

Forests

Forests: are extensive, continuous areas of land dominated by trees. Desired forests level is 20-30% of the total area of a country. 2 types:

Productive forests: mainly naturally occurring forests. High tree density, great commercial value & used for extraction of timber. Natural habitat for wildlife, strong raw material from old trees.

Production forests: mainly planted by people & usually linear plantation. Irrigated forests. Protects soil & pleasant environment by providing shade & lowering temp.

Importance of Forests:

- Prevents soil erosion & natural habitat for wildlife.
- Check pollution & cleans the environment.
- Ensures food supply to people by protecting soil fertility.
- Regulates water supply to rivers to reduce floods & reservoirs.
- Timber for construction & transport vehicles.
- Raw material for wood-based industries.
- Plants are used for medical purposes in pharmaceutical industry.
- Supply of fruit & provides recreation.
- Employment for people in forest-based industries.

Types of Forests:

Types	Examples of Areas	Importance
Alpine Forests (4000-4500m Tallest)	Northern Areas	Fuel wood.
Coniferous Forests (1000-4000m 2 nd Tallest)	Northern Areas, KPK, Balochistan Mountains, Rawalpindi, Islamabad.	Timber for furniture, boxes, environmental protection, conserves soil/wild, good breeding, attracts tourists & adds to scenic beauty. Are softwoods to make paper.
Tropical Thorn Forests (Rakh)	Punjab Plains, Sindh Plains, Southern & Western Balochistan.	Firewood.
Sub-Tropical Scrub Forests	Hills & foothills of Lower Himalayas, Sulaiman & Kirthar Range, Western Mountains, & above Makran Coast Range.	Watershed Protection, firewood & grazing.
Riverain or Bela Forests	River Indus & tributaries.	Provides Shishum, Babul & crops.
Mangrove Forests (Coastal Areas)	Sindh & Makran Coast.	Firewood, timber, breeding grounds for fish, livestock fed on leaves,

		leaves provide nutrition to marine life. Protects coastline from erosion & acts as a barrier against floods.
Irrigated Forests	Changa Manga, Wan Bachran, Chichawatni.	Timber, firewood & shade.

Irrigated Plantations in Pakistan:

Advantages	Disadvantages
Provide a source of timber for construction, fencing & firewood etc.	Planting forests need high initial investment & don't give quick profits - no short term economic benefits.
Leaves provide food for animals & humus formation increasing soil fertility.	Trees need maintenance, taken care of, require money on regular basis.
Transpiration brings rain & lowers temperature.	Need irrigation, extra burden on limited water.
Provides shade.	Loss of land for settlements, industries & transport.
Absorbs CO ₂ , releasing Oxygen & adds scenic beauty.	Illegal cutting of trees if difficult to check.
Controls surface run-off & soil erosion.	Forest fires causing damage to environment.
Employment to people in forests.	
Protects crops by shade & reduces water loss.	
Eucalyptus trees reduces waterlogging & salinity.	

Determinants:

- Altitude & height have different types of forests.
- Aridity & dryness results in thorny bushes & scrubs in Balochistan Plateau.
- Rain/precipitation encourages coniferous (evergreen) forests.
- Alluvium deposition encourages mangroves.
- Soil type/edaphic factors determine density & type of forests.

How do Mangrove Trees survive in Salt Water? (4 marks)

Exhibit high tolerance to salt, roots filter & strain salt, excess salt is carried to leaves and excreted.

Conservation & Sustainable Development of Mangrove Forests:

- Medicines & reclamation of beaches to build restaurants & roads, fodder, sea-pollution, & sand removal.
- Threat for tropical cyclones hit the sea, knocking shanty slums.
- Nursery for shrimps, crabs & fish. Fertility to estuary, honey from blossoms.
- Awareness/fines can be done for prevention, NGO's & IUCN.

Forest Products:



- Timber for construction & fuel-wood for fire.
- Minor products such as Resin for varnish, Mazri for mats & baskets and Ephedra for medicines.

Causes of deforestation in Pakistan:

- Agriculture, urbanization, industrialization & transport.
- Trade, timber, fuel-wood, overgrazing & mining.

Effects of deforestation:

- Soil exposure & climate changes lead to more aridity.
- Species extinct, air pollution & loss of habitat.
- Floods & destruction of crops leading to starvation.

Reckless and unauthorized cutting of trees leads to forests meagre. This can be stopped by implementing afforestation or sustainable forestry.

Solution to the problems caused by deforestation:

- Regeneration programs & reserving land for fuel-wood.
- Creating awareness by NGO's and supply of natural gas.
- Improving nursery techniques & sustainability.
- Ensuring logging companies to use selective cutting methods.
- Restricting bulldozers & heavy destructive machinery.
- Strict law enforcement & forestry programs.
- Urban forestry programs.
- Planting fruit trees on hilly slopes.

Terracing:

- Steps are cut into steep hillsides & the front of each flat terrace is edged with mud/stone walls as bunds. The bunds holdback the water & soil.

Contour Ploughing:

- Crops are planted parallel to the contours on the side of the hill. Strip farming is when 2 or more crops are grown in the same field. Sometime 1 crop may grow under the shelter of a taller crop for protection.

Deforestation projects in Pakistan:

Objective is afforestation of ecologically critical areas, which are threat of land degradation which causes damage to the environment.

- Selection of areas to be afforested & management of plantations.

- Development of ways of using forest products.

NGO's do projects such as the Tarbela/Mangla Watershed Management Project.

- Rachna Doab Afforestation Project.
- Afforestation campaign in Baltistan by AKRSP planted 830,000 trees.

Sustainable Forestry:

The World Commission on Environment & Development (WCED) gave a definition of Sustainable Development in its 1987 report. 'Meets the needs of the present without compromising the ability of future generations to meet their own needs.'

Sustainable Forestry: means that we should manage the forest resources in such a way as to ensure that we will be able to obtain the things that we want from the forests on a regular basis while conserving the natural environment.

- Trees vary in their rate of growth to maturity, mainly due to varying climatic conditions. E.g. trees take 30 years to mature so no more than $1/30^{\text{th}}$ of the forest should be cut down.
- Every tree cut down must be replaced with a sapling from a nursery.
- When areas of forest have to be cut for essential human requirements such as housing, schools, etc. then new areas of forest must be planted for replacement.