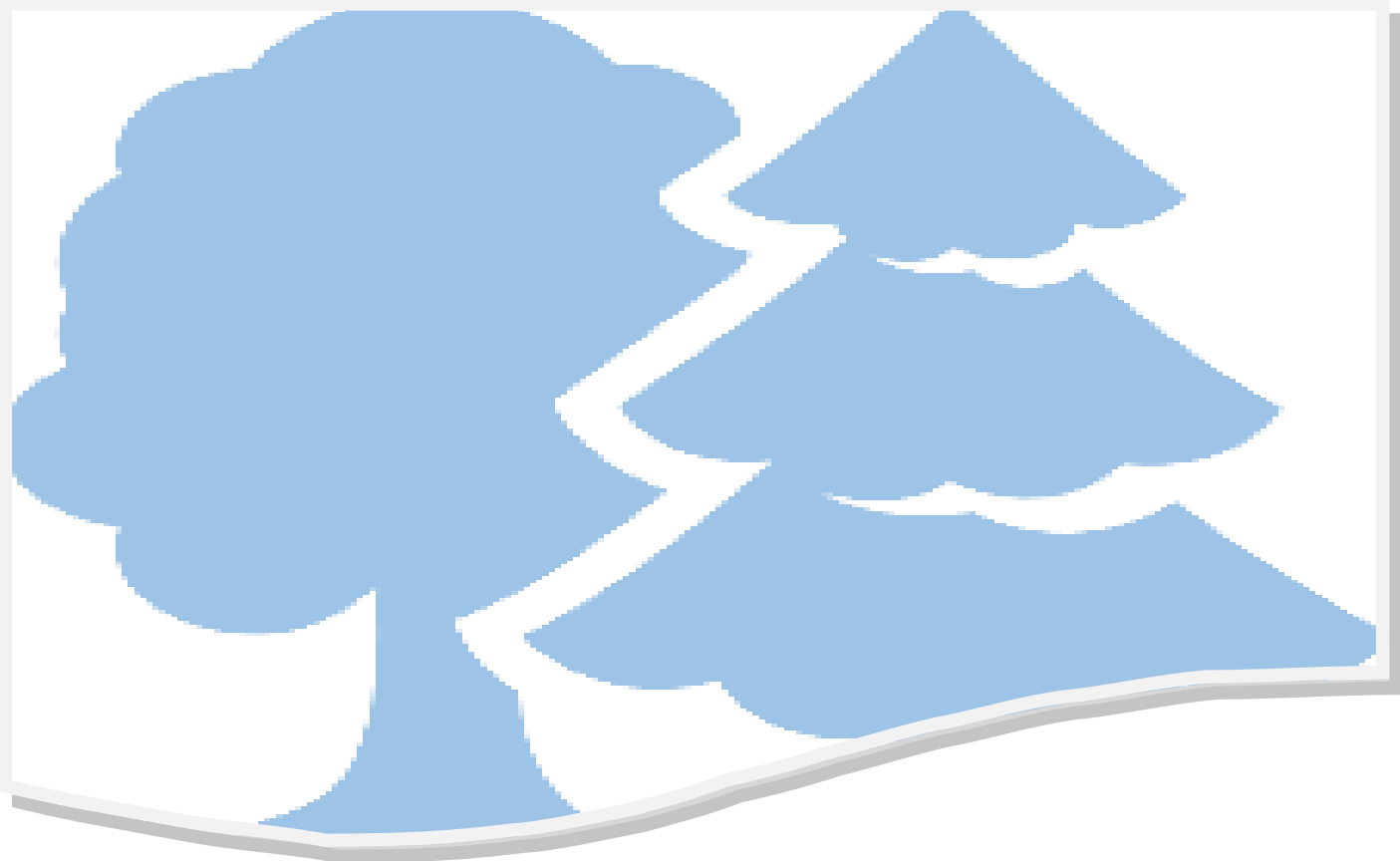# GEOGRAPHY NOTES FORM 2

FORESTRY

Specific Objectives

By the end of the topic, the learner should be able to:

a) define: i) forest ii) forestry

b) discuss the factors influencing the distribution and types of natural forests

c) discuss the significance of forests and forest products to Kenya

d) identify and explain problems facing forestry in Kenya

e) discuss ways and means of managing and forests

f) compare and contrast I softwood forests in Kenya and Canada

FORESTRY

Forestry is the science of developing and managing forests including cultivating them.

Type of Forests

    a)   Natural forests-which grow by natural means of seed dispersal.

    b)   Semi-natural/derived/cultivated forests-which is in the process of recovering from interference by man.

    c)   Planted/cultivated forests-which have been planted by man.

    d)   Indigenous forests-which are native to a region or which have grown in a region from the beginning.

    e)   Exotic forests-which have trees which have been introduced to a place from other countries.

    f)   Other types have been discussed in the chapter of vegetation.

Factors Influencing Types and Distribution of Forests

Temperature

- High temperature causes fast growth of trees while low temperature causes slow growth.
- Rain forests are found at low altitudes which are warmer while coniferous forests are found at high altitudes which are cooler.

Aspect

- Dense forests are found on windward slopes of mountains because they are wetter than leeward slopes and they start at a lower level than on the leeward slopes.
- In temperate region slopes facing equator have dense forests because they are warmer while those facing the poles have coniferous forests which are adapted to low temperatures.
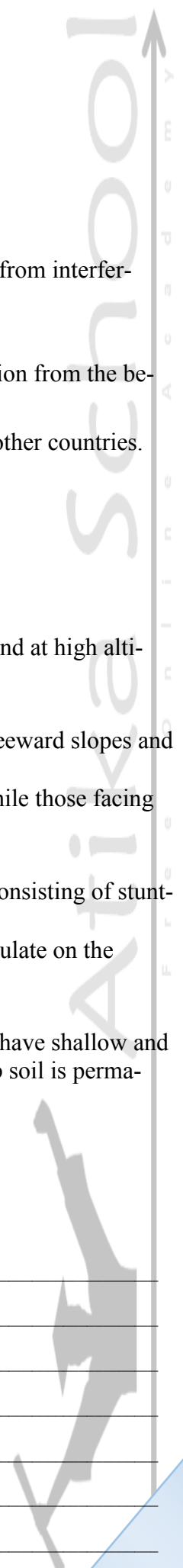
Precipitation

- There are dense forest where there is heavy precipitation while there is less forest cover consisting of stunted trees in areas with little precipitation.
- Coniferous forest have cone-shaped crowns to allow snow to slide off so as not to accumulate on the branches and cause them to break off.

Soil

- Deep soils support huge tropical trees while shallow soils support coniferous trees which have shallow and wide spread root system to be able to maximally utilize water on the top soil since the sub soil is permanently frozen.
- Poor or infertile soils have stunted trees.

Learner's Short Notes

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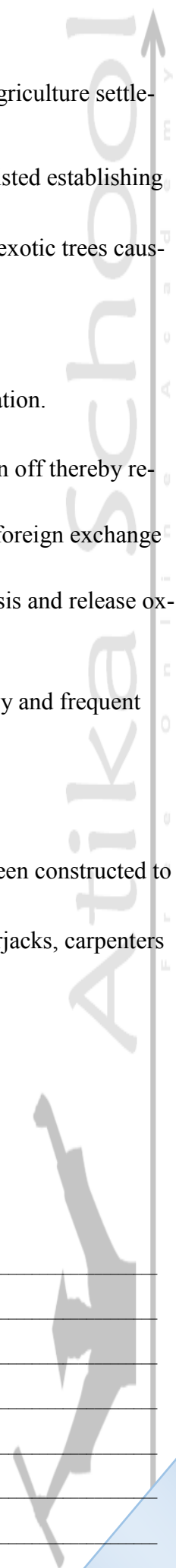
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Human Activities

- Deforestation and shifting cultivation- man has cleared forests to create room for agriculture settlement etc. which has reduced forest cover on the earth's surface.

- Afforestation and Agroforestry-man has planted trees in areas where they never existed establishing forests there.

- Reforestation-man has replanted forests which he has cleared with indigenous and exotic trees causing natural forests to become semi-natural/secondary or derived forests.

Importance of Forests to Kenya

i) Forests are water catchment areas which supports agriculture and H.E.P. generation.
ii) Forests provide us with wood fuel e.g. firewood, charcoal and saw dust.
iii) Forests prevent soil erosion by their roots binding the soil together, reducing run off thereby reducing incidents of flooding and dam siltation.
iv) Forests are habitats of wild animals which are a tourist attraction which brings foreign exchange used to import goods and services and fund development projects.
v) Forests are a disposal system for carbon dioxide which they use in photosynthesis and release oxygen thereby purifying air and reducing global warming.
vi) Forests increase soil fertility when leaves fall and rot forming humus.
vii) Forests regulate the climate of an area by creating a micro climate causing heavy and frequent rain by evapotranspiration and lowering temperatures.
viii) Forests are a source of timber for construction and furniture making.
ix) Forests beautify the environment by flora (plants) and fauna (animals).
x) Some forest's trees are a source of medicine.
xi) Presence of forests has led to the development of infrastructure as roads have been constructed to make forests accessible.
xii) Forests provide employment to people e.g. forest guards, forest officers, lumberjacks, carpenters and timber merchants.

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Importance of Forest Products

a. Forests are a source of food e.g. fruits, honey, mushrooms and bamboo tender leaves which are used for vegetables.

b. Forests provide wood used for manufacture of paper, soft boards, ply wood etc.

c. Animals in forests are hunted for food, skins and horns.

d. Leaves of trees and forest undergrowth are used as livestock fodder.

e. Forests provide wood which is used in cottage industries for making carvings and wooden utensils which are sold locally and exported.

f. Forest flora and fauna are a rich reservoir for research.

Problems Facing Forestry in Kenya

1. Encroachment by people by clearing them to create room for agriculture and settlement, grazing etc. which puts some plants and animal species in danger of extinction.

2. Destruction especially of young trees by herbivorous wild animals such as elephants due to rapid increase in the population.

3. Destruction of huge tracts of forests by fires caused by poachers, honey harvesters etc. especially during the dry season.

4. Pests and diseases outbreak which can result in destruction of large tracts of land with valuable tree species e.g. there was an outbreak of aphids in 1980s which destroyed cypress.

5. Overexploitation whereby the trees are harvested at a higher rate than which they are being replaced naturally and also harvesting of immature trees.

6. Excision of forests e.g. by converting some parts of forests into private land, government land like Nyayo Tea Zones and public utilities like Agricultural Show Grounds which has resulted into reduction of the area under forests.

7. Poor management of forests e.g. clear cutting which may lead to harvesting of immature trees in future, government officials carrying out illegal logging and government in the past having not been strict in forest conservation of forests which led to destruction of large areas of forests.

Management and Conservation of Forests

Conservation of forests is protection of forests against interference and destruction by man while forest conservation is effective planning and control of forests and forest resources.

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Conservation Measures

1. Creation of forest reserves to protect indigenous forests from extinction e.g. Mt. Kenya forest, Shimba Hills and Arabuko Sokoke.
2. Setting of forest guard posts in the forests to protect forests against illegal logging (tree felling).
3. Setting Nyayo Tea Zones to act as protective belts to prevent people from trespassing into the forests. They are also a source of employment and foreign exchange.
4. Afforestation and reafforestation.
5. Agroforestry (intercropping of various crops with trees) which:

   - Supplies wood resources
   - Provides animal fodder
   - Provide food e.g. fruits e.g. mangoes and avocadoes for good health and nutrition
   - Acts as wind breakers and
   - Shade for crops.

Management Measures

i) Research to determine which tree species are suitable for which area and how to combat pests and diseases outbreak.
ii) Carrying out public campaigns through mass media on the importance of forests.
iii) Use of alternative sources of energy e.g. sun, wind, biogas and water to reduce the rate of tree felling.
iv) Use of energy saving stoves to reduce the rate of overexploitation of wood fuel.
v) Improvement on cutting practices by selective falling of trees and replanting more trees than those cut.
vi) Control of pests and diseases which affect trees.

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Importance of Forest Management and Conservation

1. Are a source of utility products e.g. firewood for fuel and food from fruits and nuts.
2. For ecological reasons in that they help in the following ways:

- To preserve flora and fauna
- It's a water catchment area
- Moderating the flow of water reducing soil erosion and floods which also prevents siltation of dams.

3. For posterity i.e. so that the future generation will have forest resources available for their use.
4. Industrial reasons because forest products are used as raw materials in the industries such as furniture, paper making, etc.
5. Forests are important for scientific research such as on herbal medicine and genetic mapping of the species of plants and animals which haven't been identified.

Softwood Forests in Kenya and Canada

Factors Favouring the Development of Softwood Forests

Kenya

1. Cool climate of Kenya highlands which enables coniferous forests to thrive e.g. Mt. Kenya and Aberdares.
2. Heavy rainfall received in Kenya highlands and low evaporation rates which supports forest growth.
3. Ruggedness and steepness of some parts of Kenya highlands making them unsuitable for settlement thereby leaving forests to thrive.
4. High demand for timber and wood products locally and outside the country which encourages tree farming.

Canada

a) Cool and cold climate which favours growth of coniferous forests.
b) Very low average temperatures in the interior which favours the growth of coniferous forests.
c) Ruggedness and steepness such as of British Columbia which discourages agriculture and settlement leaving forests to thrive.
d) Very low population density leaving a lot of land available for forests.
e) Heavy rainfall on the windward slopes of mountain ranges of British Columbia and low evaporation in the east giving sufficient moisture to sustain forests.

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Mode of Exploitation

Kenya

- Workers are transported daily to logging sites in Kenya while in Canada settlement is set for workers within forests.

- Power saws are used in both countries to fell trees but axes are used to a limited extent in Kenya.

- In Kenya transportation of logs is by tractors and lorries while in Canada rivers are widely used to transport logs by floating.

- In both countries logging is systematic and it is done in blocks.

Factors Favouring Exploitation of Softwoods

Kenya

1) Doesn't experience winter so logging can go on throughout the year.
2) Soft wood forests in Kenya are easier to exploit because trees are planted in rows unlike in Kenya where they are natural and trees grow haphazardly.
3) In Kenya forests are accessible throughout the year unlike in Canada where forests in the north are inaccessible during severe winter and ruggedness.
4) In Kenya logging can go on throughout the year because there is no winter.
5) Availability of water from R. Nzoia for pulp and paper manufacture at Webuye.
6) Ready market due to high demand for wood products locally and outside in COMESA.

Canada

1. Mild winters in British Columbia which makes it possible to transport logs throughout the year.
2. Availability of water from many rivers providing plenty of water for paper and pulp manufacture.
3. Cheap H.E.P. for factories from many rivers in Canada.
4. Cheap and efficient land and water transport system easing transport of logs to factories and to markets.
5. Coastal location of major producing areas making exportation of timber to U.S.A. and Japan easy.
6. High demand for forest products in the neighboring U.S.A. and locally due to high purchasing power.
7. Existence of natural coniferous forests in pure stands (one tree species covering a large area) making exploitation easy.
8. Absence of undergrowth which makes exploitation easy (due to dead leaves resulting in acidic humus.

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Planted soft Woods in Kenya

- Planted in clear rows.
- Clear cutting
- Mature at the same time.

Products

In Kenya and Canada products are poles sawn timber, pulp, paper, block board, ply wood, clip board etc.

Economic Significance of Softwood Forests in both Countries

1. Provides employment to people e.g. lumberjacks, tree farmers and in timber related industries.
2. Has led to development of timber/wood related industries e.g. furniture, paper manufacture etc.
3. A foreign exchange earner when in Canada timber is exported to U.S.A. and when products in Kenya are exported to COMESA.
4. Saving some foreign exchange when the country produce wood products to cater for their needs on which they'd otherwise spend foreign exchange.
5. Infrastructural development when roads are constructed to ease transportation of logs to industries and products to markets.
6. Provide income to tree farmers.

Problems in Kenya and Canada

a. Forest fires which destroy large tracts of land where in Canada the greatest number of fires are caused by lighting while in Kenya they are caused by illegal loggers, poachers, etc.
b. Pests and diseases e.g. aphids which destroyed cypress in 1980s.
c. Overexploitation leading to soil erosion as trees takes long time to mature and provide sufficient cover to the soil after planting.
d. Canada's trees take long time to mature (50-60 years due to severe winters which slow their growth. In Kenya they take 12-35 years.
e. In Canada there is problem of inaccessibility of forests in the northern part in winter and due to rugged terrain while in Kenya they are planted and easily accessible.

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Comparison of softwood forests in Kenya and Canada

Similarities

i) Soft wood forests in both countries experience the problems of pests and diseases, fires, soil erosion and overexploitation.

ii) Softwood forest products are similar e.g. sawn timber, wood pulp, paper, poles, etc.

iii) Softwood forests in both countries grow in places with heavy rainfall, cool temperatures, heavy rainfall and rugged terrain.

iv) Forest products earn foreign exchange in both countries.

v) Tree species are similar e.g. there is pine in both countries.

Differences

i) Species of trees differ e.g. in Kenya there is Kenya cedar and podo while in Canada there is Douglas fir and white pine.

ii) Canada's soft woods are mainly natural while Kenya's are mostly planted.

iii) Kenya's softwood forests are found in highlands while Canada's are found in lowlands due to cool temperatures.

iv) Canada's softwood forests cover large tracts of land than Kenya's.

v) In Kenya softwood forests are propagated by afforestation while in Canada it's by leaving some trees uncut so that they produce seeds to be dispersed naturally.

vi) Canada's softwood forests take longer to mature than Kenya's due to severe winter temperatures.

vii) Kenya's softwood forests are planted in rows and easily exploitable unlike Canada's which grow naturally and haphazardly.

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PAST KCSE TESTED QUESTIONS

FORESTRY

1. a)

    i)   What is forestry? (2mks)

    ii)   Explain three factors that favours the growth of natural forests on the slopes of Mt. Kenya. (6mks)

    iii)   State five factors that have led to the reduction of the area under forest on the slopes of Mt Kenya. (5mks)

b) Explain four measures that the government of Kenya is taking to conserve forests in the country. (8mks)

c) Give the differences in the exploitation of softwood forests in Kenya and Canada under the following sub-headings;

   i) Period of harvesting; (2mks)

   ii) Transportation (2mks)

2. Explain factors favoring forestry in Canada

3. List two species of indigenous hardwood forest trees in Kenya. (2mks)

4. Name two industries associated with forestry. (2mks)

5. Explain three measures being undertaken to conserve forests in Kenya. (6mks)

6. Explain four problems that are being experienced in exploitation of hardwood forests in Kenya. (8mks)

7. Explain three reasons why only a small part of Kenya is forested. (6mks)

8. Outline three consequences of forest depletion in Kenya. (3mks)

9. State the factors favoring forestry in Kenya. (8mks)

10. Name four secondary products of forests. (4mks)

11. List eight major indigenous tree species in West Africa. (8mks)

12.

   (a) Define agro-forestry. (1mk)

   (b) Outline four benefits of agro-forestry (4mks)

MARKING SCHEME

1. a)

i) Is science of planting caring and using trees/forests and their associated resources or the practice of managing and using trees/ forests and their associated resources.

ii)

- The area receives high rainfall/1000 mm-2200mm throughout the year which
- encourages continuous growth of trees.
- The area has deep fertile volcanic soil that allow the roots for penetration deep
- into the ground support trees.
- The area is a gazetted reserve prohibiting cultivation and settlement hence
- allowing growth of trees
- The steep slopes discourage settlement thus forests thrive.

iii)

- The government policy of degazetement has allowed illegal cultivation and settlement in forest areas.
- Increased population of elephants that destroy trees
- Prolonged droughts have caused drying up of some trees.
- Plant diseases and pests destroy parts of forests.
- Over exploitation of certain species of trees

b)

- Legislations aimed of curbing encouraging public to participate in conservation of forests.
- Legislations aimed of curbing encroachment in forested areas.
- Encouragement in frosted areas
- Encouraging public to participate in conservation of forests.
- Setting up of buffer zones to hinder human encroachment into forested areas (Nyayo Tea Zones)
- Creation of forest reserves
- Encouraging agro-forestry
- Setting up presidential commission with the mandate of rehabilitation destroyed forested areas.

c) Give the difference in exploitation of softwoods forests in Kenya and Canada under following subheadings.

i) Period of harvesting

ii) Transportation.

Period of harvesting

- In Kenya harvesting is done throughout the year while in Canada harvesting is in winter and early spring.

Transportation

- In Kenya transportation is mainly by road transport while in Canada transport is mainly by water transport.
- To ensure continuous supply of wood fuel, timber and raw materials for paper
- industries.
- To protect soil from being carried away (erosion)
- To protect water catchment areas
- To create room for conservation of wildlife
- To create employment opportunities
- To reduce importation of forest products thus saving foreign exchange
- To promote scenic beauty.

2.

- The low temperatures limit other land use activities making forestry a good alternative.
- The thin infertile soils due to keep glacial erosion limit agriculture and favours
- forests
- Adequate precipitation throughout the year
- Many rivers with waterfalls provide HEP used in the timber related industries
- River provides cheap transport and water needed in the processing purposes.
- An extensive ready market for forest products in Canada and U.S.A.

3.

i) Meru Oak
ii) Elgon teak
iii) Camphor

4.

- Furniture making
- Wood carving industry
- Construction

5.

- Mature trees felled are replaced immediately.
- Tree farming is practiced in many parts with the aim of raising trees for future use.
- Regions which previously were devoid of trees are being planted with trees
- People are now being encouraged to plant trees and food crops in the same farms.
- The reduction of wastage e.g. the use of waste paper to produce newsprint.
- The reduction of wastage e.g. the use of waste paper to produce newsprint
- People are required to seek permits if they have to cut trees. This reduces the rate of trees felling/unlicensed people do not cut down trees.
- The forest reserves are patrolled by guards to ensure that fires are reported promptly and also to ensure unlicensed people do not cut down trees.
- Forest reserves have been set aside to conserve indigenous species.

- Forestry department of the ministry of natural resources carry out research to produce and distribute seedlings to ensure the extension of forests.
- People are being educated through mass media on the importance of trees
- People are being encouraged to use alternative sources of energy/energy saving jikos.

6.

a. There is a wide variety of trees species in a given area. This makes the exploitation difficult and expensive

b.

c. The buttress roots make the felling cumbersome

d. The dense underground/thick forests and quick generation of plants hinder accessibility, exploitation difficult

e. The heavy rainfall throughout the year results in muddy roads which makes transportation difficult.

f. Inadequate capital limits the use of modern techniques in the exploitation of the forests.

g. The demand within the region/markets are discouraging exploitation/expensive to transport/difficult to transport.

h. River transport is hindered by waterfalls/rapids. This makes transport expensive.

7.

i) Aridity that has reduced area under forests
ii) High population leading to clearing of forests for settlement
iii) Over exploiting of forests resources e.g timber fuel.
iv) Government policy of resettling people in forested areas.
v) Forest fires which have contributed to destruction of forests.
vi) Pests and diseases which destroys trees.

8.

    i)   Desertification

    ii)   Soil erosion/degradation

    iii)   Extinction of some tree species

    iv)   Decline in employment for those in forestry related areas

    v)   Loss of plants with medicinal value

    vi)   Loss of aesthetic value

    vii)   Decrease in wild animals

9. Factors favoring forestry in Kenya

    i)   Cool climate especially in the Kenya highlands.

    ii)   Fertile soils-Volcanic soils within the Kenya highlands and Rift valley.

    iii)   High precipitation ranging between 1000-2000 which favours growth of trees.

    iv)   Rugged landscape in some areas which discourages settlements and agriculture leaving growing of trees as the only alternative

    v)   Varied altitude which favours growth of different types of trees due to varied temperatures and rainfall.

    vi)   High demand of forest products

    vii)   Creation of forests reserves which enables forests to develop without interference from humans

10. Secondary products of forests-Ply woods, Venner, fibre board, paper, wood, carvings wine, tannins

11. Mahogany, ebony, ironwood, rosewood, green heart, goarea, mahure, supele, duhuma, African walnut, camphor, palms.

12.

a)   Agro-forestry involves cultivation of both crops and trees.

b)

- Provides sources of firewood and charcoal
- Source of income to farmers after selling tree products like fruits
- Trees act as wind breakers
- Trees create micro climate within the farm
- Some trees are of medicinal value
- Trees leaves decomposes to form fertile soils