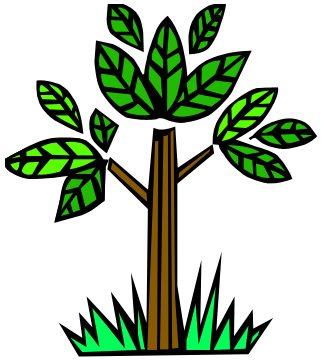
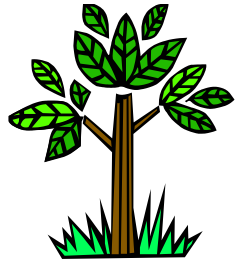
Forests of Afghanistan



Preface

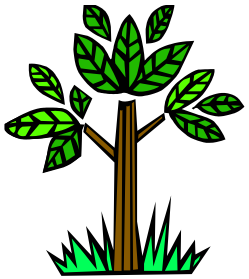
- The surface area of Afghanistan is 65.3 million hectares.
- Before the war in 1357, our forests were 1.97million ha (3% of total area).
- The geographical condition of Afghanistan because of different topography is not the same; the climate regime is also different.

Forests of Afghanistan (con)



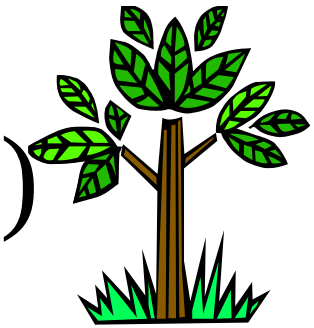
- The maximum height of Koh-e-Baba is 5140m.
- Nuristan mountains are 6300m high.
- Wakhan of Pamir is 7500m in elevation.
- The minimum elevation for the country is 300m above sea level.

Forests of Afghanistan (con)



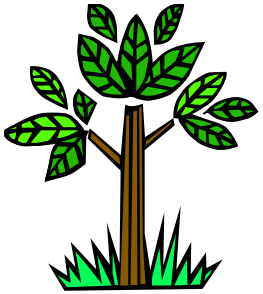
- Precipitation varies across Afghanistan (100mm – 400mm).
- The Indian Ocean monsoon season occurs from July to September and is very important for the eastern, northeastern, and southeastern regions of the country.
- Different topography takes monsoon rain in the east and southeast (Nuristan and Paktia) on 2000-3000m elevations.
- That’s why conifer forests grow naturally there.

Forests of Afghanistan (con)



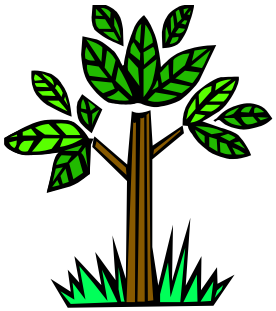
- Precipitation from the Black and Caspian Seas starts in late autumn and continues to May/June. It also reaches to the Pakistan plain areas.
- The Pamir high peaks block the cold Siberian winds from the northeast into Afghanistan.
- The cold winds of Siberia come together with the Indian warm monsoons and make moderate, sunny weather for Afghanistan.

Forests of Afghanistan (con)



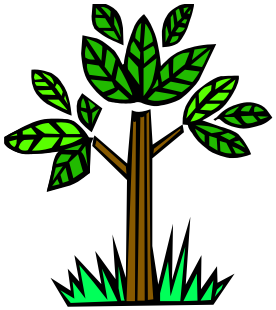
- Temperature extremes range from – 15.5 in the winter and + 45.5 in the summer
- Microclimate is very different between localities based on elevation. High elevations are more cold, and lower valleys are warmer and even hot in some places.

Forests of Afghanistan (con)



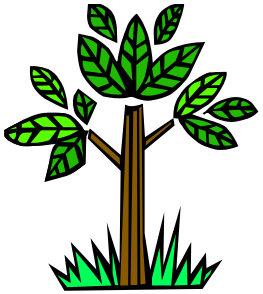
- From ancient history (2000 years ago), Afghanistan had good forests and was green (like an orchard).
- The people exploited their forests severely, and there was no management or protection of the forests.
- Destruction of the woody lands changed the climate and the ecosystem as well.
- Soils are eroded, plants of the forests of the country have disappeared, and the remaining greenery will also go in a few years.

Forests of Afghanistan (con)



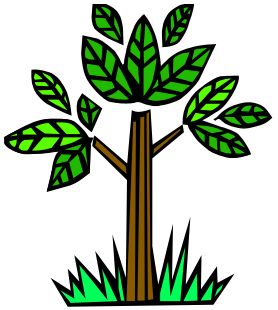
- Mountains and valleys are naturally suitable for forests.
- Hindukush is the biggest and highest mountain range in the country. It is located east to west (very important because of its forests and ranges).
- Elevations range from 300m to 6000m or greater.
- South and Southwest deserts are found between 300-1000m. Marco is the biggest and joined in the south to Loot deserts.
- These deserts plus others covered the majority of the country.

Forests of Afghanistan (con)



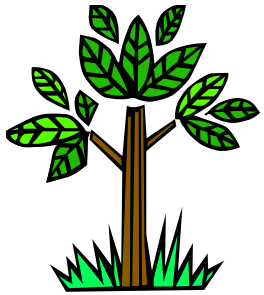
- The Afghanistan climate is dry and semi-dry.
- Afghanistan's climate is Mediterranean.
- Formula for measuring is I= P/(T+10)
  - I= Index (de Mortonnes aridity index)
  - P= Annual rainfall in mm
  - T= Average temperature
  - If I is lower than 20, then the climate is considered dry. Between 20-40 is semi-dry and greater than 40 is humid.

Forests of Afghanistan (con)



- Varying topographies in the country caused different plant ecosystems to occur at different elevations.
- A classification of the ecosystems has been done based on the different elevations, topography, climate, and vegetation.
- It is divided mainly into two ranges or orders.

Forests of Afghanistan

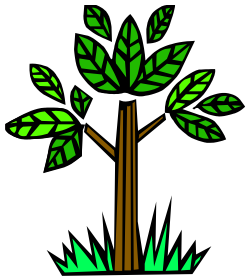


I – Range one

<u>Scrub Forests</u>

- The scrub forests of the country are nominated as Plant Formation or station and are a collection of natural plants. This scrub forest does not reach a climax stage but continues to the next ecological succession condition.
- These plants or forests are divided to sub-orders as follow:

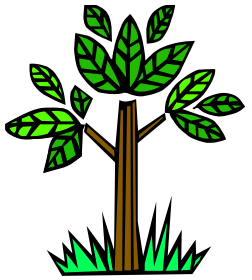
Forests of Afghanistan



1- Colligonata collective

- This collective is located in the south and southwest areas of the country.
- Rainfall of this area is less than 150 mm.
- The plants of this collective grow in sand or sand dune areas (Endodynamomorphic), and the plants' collective height is in the group of Manophanirophytes.

Forests of Afghanistan



1- Colligonata collective (cont.)

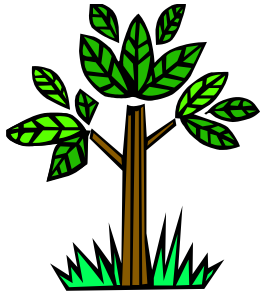
- The plants' water status is xerophytic, and they are drought resistant.
- Because of ecological conditions, Psemmosere started its succession in sandy soils and continued.

Forests of Afghanistan

1- a-The Colligonum spp are

- Coligonum commosum
- Colligonum turkistanicum
- Colligonum bungi

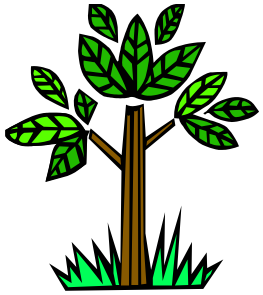
Forests of Afghanistan



1- b- Character of Coligonum spp

- Root system is long and deep.
- Root system controls sand dunes, soil creep, and desertification .
- Good fodder for animals

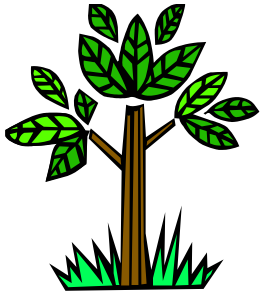
Forests of Afghanistan



1- c- Problems

- People use its wood for fuel.
- Severe over grazing occurs.
- People dig up the plants
- Soil erosion by wind occurs.
- Desertification takes place.
- Destruction of neighboring agriculture lands occurs.
- Control is not easy and not economical.

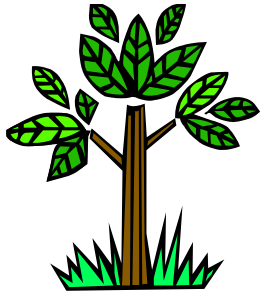
Forests of Afghanistan



2- Collective of halophileta (stalwart) Con

- These plants successfully grow in salty areas.
- These forests covered deserts in western and southwestern Afghanistan (Zabul, Kandahar, Helmand and Farah Provinces).
- Annual rainfall is 150mm, and Salsola subaphylla (Chargas) bush is the first invader of this collective.
- This bush naturally has good role for making soil.

Forests of Afghanistan

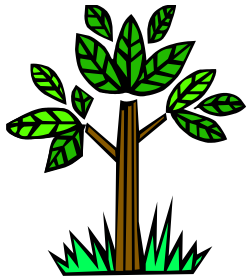


2- Collective of Halophileta (stalwart) Con

Problems

- The people clearcut it for fuel.
- They also dig up this plant or remove it (extended desertification).
- The neighboring fertile agricultural lands also change to salty soil.

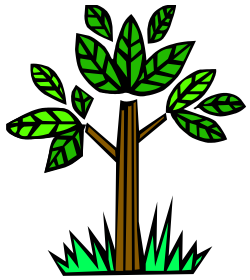
Forests of Afghanistan



3- Haloxyloneta collective (con)

- This collective is found in sandy deserts of north and west Afghanistan.
- Rainfall averages 150 mm.
- Haloxylon bush is the invader plant of this collective in Taj Guzar of Balkh Province.
- Haloxylon persicum and H. salicornicum are the species of this collective.

Forests of Afghanistan



3- Haloxyloneta collective (con)

- Salsola subaphyla (Qandum or Chargas), Seidlitzia rosmarinus (Zemi or Sabun buta), and Atriplex spp are the united of this collective.

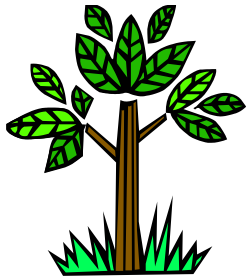
Benefits

- Root system is deep and bunched to stabilize the movement of sands.
- Wood is used for fuel.

Problems

- The people cut wood, clearcut them, and dig them up.

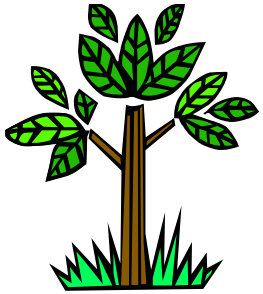
Forests of Afghanistan



4- Collective of Tamarixeta (con)

- There are several Tamarix spp in Afghanistan.
- Natural growth of it is on both sides of Herirod River in Heart.
- Rainfall is 150 mm per year.
- Temperature is more than 50 degree C in summer.
- Resistant to drought and bud condition of nature.

Forests of Afghanistan



4- a- United plants of this collective are (con)

- Salsola subaphylla, Bromus spp (Jaro buta), Alhagi camelorum, and Glyserhizia glabra (Sherin boia).

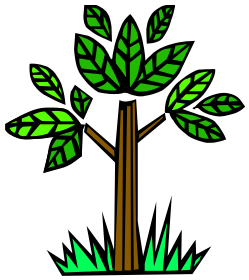
Benefits

- This collective controls the desertification effects.

Problems

- The people cut and dig them up for fuel.

Forests of Afghanistan

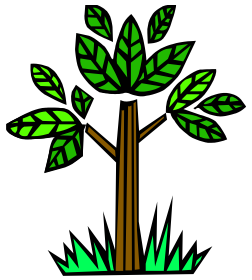


5- Collective of Zygophilleta (con)

- This collective grows in a very difficult natural condition.
- Rainfall is less than 150 mm.
- United plants of this collective are Zygophillum tetrapetrum, Zygophillum atriplicoides, Artimisia, and Salsola subaphylla.

Noorullah:

Forests of Afghanistan



5- Collective of Zygophilleta (con)

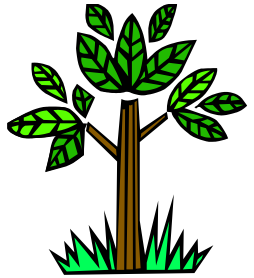
Benefits

- Root system is long and bunched, and it can easily control desertification.
- It is resistant against drought and grows in naturally bad conditions.

Problems

- The people cut and dig them for fuel.

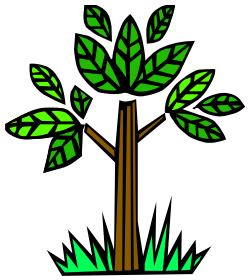
Forests of Afghanistan



6- Collective of Artemiseta (con)

- This collective is mostly found in the north, south, southwest, and west regions.
- Rainfall is more than 150 mm annually.
- Soil condition is deep and fertile with sufficient organic matter.
- Artimisia herba alba is the target plant, and Astragalus bushes also belong to this collective.

Forests of Afghanistan



6- Collective of Artimiseta (con)

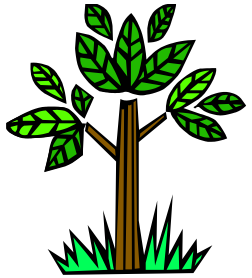
Benefits

- Grows near or adjoining to agricultural lands and sometimes uses irrigation water.
- Good plant for animal grazing.
- Protects soil from erosion

Problems

- Heavy grazing use by herd owners
- Cut and dig them for fuel
- Turn to rain fed agriculture land

Forests of Afghanistan

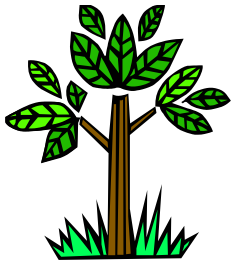


II- Second range or order (con)

<u>Collective of tree stages</u>

- These tree collectives complete the succession trends and are in the ecological climax stage with a chance of extension.
- All plants of this range are woody (phanirophytes), and all trees are the members of these collectives.

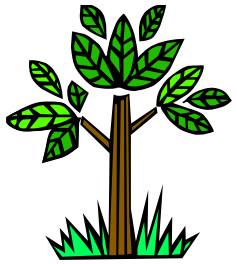
Forests of Afghanistan



II- Second range or order (con)

- All plants of this range live under environmental conditions of soil, climate, topography, and biology that occurred naturally and provided specific systems to reach different progressions of climax stages.
- Biological zones of the stages have a direct relationship with elevations.

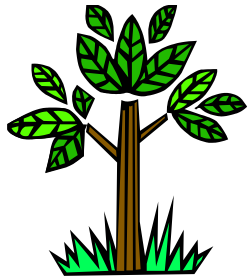
Forests of Afghanistan



1- Amegdaletum inferious collective(con)

- Name of this collective shows that it is farmed of Amygdalus communis.
- This tree zone is located between 900 and 1200 m in southwest and west regions of the country.
- Rainfall is 150-250 mm per year.
- Biological height of the trees is in the range of Manophanirophytes (short trees), up to 2m.

Forests of Afghanistan



1- Amegdaletum inferious collective (con)

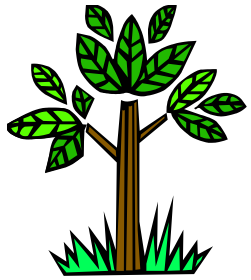
Benefits

- These trees grow on sloped areas.
- Good trees for erosion control.
- Ecological growth condition of this collective is good.

Problems

- The people clear cut them for fuel, but the volume cut is more than is growing.
- This causes strong flooding and damage to thousands of hectares of agricultural lands.

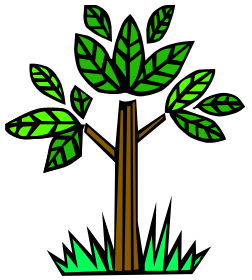
Forests of Afghanistan



2- Pistacitum atlanticum collective

- The trees of this zone are living on elevations of 1200-1800m from sea level.
- Rainfall is 250- 400mm.
- The target plant and united of this collective is Pistacia khinjuk.

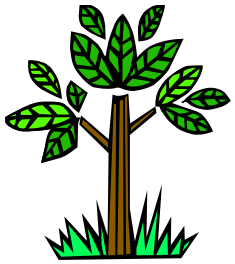
Forests of Afghanistan



3- Amygdaletum superior collective

- The trees of this zone grow between 1800-2800m above sea level.
- Rainfall is 400- 600mm.
- Soils are shallow.
- The best variety is Amygdalus abrahemica.
- Some other mountain almonds are also present.

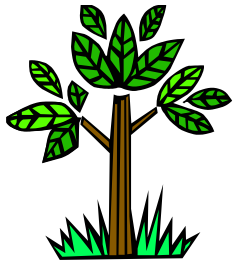
Forests of Afghanistan



4- Pistacitum verum collective (con)

- The majority of this collective is pistachio trees which live at 600-1800m above sea level.
- Pistachio is from the Angiosperm group and Anacardiaceae family, and the species is vera. Its Latin name is (P. vera). The people call this zone Pistaliq.
- It is located like a strip from northeast to west through Badakhshan, Takhar, Kunduz, Baghlan, Samangan, Balkh, Juzjan, Sairpul, Fariab, Badghis and Heart.

Forests of Afghanistan



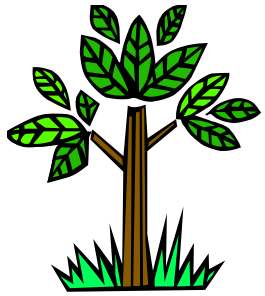
4- Pistacitum verum collective (con)

- Rain fall is always in the spring and winter. Summer is always hot, and winter is cold.
- The climate is dry.

Benefits

- Good producer of pistachio nuts
- Full of proteins and vitamins
- In 1979, Afghanistan's pistachio export was 200 Mt.
- Economically good production for the country

Forests of Afghanistan

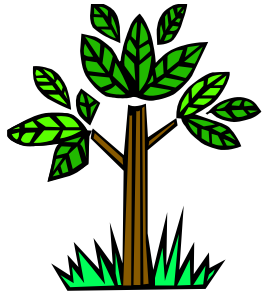


4- Pistacitum verum collective (con)

Problems

- Collection of nuts is not technically done.
- The one year productive branches are cut during collecting of nuts causing a lost of next year's nuts.
- The trees loose their shape and finally die.
- The people clear cut the trees for fuel.
- Turn the area to rain fed agriculture land.
- Soil erosion occurs because of cutting trees.

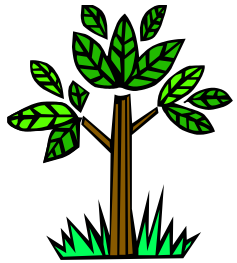
Forests of Afghanistan



5- Juniperetum trees collective (con)

- The trees of this collective are located in the northeast, north and northwest of the country between 1800- 3200m from sea level.
- These trees occupy the very sloped areas of the mountains. Soil is shallow.
- Rain fall varies because of elevations.
- Climate is dry and semidry.

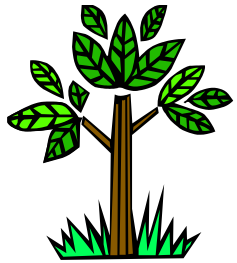
Forests of Afghanistan



5- Juniperetum trees collective (con)

- Juniperus in the north is J. excelsa, but in the northeast it is J. semiglobosa.
- Other trees in this collective are Crateagus songarica, Periploca calophylla, Khinjuk, and Almond kohi in the stage.

Forests of Afghanistan

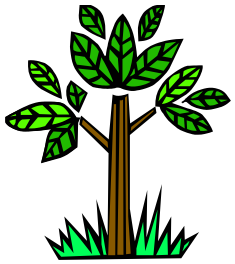


5- Juniperetum trees collective (con)

Benefits

- Prevent flooding and protect soil and water
- Good environment for wildlife
- Protect the environment, soil, and water for mountainous agricultural lands

Forests of Afghanistan

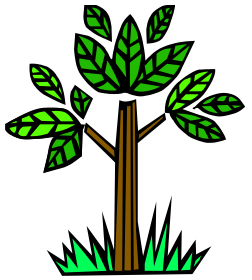


5- Juniperetum trees collective (con)

Problems

- It is does not coppice well.
- Clearcutting has destroyed the trees collective on sloped areas.
- Severe grazing also damages the environment.
- Those people who cut trees are enemies of the environment and the country.

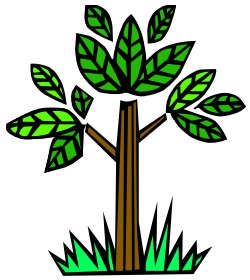
Forests of Afghanistan



6- Subtropicetum Siccum collective (con)

- The plants of this collective are found between 580- 850m from sea level of eastern (Nangarhar, Kunar) and southern (Paktia, Paktica) provinces.
- Most plants of this collective are grown on slopes.
- Rainfall is 180-325mm, and the climate is dry and hot in the summer.
- This collective is not nominated to be a special tree or plant .

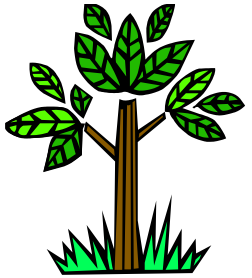
Forests of Afghanistan



6- Subtropicetum Siccum collective (con)

- Plants of this collective are: Rhazia stricta (Gadirai), Withania coagolensis (Khamazorai), Ziziphus moretiana (Onabi dashti), Calotropis procera (Spalmi), Dodonia viscosa (Ghoraskai), Periploca procera (Oom), Pistacia khinjuk (Khinjuk), Delbargia sissoo (Shisham), Pegonum haramala (isfand), Nerium oleander (Gandirai asil), Chemarups ritchiana (Mazirai), Corisa opacca (Mamana), Myrtus communis (Mano) and others. They live as united with each other.

Forests of Afghanistan



6- Subtropicetum Siccum collective (con)

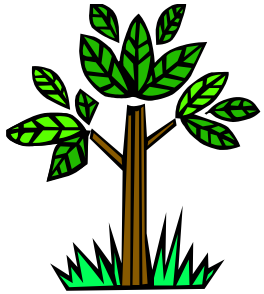
Benefits

- Prevent flooding in the slopes of foothills.
- Keep soil and water on foothills.

Problems

- The people cut them for fuel.
- They dig them up.
- Desertification is extended.

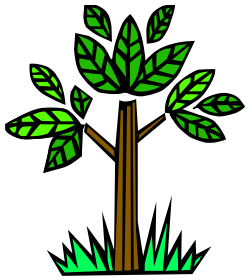
Forests of Afghanistan



7- Olea reptonetum collective (con)

- The trees of this collective mostly grow on 850-1300m of sea level in the east, southeast and south of the country.
- Trees of this collective are Olea cuspidata and Reptonia boxifolia.
- Rainfall is 400mm annually.
- Rosa moscata, Acacia modesta, barbaris spp, Vitis venefera, Romix, Cotoneaster macrophylla, and others are the united of this collective.

Forests of Afghanistan



7- Olea reptonetum collective (con)

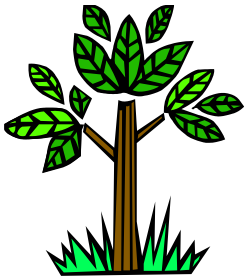
Benefits

- Keep soil and water and prevent flooding.
- Fuel for household.

Problems

- People clearcut the trees.
- People dig up the trees.
- Erosion damages the site and washes soil from the ground surface.

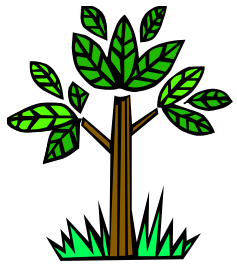
Forests of Afghanistan



8- Quercitum trees collective (con)

- Situated between 1300- 2100m from sea level. Acacia, Olea &Reptonia are united tree collective.
- Rainfall is between 400-700mm per year.
- Most trees of this collective are oak and belong to the angiosperm family of Cupuliferae or Fagaceae.
- Oak forests consist of Quercus baloot, Q. deletata, and Q. semicarpifolia.
- These forests are located in Kunar, Nangarhar, Laghman, Nuristan, Paktia, Paktica, and Kapisa Provinces.

Forests of Afghanistan



8- Quercitum trees collective (con)

- This collective covers 130,000 ha.

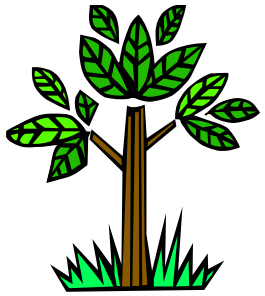
Benefits

- Trees coppice well.
- Good fodder for animals, especially in winter
- Control flooding and keep soil and water.

Problems

- Heavy grazing, cutting of branches, and cutting of trees for fuel from the forest.
- Cutting of trees for charcoal, and severe erosion.

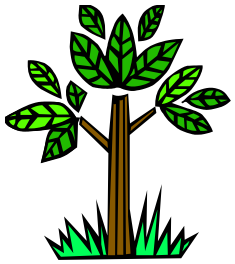
Forests of Afghanistan



9- Pinetum trees collective (con)

- Most trees of this collective are Pinus gerardiana (1300-1800m above sea level) and P. wallichiana (2800-3300m above sea level).
- Rainfall in P. gerardiana forests is 400-600mm.
- These trees are situated in Kunar, Nuristan, Laghman, Nangarhar, Paktia, Paktica, and Kapisa.
- In Laghman, Paktia and Paktica, P. gerardiana forests are very important for Jalghoza fruit production which before 1978 was mostly exported abroad.

Forests of Afghanistan



9- Pinetum trees collective (con)

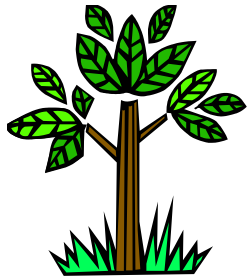
Benefits

- Good fruit (Jalghoza) producer.
- P. gerardiana wood is good for fuel.
- P. wallichiana wood is good for industrial works.

Problems

- The people clearcut the trees for fuel and timber.
- Severe grazing and clearcuts cause flooding.
- Lose of soil and water in the area results.

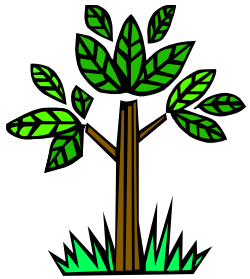
Forests of Afghanistan



10- Cedretum trees collective (con)

- Most trees of this stage are cedar, which is one of the best conifer trees.
- These trees are located in Kunar, Nuristan, Laghman, Paktia, and Paktica Provinces.
- Stage in Paktia is around 2300-2800m, and in Kunar and Nuristan occurs between 1800-2800m above sea level.

Forests of Afghanistan



10- Cedretum trees collective (con)

Benefits

- Good wood for industrial works and economic gain.
- Good forest for soil and water conservation .
- Flooding control.
- Good environment for wildlife.

Problems

- The people clearcut them for smuggling.
- Severe grazing and erosion (soil and water).
- Burning the forest for opposition and political reasons.

Forests of Afghanistan

11- Abieto Pecitum collective

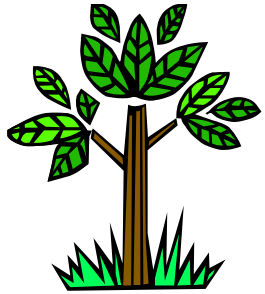
- This forest is located between 2800-3200m above sea level in Kunar, Nuristan, Nangarhar, Laghman, Paktia, and Paktica Provinces.
- Rainfall is about 860-1100mm annually.
- Climate is moderate (temperate) and semi-cold.
- The trees are Picea smithiana and Abies webiana. Ascalus indica (jawz) and Q. semicarpifolia also grow in association with them.

Forests of Afghanistan

12- Subalpinetum and Alpinetum stages

- These stages are on the elevation of 3200-4000m
- Subalpinetum stage consists of Juniperus nana (bushes), Rhododendron afghanicum (namir), and others.
- Alpinetum stage doesn’t have trees, but it does have some other plants such as grasses which make summer pasture for livestock.
- This area is also under pressure of heavy grazing and removing of plant cover by fire.

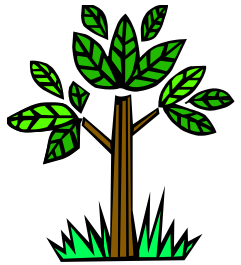
Forests of Afghanistan



Types of forests in Afghanistan (con)

- Classification of woody plants is done according to ecology and successional stages.
- In the classes each formation shows the specific bush, and each stage shows a specific tree.
- As all the formations and stages grow naturally, if some other associated plants have the same morphology. They are also taken to that combination or composition.

Forests of Afghanistan

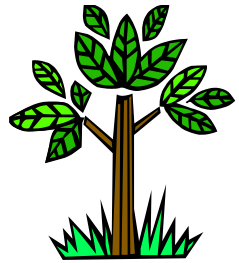


Types of forests in Afghanistan (con)

A- Ever green coniferous forests

- Collectives of P. gerardiana, P. wallichiana, Cedrus, Picea, and Abies are nominated as ever-green coniferous and cover 1.3 m ha of land.
- These forests are in the gymnosperm group and the conifereae family. These type of trees are extensively found in Afghanistan. P. gerardiana trees produce good fruits (Jalghoza) and are also good timber for housing.

Forests of Afghanistan

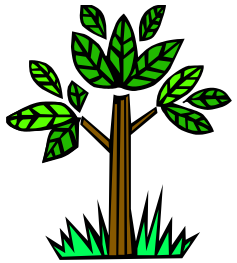


Types of forests in Afghanistan (con)

A- Ever green coniferous forests

- The largest ecosystems of these forests are: Chalas in Dewagal valley and Asmar of Kunar Province; Darin and Kamdish of Nuristan Province; Gardiz, Said Karam, and Jaji of Paktia Province; Jani khil and Tanai of Khost Province; and Spira and Jadran in Paktica Province.
- 25,000 ha of Mandahir were destroyed in the conflict.
- Dawlat Shah of Laghman and Nazian in Nangarhar were also destroyed.

Forests of Afghanistan

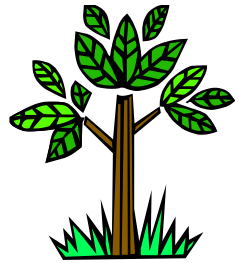


Types of forests in Afghanistan (con)

B- Ever green fleecy leaves forests

- Juniperus excelsa and Cupresus torolosa are of the Cupressaceae family and are extensively found in Afghanistan.

Forests of Afghanistan

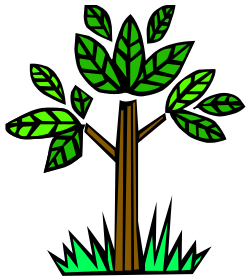


Types of forests in Afghanistan (con)

C- Broad leaved deciduous forests

- Called deciduous trees (lose their leaves in autumn).
- Huge broad leaved forests are Pistachio forests.
- Juglans regia and Diospyrus lutus (Amlok) forests also occur. Their fruits are important, but this forest does not cover as much area and the trees are found mixed with conifer forests.

Forests of Afghanistan

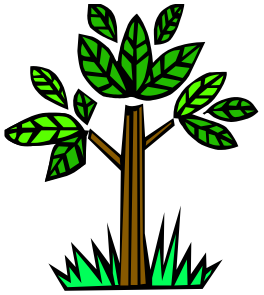


Types of forests in Afghanistan (con)

D- Other broad leaved forests

- Cercis griffithii, Fraxinus spp, Haloxilon, Acacia, and others are found scattered in all Afghanistan.
- Covers 70,000 ha of land.
- Good wood for fuel.

Forests in Afghanistan (con)

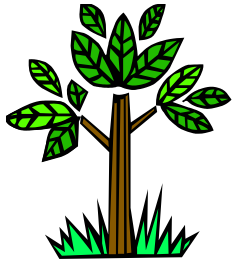


Types of forests in Afghanistan (con)

E- Man made forests (artificial forests)

- There are very few artificial forests in Afghanistan. There are 70,000 ha only of this forest which consists of different trees.
- Mostly poplar and willow of the Salicacea family are planted. These are two important genus.
- In different provinces you can find them beside canals, rivers, and picnic sites
- The people cut most of them during the war, but traditionally some remained and are very scattered.

Forests of Afghanistan

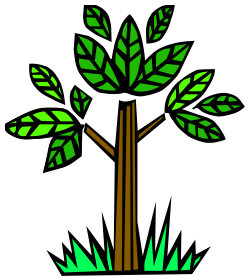


Types of forests in Afghanistan (con)

E- Man made forests (artificial forests)

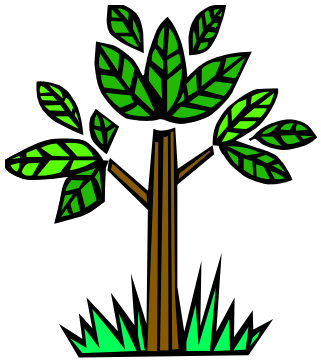
- They are very sensitive to insect and disease.
- Environment is completely disturbed.
- The underground and surface water are decreased.
- Strong flooding and land creep occur.
- Range lands are destroyed.
- Scarcity of wood (fuel/construction) will be provided from other countries.

Forests of Afghanistan



Result of discussions

- 50% of the natural and artificial forests are destroyed and damaged.
- Rehabilitation is not easy and may be impossible.
- Good policy and planning, forest law, sufficient budget, specialists and experiments, technology and sufficient time are needed to solve this problem.
- Implementing of projects (establishment, rehabilitation, management of catchments) and regular practical works are necessary.



Hope this was useful.

Thanks for your attention.