# FOREST

## Forest

- Forestry is a primary profession as in the raw materials are obtained from nature i.e. Land. Other primary professions are mining, fishing, etc.
- Forests are continuous areas of land dominated by trees.
- *there are two main types of forests:*
    - **Productive forests (1/3rd of Pakistan)**
    - **Protective forests (2/3rd of Pakistan)**
- **Productive forests are natural**
- Protective forests are planted by man
- **Productive forests have high density**
- Protective forests have relatively less density as they are planted by spacing / linearly.
- **Productive forests have high commercial value**
- Protective forests have low commercial value
- **Productive forests examples are timber for construction, etc.**
- Protective forests examples are: - to prevent soil erosion, for pleasant environment, etc.
- **Productive forests are planted at western and northern mountains**
- Protective forests are planted on the banks of rivers and around fields.

## Importance

- They reduce air pollution by absorbing pollutants like nitrogen and they provide oxygen.
- They provide natural habitat to wild life e.g. Food, nesting sites, etc.
- They prevent soil erosion as their roots hold soil and their leaves intercept rain.
- They increase the fertility of soil through decomposition of leaves.
- They reduce flooding by regulating water supply.
- They provide employment to those who work in forest departments ...
    - ... as well as to those who work in wood – based industries
- They attract tourism due to their scenic beauty.
- One of their products are ephedra, which is used in pharmaceutical industry.
- Their products are also used in chemical industry as well like resin for varnishes.
- They are used as raw material in wood – based industry e.g. Timber is used in construction industry, in flooring, in making cupboards, etc.
    - ... in furniture industry for making tables, chairs, etc.
    - ... in sports good industry in making bats, racquets, etc.
    - ... in transport industry in making wooden carts, bus bodies, boats, railway     sleepers, etc.
- Wood is used in agriculture as well e.g. making agricultural implements like animal shed, fences, wooden plough, gates, etc.
- Mazri, another minor product of trees, is used in making packing material and baskets
- Contributes to GDP/GNP therefore to national income.
- Wooden pulp is used in paper industry.
- It helps to restrict imports as it fulfils local demand of timber / wood in wood – based industries therefore save foreign exchange.
- It is used as fuel for cooking / heating (both domestically and commercially)

# Factors / Determinants

## Soil
- If soil is alluvial, then better growth of trees e.g. Mangroves grow well in the   alluvium of deltas.
- However, if the soil is thin, then less / low / stunted growth of trees e.g Alpine forests have stunted growth due to thin soil of mountain peak.

## Rainfall
- If rainfall is high, then better growth of trees e.g. Coniferous grow well in rainy areas of Murree.
- However, if rainfall is low, then stunted growth e.g. only bushes are found in deserts due to rainfall there.

## Temperature / Sunlight
- If temperature is very high or very low then low / slow growth e.g. Alpine forests in   low temperature of mountain peaks and bushes in high temperature in deserts.
- However, if the temperature is warm – hot then better growth e.g. Coniferous grow well in warm temperature of mountain valleys.

## Altitude / Height
- Above 4000 metres :- Alpine (only in north of Pakistan)
- Between 1000 – 4000 metres :- Coniferous (Both northern and western mountains)
- Less than 1000 metres: - Subtropical / Thorne / Dry / Scrub forest (at coastal level /    sea level in Pakistan like mangroves). Grown in Potowar Plateau.

# Forest Products
- Main products are timber and firewood.
- Minor products are rasin, mazri and ephedra.
- Timber is used for paper, furniture, sports good industries, etc.
- Firewood is used for cooking / heating
- Rasin is used for varnishes
- Mazri is used for making packing material and baskets
- Ephedra is used for making medicines
- there is an increase in demand of timber due to high population, growth of wood – based indiustries, demand abroad of sports goods, etc.

# Afforestation / Forestation
Forestation / Afforestation is the planting of trees for the first time.

# Deforestation
Deforestation is the cutting or clearing of trees and forests.

# Re-forestation
It is the replantation of seeds after their deforestation / cutting / cleaning.

# Causes of Deforestation

o   To grow more food crops because of growing population
o   For exploration and exploitation of minerals
o   For construction of infrastructure like motor ways, highways, dams, etc.
o   Urbanization – that is the extension of cities due to more rural – urban migration.
o   More residential areas and more commercial areas.
o   Over – grazing by sheep and goats as they graze right from the bushes or grass. In a way they cause soil erosion.
o   Used as fire-wood and fuel wood as less gas is available in northern areas e.g. In heating, cooking (at both domestic and commercial level)
o   Demand of timber in wood – based industries e.g. Paper, sports, furniture industry, etc.

# Effects of Deforestation

•   No roots to hold soil and no leaves to intercept rain therefore causes soil erosion.
    •   Therefore loss of nutrients for agriculture
•   Siltation in reservoirs of dams
    •   So less production of HEP / irrigation
•   More floods therefore greater destruction like loss of life, loss of livestock, crops destroyed, roads washed away, etc
•   Silt is deposited on farm – land due to flooding. If fertile, then better crop next year, but if infertile, then bad quality crop.
•   Low rainfall due to less transpiration.
    •   So low crop yield especially in barani (rain dependant) areas.
•   Loss of natural habitat so loss of wild life
•   Shortage of wood for being used as fuel.
•   People may have to travel more to collect wood
•   Loss of timber for wood based industries like sports goods industry.
•   Increase in air pollution due to less oxygen in atmosphere.
•   Gullying (dissection) / bad land due to soil erosion
•   More landslides / landslips as no trees / roots to stop them
•   Import of timber due to its shortage so loss of foreign exchange and negatively effects Balance of Trade.

# Solutions

•   Selective cutting so that small / young trees should not be wasted.
•   Heavy machinery be restricted in forest on small plants (do not cut small plants)
•   Reforestation to compensate for deforestation
•   Land reserved for fuel wood plantation so that expensive wood / forests can be protected for wood – based industries.
•   Forestation on hill slopes which will reduce soil erosion, silting and flooding e.g. Terraced farming, contour ploughing and strip farming.
•   Awareness about the benefits of trees through media, NGO's and educational institutions.
•   Nurseries for more plants.
•   Forest laws be strictly implemented

## Some afforestation projects have been started e.g.  :-

➤  Agha Khan Rural Support Program has started an afforestation project in Balochistan which has planted over 80,000 plants.
➤  Tarbela / Mangla project – which is planting trees on privately owned bad-lands
➤  Rechna Doab Aforestation Project is planting trees between River Chinab and River  Ravi.

## Sustainable Forestry

- To ensure forests are available for future by selective cutting.
- By reforestation of trees which do not need irrigation.
- More areas of forests
- Reforestation of trees from where they have been cut down. Maintain forests

## Long – term investment

### Forests:-
- Because trees take many years to grow.
- Many years before financial return / start production / results are seen
- High cost of planting
- Costs during growth.

# Types of trees in Pakistan

## Alpine

### Features
- Stunted growth due to thin soil of mountain peaks.
- Their roots spread sideways to get more nutrients
- They have upward branches to get more sunlight
- They grow at the height of about 4000 m above the sea level

### Main Areas
- Northern Areas (Chitral, Dir, Kohistan,Gilgit baltistan)

### Importance
- Used as fuel wood

## Coniferous

### Features
1. Evergreen to get benefit from short growing season
2. Conical in shape to shed snow
3. Thick and lathery leaves for less transpiration (water cycle)
4. Thick barks for protection from cold
5. Needle shape leaves for less transpiration
6. Less leaf fall provide less humus formation
7. Soft wood trees

## Main Areas
- KPK (Abbottabad, Mansehra,Kohistan, Shangla, Swat)
- Rawalpindi, Islamabad, Murree
- Balouchistan , Mountains(Quetta and Kalat divisions)

## Importance
1. Timber for construction, furniture, sports good industries, etc
2. They check flooding by regulating water supply
3. Conserve soil with the help of their strong roots therefore reduce soil erosion
4. Promote tourism due to their scenic beauty
5. Reduce air pollution by proving oxygen and removing pollutants
6. Good breeding and conserving centres for birds, wildlife.

# Bela (not natural and also irrigated)

## Features
- Planted by man
- Linear plantation
- Normally high-yielding commercial hardwood species.
- Same size
- Same height
- Linear plantation along the bank of rivers, dams and barrages

## Areas

Along River Indus and its tributaries like Chenab, Jhelum

## Importance
1. Reduce temperature by providing moisture to air
2. Reduce erosion of bands with the help of their strong roots
3. Used for shade
4. Wood is used for furniture and agriculture implement
5. Provide scenic beauty
6. Reduce the chances of water logging and salinity

# Mangroves

## Features
- Broad leaves for more sunlight
- Lathery leaves for less transpiration
- Survive in salty water as their roots filter out salts and their leaves excrete extra salts.

## Areas
- Indus (Sindh) delta , Hub (Balochistan) delta and coastal areas of Sindh and Balochistan

## Importance
1. Provide firewood for cooking / heating
2. Timber for construction
3. Leaves provide food for livestock
4. Protection against tsunamis as they absorb shockwaves
5. Protection of coast line from flooding
6. Breeding centres for birds
7. They are beneficial for fishing industry because:-
   - a) Breeding ground for fish
   - b) Protect small fish from predators
   - c) Provide nutrients to fish

## Reasons of stunted growth of Mangroves

- Dumping of sewage water and sewage waste in Arabian sea
- Toxic water from industries
- Oil spill from ships
- Heavy traffic in Arabian sea

# Sub-tropical /Tropical Dry / Tropical Thorn/Rakh forests

## Features
- Small / medium in height
- Usually are rounded bushes
- They have hard wood
- They are deciduous (they shed their leaves in autumn)
- They are thorny

## Main areas

- Punjab Plain
- Sindh plain
- Thar desert
- Kharan desert
- Potwar Plateau

## Importance

1. Protection from floods
2. Fire wood e.g. for cooking
3. Food for livestock
4. They provide shade
5. They reduce air pollution by providing oxygen

# Irrigated forests

## Features

- Planted by man
- Linear (in line) plantation
- Equally spaced
- Same species
- Same height / age / size
- They are regularly supplied with water
- Different species are planted in different blocks
- Roads are constructed between these blocks
- Canals are also built to supply water to plantation

## Main areas

o Changa Manga
o Chicha Watni
o Distrct Sahivel
o Bhawalpur
o Thal desert
o Guddu barrage
o Taunsa barrage

## Importance

1. Promote tourism due to scenic beauty
2. Provide wood for transport industry like railway sleepers, bus bodies / chasses, carts, boats, ships etc.
3. Firewood for domestic use
4. Growing population so more need of wood (e.g. Construction of houses)
5. For a good economy of a country 25% of its area should be covered with forests but in Pakistan only 4.5 % area is under the Forests
6. More demand of wood in wood based industry e.g. Timber in paper, sports goods, furniture industry, etc.
7. To reduce timber imports
8. Due to deforestation demand of the plantation of these trees increased
9. To replace areas where forests cannot be replanted due to soil erosion / urbanization
10. To reduce water logging
11. To prevent erosion of banks and slopes
12. Wild life and breeding of birds
13. Environmental protection
14. Provide employment