# UNIT 6: FORESTS

Vegetation is the plant cover of the Earth and includes trees, shrubs, grasses, lianas (vines which climb up trees), and mosses. Of these, trees are the most important to humans because they supply timber and firewood. They also help reduce runoff, soil erosion, and air pollution.

Environmentalists and geographers have been stressing the importance of trees, and it is claimed that 20 to 25 per cent of a country should be covered by forests in order to maintain a balanced ecology. Trees must be planted extensively and protected wisely for future generations.

Presently only 4.8 per cent of Pakistan's land area is covered by forests. In 1947, the forest cover was said to be only 1.7 per cent and figures for land use were 58 per cent but actual data was unavailable. The present land use coverage is 75 per cent, the increase in forests being achieved by afforestation programmes and regeneration; yet this is far below the minimum requirement. The arid conditions, reckless chopping down of trees, and exploitation of land for commercial and residential purposes to meet the needs of a growing population account for the low percentage of forest cover in the country. Khyber Pakhtunkhwa's share of forested area has decreased from 32 per cent in the past to 20 per cent in recent years; forest cover in Gilgit–Baltistan is 27 per cent, 18 per cent in Sindh, 17 per cent in Punjab and 8 per cent in Balochistan. However, despite low overall forest cover, Balochistan is home to the rare juniper forests dating back thousands of years.

## FACTS AND FIGURES

The juniper forests of Ziarat, covering 247,000 acres (99,957 hectares), are the world's second-largest and second-oldest and have been recognized by UNESCO as a World Heritage site.

Figure 6.1: Juniper forest near Ziarat, Balochistan

## Forest types and distribution

The following factors determine the types of forests found in Pakistan.

i) Arid and semi-arid conditions prevailing over most parts of the Indus Plains and the Balochistan Plateau
ii) Humid conditions prevailing over parts of the northern hills and mountains
iii) Diversity of topography, ranging from low plains to lofty mountains rising to snow heights

In the arid and semi-arid regions of Pakistan, there is very little vegetation aside from the occasional scrub forest. In better-watered areas like river banks and deltas, there are riverine and mangrove forests. In the humid hills and mountains, forest types change with altitude. Up to an altitude of 1000 metres, dry subtropical forests dominate, followed by coniferous forests from 1000 to 4000 metres; there are dwarf alpine forests between the treeline and the snowline.

The following forest types are found in Pakistan:

i) alpine forests (from 4000 metres up to the snowline)
ii) coniferous forests (from 1000 to 4000 metres)
iii) subtropical dry forests (below 1000 metres)
iv) tropical thorn or *rakh*
v) riverine or *bela* forests
vi) mangroves
vii) irrigated plantations

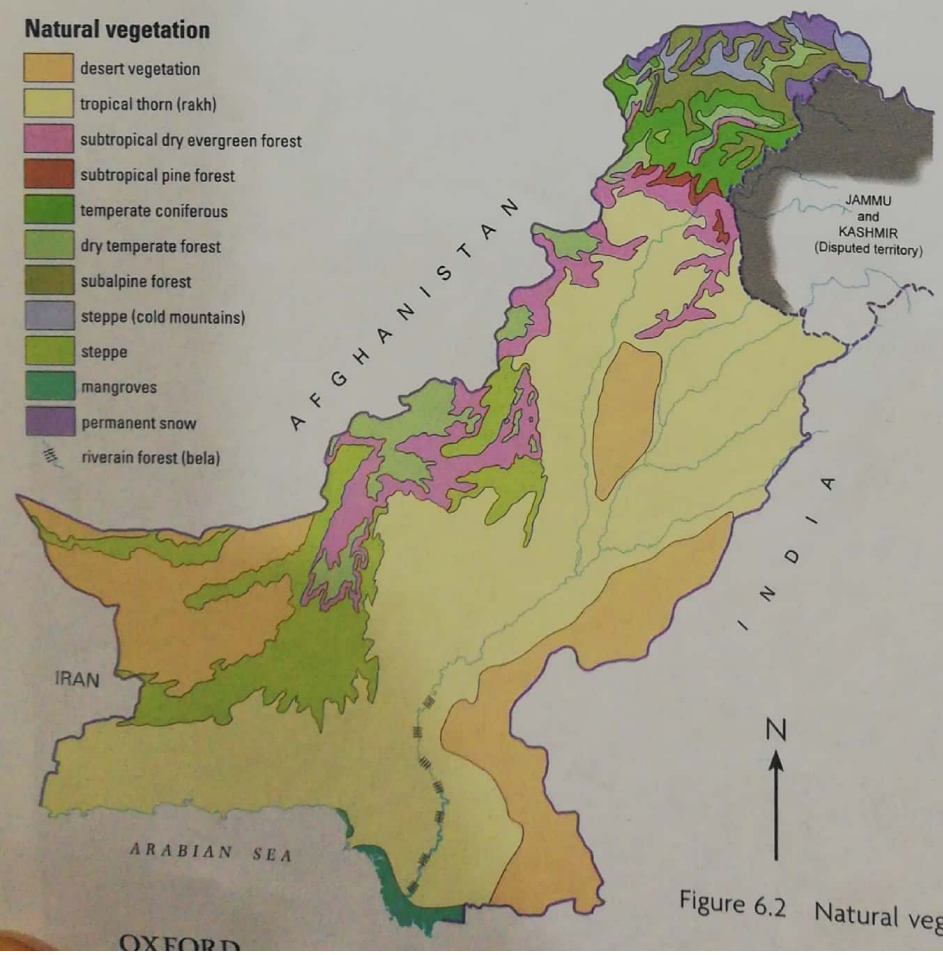


Figure 6.2 Natural vegetation in Pakistan

### a) Alpine forests

Alpine forests are found above the treeline at 4000 metres, in the districts of Chitral, Dir, Swat, Shangla, Kohistan, and Gilgit–Baltistan. Long severe winters and frequent freezing temperatures, coupled with the short, cool growing season prevent trees from attaining their full height. The dwarfed and stunted growth of silver fir, juniper, and birch takes place in sheltered nooks. Alpine forests are limited in area because of severe climate and difficult topography; they are not of much economic importance.

### b) Coniferous forests

Coniferous forests are found between 1000 and 4000 metres in Gilgit–Baltistan and in Swat, Shangla, Dir, Malakand, Kohistan, Mansehra, and Abbottabad districts in Khyber Pakhtunkhwa and Rawalpindi district.

Punjab. The largest area of coniferous forests is in Khyber Pakhtunkhwa, followed by Gilgit–Baltistan. Fir and spruce are found at the highest altitudes; *deodar* and *kail* at intermediate heights; and *chir* in the lower regions. There are significant numbers of broad-leafed deciduous trees like oak, maple, willow, birch, poplar, and walnut which provide Pakistan with much of the timber used in industry and for furniture, boxes and crates.

Coniferous forests, mainly *chilghoza* and pencil juniper, are also found in the Balochistan Hills, covering an area of 1160 sq km at an elevation of 1500 to 3000 metres in the Quetta and Kalat divisions; however, they are of limited economic importance.

Figure 6.3: Silver fir forest, Jabba Valley, Swat

### c) Subtropical dry forests

The hills and foothills of the Gujrat, Jhelum, Rawalpindi, and Attock districts in Punjab and Mansehra, Abbottabad, Mardan, Peshawar and Kohat districts in Khyber Pakhtunkhwa, up to the height of 1000 metres, are covered with dry, evergreen forests interspersed with patches of dry deciduous forest. In Balochistan, vegetation in patches of dry mixed scrub is confined to the Sulaiman Mountains and other hilly areas; the careless cutting down of trees and forest fires have turned this area into scattered forest, with occasional dense patches. The open areas are covered with grass and are useful for grazing. The dominant trees here are *phula* and *kao*. The deciduous trees in this region are chestnut, juniper, walnut, and oak; *kao* and, occasionally, *chir* are found at higher elevations. These trees are commonly used as firewood and, in limited amounts, as timber.

### d) Tropical thorn forests

Tropical thorn forests are open, low forests dominated by thorny hardwood trees. In Punjab, especially in the plains, they are characterized by scrub called *rakh* which can survive on very small amounts of water. They are also found in Sindh, with scattered patches in southern and western Balochistan. In general, the scrub is 6 to 10 metres high. Common species include acacia, tamarisk, and salvadora, and are primarily used as firewood.

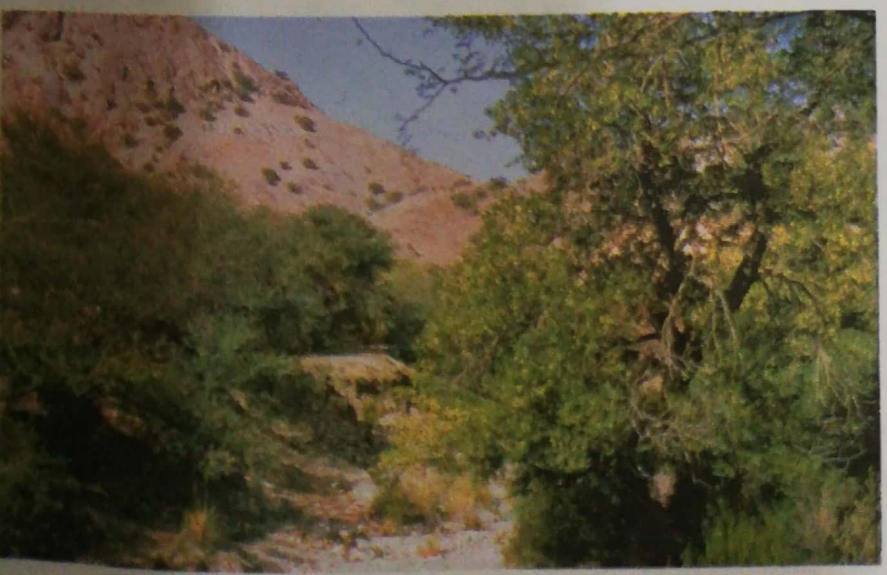

Figure 6.4: Tropical thorn scrub in the Punjab Salt Range

Figure 6.5: Riverine forest

### e) Riverine or *bela* forests

Narrow belts along the banks of the Indus and its large tributaries are covered by riverine forests locally referred to as *bela*. Riverine forests are mostly found in Sindh and cover the active flood plains. *Babul* (*Acacia arabica*) and *shisham* are the most commonly found species; in waterlogged areas, there are willow and *dhak* (*Butea forondosa*); other species include *jhand (Prosopis spicigera)*, tamarisk and *Populus euphratica*. *Shisham* is important for furniture-making; *babul* and the other riverine species are used as fuel and for miscellaneous items such as agricultural implements and beams used in construction.

### f) Mangrove forests

Mangrove forests are found in coastal and delta areas; they can thrive in brackish as well as saline water; they protect coastal regions from erosion, storm surge, and tidal waves, and also serve as nurseries for marine life. Thus mangroves are an important part of conservation programmes as they are ecologically beneficial for coastal areas.

In Pakistan the Indus and Hub deltas and adjoining areas are covered with mangrove forests which mainly comprise the species *timar* (*Avicennia officanilis*), followed by *chauri* or *kirani* (*Ceriops*) and *kunni* (*Rhizophoras*). The average height of these trees is 3 metres, although in areas well-supplied with water, they can rise to a height of 6 to 8 metres. Mangroves are useful in several ways; they supply firewood, house posts, and thatching material for huts. However, mangroves too are at risk of elimination to make place for commercial and residential projects. Damage and destruction of the mangrove forests will not only result in environmental problems, it will also threaten the livelihood of the fishing community along Sindh's coast.

Figure 6.6: Mangrove forest, near Karachi

### g) Irrigated plantations

The development of irrigated man-made forests is unique to Pakistan. In 1866, the first irrigated forest was established at Changa Manga, 90 km south-west of Lahore, to supply firewood for railway steam engines. In 1888, the discovery of the Dandot coalfield met the railways' needs, but with the demand for firewood in Punjab and for constructional timber in Karachi, Quetta, and other cities, the Changa Manga forests became so economically

valuable that more forests were developed. By 1947 there were ten such forests, covering an area of 769 sq km and except for the one at Sukkur Barrage, all were located in Punjab. Even after Partition the trend of man-made forests has continued at Thal, Kotri, Taunsa, and Guddu; by 1984, there were 2000 sq km of irrigated forests in Pakistan. The main problem in their growth and maintenance is the shortage of water between November and March, which affects their growth. Besides these forests, which are dense and compact, there are also linear plantations along rivers, canals, roads, and railways. The most common trees planted are *shisham*, *babul*, eucalyptus (*Eucalyptus spp.*), and *jhand*; these forests are also an important source of timber and firewood in Pakistan.

The table below shows the distribution of forest types and area by location.

**Table 13: Forest area under Forest Department ('000 hectares) 2005–06**

| Category | Punjab | Sindh | KP | Balochistan | Gilgit–Baltistan | Pakistan |
|---|---|---|---|---|---|---|
| Coniferous | 49 | --- | 1073 | 131 | 285 | 1538 |
| Irrigated Plantation | 150 | 90 | --- | 6 | 8 | 254 |
| Riverine | 55 | 216 | --- | 2 | --- | 273 |
| Scrub | 260 | 1 | 64 | 598 | 652 | 1575 |
| Coastal (mangrove) | --- | 280 | --- | 216 | --- | 496 |
| Linear Plantation | 17 | --- | 2 | 1 | 1 | 21 |
| Range land | 2671 | 458 | 155 | 371 | 2104 | 5759 |
| **Total** | **3202** | **1045** | **1294** | **1325** | **3050** | **9916** |

*Source: Agricultural Census of Pakistan, 2010–11*

## Forest products

Overall, Pakistan is poor in forest resources, hence the contribution of forest products to the GNP is the lowest at 0.1 per cent. Forest products, especially timber and firewood, are essential for human life; however, there is a marked fluctuation in their production in Pakistan. The main sources of timber are coniferous, irrigated, and riverine forests. Firewood is obtained from trees in general, irrespective of type.

Other important forest products in Pakistan are resin, ephedra, and *mazri*. Resin is useful for the manufacturing industries and particularly for the production of varnish; it is extracted from the *chir* which is generally found in Khyber Pakhtunkhwa, but there is variation in resin production from year to year. A number of medicinal plants are also grown in Pakistan, including ephedra which is used in the manufacture of ephedrine, a drug used to treat asthma and is supplied exclusively by Balochistan. *Mazri*, all of which comes from Balochistan, is used for making mats, baskets and packing material.

However, to meet its needs, Pakistan imports large quantities of timber, wood and wood products, pulp and paperboard, resin, cork, bamboo, and cane, and these imports are growing in volume and value.

Table 14: Output of major forest products, 2000–10

| Year | Quantity (in '000 cubic metres) | | Value (million rupees) |
|---|---|---|---|
| | Timber | Firewood | Total Value |
| 2000–01 | 383 | 543 | 1043.3 |
| 2001–02 | 414 | 478 | 1961.0 |
| 2002–03 | 384 | 444 | 1446.3 |
| 2003–04 | 436 | 505 | 1412.0 |
| 2004–05 | 408 | 752 | 1460.5 |
| 2005–06 | 632 | 478 | 1607.7 |
| 2006–07 | 632 | 577 | 1179.0 |
| 2007–08 | 1864 | 8009 | 1682.6 |
| 2008–09 | 222 | 70 | 1112.0 |
| 2009–10 | 229 | 77 | 1533.7 |

*Source: Pakistan Statistical Yearbook 2012*

## Deforestation and afforestation

The low forest cover in Pakistan—4.8 per cent of the total land area—and the factors it have been mentioned earlier in this chapter and are further discussed below. Howe it cannot be denied that some afforestation projects have been undertaken with succ

### Deforestation

This is the process by which forested areas gradually lose their trees due to careless fel for fuel, timber, and construction, and for agricultural, commercial, residential, and indust purposes. People live on the land and get their sustenance from it. Land is also needed building homes, constructing roads and railways, industries, etc. Wood is needed for furnit and construction, and also for firewood in rural areas, while leaves are used as fodder for thatching the roofs of huts. Consequently, forests are cleared. The adverse effect deforestation are being felt in many areas, particularly Balochistan.

FACTS AND FIGURES

The WWF report for 2010 warns against the current deforestation rate of 2.1 per cent in Pakistan due to which the country will not be able to increase its forest cover to 6 per cent by 2015. The report notes that more than 61,000 hectares (approx. over 151,500 acres) of forest land have been converted to non-forest use in the country since 1947. A province-wise survey shows that Punjab tops the list with conversion of 99,711 acres, followed by Sindh with 27,874 acres, Balochistan with 13,693 acres, Khyber Pakhtunkhwa with 9,692 acres, and Azad Jammu and Kashmir with only 577 acres, which brings the total to 151,548 acres. The highest rate of deforestation has been in the Indu delta mangroves, which have depleted at a rate of around 2.3 per cent, while the coniferous forest depleted at 1.99 per cent and riverine forests at 0.23 per cent.

## Effects of deforestation

Deforestation not only destroys a valuable natural resource but also affects the quality of the atmosphere, causes flooding, soil erosion, silting of river beds and canals, and loss of the ecosystem, i.e. wildlife and plant species.

Deforestation impacts the atmosphere by adding to carbon emissions and causing global warming which affects not only the country of origin, but world climate as a whole. Trees' roots bind the soil and help to absorb rainwater but deforestation leads to soil erosion and flooding. This has been evident in the heavy floods in Pakistan in the last few years.

The urgent measures to curb the negative trend are:

- an immediate ban on forest land conversions, commercial harvesting, and land allotments;
- spread of awareness among lawmakers for proper legislation to restrict land conversions;
- recovery of forest land from encroachers, and its subsequent reforestation;
- in case of unavoidable land conversion, necessary provisions in the law for compensatory forestation on twice the area being converted/allotted.

## Afforestation

However, afforestation has also been taking place; every year, in spring and the monsoon season, tree planting days are observed but the process has not borne fruit because tree planting has become more ceremonial than a real effort to increase forested areas. The Tarbela/Mangla Watershed Management Project aims at the afforestation of the privately-owned watershed areas of the two dams. Appreciable success has been achieved in the management of the Mangla Dam but the same cannot be said about Tarbela Dam, where the topography is rugged and its bed load is very heavy.

The Rechna Doab Afforestation Project was started in 1995 and afforestation of 95 per cent of the project area of 1704 hectares was completed by mid-2004. Under the Aga Khan Rural Support Programme, a successful afforestation programme was launched in Balochistan in 1995. The total forest cover in Balochistan is only 3780 hectares, in addition to which the government has started tree plantation on over 620 hectares of land.

The recovery of the Thal desert is another success story. Careless chopping down of the sparse vegetation and the strong winds had led to building up of sand dunes and spread of desert conditions. However, the planting of tamarisk and acacia trees to provide shelter against the wind, and the inauguration of the debated Thal Canal in 2001, by Pervez Musharraf, have led to reclamation of about 20,000 hectares. Sandstorm intensity has been reduced, the land has been made arable, crops and vegetables are being cultivated, and afforestation is also taking place.

Overall figures show an increase in forest cover from 3.78 million hectares in 1999–2000 to 4.24 million hectares in 2008–09.

FACTS AND FIGURES

Islamabad, 23 June 2013: Pakistan created a world record for planting the greatest number of saplings in a day by planting over 700,000 mangrove saplings at Kharochan coastal area in the Indus Delta, about 230 km from Karachi. Some 300 volunteers were engaged in this activity. The record was earlier held by India for planting 611,137 saplings in a day. This campaign was launched on Saturday (22 June) morning with the assistance of the Asian Development Bank, Coastal Community Development, and Forest Department.