



Importance of Wildlife and Forest

Wildlife comprises all living organisms (animals, plants, micro-organisms) in their natural habitats which are neither cultivated / domesticated nor tamed. But in its strictest sense, it includes uncultivated mammals, reptiles, birds and fishes, etc. which are generally hunted.

A. IMPORTANCE OF WILDLIFE

If we view *wildlife* from close quarters and juxtapose our observations and all the major disciplines, we simply cannot believe how important wildlife is. We may nail down the following cardinal points:

1. **Ecological Balance:** Wildlife maintains nonetheless balance of nature through:
 - a. Regulation of population of different species by self-regulation and feedback,
 - b. Food chains or passage of food and energy through series of populations comprising producers, consumers and micro-organisms, and
 - c. Natural cycles or circulation of inorganic nutrients between biotic and abiotic environments, prevention of leaching and run-off.

Thus it preserves the environment as a self-sustaining system. It balances population and maintains food chains and natural cycles.

2. **Gene Bank:** The most direct relationship of preservation of wildlife to human progress is its significance as gene banks for breeding programmes in agricultural, animal husbandry and fishery. Wildlife serves as a gene banks for breeding improved varieties in agriculture, animal husbandry and fishery. Plant and animal breeders have been able to produce high-yielding and disease-and-stress resistant varieties which form the backbone of modern agriculture. Average life of a crop variety is 5–15 years. More application of fertilizers, irrigation and pesticides cannot raise production unless a variety of a crop or of an animal has the genetic potentiality to respond to improved inputs. To develop such varieties, a very wide range of plants or animals has to be screened and selected. Scientists have been constantly examining the wild relatives of crop plants for the presence of useful genes that can be introduced to breeding programmes. Hence, gene bank maintenance is essential. Let us see how this point has held well in practice.

- i. Some old rice varieties from Kerala saved rice cultivation when *Nilaparvata lugens* (brown planthopper) attacked all modern rice varieties.

- ii. Wild rice (*Oryza nivara*) provided the resistance to the grassy stunt virus which has threatened rice cultivation in 1970s. It was incorporated in IR-36 by Dr Khush and others.
- iii. In potatoes, resistance to late blight has been incorporated from *Solanum demissum*, mosaic virus and leaf roll virus from *Solanum acaule*, mosaic virus Y from *Solanum stoloniferum* damping-off and nematodes from *Solanum spegazzini*.

The production of high-yielding, disease-resistant crops, livestock and fish cannot continue without the wild relatives of the cultivated varieties. This is because of pests and pathogens evolve new strains; climates change; soils vary; and consumers' demand change with time. Since the average life of a crop variety is only 5–15 years, new varieties are constantly being produced to meet the changing demands.

We cannot predict which species become useful to us in the future. With increasing knowledge and skills, man is busy finding new uses for the traditionally used species. If penicillium had been eliminated from the earth before man could discover its antibiotic properties or Cinchona had become extinct from Peru before quinine was discovered, some of the severest infectious diseases would have continued to savage the world.

Man is the only species who has widely used the hidden values of a wide range of species around him. He is aware that the rich diversity of organisms today is the product of natural evolution stretching unbroken through 3.5 billion years. A species once lost cannot be retrieved. Therefore, it would be unethical to be responsible for the destruction of a species. We have an evolutionary responsibility to conserve biological diversity for our descendants.

3. **Plant Propagation:** Pollination in certain plants is performed by wild animals like birds; insects, etc. and thus helps in plants propagation, which is very essential.
4. **Cleaning of Environment:** *Scavengers* and *decomposers* wild animals (like vultures, eagles, jackals, hyaenas, etc.) as well as micro-organisms, which feed upon dead animals, convert them into different nutrients and release energy back to the nature increasing fertility of the soil. They do very important work of cleaning the environment; otherwise what the fate of this planet will be, can be assumed.
5. **Scientific Importance:** For research purposes and studies of anatomy, physiology, ecology, evolutionary aspects; wild animals are used, which help in saving human life.
6. **Soil Erosion:** It is prevented by plant cover, litter, mixing of litter by movement of wild animals and conversion to spongy humus by micro-organisms.
7. **Control of Pollution:** Plants absorb pollutants minimising the pollution of the environment, while wild animals specially scavengers and decomposers clean the environment.
8. **Perennial Fresh Water:** By maintaining climate and removing pollution, wildlife protects and conserves perennial fresh water resources as well as other water bodies.
9. **Maintenance of Climate:** Wildlife helps too much in maintaining temperature, etc. of the climate.
10. **Recreation:** Wildlife (animals and plants both) has recreational values.
11. **Experimental Animals:** Monkeys, rabbits, guinea-pigs, rats, etc. are used as experimental animals for research and teaching purposes.

12. **Economic Importance:** Timber, firewood, paper, gum, resins, tannins, several drugs, essential oils, spices, lac, silk, honey, hair, feathers, guano (the dung of sea-fishes used as manure or the manure made from fish), leather, musk, ivory, etc. are obtained from wildlife. Besides these, benefits are also obtained from:
 - i. Tourists
 - ii. Exports
 - iii. Hunting of surplus stock
 - iv. Procurement of food materials
 - v. Hide, ivory, etc. after death of wild animals; though nowadays it is legally banned and not in practices.
13. **Potential Uses:** Just as all present day cultivated /domesticated plants and animals are derived from wildlife; new foods, beverages (A beverage is a type of plant product used by everyone daily which contains an alkaloid called caffeine having the stimulative action in the human body, e.g. tea, coffee, cocoa, etc. It is also fragmented product of the plant), drugs and other useful products may be obtained in future from wildlife.

B. IMPORTANCE OF FORESTS

Forests are extensive self-sustained wooded tracts of land with a biotic community predominated by woody vegetation consisting of trees and shrubs with a close canopy.

A *forest* is a biotic community, predominantly of trees, shrubs or any other woody vegetation usually with a closed canopy. Forests vary a great deal in compositions and densities and are distinct from meadows and pastures.

Woodland is closer to human habitations possesses an open canopy and is managed and maintained by human beings.

Forestry is the branch of science which is connected with establishment, protection, management and exploitation of forests.

Forests are of immense importance to the life and prosperity of human beings and of nations. Forests and woodland provide a rich variety of goods useful to both affluent industrial societies and the rural poor. They give the following benefits:

- i. **Timber:** Wood is the major forest produce. The timber and sawn-up wood (saw dust) obtained from forests are used as basic material for building houses particularly in rural areas. Wood, on the other hand, is used as a temporary structural support for the construction of buildings and bridges. It is a raw material for making doors, windows, furniture, poles, posts, mine props, railway sleepers, carts, ploughs, tool handles, matches, sports goods, etc. It is also a raw material for the manufacture of paper, rayon and film.
- ii. **Fuel Wood/Fire Wood:** In developing countries, heaviest demand on forests is for fuelwood. More than 1500 million people depend on wood to cook and keep warm. The world consumption of wood for fuel is estimated to be more than 1000 million m³. This is well over 80% of the total use. About 58% of the total energy used in Africa and 42% in South-East Asia comes from fuelwood. In Gambia, a family spends 360 women days/year to gather fuel wood; while in Sahel 25% of the household budget is spent on fuel.
- iii. **Economical Uses:**
 - a. **Minor/Major Forest Produce (MFP):** It includes all forest products other than wood. Its contribution to the economy is not negligible. Bamboo, paper, rayon,

food, essential oil and perfumes, tannins, gums, resin, dyes, camphor, spices, ritha and shikakai, drugs, tendu leaf, cork, rudraksha, animal products (lac, honey, wax, tassar and muga silk), horns, hides, antlers, ivory are the items of economic value.

- b. **Support in Economy:** Forests play a vital role in the life and economy of all the tribes living in their laps. They provide food (tubers, roots, leaves and fruits of plants and meat from animals), medicines and other products of commercial use, which forms a viable forest based subsistence pattern.

iv. Ecological Uses:

a. Protection of Biodiversity, Land and Environment:

- i. Forests are large biotic communities. They provide shelter and sustenance for a large number of diverse species of plants, animals and micro-organisms.
- ii. They protect the environment. They prevent erosion of the soil by wind and water. Trees provide shade which prevents the soil from becoming too dry and friable during summer.

- b. **Moderating and Moistening Effects on Climate:** They also check the velocity of rain drops or wind striking the ground and reduce dislodging of soil particles. The root system of plants firmly binds the soil.

- c. **Retention of Subsoil Water and Increase in Rainfall Frequency:** They improve the quality of the soil by increasing its porosity and fertility by contributing humus to it. The forest soil absorbs water during rains like a giant sponge and does not allow it to evaporate or run-off quickly. This ensures a perennial supply of sub-soil water in springs and wells. Thus, the hill slopes with forests cover in the catchment areas conserve water and gradually release it into streams, rivers and subsoil springs.

Forests increase atmospheric humidity by drawing sub-soil water and sending it out in the air during transpiration. The increased humidity helps plants and animals to survive in a warm season by making it cool and pleasant.

- d. **Pollution Control:** They play an important role in reducing atmospheric pollution by collecting the suspended particulate matter and by absorbing carbon dioxide, etc.
- e. **Aesthetic Value:** They have great aesthetic value. There is hardly any part of the earth where people do not appreciate the beauty and tranquillity of forests. Having been forest-dwellers in their remote past, people have a deep evolutionary attachment to their abode. This fond has passed into gratitude and worship, which is reflected not only in social customs and rituals but also in art, literature and music.
- f. **Laboratory for Education and Research:** They are also of great educative value. They are nature's laboratories which have immensely contributed to the study of and research in various branches of fundamental and applied sciences.
- g. **Shelter of Wildlife:** People have realised their past follies of hunting wild animals for sport. There is a global effort to abstain from indiscriminate killing and preserve wildlife. Reserve forests are now centres of enlightenment and recreation.

C. DEFORESTATION

It is removal, decrease or deterioration of forest cover of an area. To deprive the environment of forests is deforestation and, hence, causing shrinkage of forest area.

Deforestation is a formidable threat to the economy, quality of life and future of the environment. According to an estimate, forests in India have dwindled from about 7,000 million ha in 1900 to 2890 million ha in 1975 and likely 2370 million ha in 2000. Tropical rain forests, which form the most important and productive forest types in the world, have been reduced from 1600 million ha to 938 million ha. One of the dangerous consequences of the deforestation might be an extinction of 10% of the estimated 10 million species of plants and animals by the year 2020. As a result, we will be deprived of important seeds, specimens of drugs derived from plants and animals.

a. **Causes of Deforestation:** The main causes of deforestation in India are:

- i. Explosion of human and livestock population causing cultivation, settlement and encroachment in forest area by the rapidly growing human population.
- ii. Increased requirement of timber and fuel wood.
- iii. Expansion of crop land (conversion of forest into agricultural field).
- iv. Enhanced grazing (over-grazing).
- v. Construction of roads along the mountains which cover nearly 30,000 km in ecologically fragile areas.
- vi. Industries, mining, quarrying, irrigation and agriculture.
- vii. Jhuming (shifting cultivation) prevalent in early stages, even now in some 30 million ha.
- viii. Increased demand for fuel, wood, wooden crates, paper, board and newsprint have led to large scale tree felling. In India, availability of fuel wood is 58 million tonnes/year against requirement of 157 million tonnes.
- ix. Forest fires.
- x. Human establishment.

b. **Consequences of Deforestation**

- i. **Change in Climate:** Deforestation results in reduced rainfall, increased drought, hotter summer and colder winter. The air quality too has been adversely affected arising pollution by deforestation. Hence, the consequences of deforestation are scanty rainfall, erratic rainfall and draught. All these have serious consequences on agricultural output. This may lead to malnutrition, starvation, diseases and death. An example of the undesirable effects caused due to deforestation, we can take the area of Cherrapunji in Meghalaya. This area used to have a large and dense forest cover and used to record the highest rainfall in the country. But in recent years, there has been such a relentless deforestation of this area that only a few trees have been left standing. This has resulted in the adverse changes in the climate. The rainfall in this area has become erratic.
- ii. **Soil Erosion:** Soil is exposed to insolation, dries up and gets eroded by wind and water. Due to deforestation, water-holding capacity of the soil is decreased. Ground water level has gone down.
- iii. **Flash Flood:** They occur during rainy season due to accumulation of eroded soil in river, etc.
- iv. **Siltation:** Rainy season rivulets bring eroded soil and deposit the same on beds of reservoirs (reduces storage of water and power generation) and rivers.
- v. **Drought:** There is very little water in rivers during dry season causing drought. Deforestation has caused intensified soil erosion, accentuated floods and drought and loss of precious wildlife and has led to deterioration of economy and quality of life of the weaker sections of the society. For example, shrinkage

of forests has resulted in such acute scarcity of fuel wood that gathering it takes 360 women days a year per family in Gambia. In the Sahel, fuel budget constitutes 25% of the household budget. In India, particularly in the Himalayan region, shortage of firewood and water has been causing serious misery among the womenfolk. There is a serious apprehension that time is not far when the cost of food would be far less than the fuel needed to cook it.

- vi. **Danger to Wildlife:** Due to deforestation, many species of wildlife have become exposed to dangers of extinction.

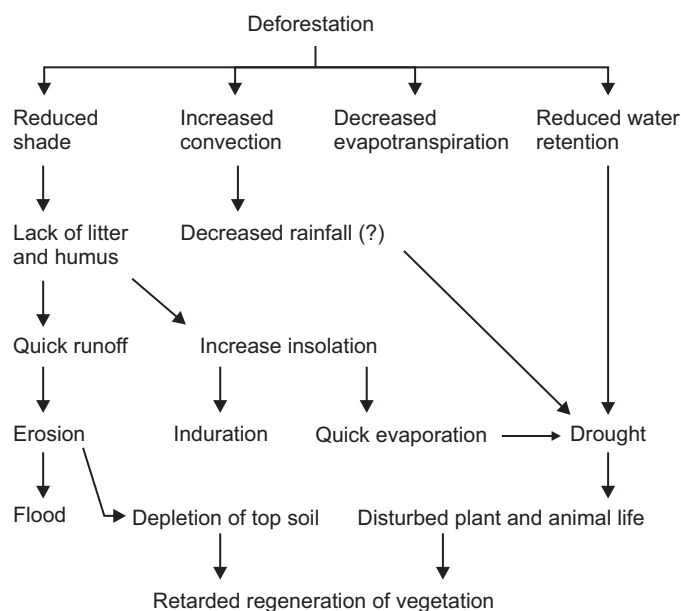


Fig. 1.1: Consequences of deforestation

D. CONSERVATION OF FORESTS

The maintenance and upkeep of forests is called *forest conservation*. Conservation of forests aims at management of forest in such a way as to maintain them at the optimum level and derive optimum sustainable benefit for the present as well as future generation.

The Indian Forest Policy aims at 60% forest covers in hills and 20% in the plains. For this, sustained efforts are made for afforestation and reforestation. The plantation movement or *Van Mahotsava* has been carried out in India since 1950 whereby both the government and private agencies perform tree plantation during July and February every year.?

Other measures for the preservation of forests are as follows:

- i. Weeds, damaged tree, crowded trees, diseased trees, etc. should be removed.
- ii. Extraction of timber should not interfere with watershed protection. Tree-felling should be matched by tree-planting programmes. Sustained Yield Block Cutting should be followed. Cutting is allowed only in invulnerable forests at a rate which is equal to their regeneration capacity.
- iii. Forest fire must be prevented.

- iv. The use of firewood should be discouraged to reduce pressure on more valuable natural forests. Other sources of energy, such as bio-gas, should supplement firewood.
- v. Modern and scientific management practices, such as optimization of silvicultural and nutritional requirements, including use of irrigation, fertilizers, bacterial and micorrhizal inoculations, disease and pest management, control of weeds, breeding of elite trees and use of tissue culture techniques should be adopted.
- vi. Massive afforestation should be undertaken to cover large areas of land with appropriate types of trees.
- vii. Prevention of scraping and litter removal.
- viii. Control of weeds.
 - ix. Pesticides.
 - x. Fire fighting equipment.
 - xi. Census.
 - xii. Supervision and surveying.
- xiii. Economy in extraction and use of timber.
- xiv. Watershed protection.
- xv. Alternate source of fuel for villagers.
- xvi. Every piece of barren land should be planted with trees.
- xvii. Control-grazing.
- xviii. Other forms of forestry such as:
 - a. **Social Forestry:** It means raising quick growing multipurpose plants in common village land to meet the requirements of fodder, firewood and small timber.
 - b. **Urban Forestry:** It is plantation of fruit, flower and shade bearing plants in urban areas to reduce pollution and the ultimate yield of wood.
 - c. **Agro-forestry:** It aims plantation of multipurpose trees/shrubs/horticultural plants/grasses along with crops to stabilise the soil and meet the needs of the fodder, fruits and timber of the community.

The Union and State Governments have launched several afforestation programmes as part of the forest conservation action. The Social Forestry Programme was started in 1976. It seeks the use of public and common land to produce firewood, fodder and small timber for the use of the rural community to relieve pressure on existing forests needed for soil and water conservation. The programme includes raising, planting and protecting trees with multiple uses (firewood, fodder, agricultural implements, fruits, etc.) for the rural community.

The Agro-forestry Programme consists of reviving an ancient land use practice where the same land is used for farming, forestry and animal husbandry.

The Urban Forestry Programme aims at planting trees for aesthetic purposes in urban settlements. Flower and fruit trees are planted along the roadside, private compounds and vacant land to add colour and mitigate the harshness of the urban environment.

Experts believe that in order to sustain agriculture and maintain the quality of the environment, at least one-third of a country's land should be under forest.

This requires action at all levels—individuals, the community and the government. There has been several people's movement in recent times in India such as the *Chipko Movement* (Tehri-Garhwal area, Uttarakhand) and the public agitation to prevent the construction of a hydroelectric project in the Silent Valley region. Protection of precious forests, especially in the ecologically fragile areas, should be supplemented by efforts to plant and regenerate forests.

- xix. Over-grazing by cattle, horses, sheep, goats, etc. should be prevented. When grazing is a must, it should be moderate. Only those plants should be introduced in grasslands which can regenerate in shorter time.
- xx. Forests should be protected against insects, pests and diseases.
- xxi. Cutting and uprooting of forests should be made a punishable crime.
- xxii. Forest nurseries should be established on large-scale basis.
- xxiii. People should be made aware of the impact of forests on their life through advertisements, lectures, speeches, radios, televisions, etc.

Forest conservation and wildlife conservation are closely interwoven. A forest is a biotic community made up of the total population of its living things, both plant and animal. Any management practice affecting any part of such a community may well affect other elements either for good or for evil. Many of these interrelationships are still not clearly understood; enough is known, though to indicate the close tie-up between forestry and the preservation and management of wildlife. Management plans must take cognizance of both. The two cannot be separated.