forest
  c) Dry Evergreen Forest
- 3. Montane Temperate Forests: This group has three group type

- a) Montane Wet Temperate Forest
  b) Himalayan Temperate Forest
  c) Himalayan Dry Temperate Forest
- 4. Sub-alpine Forests:
- a) Sub-alpine Forest
- 5. Alpine Scrub: This group has two group type
- a) Moist Alpine Scrub
  b) Dry Alpine Scrub

Role of forests in farming systems

Forests are known as the world's air-conditioner and the earth's blanket. Without forests, this world would be an inhospitable place to live in. Forests play an important role in environmental stability and provide a variety of benefits to the economy. Of all the ecosystems, forests are the largest, most complex and self-perpetuating. The maintenance of forests is vital for all sections of society regardless of their stage of development. Forests perform various functions. Some of these functions are:

1) Productive functions of the forest

- Forests are valuable natural resources. The goods provided by forests are of immense importance. Wood is a major forest produce and is used extensively for various purposes.
- Wood is a universal fuel. For thousands of years, until the advent of coal, oil, gas, electricity, etc., wood constituted man's chief source of fuel. Even today more than half of the total

world consumption of wood is for fuel. Wood remains the major source of domestic fuel in India. Out of the total requirement of 201 million tones fuelwood, 103 million tonnes is met from the forest areas (including plantations), which constitutes nearly 51 percent of the total requirement, and the balance 98 million tonnes from farm forestry sector including plantation on common land.

- Forests provide raw material to a large number of industries, e.g., paper and pulp, ply board and other boards, saw-mill, furniture, packing cases, matches, toys, etc.
- Out of 64 million m3 timber demand, nearly 31 million m3 comes from farm forestry and other woodlands and 12 million m3 from forests. The balance 21 million m3 is removed from plantations and from natural forests, largely (70%) as small timber to meet the domestic need.
- A large number of non-wood products are also obtained from forests. These are commonly called minor forest products, not because they are of minor significance, but because they are harvested in smaller quantities. Some of the important minor forest products are as under:

    a. Fibers and flosses

    b. Grasses and bamboos

    c. Essential oils

    d. Oilseeds

    e. Tans and dyes

    f. Gums and resins

    g. Drugs, spices and insecticides

h. Tendu and other leaves

i. Edible products

j. Lac and other products

k. Fodder and grazing

2) Protective and ameliorative functions of forest

i. Forests play a significant role in maintaining the CO_2 balance in the atmosphere. Without sufficient forest cover, all the CO_2 released in the atmosphere will not be utilized, resulting in a higher percent of CO_2 in the atmosphere. This, according to scientists, will result in warming of the world temperature, disturbance in the climate, melting of polar ice caps, increase in sea levels, etc. The CO_2 percent in the atmosphere has already reached 0.042% against the normal of 0.030%. If this increases continuously, higher temperature and other disturbances on the earth may bring unimaginable miseries to mankind.

ii. Forests increase local precipitation by about 5 to 10% due to their orographic and microclimate effect and create conditions favourable for the condensation of clouds.

iii. Forests reduce temperature and increase humidity. The temperature in forests is 3° C - 8° C less than in adjoining open areas. Reduced temperature makes life comfortable. It also reduces evaporation losses. The effect of forests on temperature is not limited to forests areas; it extends far beyond the boundaries of the forests.

iv. Forests maintain the productivity of the soil through adding a large quantity of organic matter and recycling of nutrients. The leaves of trees are used as manure. Supply of firewood from

forests releases dung for use, as manure.

v. Tree crowns reduce the violence of rain and checks splash erosion. Forests increase the infiltration and water-holding capacity of the soil, resulting in much lower surface run-off. This in turn results in checking of soil erosion.

vi. Forests check floods. Forests conserve both soil and water. Forests prolong the water cycle from its inception to the final disposal as run-off into streams and ocean. The longer the water retained in the land, the greater is its usefulness in nurturing crops and trees, and in maintaining a regular supply of water in streams throughout the year. Forests increase subsurface run-off which is much slower than surface run-off and the sub-surface run-off does not cause erosion.

vii. Forests and trees reduce wind velocity considerably. Reduction of wind velocity causes considerable reduction in wind erosion, checks shifting of sand dunes and halts the process of desertification.

viii. Forests and trees provide a shelterbelt and wind breaks effect which is beneficial to agricultural crops, particularly in arid and semi-arid areas, and increase in agricultural production.

3) Recreational and educational function of forest

i. Forests provide recreational facilities to the people. A large variety of trees and shrubs, animals and birds attract a large number of people towards them. National parks and sanctuaries rich in flora and fauna are visited by a large number of people every year.

ii. Forests provide an experimental area and laboratory for

college and university students. Forests provide sites for ecological studies.

iii. Forests have a natural healing effect for a number of diseases. Most of the sanatoria are found in a forested locality.

4) Developmental functions of forest

i. Forests provide employment to a large number of people. Almost all forestry activities are labour intensive and provide considerable employment in primary and secondary sectors.

ii. Forests and various forest activities help tribals to improve their socioeconomic condition through collection, processing and marketing of various forest products and by providing gainful employment. Forestry is an important activity in poverty alleviation programme.

iii. Forests provide a good sum as revenue to the government which is used for various developmental works.

iv. Forests help in biological rejuvenation of soils. Trees through their sturdy root structures open the soil; improve it by adding organic litter or humus rendering it hospitable to useful micro and macro flora and fauna.

v. Trees provide subsistence products, like fodder and other non-wood forest products nearly 30% of the fodder requirement of the country comes from the forest areas. There is removal to the extent of 145 million tonnes of dry fodder and 178 million tonnes of green fodder annually from the forest areas.

vi. In semi-arid regions trees increase soil productivity and land sustainability through nutrient recycling and by providing mulch and shade for crops, thus complement agricultural production.

vii. The most widespread benefit from keeping trees on farms is the soil enriching effect of trees and protection against erosion.

viii. Trees are planted on farm boundaries, or inter-cropped with field crops with a view to get supplementary income from trees without much loss of the main crops.

ix. Homestead plantation increases overall income from land.

x. Where income from agriculture is uncertain and inadequate and there is little possibility for farmer to seek work outside the village; in such conditions, even small farmers shift their lands to trees, which demand less labour and concentrate on wage labour for meeting their immediate consumption needs.

xi. Where trees substitute agricultural crops for increasing total profits from land.