VEGETATION IN EAST AFRICA.

This refers to the plant life on the earth's surface. Vegetation include trees and grasses. Vegetation is normally in two types; natural vegetation which grows according to the physical and natural environment of the areas. Artificial vegetation refers to the vegetation that has been planted by man.

The natural types of vegetation.

Equatorial / tropical rain forests, savannah vegetation (savannah woodland and savannah grassland), semi-desert, montane, mangrove (swamp vegetation). The dominant type of vegetation in East Africa is savannah woodland and savannah grassland. Most of the vegetation in East Africa is secondary vegetation after man's influence on the vegetation cover.

DRAW A SKETCH MAP OF EAST AFRICA SHOWING THE DIFFERENT VEGETATION TYPES.

FACTORS AFFECTING THE DISTRIBUTION OF VEGETATION IN EAST AFRICA.

1. Climate.

Areas with equatorial type of climate receive heavy and reliable rainfall ranging between 1000-3000mm per annum. Hot temperatures ranging from 24-290 c, high humidity of about 70% and a low temperature range of 30 c. This leads to the development of dense equatorial forests e.g. around lake shores of Lake Victoria, mountain slopes like Kilimanjaro, Elgon, Rwenzori, Kenya and along banks of rivers like Nile. The equatorial forests include; Mabira, Budongo, Bwindi, Kibale, etc.

Areas with savannah type of climate experience moderate humidity and moderate rainfall of about 750-1000mm and hot temperatures. This has attracted savannah vegetation e.g. in Uganda, and Central Tanzania.

2. Soil types.

Areas which have fertile soils, volcanic soils lead to the growth of tropical rain forests e.g. on the slopes of mountain Kilimanjaro (Chagga province) etc. Also, areas covered by alluvial fertile soils such as around Lake Victoria and Lake Kyoga basin have attracted tropical rain forests. Areas with rain forests are usually swampy and flooding. Areas with sandy soils have attracted poor vegetation cover such as the shrub and thickets because of the course and texture soil permeability and porosity e.g. the Turkana Land, Ankole- Masaka dry corridor, central Tanzania etc.

3. Relief.

Highland areas and mountainous regions have different types of vegetation along their slopes i.e;

I. Between 0-1000mm above the sea level, savannah dry vegetation is dominant where savannah lies at the lowest point followed by savannah grassland finally

savannah woodland.

II. Between 1000-2000mm above sea level, tropical rain forests are dominant.
III. Between 2000-3000mm above sea level temperate vegetation is dominant.
IV. Between 3000-4000mm bamboo type of forest is dominant.
V. Between 4000-5000mm heath and moorland are dominant.

Areas which are low lying have arid climatic conditions which have influenced the savannah type of vegetation dominated by grass and scattered trees e.g. in the north parts of Uganda, North Eastern Uganda, Eastern Kenya and central Tanzania etc. areas that lie on the leeward side of the mountains (rain shadow) have arid and dry conditions which attract savannah vegetation e.g. Kasese region which is the rain shadow of mountain Rwenzori.

Diagram.

4. Drainage.

Areas which are well drained like highland areas, mountain slopes and gently sloping regions are occupied by forest vegetation e.g. slopes of mountain Elgon, Kigezi highlands and Kenya highlands however areas which are poorly drained like low lands and valleys have constantly flooded and attracted swampy vegetation e.g. the shores of lake Victoria and Kyoga, coastal areas of East Africa, river banks etc. areas with limited water bodies like deserts or semi deserts attract dry savannah vegetation or semi desert vegetation basically with shrubs and thickets this is mainly found in Karamoja region, Turkana land, Ankole- Masaka dry corridor etc.

5. Biotic factors.

Areas which are infected with pests and have limited economic activities influence the growth of natural vegetation and these include national parks, game reserves e.g. Queen Elizabeth national park, Tsavo national park, Serengeti National park among others which are highly infested with tsetse flies. Insects like aphids, caterpillars, locusts, termites among others destroy surface vegetation. This influences the growth of semi desert conditions in areas such as Turkana land, Northern Uganda and central Tanzania.

6. Human activities.

Areas that are densely populated attract various human activities like agriculture, urbanization, industrialization etc. this calls for destruction of vegetation and consequently influencing the growth of savannah vegetation. Areas that area sparsely populated have dense vegetation cover especially tropical rain forests such as Kibale, Kiboga, and Mubende etc. That area sparsely populated have dense vegetation cover especially tropical rain forests such as Kibale, Kiboga, and Mubende etc.

7. Government policy.

The government can gazette areas for environmental protection such as national parks, forest reserves like Mabira forest reserve, Mt. Elgon forest reserve. However, the government can also lead to destruction vegetation by gazetting areas for settlement,

urbanization and mining etc. e.g. Kirembe mines, Tororo, Namanve etc.

Types of vegetation.

• Equatorial / tropical rain forest.
• Savannah vegetation/ savannah woodland/ savannah grassland/ dry savannah.
• Semi desert vegetation
• Montane vegetation
• Coastal mangrove vegetation.

1. **Equatorial rain forest/ tropical rain forests.**

This type of vegetation is commonly found on the slopes of mountains, areas in east Africa with this type of vegetation include; Mt. Kilimanjaro in Chagga province, the slopes of Mt. Kenya, Mt. Elgon, Mt. Rwenzori etc. they are also located in forest areas like Mabira forest, Budongo forest, Kibale forest, Bugoma forest, etc. Tropical rain forests are located in areas with equatorial type of climate which receives heavy rainfall ranging from 1000-3000mm, high temperature ranging from 250 c-300 c, and high humidity of about 70% and low temperature range of about 50 c.

Characteristics of equatorial rain forest.

• Forests are thick and dense therefore they are concentrated and compacted implying that trees are close to each other this is because of high rainfall and fertile soils.

• Trees are mostly of hard wood type because of constant hot temperature that causes them to discharge a lot water. Also because of the long period the trees take to mature.

• The trees have a long gestation period, they take a long time to mature approximately 30-40 years. This is because they are of hard wood.

• Trees are very tall of approximately 30-60m because of the fertile soils and ability to

compete for the sunlight.

• Trees are arranged in layers known as canopies and the first layer appears 90- 100 feet, and the second layer appears between 100-150 feet, and the third layer between 150-200 feet because they are different tree species that grow at different times.

• The trees have broad leaves to influence a high rate of evapo-transpiration to reduce excessive water and to tap enough sunlight required for photosynthesis

• Forests are green throughout the year because they receive rainfall throughout the year and found in areas of fertile soils.

• Forests have limited under growth because of lack of sunlight and a lot of mulch from the dropped leaves.

• Trees grow small plants on their barks e.g. lichens and mosses because of being humid and having a lot of water.

• Trees have climbing plants known as lianas/ creepers intermingle the canopies to create darkness in the forest.

• Trees have thin barks for easy discharge of excessive water.

• Trees have buttress roots to support the enormous huge size and height.

• Trees have large sized trunks because of soil fertility in the areas

Tropical rain forests are largely favored by physical factors for example;

Climate. Equatorial forests grow well in areas;

▪Receiving heavy and reliable rainfall above 1500mm annually.

▪Rain fall is distributed throughout the year with a bi-modal pattern

▪Have hot to warm temperatures of about 220c- 280c throughout the year; increase humidity in air and formation of heavy rainfall that encourages the growth of tall trees

▪Have high humidity levels of about 80% that promotes luxuriant tree growth

▪Presence of adequate sun light for plants to manufacture food promotes plant growth Altitude-affects temperature and rainfall.

Consequently tropical rain forests thrive at an **altitude** of about 1000m-2000m above sea level where rainfall is abundant and temperatures range from hot to warm in lowland and highlands respectively

Soil-tropical rain forests grow in areas with deep fertile soils along mountain slopes, gently sloping areas, alluvial soils along river valleys and loamy soil near shores of lakes.

Drainage. Tropical rain forests grow in well drained areas especially along gentle slopes of major highlands and lowlands

▪**Water logged** areas especially those containing numerous streams and rivers favor riverine forests

Aspect of relief. Equatorial rain forests thrive on the gentle slopes on the windward side of major mountains due to moist winds that facilitate the formation of relief rain fall

Influence of other factors for example;

▪Favorable government policy of conserving/ gazetting forest reserves for ecological functions has ensured the growth and continuous existence of rain forests in various parts of East Africa for example mabira, Bwindi forest reserve, Elgon forest, Rwenzori, Kibaale e.t.c

▪Human intervention through afforestation, re-afforestation and agro forestry programs has led to regeneration of formally degraded tropical rain forests.

Factors favoring the growth and distribution of natural forests.

The growth and distribution of natural forests in East Africa is influenced by; climate, type of soil, drainage, altitude, relief and biotic factors as explained below.

Climate- has influenced the growth and distribution of forests through its elements of rainfall, temperature and humidity.

▪hot and wet/ humid conditions have encouraged the growth of tropical rain forests.

▪cool and wet conditions in highland areas have encouraged the growth of montane forests.

▪hot and moist conditions in the coastal areas of East Africa have encouraged the growth of mangrove forests.

Altitude: refers to the height above sea level and affects temperate and rainfall.

▪Low and high altitude about 1000m-2500m above sea level encourages tropical rain forest

▪High altitude of about 2500m-3500m above sea level has encourage growth of montane forest vegetation

▪Coastal areas of about 0-200m above sea level have encouraged the growth of mangrove forests.

Nature of the soil. The Type of soil in terms of; fertility, depth and texture has influenced the growth of forests in the following ways;

▪deep and fertile soils such as volcanic on gentle slopes of volcanic highlands, loamy and alluvial soils in low lying areas such as lake shores and valleys have encouraged growth of rain forests.

▪shallow and fairly fertile soils on mountain slope have encouraged the growth of montane forests.

▪deep, muddy and saline soils have encouraged the growth of mangrove forests

Drainage of the area influences the moisture in the soil.

That is;

▪Well drained areas such as gentle slopes and steep slopes have encouraged the growth of both rain and montane forests.

▪poorly drained or water logged areas such as salty marshes in the coastal areas and deltas have encouraged the growth of mangrove forests.

Influence of relief.

▪lowlands and gentle slopes have encouraged growth of rain forests

▪fairly steep slopes or hilly areas have encouraged the growth of montane forests

▪low lying coastal plains have encouraged the growth of Mangrove forests.

Influence of other factors for example;

▪Bird have helped in dispersing seeds form which trees thrive

▪Human intervention through afforestation, re-afforestation and agro forestry has facilitated the existence of natural forests,

▪Favorable Government policy of conserving natural forests in form of forest reserves and national parks has facilitated the existence of natural forests for example Mabira, Budongo, Bugoma, Maramagambo, Bwindi impenetrable forests, Elgon forests, Tsavo National parks e.t.c

▪Absence of serious diseases and pests such as elephants and giraffes which would have otherwise destroyed and change the quality and quantity of forest vegetation. For example Mabira and Bwindi forests.

2. **SAVANNAH VEGETATION.**

Savanna refers to a belt of tropical grassland with scattered trees. It occurs in the interior landmasses experiencing tropical climate.

Savanna vegetation is subdivided into three types depending on the annual rainfall received and the duration of the dry season. That is; dry savanna, grassland and woodland.

Factors or conditions favoring the growth of savanna vegetation

These include climate, type of soil, drainage, altitude, relief and biotic factors.

Climate- Influences the growth and distribution of savanna vegetation through its elements of rainfall, temperature and humidity.

▪Moderate to heavy rainfall of about 760 mm -1200 mm annually and distributed in one season and hot temperatures of about 240c - 300 c encourage growth of savanna woodland.

▪moderate annual rain fall of about 500mm-760mm and hot temperatures over 300 c encourage grass lands.

▪Low and seasonal rain fall of about 250mm- 500 mm per annum and very hot temperatures over 300 C encourages the growth of dry savanna vegetation.

▪high to moderate humidity has favored savanna wood lands and grassland while low humidity for dry savanna vegetation.

Altitude -Low altitude of less than 1500 meters above sea level encourages savanna vegetation.

▪ Low plains encourage dry savanna and grassland while high plains encourage savanna woodland.

Nature of the soil. The Type of soil in terms of; fertility, depth and texture influence savanna vegetation in the following ways;

▪fairly fertile soils with low water retention capacity have favored the growth of

woodlands

▪soils of moderate fertility for example latosols and laterites have favored grass lands

▪Poor sandy soils for example in Karamoja and rift valley regions have encouraged growth of dry savanna vegetation.

Drainage of the area influences the moisture in the soil**.**

▪Well drained areas without or very limited surface water have encouraged the growth of dry savanna vegetation

▪Fairly good drainage especially in the wet season increases moisture in the soil hence growth of tall grasses

▪Fairly good drainage with limited surface water and streams favors growth of savanna woodland characterized by deciduous and drought resistant plants

Influence of relief- determines depth and moisture in the soil for example;

▪Low lying plateau areas have favored savanna woodlands while flat lowlands have favored both savanna grasslands and dry savanna for example rift valley areas and the plains.

Biotic factors for example;

▪Occurrence of pests such as tsetse flies, termites, bees, caterpillars and locusts, and diseases such as Nagana and sleeping sickness deter human interference through deforestation hence continuous existence of savannas.

▪Wild fire and animals especially in national parks have destroyed and altered the characteristics of the tropical forests; degradation and changing them into savannas for example Elephants, giraffes, buffaloes and cattle.

Man’s activities such as logging, charcoal burning, mining and agricultural expansion in the tropical forests has led to degradation and changing of these forests into savannas

▪Favorable government policy of conserving/ gazetting savannas as reserves and national parks for ecological functions has ensured their growth and continuous existence in various parts of East Africa for example Murchison falls national park, Queen Elizabeth national park, Tsavo, Masai Mara and Serengeti national parks.

▪Human intervention through afforestation, re-afforestation and agro forestry programs has led to regeneration of formally degraded savannas.

Savannah vegetation is categorized in 3 groups which include;

(I) Savannah woodland. Which is dominant in central Uganda, eastern Kenya, in the Nyika plateau, central and southern Tanzania (Miombo woodland).

Characteristics of savannah woodland.

• The trees are mediumly tall ranging from 30-40m because of limited soil fertility and inadequate rainfall.

• Trees are umbrella shaped because of the broad space around them therefore giving them maximum expansion.

• Trees shade their leaves during the dry season in order to minimize/reduce the rate of water loss.

• Leaves are mediumly small to minimize the rate of water loss.

• Trees have a lot of undergrowth because of the excess light.

• Trees are mediumly of small size because of limited food supply and inadequate rainfall.

• Trees have thick barks to reduce the amount of water loss from plants.

Factors or conditions favoring the growth of savanna woodland vegetation

Climate, altitude, soils, drainage, relief, biotic factors, influence of human activities.
Climate- Influences the growth and distribution savanna woodland vegetation through its elements of rainfall, temperature and humidity;

▪Seasonal and moderate rain fall of 760-1000mm per annum has encouraged the growth and dominance of trees to form a continuous cover towards the margin of rain forests.
▪Rain fall is concentrated in one peak
▪The dry season encourages shedding of leaves and growth of grasses
▪High temperatures over 270 C - 300 C encourage growth of drought resistant tree species such as acacia
▪Moderate humidity allows fairly high transpiration.
Occurrence of fairly fertile and porous soils enables water to drain easily and trees to develop long tap roots.
Relief. The occurrence of low lying plateau areas has favored the growth of Miombo woodland vegetation.
Low altitude of less than 1500 meters above sea level has encouraged the growth of savanna woodland. **Drainage**. Limited or lack of surface water leads to quite good drainage which encourages the growth of Miombo woodland.

Biotic factors for example;
▪Occurrence of pests such as tsetse flies, termites, bees, caterpillars and locusts, and diseases such as Nagana and sleeping sickness deter human interference through deforestation hence continuous existence of savanna woodland.
Man's activities such as logging, charcoal burning, mining and agricultural expansion in the tropical forests has led to degradation and changing of these forests into savanna woodland.

Government policy creating of national parks and forest reserves for ecological functions has led to protection and regeneration of formally degraded savanna wood lands for example Murchison falls national park, Queen Elizabeth national park, Tsavo,

Masai Mara and Serengeti national parks.

ii) SAVANNAH GRASSLAND

It is dominantly located in Northern Uganda, western Kenya, the Masai land of Kenya and Tanzania, western Uganda specifically Nyabususi.

CHARACTERISTICS

The dominant type of vegetation is grass.

The common grass specie is elephant grass and spear grass.

The grass is tall of about 5~7 meters.

Grass dries up during the dry season

The area has scattered trees which are thorny.

Trees have small leaves especially the acacia.to reduce water loss.

Grass have taproots to reach the water level and brittle leaves.

Trees have thick barks to store water. Trees are short of approximately 20-30m.

Trees have hard wood.

(iii)DRY SAVANNAH VEGETATION

It's located in semi-arid areas of east Africa particularly north eastern Uganda (Karamoja), pader, kitgum, Northern Kenya (Turkana land), north eastern Kenya (wajiri, marsabit, and Mandela), central Tanzania (Kondoa districts), the ankole Masaka dry corridor.

Characteristics

• The biggest part of land is bear with no vegetation cover.

• The dominant type of vegetation are thickets (shrubs and scrubs)

• Trees are very short of about 15-20m

• Trees are thorny

• Trees have very thick barks

• Trees have big tap roots which access water deep in the water table

• Trees store water in their trunks/stems to be used in the dry season.

• Leaves are waxy and powdery to reduce on the size of the stomata and minimize water loss.

• Grass is hard and brittle when mature and tender when young after burning has taken place.

• Trees are hard wood because of excessive hot temperature.

TEMPERATE (CONIFEROUS FORESTS) VEGETATION.

This type of vegetation occurs between 2000-3000m above sea-level with the following.

Characteristics

• Trees appear in large/ big stands

• Forests are ever green throughout the year

• There is a lot of undergrowth especially grass and shrubs.

• Trees are soft wood in nature.

• Trees have thin barks that can easily discharge water.

• Trees are mediumly tall, approximately 30-40m

• Leaves are needle shaped and very small in nature in order to minimize water loss.

• Trees are cone shaped in order to allow easy snow flow

• The main species include, eucalyptus, pine, red cedar, hemlock.

• Trees have deep taproots to access water deep in the soil layers

• Stems produce a lot of wax.

Bamboo forests exist at an altitude of about 3000m – 3500m above sea.

Bamboo plants have the following characteristics;

▪they appear in single layer, ▪grow in pure stands

▪have segmented or reed like stems with hollows inside to minimize water consumption which is relatively scarce at this altitude,

▪have small, tough pointed leaves,

▪they are ever green,

▪have prop roots to anchor in the swallow soil.

Bamboo forests exist at this level because of;

▪low rain fall

▪cool temperatures

▪thin and skeletal soils.

Heath and moorland exists at an altitude of about 3500m – 4500 meters above sea-level and have the **following characteristics;**

▪They consist of short grasses, shrubs and Alpine flowers

▪Plants include lobelia and giant groundsel.

Heath and moorland exist at this level because of;

▪low rain fall

▪cold or Low temperatures

▪thin soils such as scree soils due to high rate of erosion on steep slopes and limited chemical weathering

Swampy vegetation found in poorly drained areas and includes

●Mangrove swamps in the salty waters along the coastal plains for example Lamu and Rufijj delta.
●Papyrus swamps in water logged areas such as shores of Lake Kyoga and Victoria; valleys in central and western Uganda and river valleys such as katonga, kagera and Rwizi.

Characteristics of swampy vegetation

▪dominance of papyrus, palm trees and sedge grass in papyrus swamps,

▪Mangrove swamps have Medium height trees of about 12 meters,

▪trees have aerial roots for breathing because of mud,

▪trees have short and twisted trunks, ▪trees have ever green broad leaves

▪trees are of tropical hard wood.

Sample question.

1. With specific reference to East Africa, examine the factors that influence the growth and distribution of natural vegetation. (EDWARD KYALIMPA)
2. To what extent has climate influenced vegetation distribution in East Africa? (NAIRUBA PRIMA)

3. To what extent has altitude influenced the distribution of natural vegetation in the highland areas of East Africa? (ABDUL KARIM N)
4. Account for the differences in the natural vegetation zonation in one mountainous area in East Africa (NAKYA FATUWA)
5. To what extent has the natural vegetation of East Africa been modified by human activities? (AKERA NORAH)
6. To what extent has man influence the distribution of natural vegetation of East Africa? (EDDY MUS…)
7. Account for the distribution of natural forest vegetation in East Africa. (NAMAGEMBE DIANA)
8. (a)describe the characteristics of tropical rain forests in East Africa(GODWIN EJOHN)

   (b) Explain the conditions which have favored the growth of tropical rain forests in East Africa.

9. Explain the factors influencing the distribution of tropical rain forests in East Africa

   (SHANITAH NAB……)

10. (a) Describe the characteristics of savanna vegetation. (SUMAYYA N……)

(b) Explain the conditions which have favored the growth of savannah vegetation in East Africa.

NB. EVERY ONE IS HAVING QUESTION TO TRY.