

P250/3 GEOGRAPHY PAPER 3- UGANDA AND FIELD WORK

UNIT 1: INTRODUCTION TO UGANDA

1:00 Location of Uganda

Uganda is a landlocked country located and lies astride the equator, about 800 kilometers inland from the Indian Ocean. It lies on the northwestern shores of Lake Victoria, extending from 1° south to 4° north of the equator (latitude) and 30° to 35° East of green which (longitude)

1:01 Position

Uganda is positioned in East Africa, and bordered by the Democratic Republic of the Congo (DRC) in the west, Kenya in the East, Rwanda in south west, and South Sudan in the North, Tanzania in the south.

Map of Uganda showing its location and neighboring countries



1:02 Total land area

With a land surface of 241,137 km² Uganda occupies most of the Lake Victoria Basin, which was formed by the geological shifts that created the Rift Valley during the Pleistocene era. The Sese Islands and other small islands in Lake Victoria also lie within Uganda's borders.

1:03 Altitude

Uganda averages about 1,100 meters (3,609 ft.) above sea level, and while much of its border is lakeshore, Uganda has no access to the sea.

The country is mostly plateau with some rolling hills and low mountains, with volcanic foothills in the east.

Minimum (above sea level – Albert Nile at the border with South Sudan): 614 meters (2,014 ft.)
Maximum (above sea level – Mt. Rwenzori): 5,111 meters (16,768 ft.) at margherita peak.

1:04 Relief

The Ruwenzori Mountains form much of the southwestern border between Uganda and the DRC with the highest peaks that are snowcapped. In eastern Uganda, the border with Kenya is marked by volcanic hills.

1:05 Drainage

Uganda is replete with water and contains many large lakes. Almost one-fifth of its total area is open water or swampland. Four of East Africa's Great Lakes - Lake Victoria, Lake Kyoga, Lake Albert, and Lake Edward lie within Uganda or on its borders.

1:06 Climate

Uganda has a warm tropical climate with temperatures falling in the 25–29°C (77–84°F) range on an average. The months from December to February are the hottest, but even during this season the evenings can be chilly with temperatures in the 17–18°C (63–64°F) range.

Uganda receives an annual rainfall of 1,000mm to 1,500mm. The rainy seasons are from March to May and from September to November. During these months, heavy rains can make roads and terrains hard to traverse. The period from January to February and again from June to August are dry

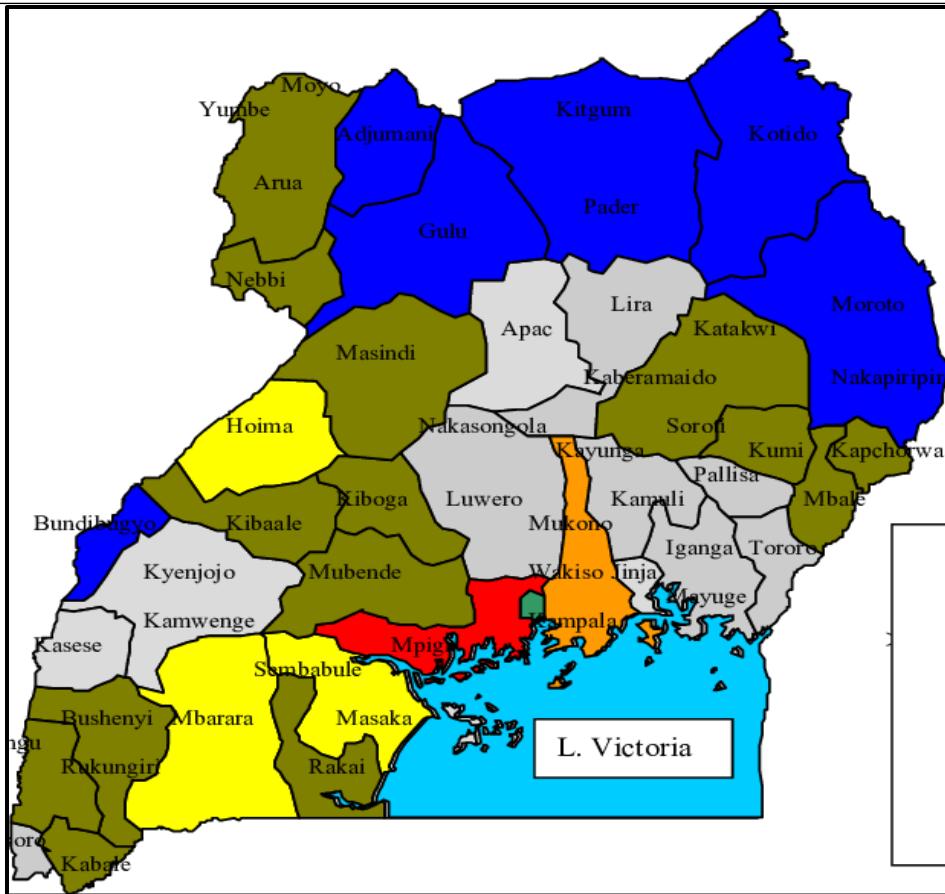
1:07 Administrative units

By 2016 census Uganda had about 116 districts, 200 counties, 1440 sub counties, 7571 parishes and 57858 villages. Kampala is the capital city with other cities like Jinja, Mbale, Mbarara, Masaka, fort portal, Gulu and Arua.

1:08 Population

The total population by 2014 was 34.6 million people with population density of 173 persons/km². The sex percentage was female 51% and male 49% with urban population making 21.4% of the total population. Uganda has a young population with 55% below 18 years.

Map of Uganda showing some districts



Assignment

In not more than 500 words describe the physical make of Uganda

UNIT 2 LANDFORM EVOLUTION IN UGANDA

2:00 Introduction

A landform is a natural feature of solid surface of the earth. Land forms make up the topography. Examples of landforms include hills, mountains, plateau, valleys, shoreline features such as stacks and bays etc.

Uganda has a wide variety of Land forms ranging from small coastal features to extensive Mountain and the plains. The formation of these landforms was as a result of mainly two processes;

- a) Tectonism i.e. faulting, volcanism, folding and crustal displacement
- b) Denudation processes i.e. Erosion, weathering and mass movements.

Tectonism refers to the processes of deformation that produces in the earth's crust its continents and ocean basins, plateau and mountain, folds of strata and faults.

2:01 Origin of tectonism; tectonism is due to great heat resulting from pressure of the overlying rocks on the underlying rocks, friction between the moving plates, geochemical and radio activity within the earth's mantle.

The heat melts the underlying rocks forming a molten substance that gives off convectional currents from the earth's interior. The convectional currents move in different directions contributing to endogenic disturbances.

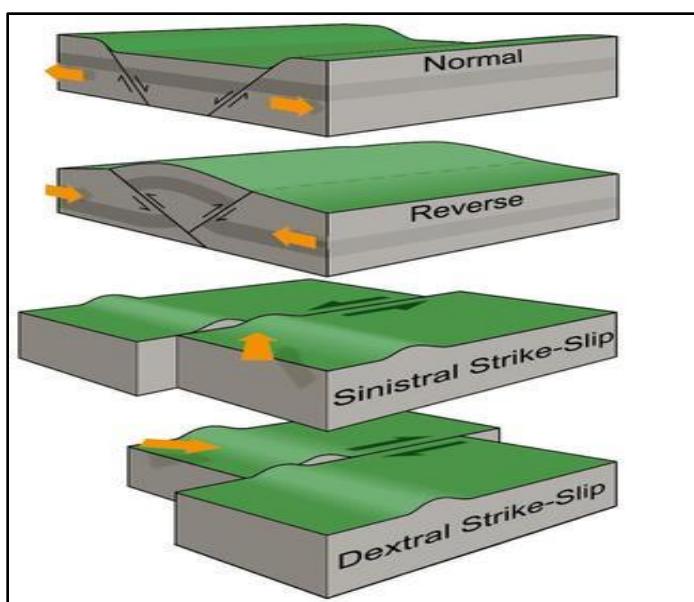
2:02 FAULTING IN UGANDA

Faulting refers to the breaking/ fracturing of the earth's crust due to tectonic forces of either compression or tension that results into horizontal or vertical displacement of the crustal rocks.

The breaking /fracturing of the earth's crust creates a fault/ line of weakness. A fault is a fracture along which displacements of rocks take place.

Types of faults.

Illustration



Faulting in Uganda has led to formation of the following land forms;

- Rift valley
- Fault lakes/ Grabens
- Block Mountains
- Escarpments

- Fault guided valleys

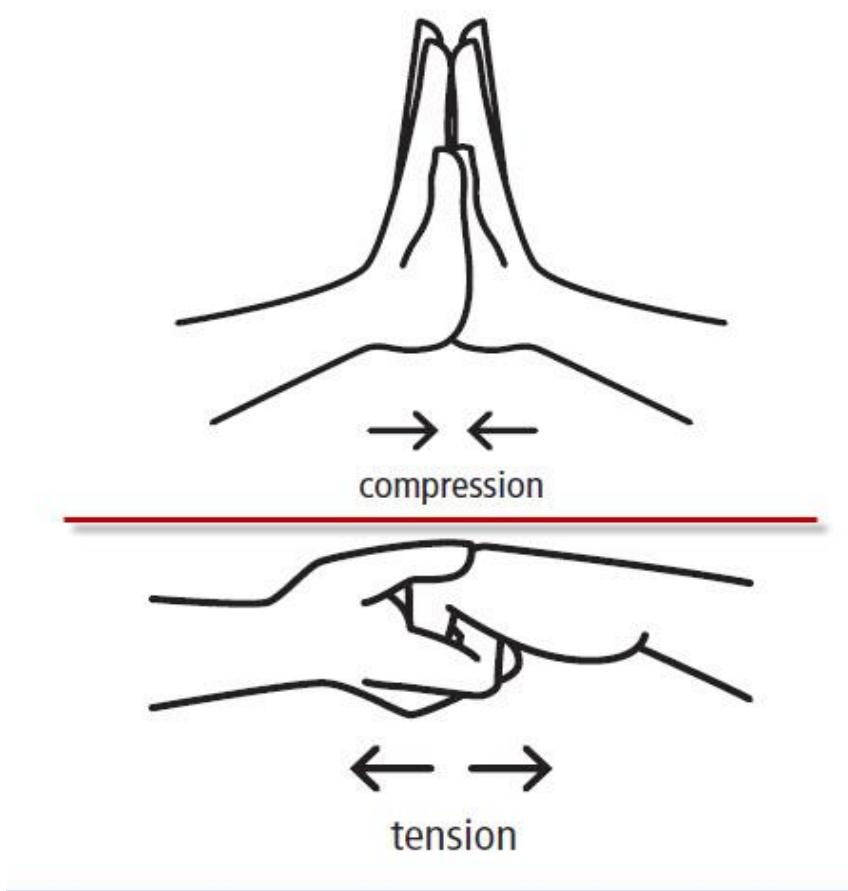
2:03 RIFT VALLEY (THE WESTERN ARM OF THE GREAT EAST AFRICAN RIFT VALLEY)

A rift valley is an elongated narrow and flat floored depression bordered by in facing steep slopes or sides known as (fault scarps) along one or more parallel fault lines.

Two main theories have been advanced to explain the formation of the rift valley in Uganda; the **tensional force** theory and the **compressional forces** theory.

These theories are based on the fact that material in the interior of the earth is in a molten state due to radioactivity (Radioactivity is the process by which an unstable atomic nucleus loses energy by emitting radiation.), geochemical reactions and pressure from overlying rocks.

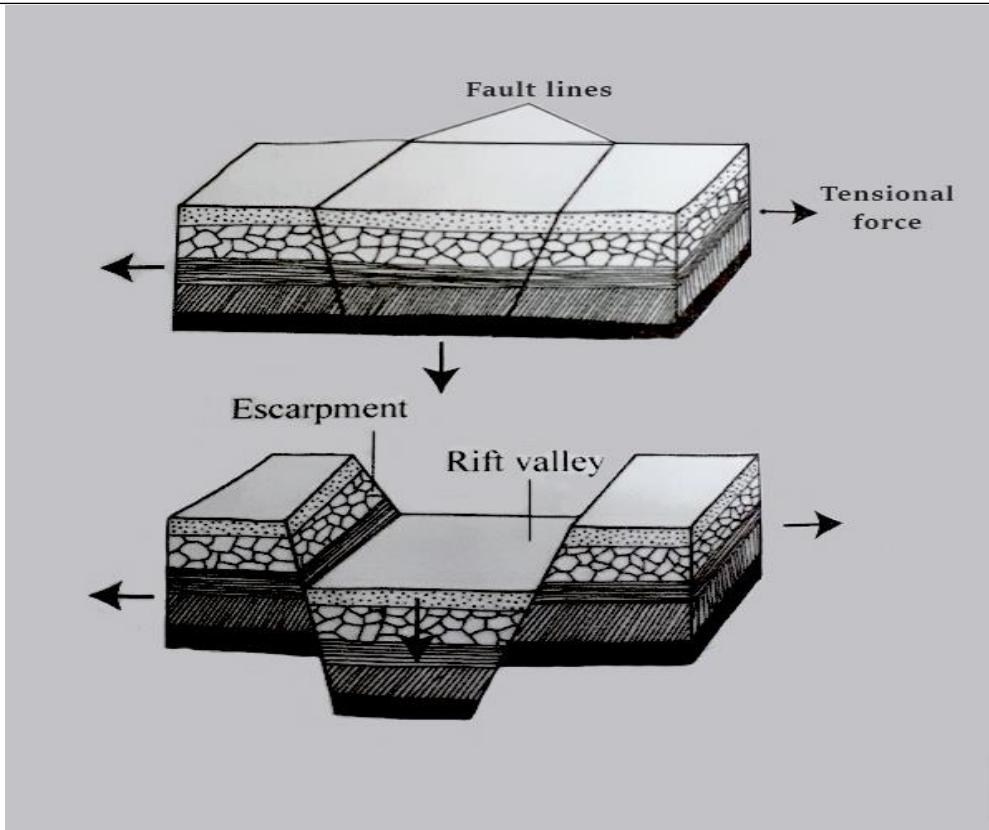
The interior then behaves like a giant convective system causing materials to raise towards the earth's crust and surface before spreading out laterally or horizontally away from each other generating tensional forces and where the currents move towards each other or converge, compressional forces are formed. These explain the formation of the rift valley in the following ways;



2.04 Tensional forces theory; this theory suggests that the crustal block was subjected to tension forces that pull the crust apart creating normal faults that divide the crustal block into three sections/ blocks i.e. middle/central and two adjacent/side blocks.

The middle block subsides/ sinks under its own weight to form a depression known as a rift valley.

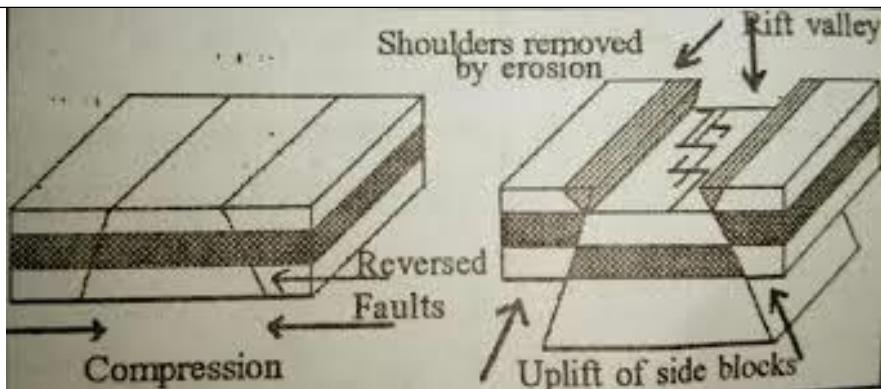
Illustration



2:05 Compressional forces theory; the theory explains that a crustal block was subjected to compressional forces that push towards each other creating reversed faults. The crustal block was then divided into three sections/ blocks i.e. the middle/ central block and two adjacent/ side blocks. Due to continued compression, the side blocks were forced to over-ride the middle stable block leaving it at a lower level to form a depression known as a rift valley.

The sharp edges of the up thrown side blocks collapse due to denudation processes like erosion, to exposes the depression at the surface.

Illustration



2:06 Influence of the rift valley to the human activities in Uganda

1. The rift valley has a beautiful scenery which attracts tourists from both within Uganda and abroad. These tourists pay for viewing licenses which is one of the major sources of income to the government that has been used to develop other sectors in the economy like building health facilities, construction of roads etc. this is evident in areas like Kasese where many tourists visit the rift valley.
2. The rift has grabens/ fault lakes like Albert, George, Edward, the have encouraged activities like fishing which is a major source of employment and income to people around and to the government e.g. around lake Edward at Rwenshama and Katwe landing sites, Butiaba and Ntoroko on lake Albert.
3. The relatively flat rift valley floor has encouraged the development of transport networks like roads e.g. Kasese- fort-portal road and Masindi- Butiaba road. The rift valley lakes have also encouraged water transport e.g. from Ntoroko to Tonya landing sites on Lake Albert. This has promoted trade in the region e.g. in Kasese town.
4. The rift valley is associated with various mineral deposits thus encouraging mining activities that provide income to people and the government e.g. oil from the Albert flats, limestone at Hima in Kasese, cobalt at Kasese etc.
5. The rift valley floor is covered by extensive rangelands/ grass lands which have encouraged livestock farming. This is evident in areas like Buliisa and kibaale where pastoralism is commonly practiced.
6. The extensive range lands at the rift valley floor have encouraged wildlife conservation and tourism with important national parks like Queen Elizabeth national park in Kasese, kibaale national park in kibaale district with animals like giraffes, zebras, birds, reptiles etc. This has promoted tourism in that region and the country which is a major source income to the government.
7. The rift valley is also associated with various features like grabens, escarpments etc. which have provided avenues for research and study purposes especially in the higher institutions of learning e.g. Makerere university, the institute of ecology at mweya in

Queen Elizabeth national park in Kasese. This has widened the scope of knowledge for such students which is vital for development.

8. The relatively flat rift valley floor has encouraged settlement in the rift valley, this is because it is easy to construct residential houses and socio-economic infrastructures like roads schools etc. examples are areas of Muhokya, katwe. Kibaale, Buliisa all in the rift valley.
9. The rift valley is also associated with fertile soils in various areas which has promoted arable/ crop farming e.g. cotton and fruits growing in mubuku irrigation scheme in Kasese.
10. The rift is associated with features like the escarpments that are crossed by rivers, these have promoted generation of hydroelectricity which has been used for both domestic and commercial purposes e.g. mobuku 1 and 2 power stations in Kasese.
11. The grabens like Lake Edward, Albert, and Edward provide to the surrounding population which is used for both domestic and industrial purposes e.g. the cobalt processing plant in Kasese uses water from Lake George.

Negatively

12. The sides of the rift valley form escarpments that hinder the development of transport networks like roads thus making such areas remain remote e.g. Biiso escarpments in Masindi.
13. The steep slopes along the sides of the rift valley accelerate surface run-off and soil erosion thus affecting the nature of soils hence reducing the productivity of the land for agricultural purposes e.g. Butiaba in Masindi.
14. The rift valley is found in the region of crustal instability and therefore it is prone to severe earth quakes that claim lives and property. This is common in Kasese, Bundibugyo etc.
15. Most of the rift valley region is situated in the rain shadow of mountain Rwenzori which affects the micro- climatic conditions like causing low rainfall amounts which has limited agricultural activities especially crop growing in the region e.g. in Buliisa.
16. The rift valley region forms one of the lowest areas in Uganda lying between 600-900 meters above sea level. Because of the low altitude, the region is associated with high temperatures throughout the year thus affecting activities like farming e.g. in Kasese, Buliisa etc.
17. The rift valley region being one of the lowest in terms of altitude is liable to flooding especially around the grabens. This is common around lakes George, Albert etc. This has led to loss of lives and property.
18. The rift valley lake are very deep and this limits activities like fishing and water transport especially with small vessels like canoes. This is evident on Lake Albert.
19. The fault lake contain salty water since they don't have outlets like e.g. Lake Edward. This water is not suitable for human consumption that causes scarcity of sweet drinking water in the region e.g. in Ntoroko, Butiaba landing site on Lake Albert.

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20. The rift valley region is a habitat for dangerous wild animals in the national parks that occasionally stray and destroy people's crop fields and sometimes kill people. E.g. around Queen Elizabeth national park in Kasese.

Assignment

Explain the significance of the rift valley to the people in the surrounding environment

2:07 BLOCK MOUNTAIN (HORST)

A block mountain is an upland bordered by faults on one side or more sides.

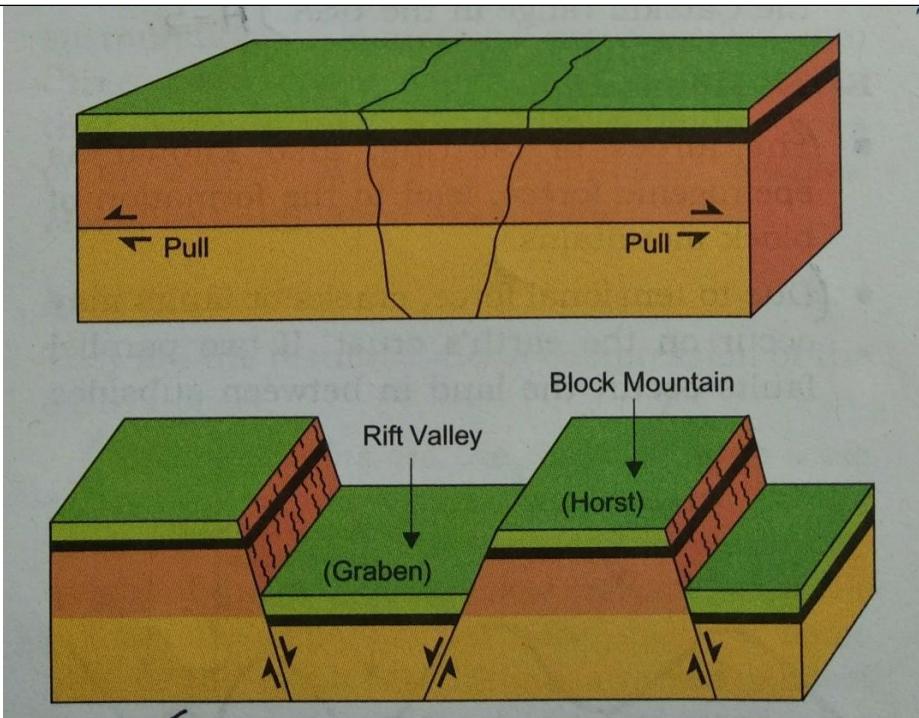
In Uganda Mountain Rwenzori is the only block mountain. It is found in the western region of the country at the floor of the great east African rift valley. The mountain stands at an altitude of about 5110 meters above sea level with magherita as the highest peak.

It is believed that the mountain was formed during the formation of the rift valley due to tensional and compressional forces.

2:08 Tensional forces theory

The theory explains that tensional forces must have pulled the earth's crust apart on either sides to form normal faults. This divided the crustal block into three sections i.e. the middle/central and two adjacent blocks. This was followed by the sinking of the side blocks leaving the stable central/middle block a higher level to form a horst/ block mountain.

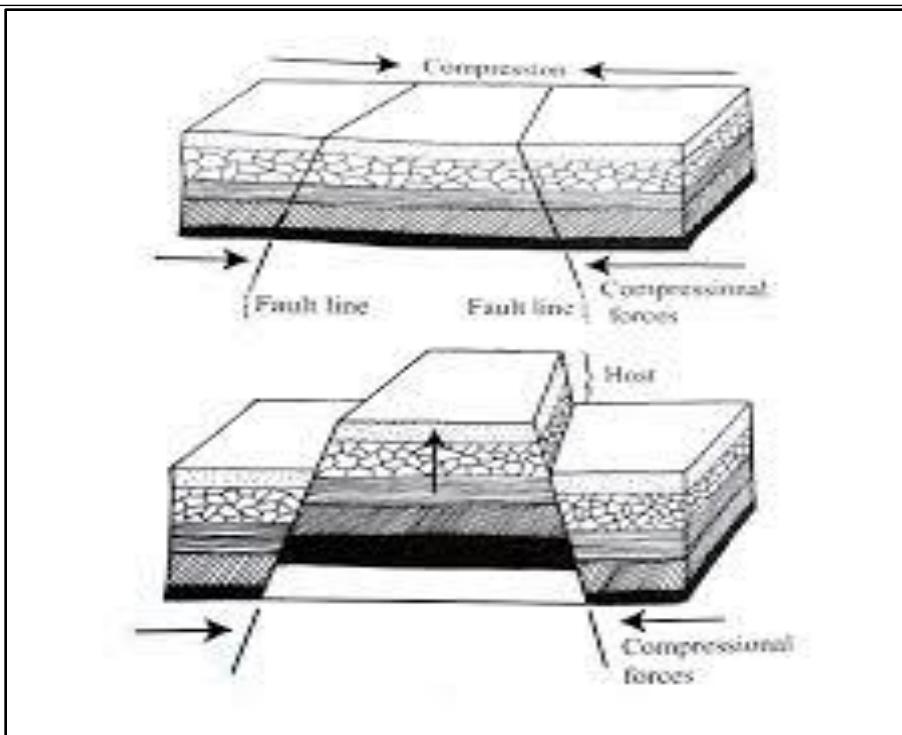
Illustration



2:09 Compressional forces theory

The theory explains that the compressional forces acted on the crustal block pushing towards each other. This resulted into formation of reversed faults that divided the crust into three blocks; the central block and two adjacent blocks. Due to continued pushing the central block was up thrown while the side blocks remained stable. The up thrown central block formed a block mountain.

Illustration

**Assignment**

Describe the processes that led to the formation of mountain rwenzori

2:10 The influence of mountain Rwenzori on the surrounding areas/ importance

1. The mountain has influenced the micro climatic conditions in the surrounding areas. It influences the formation of orographic rain fall that is received especially on the wind ward side thus encouraging activities like crop growing e.g. banana and coffee growing in Kabarole and Bundibugyo. On the lee ward side that is relatively dry there mainly animal rearing e.g. in Buliisa.
2. The mountain being the highest in Uganda plus other related features like glaciated features attracts tourists from within the country and abroad thus promoting the tourism industry which is a major source of income to the country. This income has been used to construct roads, hospitals etc. this is evident in areas of Kabarole, Kasese, Bundibugyo etc.
3. The mountain is associated with heavy rainfall and fertile soils which have encouraged the growth of luxuriant highland tropical rainforests thus promoting forestry with activities like lumbering that has provided employment to people thus improving on their standards of living e.g. mountain Rwenzori forest in Kasese.
4. The foot Hills of mountain Rwenzori have important mineral deposits which have given rise to mining activities that a source of income to the local people and the government e.g. copper and cobalt mining at Kilembe in Kasese.

5. The mountain is a source of various rivers that provide water to the people around for both domestic and industrial purposes e.g. river nyamwanba provides domestic water for people in Kasese, river sebwe and river mobuku provides water for mobuku irrigation scheme in Kasese.
6. The mountain has provided a good habitat for wild animals like the blue monkey, chimpanzee, and the giant forest hog with the luxuriant montane vegetation. This has provided a beautiful which has promoted the tourism industry.
7. The steep slopes of the mountain together with rivers that originate from the top of the mountain has encouraged the establishment of hydroelectricity power stations that generate power for both domestic and industrial purposes e.g. mobuku 1 and 2 power stations on river mobuku, Rwimi power station on river Rwimi in Bunyangabo etc.

Negatively

8. Low rainfall is received on the lee ward side of the mountain because of being in the rain shadow area. This has limited activities like crop growing in areas Kasese, Buliisa districts etc.
9. Mountain Rwenzori region is associated with steep slopes which have limited the development of transport and communication networks because it make it difficult and expensive to construct thus rendering such areas remote e.g. in Bundibugyo, Buhweju etc.
10. The mountain Rwenzori region has very steep slopes that make the area prone to natural hazards like landslides that are very common in areas of Bundibugyo. These have led to destruction of property and in many cases loss of lives.
11. The upper most parts of the mountain like magherita peak, Stanley peak are very cold, steep and made up of bare rocks. This has limited land uses like agriculture, settlement etc.
12. The steep nature of the mountain sides have accelerated run off after heavy rainfall and this has led to severe soil erosion in the area which has limited activities like crop growing and leaving land barren, this is seen in Bundibugyo, Kasese districts.
13. There is a problem of flooding especially along the rivers that originate from top of the mountain like river nyamwamba, mobuku in Kasese that occasionally overflow during the rainy season cause destruction of property and sometime loss of lives.
14. The steep nature of the Rwenzori region has hindered agricultural mechanization like use of tractors. This has also limited agriculture in the area e.g. Buhweju and Bundibugyo districts.
15. Mountain Rwenzori is used as a hiding place for criminals/ wrong doers that sometimes make the region insecure for example the ADF rebels that caused political insecurity in the areas of Kasese, Bundibugyo etc.
16. The mountain also is habitat for dangerous wild animals like leopards, pythons that sometimes attack and kill domestic animals and sometimes people around the area e.g. in Kasese, Bundibugyo etc.

17. Mountain Rwenzori is also prone to earth quakes since it is associated with faulting and earth movements. This on several occasions has led to loss of property and lives in the areas of Kasese, Bundibugyo etc.

2:11 FAULT BASINS/FAULT LAKES/GRABENS

These are narrow, deep, elongated depression with a regular shape and steep sides formed at the rift valley floor.

They are formed through secondary faulting within the rift valley by either tensional or compressional forces.

In Uganda fault basins have been filled up by water to form fault lakes or grabens and these include Lake Albert, Lake Edward and Lake George found at the rift valley floor in the west of the country.

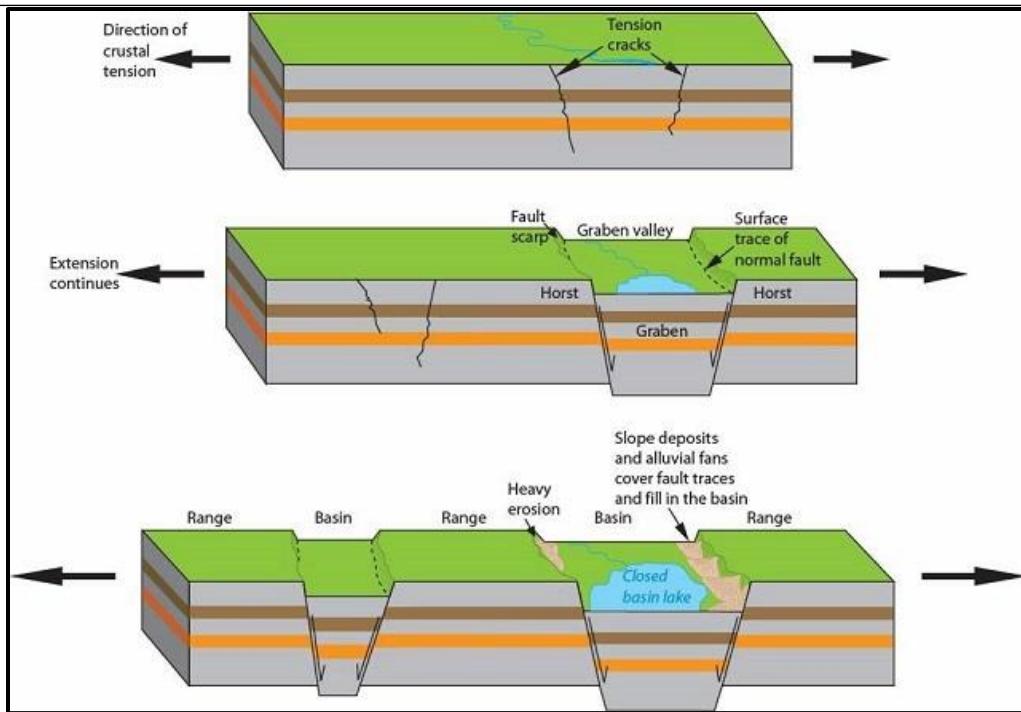
Formation by the tensional forces theory.

This theory suggests that due to heating caused by radioactivity and geochemical reaction at the mantle, convective currents were created and when they reached the earth's crust they tended to diverge leading to tensional forces that caused normal faults within the crust. These divided the crust into three blocks which was followed by the side blocks moving in opposite direction and the central block sinking under its own weight thus forming the rift valley.

Due to continued impact of the tensional forces, secondary faulting and sinking of the central block took place at the rift valley floor forming a secondary depression known as fault basin.

The secondary depression was then filled up with water to form a graben/ fault lake/ rift valley lake.

Illustration



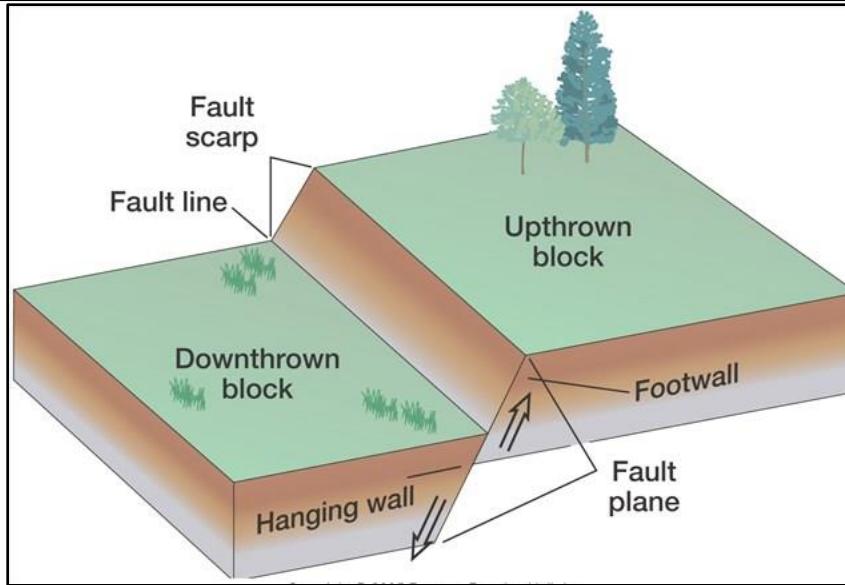
2:12 FAULTSCARP/ ESCARPMENT

A fault scarp is a steep slope where the land falls from a higher level to a lower level. Fault scarps are steep slopes along the rift valley caused by vertical displacement along a fault.

They occur where fracturing of a crustal block by either tensional or compressional forces has taken place followed by vertical displacement along the fault line.

In Uganda, examples include Butiaba escarpment, Biiso escarpment in Masindi and kicwamba around Lake George.

Illustration



2:13 FAULT GUIDED VALLEY

This is a depression or valley formed when faulting shatters the rocks which are later subjected to weathering and erosion. The weathered materials are easily removed by erosion leaving behind a fault guided valley. When a river flows along the valley it's referred to as a fault guided river.

Example of a fault guided river is river Aswa in Amuru northern Uganda.

Assignment

Explain the influence of faulting on land formation in Uganda

UNIT 3: THE CLIMATE OF UGANDA

3:00 Introduction

Climate is the average weather conditions of a place recorded for a long period of time usually for 30-40 years.

Weather refers to the state of atmosphere of a particular place and time. It is determined by weather elements which include; temperature, rainfall, atmospheric pressure, cloud cover, sunshine, wind strength and direction and humidity.

The weather recordings are taken from weather stations by use of different tools that measure specific elements. There are many weather stations in Uganda but the major one is the Entebbe meteorological station.

3:01 TYPES OF CLIMATE IN UGANDA

Uganda experiences varied climate types which include;

- Equatorial climate
- Montane climate/modified equatorial climate
- Tropical/savannah climate
- Semi desert climate

Equatorial climate

This type of climate is experienced around the northern shores of Lake Victoria in the current districts of Jinja, Mukono, Buikwe, Kampala, Wakiso, Mpigi, Masaka, Kalangala etc.

Characteristics of equatorial climate

- i. It experiences heavy rainfall of over 1500mm per annum.
- ii. The rainfall is well distributed throughout the year.
- iii. It experiences two rainfall maxima i.e. around March to May and September to November.
- iv. There are hot temperatures ranging between 24⁰C to 27⁰C.
- v. The temperature range is small i.e. about 3⁰C.
- vi. Humidity is generally high.
- vii. The cloud cover is generally high.

Montane climate/modified equatorial climate

This type of climate is experienced around the highland areas of Uganda such as Kigezi highlands in Kisoro and Kabale districts, mountain Rwenzori in the districts of Bundibugyo, Kabarole, mountain Elgon in the districts of Mbale, Bududa, Manafwa, Kapchorwa, Bukwo etc.

Characteristics of montane climate

- i. It receives heavy amounts of rainfall i.e. over 1500mm per annum.
- ii. The rainfall received is well distributed throughout the year.
- iii. Temperatures are generally low of about 20°C due to high altitudes.
- iv. High humidity is experienced.
- v. There is a small temperature range of about 2°C .
- vi. There dense cloud cover.

Tropical/savannah climate

This type of climate is generally experienced in the most parts of the country but majorly in the northern districts of Gulu, Iira, Kitgum, Apac, Moyo, Nebbi etc. and western in the districts of Masindi, Hoima, but also in the eastern districts of Soroti, Kumi, Tororo, Iganga, Pallisa etc.

Characteristics of tropical climate

- i. The rainfall received ranges between 500mm-1000mm per annum.
- ii. It experiences one dry season and one wet season.
- iii. Temperatures are generally high above 25°C .
- iv. Humidity is generally high.

Semi desert climate

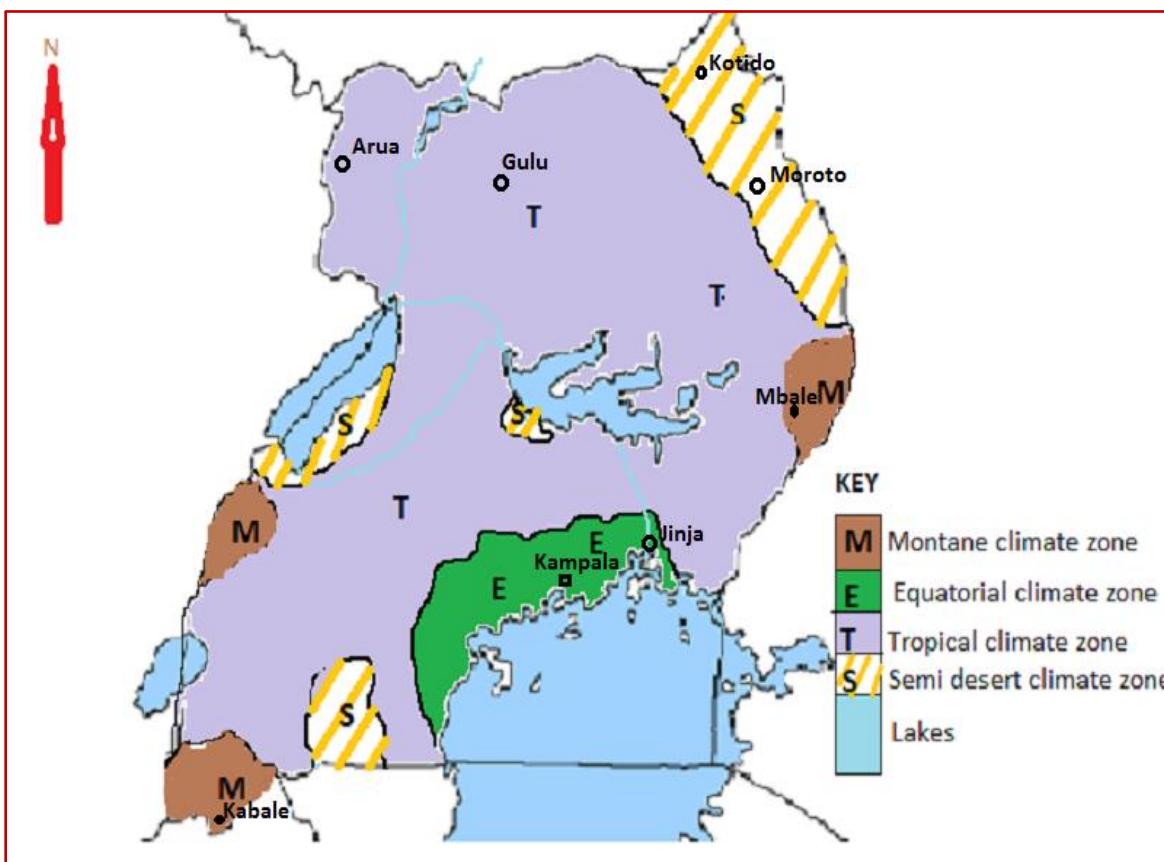
This type of climate is majorly experienced in the north eastern region in the districts of Kotido, Moroto, Kaabong, Nakapiripiriti, and Abim. Also in some parts of Ankole-masaka dry corridor in the districts of Rakai, Ssembabule, Kiruhura, Lyantonde, Lake Albert flats in Buliisa district.

Characteristics of semi desert climate

- i. Rainfall received is low of below 600mm per annum.
- ii. Temperature are generally high exceeding 30°C
- iii. There is a long dry season of about 6 to 8 months.
- iv. The rainfall received is very un-reliable
- v. There is a wide diurnal temperature range

- vi. One rainfall season is experienced
- vii. Humidity is very low due to clear skies
- viii. Very low cloud cover(clear skies)

Map showing climatic regions in Uganda



3:02 FACTORS THAT INFLUENCE THE CLIMATE OF UGANDA

Uganda experiences different climatic types in various parts of the country and this is because it is a heterogeneous block of land and the variations can be explained in the following ways.

1. The influence of altitude, Uganda has variations in altitude which affects climate in the following ways;
Areas with high altitude experience low temperatures because temperatures drop for every increase in altitude (for every increase of 1000m above sea level temperatures drop by 6.5°C) thus the principle the higher you go the cooler it becomes. This common around Mtn Elgon in the Mbale, kapchorwa, Bududa etc. and around Mtn Rwenzori in Bundibugyo and Kabarole districts.

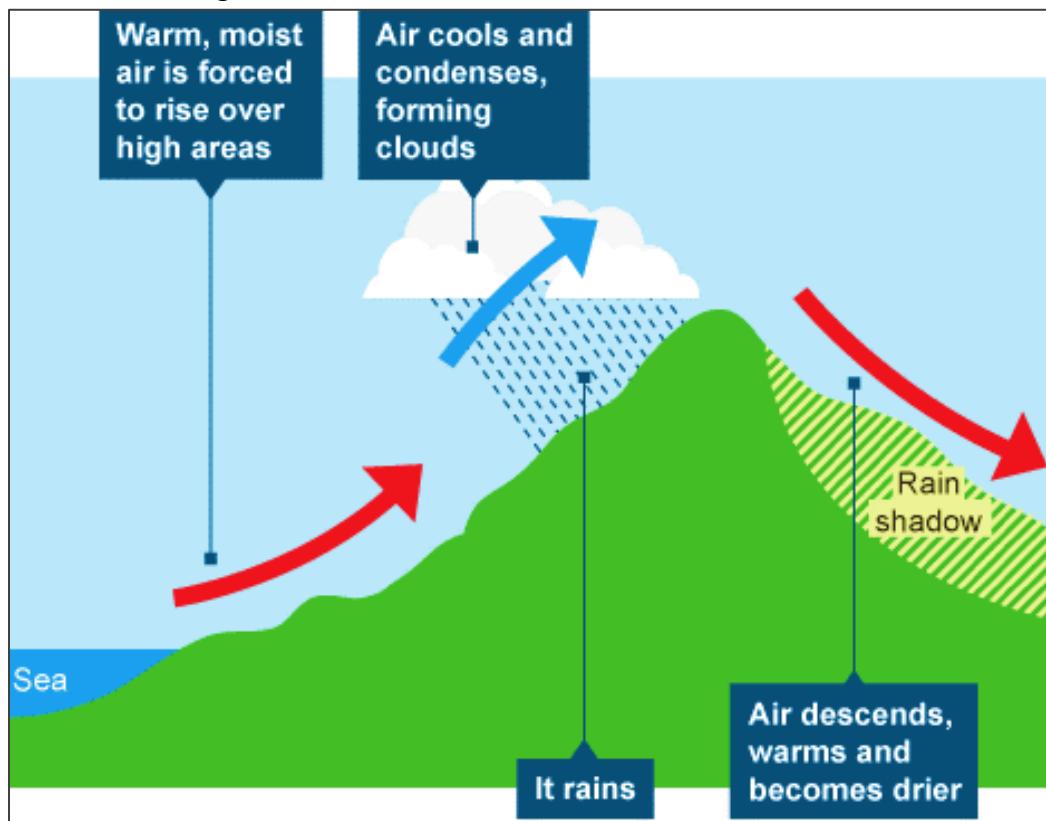
Areas with low altitude experience high temperatures and this is attributed to the fact that low altitudes contain more water, gasses and impurities like dust that act like a blanket limiting the escape of heat into the atmosphere but also these gasses have the capacity to absorb and retain heat in the atmosphere, this is evident in places like Muhokya, Kilembe at the foothills of Mtn Rwenzori.

Areas of high altitude receive heavy rainfall amounts and this due to the fact that moist laden warm winds ascend to the highland raising up to the condensation level where it forms clouds that later give heavy orographic rainfall on the wind ward side. This is seen on the slopes of mountain Elgon in the Mbale, Manafwa, and Bududa etc.

Areas that lie on the lee ward side of the highlands receive relatively low rainfall amounts because of being in the rain shadow e.g. semliki basin, Buliisa and parts of Kasese that lie on the lee ward side of Mtn Rwenzori.

The low altitude areas experience low amounts of rainfall due to the lack of obstacles/highlands that would force wind to ascend to influence rainfall formation and such wind just passes over the flat areas leaving them dry e.g. in the districts of Kotido, Moroto etc.

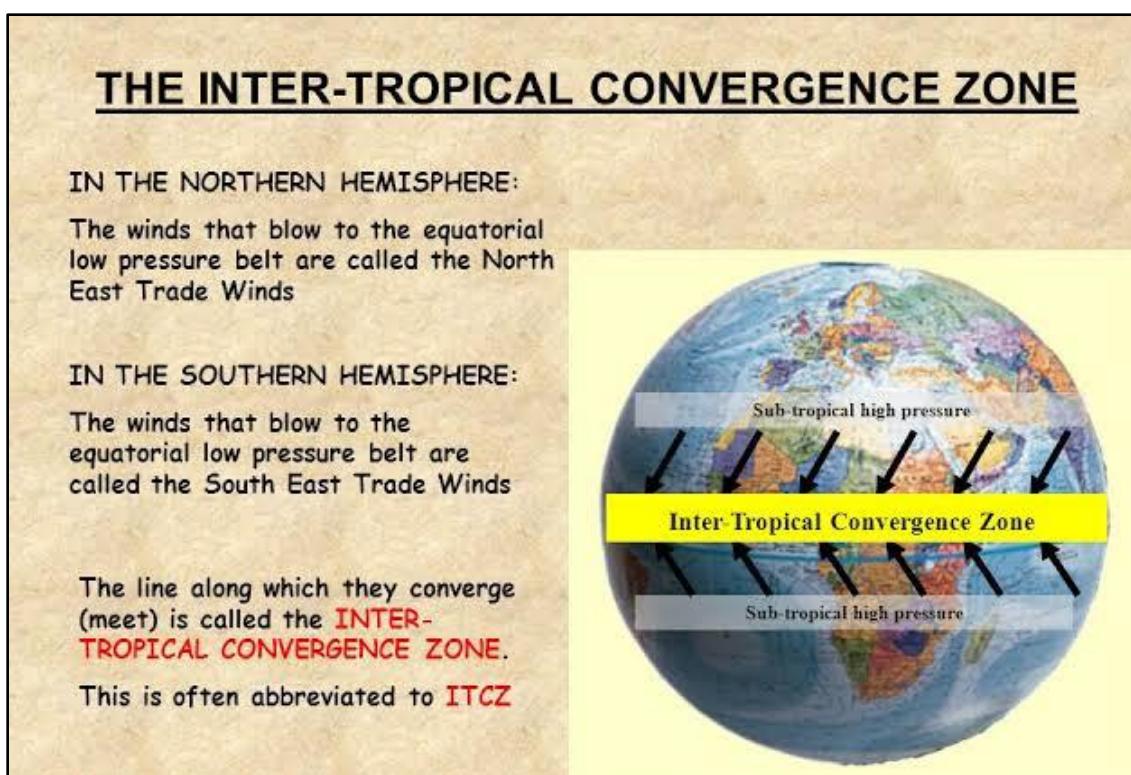
Illustrational diagram



2. The influence of latitude (inter-tropical convergence zone), Uganda is located astride the equator where the sun's rays fall vertically in maximum insolation. This results into hot temperatures throughout the year in the areas that are located along the equator e.g. Entebbe, Kampala, Masaka, Mpigi etc.

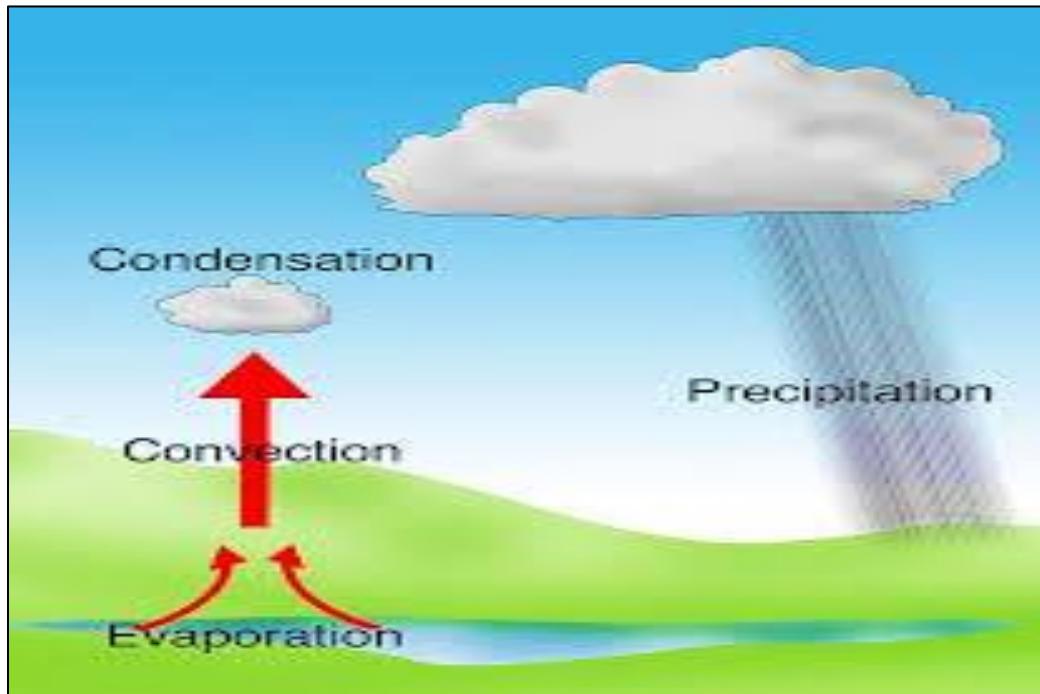
The equator is an area that experiences low pressure due to intense heat that cause the expansion of air into the atmosphere thus exerting less pressure onto earth's surface. The area also experiences convergence of winds (ITCZ) that move from areas of high pressure to areas of low pressure e.g. the N.E trade winds and the S.E trade winds that move towards the equator. This results into warm air raising into the atmosphere that reaches the condensation level resulting into formation of clouds that later fall back as convectional rainfall. Areas that are along the equator experience these conditions twice a year resulting into double maxima rainfall i.e. around march to May and September to November. This seen in areas of Kampala, Entebbe, Masaka Mukono etc.

Illustration diagram



3. The influence of water bodies, water bodies modify the climate through the process of evaporation where by when the surface water receives heat from the sun rays results into release of water vapor into the atmosphere that raise up to the condensation level, forming clouds that later fall back as heavy convectional rainfall. This is evident in the areas around Lake Victoria e.g. Kalangala, Entebbe, Masaka etc.

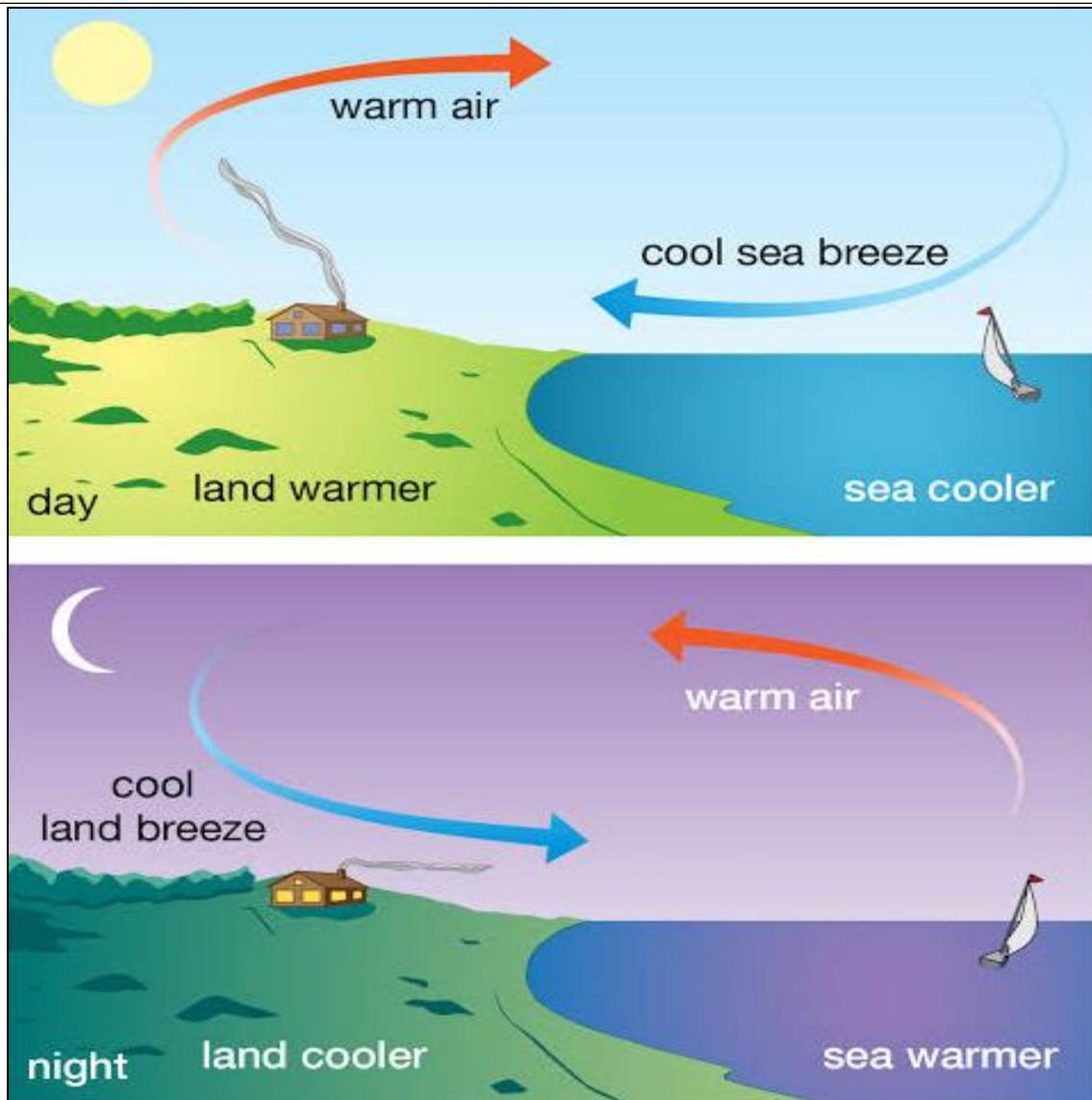
Illustrational diagram



4. Influence of sea breeze and land breeze, sea breeze involves rapid movement of air from sea (water body) onto the land. This occurs during the day and it is caused by the instant heating of land surfaces by the sun creating a low pressure belt over land. Cold air therefore moves from the sea towards the land where it becomes warm, rises into the atmosphere resulting into formation of convectional rainfall that is received especially in the evenings

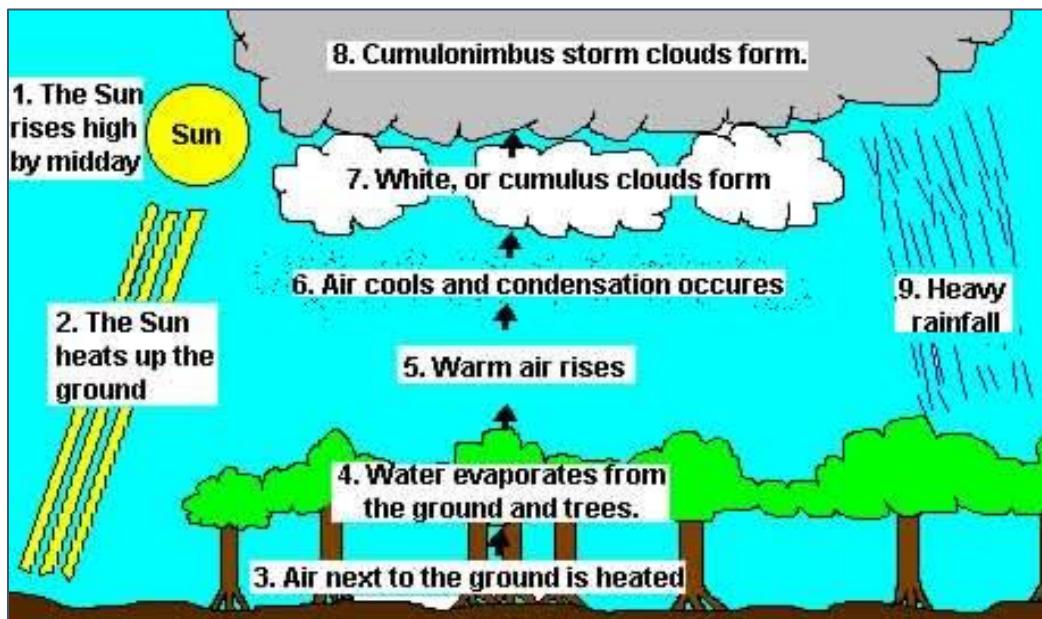
The land breeze involves the rapid movement of air from land towards the sea (waterbody), this occurs in the night where during night the land cools faster than the sea thereby creating a low pressure belt along the sea. The cold air therefore moves from the land to come and replace the rising warm air along the sea, the warm rising air from clouds that later results into rainfall especially early in the morning. This is evident around Lake Victoria like Jinja, Mukono, Masaka, Wakiso etc.

Illustrational diagram



5. The influence of vegetation cover, areas with a dense vegetation cover like the tropical rainforests e.g. Mabira forest in Buikwe, Budongo forests in Masindi, Bwindi impenetrable forests in Kanungu etc. experience very heavy amounts of rainfall because the thick vegetation cover facilitates the formation of heavy rain fall through the process of evapotranspiration and on the other hand areas with scanty vegetation like the semi desert vegetation in Moroto, Kotido etc. have remained dry due to limited evapotranspiration.

Illustrational diagram



6. The influence of man's activities, man's influence can be either positive or negative. Man influences climate positively through activities like afforestation and re-afforestation which lead to modification through facilitating rainfall formation. This is evident in areas where there has been intense afforestation like muko forest in Kabale, magamaga forest in Jinja etc. on the other hand man has influenced climate negatively through activities like deforestation, industrialization, bush burning, overgrazing etc that leads to increased desertification characterized by reduced rainfall, increase in temperatures, clear skies, low humidity. These conditions are seen in the areas of Kotido, Nakapiripiriti, Nakasongola, Rakai and Moroto etc.

Assignment

- 1) Describe the factors that have influenced the climate of Uganda.
- 2) To what extent has altitude influenced the climate of Uganda?
- 3) Explain how the climate has influenced the land uses in Uganda.

UNIT 4: VEGETATION DISTRIBUTION IN UGANDA

4:00 Introduction

It refers to the living plant cover on the earth's surface. Uganda had a variety of vegetation types which ranges from forests, tall grass, bush and thicket and montane vegetation on the highlands e.g. Mt. Elgon, Mt. Rwenzori etc.

4:01 Vegetation types

There are various vegetation types which include;

1. Equatorial vegetation / Tropical rain forests.

This type of vegetation is mainly found in the wetter areas in Uganda e.g. Bugoma forest in Hoima, Budongo forest in Masindi and areas around the shores of L. Victoria, Mabira forest in Buikwe / Mukono.

Characteristics

- It is thick and luxuriant with much foliage (leaves).
- It contains a variety of tree species e.g. mahogany, mvule, msizi.
- The trees have broad leaves and they are ever green.
- The trees grow to a great height of about 50m tall in an attempt to get enough sunlight.
- The under growth is poorly developed as the dense canopies shut out light from reaching the lower levels.
- There are many climbing plants which twin from tree to another.
- Tree species do not appear in pure stands.
- They have buttress roots.

2. Savannah / Dry Savannah vegetation.

It consists of savannah wood lands and savannah grass lands. This is found in areas with alternating dry and wet seasons with rainfall of between 600 – 800mm per annum which is also reliable. This can be found in areas of Mubende, Gulu, and Kitgum etc.

- There are scattered trees in areas that experience high amounts of rainfall
- The trees shade off their leaves during the dry season
- The trees have special storage devices of parts with long roots spreading roots to top scarce water e.g. acacia tree.
- The trees are usually umbrella shaped with spaces in between and big enough to allow penetration of sunlight.
- The ground has a dense undergrowth i.e. grass.
- The grasslands are characterized with both short and tall grasses e.g. elephant grass.

- The leaves of the trees are usually small.
- The grasses in some areas are drought resistant.
- Towards the semi desert margin, the grasses take on the characteristics of the semi- desert vegetation i.e. shrubs and thorny bushes.

3. Montane vegetation

This is dominant on high mountains e.g. Mt. Rwenzori, Mt. Elgon and Mt. Mufumbira. It is characterized by various vegetation zones as a result of changes in temperature, rainfall and altitude.

Characteristics

Temperate forest zone

- ❖ Tress is short
- ❖ Tree species appear in pure stand.
- ❖ Trees provide soft wood.

Bamboo forest zone

- ❖ Trees in this zone are not fully grown.
- ❖ They are characterized with hollows (stems).

Health and moor land.

- ❖ This is found 4000m above sea level and it is characterized by plants such as mosses, ferns.
- ❖ Above 5000m above sea level, the temperatures are too cold and cannot favor the growth of any plant because in most cases it is covered by snow or ice.

4. Desert and semi desert vegetation.

This is dominant in the dry areas of Uganda in districts of Kaabong, Moroto.

Characteristics.

- Bushes which are very wide are common
- Thorny plants are also common
- The leaves of trees are needle like.
- Plants have long roots / tap roots.
- Trees are succulent.
- The grass level is generally below the savannah region.

5. Swampy vegetation

It is characterized by the water loving plants e.g. papyrus and mangrove. It is dominant along fast flowing rivers e.g. around kafu, Albert Nile etc.

Also around the various lakes e.g. L. Victoria, L. Kyoga etc.

It is also found in the low lying areas (valleys) e.g. of highlands, Pallisa, Soroti etc.

4:02 Factors influencing vegetation distribution in Uganda.

1. Climate. The major climate elements that influence vegetation are rainfall and temperature. Rainfall affects positive distribution in such a way that areas that experience high amounts of rainfall of above 1500mm per annum have got well developed and luxuriant type of vegetation (Tropical rainforests) e.g. Mabira in Buikwe whereas areas experiencing moderate amounts of rainfall of about 700 – 1000mm per annum. Such areas have encouraged the growth and existence of the dry savannah vegetation. The areas experiencing low amounts of rainfall of below 600mm per annum such areas have encouraged, arid and semi-arid vegetation e.g. Moroto, Kaabong etc.
2. Areas experiencing high temperatures of above 26°C have encouraged the growth of savannah vegetation e.g. in Mubende, Hoima etc. and also the tropical rainforest e.g. Bugoma, Mabira etc. Areas that receive very low temperatures have encouraged the growth of heath and moorland and also temperate forests i.e. montane vegetation e.g. around Mt. Rwenzori etc. Areas that experience very hot temperatures of above 30°C especially during the day, such areas have encouraged the growth of arid and semi- arid vegetation i.e. thicket and thorny bushes e.g. Kotido, Kaabong etc.
3. Altitude. This plays a significant role in the distribution of vegetation especially in the highland areas i.e. around Mt. Rwenzori, Mufumbira ranges. This is so because various vegetation zones are established at different heights due to changes in temperatures. At low altitude, the temperatures are high encouraging the growth of savannah and tropical rainforests but with increase in altitude, the temperatures reduce encouraging the growth of Bamboo and the temperature forests and with further reduction in temperatures, it encourages the growth of heath and moorland.
4. Edaphic factor / soil, the mineral content, alkalinity, depth, maturity and acidity of the soil determines vegetation distribution. Areas with well developed, deep and mature soils have encouraged the growth of forests e.g. the fertile alluvial soils around lake Victoria have encouraged the growth of Mabira forest in Buikwe, the fertile volcanic soils around Mt. Elgon have encouraged the growth of Mt. Elgon forests.
5. The presence of deep weathered soils with low fertility have encouraged the growth of savannah vegetation in areas of Kitgum. Soils which are extremely infertile have encouraged the growth of desert and semi desert vegetation e.g Kotido, Moroto etc.
6. Relief, Areas with steep slopes are characterized with poor vegetation cover because of the severe soil erosion. On the other hand however, the flat and gentle sloping areas have encouraged the growth of forests e.g. Mabira forest in Buikwe and also savannah

vegetation in areas of Masindi, Gulu etc. The valley or low lands have the growth of swampy vegetation and this is evident around the shores of L. Kyoga, L. Victoria etc.

7. Drainage; It influences vegetation in such a way that areas with water bodies e.g. lakes, swamps, rivers have encouraged the growth of swampy vegetation which is characterized by water loving plants. This is commonly around L. Victoria, along Albert and Victoria Nile, R. Katonga. Areas which are well drained have encouraged the growth of savannah vegetation e.g. Masindi, Mbarara and tropical rainforests e.g. Mabira, Budongo.
8. Biotic factor(man); man has influenced vegetation distribution, positively and negatively;

Negatively;

- Through cultivation; this has resulted in to destruction of the original vegetation type i.e. parts of tropical rainforests have been replaced by perennial crops e.g. tee and sugarcanes e.g. part of Mabira forest was cleared for sugarcane plantation.
- The destruction of tropical rainforests by man has made those areas turn into savannah grasslands and in some parts savannah grasslands have degenerated into shrubs and thickets e.g. Nakasongola, Kitgum.
- Bush burning; man has burnt down the bushes in order to get fresh pastures of grass for the animals especially in areas where livestock farming is dominant. This has resulted in to extinction of some original bushes and sometimes encouraging the growth of fire resistant species in areas of Kotido, Kitgum etc.
- Overgrazing; this is as a result of overstocking of animals leading to severe loss of vegetation cover and also erosion of the soils. This is common in areas where livestock farming is practiced e.g. in Rakai, Mbarara, Moroto etc.
- Man has also destroyed vegetation so as to establish the land for settlement and crop cultivation e.g. part of Mabira forest was cleared for settlement and also part of Mt. Elgon forest was cleared for agriculture and settlement.
- Through industrialization man has destroyed forests due to the need for land to establish industries and also need for wood that is used in some industries e.g. Bakeries, clay industries.

Positively

- Agro forestry; man has used the forests sustainably by maintaining them or preserving them and at the same time practicing crop growing, therefore various crops have been grown in the forested areas e.g. coffee, cocoa in Mukono, Bundibugyo etc.
- Through afforestation and re-afforestation programs, man has replaced the original forests with quick or fast growing species in areas were the vegetation has been

destroyed and even some places where the forests have never existed e.g. Kateera forest, Kiboga forest, Kabale etc.

- The government has gazette some areas with natural vegetation e.g. Mt. Elgon forest in Mbale, Mabira forest and various swampy vegetation zone e.g. Nabajuzi swamp in Masaka.
- 1. To what extent has climate influenced vegetation distribution in Uganda?
- 2. To what extent has man influenced vegetation distribution in Uganda?

4:03 LAND USE PLANNING IN THE VARIOUS VEGETATION ZONES

Tropical rainforests

- Crop cultivation, these areas experience high amounts of rainfall which favor the growth of crops e.g. bananas, tea e.g. around Mukono, Jinja, Wakiso etc.
- Tourism, the tropical rainforests are unique where by trees are tall with broad leaves. This gives good site for tourism activities and also establishment of picnic sites and camping e.g. in Mabira forest, in Buikwe, Kalangala forest in Kalangala Island.
- Wildlife conservation, they have a variety wild animals e.g. monkeys, gorillas etc. and also various plant species. For instance Bwindi impenetrable forest in Kabale, Budongo forest.
- Lumbering, they have encouraged the harvest of wood leading to establishment of saw mills around these forests e.g. Sonso mills around Budongo forest.
- Medicinal or herbal collection, They have got a variety of tree species which are of a medicinal value or use, therefore they are collected in form of leaves, roots, barks, stems and they are used to treat diseases like cough, malaria, measles etc.
- Hunting; presence of animals in the forests.
- Bee keeping
- Fruit gathering

Savannah vegetation

- Livestock farming; is very common because of the abundant pastures i.e. savannah grasslands on which the animals feed e.g. cattle, goats e.g. in Mubende, Nakasongola.
- Crop cultivation is also common. This is because the vegetation is easy to clear to establish gardens and also the area experiences both wet and dry seasons that encourage the growth of mainly annual crops.

- Lumbering is also common mainly in the savannah woodlands which is characterized with scattered trees. This is evident in areas around Mt. Kei in Yumbe, Mt. Otze forest.
- Tourism and wildlife and this is because these areas are characterized by tall grasses which act as good habitants and food for the wild animals e.g. Queen Elizabeth national park in Kasese, Kidepo valley national park in Kaabong.
- Art and craft. This is because of the dominant grasses in the savannah vegetation that is used to make mats, hats etc.
- Charcoal burning e.g. Nakasongola.
- Medicinal and herbal collection.
- Fishing around the swamps, rivers.
- Clay mining and sand mining.

Swampy vegetation

- Art and craft. There is papyrus harvesting where papyrus reeds are collected to make mats, baskets e.g. in the swamps of Busega in Wakiso district, swamps in Kajjansi etc.
- Crop cultivation.
- There is growing of crops especially the water loving crops e.g. yams.
- Fishing
- Brick making.
- Medicinal collection.

Montane vegetation

- Crop cultivation especially the perennial crops e.g. Arabica coffee around Mt. Elgon.
- Mining and stone quarrying.
- Wildlife conservation and tourism e.g. Mt. Elgon national park.
- Bamboo collection used as food especially on slopes of Mt. Elgon.
- Tourist attraction.

Assignment

1. Account for the growth of dry savannah vegetation in Uganda.
2. Outline the economic activities taking place in the dry savannah areas of Uganda.
3. Discuss the view that the distribution of natural vegetation provides the basis for land use planning.
4. Describe the characteristics of the range lands (dry savannah vegetation in Uganda).

5:00 introduction

A forest is a thick vegetation cover with a collection of trees occupying a particular area on the earth's surface. The forests in Uganda are mainly classified into forests and planted forests.

5:01 Natural forests-These are forests that are there by nature or God given. These include;

1. **Equatorial / tropical rainforests/ tropical low land forests.** E.g. Mabira forest in Buikwe, Budongo forest in Masindi, Bugoma forest in Hoima, Marabigambo in Rakai, Kalinzu forest in Bushenyi.

Characteristics

- They are thick and luxuriant because of the heavy rainfall received.
- Trees occur in mixed stands with a variety of tree species e.g. Mvule, mahogany, musizi etc.
- Trees are tall with straight stems normally about 40m.
- Trees form canopies usually 3 layers.
- They are composed of predominantly hard wood tree species.
- Trees have buttress roots to support the heavy and tall tree.
- They usually take long to mature i.e. 50yrs.
- They have climbing plants which climb from tree to tree.
- They are ever green given that they shed their leaves at different intervals.
- They have a thin or no undergrowth because of the inadequate light that reaches the ground.
- They have marshy undergrowth composed of plants like algae, ferns, mosses.
- They have thick and smooth backs.

2. **Montane / Tropical highlands forests.**

These are forests found around mountains / highlands i.e. Mt. Elgon forest, Mt. Rwenzori forest.

Characteristics

- The trees are ever green throughout the year.
- Most of the forests occur in pure stands e.g. Bamboo confined to one species.
- The trees tend to grow tall, straight, slender and close to each other because of the reduced transpiration.
- Trees especially the conifers tend to have shallow roots to survive in the thin soils.
- There is very sparse undergrowth since there is little relief rainfall to enrich the fall.
- Trees normally yield soft wood.
- Trees become shorter and twisted in the increasing height of altitude.

3. Savannah woodland forests

These are forests that are common in savannah vegetation especially savannah woodland vegetation i.e. Timu forest in Kotido, Kadam forest in Nakapiripiriti, Kei forest in Yumbe, Agoro-Agu forest.

Characteristics

- Trees shed off their leaves during dry season to limit water loss.
- They are usually umbrella shaped.
- Forests have a dense undergrowth.
- Trees are scattered.
- Forests are associated with tall grass.

4. Riverine forests

These are forests found along the shores of rivers e.g along Albert Nile, R. Katonga, and Victoria Nile etc.

5:02 Planted forests-These are forests that are planted by man. They include Lendu forest in Nebbi, Kateera forest in Kiboga, Mafuga in Kabale, Agwata forest in Kitgum, Abera forest in Gulu district.

Status of the forestry sector.

- Afforestation and re-afforestation is catching up and mainly fast growing tree species are being planted.
- There is increased destruction of forests due to the increase in population.
- Forestry contributes about 8.5% of Uganda GDP (gross domestic product).
- The annual deforestation rate in Uganda is about 1.8% which is quite high.
- About 23.6% of the forests is gazette while 69% is non gazette and 6.5% is under the national forestry authority (NFA).

5:03 Factors that influence the growth / existence / distribution of forests in Uganda

Physical factors

1. Climate. Through its elements of rainfall and temperature has greatly influenced the growth and distribution of forests in Uganda. Areas that receive heavy amounts of rainfall of above 1500mm per annum and high temperature of about 25°C have favored the growth of tropical low land forests e.g Bwindi, Mabira, Malabigambo etc. Areas that receive rainfall in between 700- 1000mm per annum and high temps of above 25°C have also encouraged the growth of the wood land forests e.g Timu forest in Kotido, Kei forest in Yumbe etc.
2. Altitude. High altitude areas influence the growth of both montane and tropical highland forests e.g Mt. Elgon forest, Mt. Rwenzori forest. Low altitude areas favor the growth of tropical lowland forests e.g Budongo, Mabira and Malabigambo etc.
3. Soils. The deep fertile soils e.g. around lake Victoria shores support the growth of dense forests i.e. tropical low land forests e.g Mabira forest in Buikwe while the poor infertile and thin skeletal soils in North Eastern Uganda have encouraged the growth of woodland forests e.g. Timu forest in Kotido.
4. Drainage water logged areas e.g. along Rivers like R. kafu, R. katonga, Victoria Nile have influenced the growth of Riverine forests which the well-drained soil have supported the growth of dense tropical lowland forest e.g. Budongo in Masindi, Mabira in Buikwe etc. The relatively dry soil have encouraged the growth of the savannah woodland forests e.g. Mt.kei forest in Yumbe, Agoro-Agu in Kitgum.
5. Relief. Mountainous areas/highland areas support the growth of thick montane forests e.g. tropical highland forests especially on the wind ward side of the mountain. This is due to the heavy rainfall received and also due to less human interference along the steep slopes e.g. Mt.Elon forest in Mbale and Mt. Rwenzori forest in Kasese While the generally flat landscape areas have less or no major forests because of the low levels of rainfall and increased human interference e.g. Nakasongola, Mubende etc.
6. Pests and diseases. Forests like Budongo in Masindi, Bunya forest in Mayuge have experienced high growth of trees because they are infested by tests flies and therefore there is less human interference. On the other hand, relatively free forests from pests and diseases have been encroached upon e.g Mabira forest etc.

Other factors

7. The deliberate govt policy of encouraging tree planting and protecting forests through institutions like National Forest Authority has influenced the growth of trees through offering tree seedlings and the advisory services e.g Lendu forest in Nebbi, Agwata forest etc.
8. Agro forestry programs, It is the planting of crops together with trees e.g. coffee growing in areas of Kayunga, Mukono , Cocoa growing in areas of Bundibugyo has encouraged the planting of numerous trees which turn into forests.

9. Government policy of gazetting forest reserves both natural and planted. This has also led to conservation and growth of forests e.g. Moroto central forest reserve, Kadam central forest reserve etc.
10. Human encroachment has also led to cutting down of forests i.e. part of Mabira forest in Buikwe was cut down to establish sugarcane plantation, Namanve forest in Mukono was also cut for industrialization.

Questions

1. Assess the factors that have influenced the growth and distribution of forests in Uganda.
2. To what extent have the physical factors influenced forest distribution in Uganda?

5:04 CONTRIBUTION/SIGNIFICANCY OF THE FORESTRY SECTOR.

The forestry sector has contributed to the development of Uganda both positively and negatively in the following ways.

1. It provides revenue to the government through licenses given to the lumbering companies, saw mills etc. e.g. Nile ply in Kampala, also the people who are employed in the forestry sector pay income tax e.g. forest rangers, forest wardens. This revenue is used to develop other sectors in the economy for instance construction of roads, hospitals etc.
2. Forests provide timbers e.g. from Budongo, Bwindi and Mabira forest etc. The timber is exported to countries like Egypt, China, Denmark and this earns the country foreign exchange. The foreign exchange earned from exportation of timber is used to
3. Forests are a source of energy in terms of wood energy used for domestic and industrial purposes, about 90% of the natural energy needed is provided by forests in form of charcoal, firewood etc. In West Nile, pure wood is used for tobacco curing. Firewood from forests is also used as a source of fuel especially in rural areas for cooking, brick burning.
4. Forests have provided variable timber used in the making of furniture and also in the construction industries. Trees are harvested to provide timber to make furniture like desks, cupboards, chairs, tables etc. e.g. the Nile ply company was given license to exploit Budongo and part of Mabira forest to provide timber.
5. The different tree species in the forests provide medicinal herbs used in the treatment of various diseases thus improving the health of people e.g. Aloe Vera, Lemon grass, Neem tree etc. All these are got from forests e.g Budongo, Mabira forest etc.

6. The forestry sector provided employment opportunities to people both directly and indirectly e.g. forest rangers, guards, wardens etc. All these work in forests like Mabira, Budongo, they earn income and therefore improvement in their standards of living.
7. They attract tourists both local and foreign tourists. They visit forests to see the various plants and animals e.g. Semliki forest, Mt Elgon, Mabira forest, The tourists bring in revenue 2 the gov't used to develop other sectors in the economy e,g construction of schools roads etc.
8. Forests are important for research and training e.g. research in bio diversity, helping to find behaviors of animals and plants and this has helped to widen the scope of knowledge about nature e.g. Kibale forest is used by Makerere University for research, Budongo forest used by Nyabyeyo Forest College for training in masindi etc.
9. Forests protect soils from soil erosion because of the roots of the trees that hold the soils together thus protecting it from the soil erosion agents thus improving soil productivity in such areas for instance Timu forest, Mt. Kei forest, Agoro-Agu forest etc.
10. Forests are important in purification of the environment by absorbing in carbon dioxide which is dangerous to the environment and human life in particular e.g. Timu forest, Bwindi forest, Mt. Kei forest etc.
11. Forests help in soil conservation and maintaining of soil fertility thru the formation of humus as the leaves fall off the trees on the ground, they later decay hence farming humus which is important in soil fertility hence encouraging crop growing.
12. Forests also provide food in form of fruits e.g. passion fruits, jack fruits etc. Honey is also collected from the forests e.g. Budongo, Marabigambo etc.
13. Some forests are water catchment areas for various rivers e.g. Mt. Elgon forest is a water catchment area for rivers like r. Manafwa, R.Mpologoma and Mt. Rwenzori forest for R. Mubuku and Mabira for R. Sezibwa. These rivers help to promote facilities like irrigation, fishing and also used for domestic use.
14. Negatively forests harbor dangerous wild animals which sometimes lead to destruction of property and lives e.g. leopards in Kalinzu forest, snakes, and monkeys. These animals score away people and limit exploitation of such forests.
15. Forests are habitants for disease spreading vectors e.g. Bunya in Mayuge, Budongo, are infested with tsetse flies that spread Nagana and sleeping sickness to animals and humans. These also scores away people thus limiting activities in the forest.
16. Forests have discouraged the growing of transport communication networks because they make it difficult and costly clearing them especially the thick tropical rainforests e.g. Mabira along Kampala – Jinja road, Echuya along Kabale, Kisoro road.
17. some forests are used as hiding places by the wrong doers (criminals) e.g. rebels, thieves, rapists, robbers etc. e.g. the highway robbers in Mabira forest along Kampala – Jinja road, Mt. Rwenzori used to harbor the ADF rebels, Zoka forest in Northern Uganda

for LRA rebels. This sometimes cause political instability and general insecurity in such areas thus discouraging economic activities.

18. The existence of forests has also encouraged remoteness of some areas making it difficult to access such areas due to limited transport and communication networks. Such areas have lagged behind in terms of economic development e.g. Bugoma, Maramigambo forests etc.
19. Forests also occupy large pieces of land which would otherwise be used for other economic activities e.g. agriculture, settlement etc. e.g. Mabira forest, Bugoma forest etc.
20. Some planted forests have encouraged excessive draining of soils making such soils less productive and not suitable for agricultural activities e.g. Lendu forest in Nebbi, Muko forest in Kabale where such trees like Eucalyptus have been planted that require a lot of water from the soils.

QNS

Assess the significance of forests to the economic development of Uganda.

5:05 Problems facing forest exploitation in Uganda (factors leading to forest exploitation)/ challenges.

1. Pests and diseases. Some forests harbor disease spreading vectors which discourage their exploitation e.g. tsetse flies in the Budongo forest in Masindi and Bunya forest in Mayuge that scare away the people who exploit the forest.
2. The nature of relief. Some forests are concentrated or located in rugged/ mountainous terrains with steep slopes which limit their exploitation in terms of movement and transportation of the timber e.g. Mt. Elgon forest along Mt. Elgon and Mtn Rwenzori forest along Mtn Rwenzori.
3. Some forests produce heavy hard wood logs which are difficult to transport both by road and water. This is worsened by the poorly
4. Trees especially in the tropical forest have a very long gestation period of over 50 yrs. This makes continuous exploitation almost impossible in those forests e.g. Mabira forest, Budongo forest in Masindi.
5. Presence of climbing plants e.g. epiphytes, lianas which climb from tree to tree also make harvesting quite difficult i.e. Mabira forest, Budongo forest.
6. The trees especially in the tropical rainforests do not appear in pure stands and this makes the exploitation of commercial trees quite difficult e.g. Mabira forest, Budongo forest.
7. Some trees have buttress roots especially in tropical rainforests. This makes felling difficult especially where there is undeveloped technology or equipment used in cutting

of trees e.g. use of axe, pangas. This is evident in Bugoma forest and Marabigambo forest.

8. Wild fires, these are sometimes caused by lighting, careless people and hot temperatures. These lead to destruction of large hectares of forests especially the savannah woodland forest e.g. Timu forest in Kotido, Mt.Kei forest in Yumbe.
 - a. Others include,
9. High population growth rate leading to destruction of forests to provide land for other activities to meet the demands from big population e.g. settlement, provision of timber and agriculture etc. All these have led to clearing of forests like Budongo in Masindi, Namanve forest in Mukono, Mabira forest in Buikwe.
10. Use of undeveloped or poor methods of logging resulting into wastage of forest products. Some of the equipment used to cut and process timber can lead to wastage thus limiting exploitation of forests e.g. pangas e.g. Mabira forest in Buikwe, Budongo in Masindi.
11. Political instability / insecurity in some areas has also discouraged forest exploitation because the forest exploiters, fellers, loggers feel insecure to work in such forests e.g. ADF rebels around Mt. Rwenzori forest, LRA rebels that destabilized areas of Lendu forest.
12. Corruption and embezzlement of resources directed towards the forestry sector e.g. the national forestry authority where its officials have illegally given away some parts of the forests to individuals thru bribe e.g. part of Mafuga forest in Kabale was given to farmers.
13. Limited market due to poor forest products and also due to competition from forest products that are imported from other countries e.g. forest products from Budongo, Mabira face competition from other countries like Congo, China.
14. Poor transport and communication networks to transport forest products to market centres and processing centres. This is a challenge because some of these transport networks like roads are almost impossible during the rainy season e.g. the roads on Ssese islands.
15. Limited capital needed to invest on the forestry sector. This has resulted into use of poor methods and equipment, use of unskilled labour thus limiting effective exploitation of the forest. This is common in Bugoma forest in Hoima, Marabigambo.
16. Less developed technology. This has resulted into the use of simple and rudimentary tools e.g. axe, pangas etc. In forests like Kateera forest, Timu forest.
17. Inadequate skilled labour which is as a result of competition of labour with other sectors like agriculture. This has consequently affected effective exploitation of the forests.
18. Unfavorable gov't policy towards development of the forestry sector. The government has not allocated sufficient firms for the protection and growth of forests and also for

developing infrastructure like roads to encourage transportation of forest products to market centres.

5:06 Deforestation in Uganda

This is the massive cutting down of forests on a large scale with other plants without replacement.

- By 1900, Uganda was covered by about 3090km² of forests but today only 21% of the original forests are remaining and these include 1490 sq.km which are gazette as forest reserves.
- A lot of deforestation of forests has occurred in the central region, followed by Western, then Eastern and Northern region. Forests that have experienced severe deforestation include Mabira forest, Mt. Elgon forest, Mt. Rwenzori forest, Buga Island forest, Kibaale forest.

Causes of deforestation.

1. Increase in population. The population of Uganda has increased over time and this has resulted to high demand for land for activities like settlement, agriculture and as a result people have encroached on some forests e.g. Mt. Elgon forest, Mabira forest, Butamisa forest etc. Wiceri forest.
2. The increasing need of fuel in form of firewood especially in rural areas e.g. Rakai, Kotido and also charcoal especially in urban areas forests like Katugo in Nakasongola, Busitema forest in Bugiri and they have been cleared for such processes.
3. Some forests have been cleared because they are hide out for wrong doers like the rebels thieves e.g Zoka forest in Gulu where cleared in order to chase away the LRA rebels.
4. Industrialization has also increased on the rate of deforestation where by some forests have been cut down in order to get land for industrialization e.g Namanve forest was cleared to establish a coca cola industry in Mukono.
5. Construction of transport and communication networks. Some forests have been cleared to pave way for the construction of roads e.g part of Mabira forest was destroyed to construct Jinja –Kampala road, Jinja –Malaba road through Busitema forest, part of Echuya forest was cleared to construct kabala - Kisoro road etc.
6. Corruption. Some forests have been destroyed because of the corrupt forestry officials e.g part of Mafuga forest was illegally given away to farmers by the corrupt forestry officials through bribes thus leading to its destruction.
7. Outbreak of forest wildfires normally started by careless hunters and cattle keepers who occasionally set the bushes/forests on fire especially during the dry season. This is very

common with the savannah woodland forests e.g Timu forest in Kotido, Mt. kei forest in Yumbe.

8. Mining activities have also led to destruction of forests where by the forests are cleared to pave way for establishment of mines e.g in Buhweju in Bushenyi, Kitaka mines in Mubende where forests have been cleared for gold mining.
9. The weak government policy towards forest conservation has also encouraged people to illegally destroy the forests. There are few forest rangers and wardens to monitor and patrol around the forests as a result illegal lumbering takes place e.g in kateera forest in kiboga and Budongo forest in Masindi.
10. Increased demand for timber. forests like Maramagambo, Bwindi are not only used for supply of timber for local consumption but timber is also smuggled into the neighboring countries like Rwanda and this has increased the rate at which these forests are being cleared.
11. Illegal grazing of domestic animals on the forest lands/reserves. Forests like Kadam in Nakapiripiriti, Timu have been highly degraded by the cattle keepers i.e. the Karamojongs due to over grazing in those forests.
12. Wild animal have also destroyed the forests because some of them feed on the leaves, stems and roots of the trees e.g the elephants, Buffalos in forests like Timu, Abele, Budongo.
13. Pests and diseases have also destroyed forests by attacking the trees e.g aphids in Buko forest in Kabale and other forests have been destroyed because they harbor disease spreading sectors like tsetse flies that spread sleeping sickness in humans and Nagana in animals e.g. Bunya forest in Mayuge.
14. Some forests have been destroyed because of heavy rainfall associated with hail storms and very strong winds. This is common with the tropical highlands forests e.g. Mt. Rwenzori forest, Mt. Elgon forest.

Assignment

1. Account for the high levels of deforestation in Uganda.

5:07 Effects of forest destruction.

1. Destruction of forests has led to micro changes in the local climate resulting into reduced and more unreliable rainfall e.g. around Mt. Rwenzori forest, around Mabira forest where the rainy seasons have recently been less reliable thus discouraging activities like agriculture.

2. Forests help to maintain soil fertility by preventing soil erosion and also provide humus through the decaying leaves. Therefore the destruction of forests has left the soils exhaustion e.g Kibaale forests, Mgahinga forest, Busitema forest.
3. Reforestation has increased rates of soil erosion and deposition of silt in rivers that run through some forests e.g. R.Sezibwa and R. Musamya through Mabira forest in Buikwe. This has resulted into contamination of water used for domestic and industrial purpose thus causing a threat to human life.
4. Deforestation has also increased shortage of wood fuel especially in rural areas and charcoal in urban areas. This is due to the reduction of number of trees in the forest and this is evident in Katuugo forest in Nakasongola, Kateera forest in kiboga etc.
5. Destruction of forests has led to loss of bio diversity where different forms of plants and animals have been lost through clearing of the forest. Some plants species get extinct while some animals die or migrate other areas e.g. snakes, monkeys from Ssese islands were killed after clearing the forest for oil palm tree growing in Kalangala district.
6. Forests such as Bwindi, Mgahinga, Budongo are habitants for wild animals and themselves are also tourist attractions therefore there destruction has led to reduction of number of tourist resulting into reduced foreign exchange got from such tourist attractions.
7. Forests help to contribute to the reliable water supply because they facilitate the formation of rainfall which in turn yields lakes, rivers, swamps e.g. L. Kyoga, L. Victoria etc. Some rivers are increasingly becoming seasonal especially during in the dry season thus leading to death of aquatic life which later affects fishing activities.
8. Destruction of forests has also led to global temperature warming. Forests help to absorb greenhouse gases e.g. carbon dioxide. Accumulation of such gases into the atmosphere leads to destruction of the Ozone layer hence setting the green house effects.
9. Forest plants are source of natural medicines e.g. the Neem tree, Aloe Vera from forests like Budongo, Mabira. Some pesticides and other chemicals are also got from the forests; therefore destruction of forests has led to scarcity of local herbs.
10. Destruction has increased desertification. this is because the forest helps to maintain high level of humidity in the atmosphere, increase rainfall formation, therefore clearing forests reduces such hence desertification e.g. in northern Uganda where forests like Agro – Agriculture, Timu have been cleared.

Assignment

1. Giving specific examples from Uganda, Assess the value of tree planting/afforestation.

-
2. Discuss the effects of forest destruction in Uganda.

5:08 Measures being taken to utilize forests sustainably.

1. The government has introduced institutions in charge of regulating forest exploitation e.g. the national forest Authority, The national Environmental management Authority. All these check the sustainably use of forest e.g. Budongo forest in Masindi, Mabira in Buikwe.
2. Mass sensitization and education is also being undertaken in order to educate the masses of people about the valve of forests for sustainable use. This has been done thru various media like T.V, magazines and it is being facilitated by institutions like NFA, NEMA i.e. around Marabigambo forest in Rakai.
3. Some forests that have been encroached on e.g. Kibaale, Mgahinga forest. The encroachers have been evicted thru institutions like NFA, NEMA e.g. People have been evicted from Mgahinga forest, Mt. Elgon forest etc.
4. Afforestation programs have been encouraged and undertaken especially in those areas that have experienced high levels of deforestation. This is also being down thru encouraging the growth of fast growing tree species like Eucalyptus and pines etc. This is evident in areas of Mbarara, Nakasongola etc.
5. The ministry of water, lands and environment is licensing forest exploiters or lumber jerks or lumbering companies as a means of controlling the harvesting of forests. This is evident with the forests in Kalangala, Marabigambo forest in Rakai etc.
6. The gov't has also gazette forests by turning them into central forest reserves so that they are not encroached upon e.g. Mabira forest, Mt. Elgon forest etc.
7. Efforts are also being undertaken to develop alternative sources of energy to reduce on the pressure for fuel from the forests e.g. sugarcane remains in Kakira are being used to produce electricity, use of coffee husks in clay industries.
8. Efforts are also being made to encourage Agro forestry. In this regard, demonstration farms have been put purposely to teach farmers how to carryout Agro forestry e.g. at Namulonge and Kawanda research stations. Agro forestry is also being practiced in areas of Mukono.
9. Use of alternative sources of raw materials in making furniture is also being emphasized to limit on the excessive exploitation of the forest products e.g. use of plastic chairs instead of wooden chairs, use of metallic hoes instead of wooden hoes.
10. The government is also encouraging the practice of silvi-culture which is the growing of trees purposely for wood cutting to prevent excessive use of the natural forests e.g. in Tororo.

UNIT 6: FIELD WORK STUDY

6:00 introduction

This is the practical part of geography that is done outside the classroom. It involves observation, recording, analysis and interpretation of geographical data collected from the field.

It can also be understood as the science of collecting, evaluating, and reporting of geographical phenomena of a particular area. The geographical phenomena may be natural e.g. climate, soil, natural vegetation, drainage systems etc. it can also be human or man-made like agriculture, transport, fishing, mining etc.

REASONS FOR CARRYING OUT FIELD WORK

- To acquire information that help to make a strong basis for important decisions making.
- It is carried out in order to update the already existing information since geographical phenomena keep on changing.
- To relate what is studied in class with the real environment in the field.
- Field work research is carried out to acquire new information about geographical phenomena.
- To expose oneself to a variety of a variety of environment and socio-economic aspects so as to broaden the scope of knowledge.
- To acquire information so as to find solutions to existing societal problems.
- To get first-hand information which may not be distorted in any way.
- To create some form of relaxation to break the routine class room monotony of study.

6:01 STAGES OF CARRYING OUT FIELD WORK

There are basically three stages of conducting fieldwork and these include;

A. PREFIELD WORK STAGE/PREPARATORY STAGE.

This is the very first stage which involves all activities done before going out for the real field work excursion and involves the following steps;

1. Pilot study. It refers to the first visit to the intended area of study before the real field work is conducted in the field. Its purpose is to ascertain the feasibility of the intended study, seek permission from the relevant local authorities, make necessary bookings, evaluate the time required for the actual field work excursion etc.
2. Formulation of the topic of study. This is the second step after the pilot study and the topic of study is formulated basing on the information got from the pilot study [after ascertaining that it is feasible to conduct the intended research in that

particular area]. The topic should clearly WHAT is to be studied, WHERE the study is to be conducted and it should also show a geographical relationship. E.g. *The growth and development of Nakigalala tea plantation, kajansi town council, wakiso district.*

3. Formulation and stating of objectives. These are formulated basing on the topic of study already stated and should be specific, measurable, achievable, realistic and should be related to the topic of study. The following phrases may be used while stating the objectives; To find out....,To discover....,To asses....,To identify....

Examples of stated objectives may include;

- *To find out the location of nakigalala tea plantation.*
- *To find out the nature of relief at nakigalala tea plantation.*
- *To assess the effects of nakigalala tea plantation on the environment.*

4. Selection of data collection methods/techniques. These are used as means of gathering data in the field of study. They are selected basing on the topic of study

and the objectives that have already been formulated and stated. These include the following; *observation, recording, interviewing, sampling, questionnaire, measurement, pacing, map orientation, documentary analysis[literature review],*

5. Identification and collection of tools/instruments to be used in the field. Tools are help while using the different methods in the field of study to gather data and these may include the following; stationery [note books, pens, pencils etc.], tape measure, hand hoes, spades, tins, strings, cameras, audio recorders, compasses ,binoculars, base maps etc.



-
6. Seeking permission. This step involves seeking permission from the different relevant stakeholders for instance in a school setting permission must be got from the school administration to allow students move out of school to conduct field work, the parents also must permit their children to go away from school to carry out field work.
 7. Formation of groups. This will apply when field work is to be conducted as a group like a class at school. Here different groups are made and given different names like A, B, C and different tasks are assigned to each group. This is basically done for easy management and collection of data while in the field of study.
 8. This is the very last step at this stage [preparatory stage]. At this moment the researcher moves out to go and interact with the environment in the area of study.

ACTUAL FIELD WORK/REAL FIELD WORK EXCURSION/ DATA COLLECTING STAGE.

This is the main stage of carrying out field work and the main activity is data collection. Only data related to the topic of study and objectives should be collected and at this stage the methods of data collection are applied.

FOLLOW UP STAGE/ POST FIELD WORK STAGE.

This is the last stage of carrying out field work. The different steps/activities conducted at this stage are done to organize the findings of the study so as meaningful conclusions can be made out the field work study. The following are the steps/activities that are conducted at this stage;

1. Presentation of data from different individual researchers/groups.
2. Discussion and organization of data presented.
3. Analysis and interpretation of data collected.
4. Finishing and polishing of sketches/ diagrams drawn in the field.
5. Making of geographical conclusions about the fieldwork.
6. Making recommendations about the findings of the study.
7. Compiling and writing of the report of findings about the field work study.
8. Dissemination of the report of findings to different stakeholders.

6:02 METHODS OF DATA COLLECTION

These can also be referred to as **techniques** of data collection. They are used while in the field of study to gather and record data, however they have got advantages and disadvantages as explained below.

OBSERVATION METHOD

This is the use of sense of sight [naked eyes] to see and sort out the geographical phenomena in the field of study. It is normally used together with other senses like smell, feel etc.



Advantages of using observation method

- It gives first-hand information of what exactly is happening in the field and this helps to reduce on the bias about the different geographical phenomena.
- Learning takes place much faster because there is instant physical seeing of the geographical phenomena.
- There is high level of accuracy since the observer physically interacts with the environment thus minimizing gathering of false information.
- It saves time since a large field can be studied in a short period of time.
- It supplements other methods since most methods depend on observation.
- It is relatively a cheap method of data collection since it involves limited costs.

Disadvantages of using observation method

- The observer is exposed to environmental dangers and accidents e.g. wild animals since it requires going to the field of study.
- It is limited by obstruction from tall trees, fog, smog, hills and buildings thus affecting coverage.
- Sometimes it is expensive where the field is distant and it requires the researcher to travel.
- It is limited by inaccessibility of some places like extensive swamps, forests etc.
- It is liable to misinterpretation of geographical phenomena where one might omit some information especially when the researcher lacks observation skills.

- It is limited by unconducive weather like heavy rains, scorching sun shine that may affect clear views.
- It is not a very good method of gathering historical information e.g. historical backgrounds.

INTERVIEWING METHOD

It involves physical interaction between the interviewer [researcher] and the interviewee [respondent] in the field where the interviewer asks verbal questions to the interviewee who also gives verbal answers.

Advantages of interviewing method

- ✚ First-hand information is got from the source [interviewee]
- ✚ It is a very flexible method because if the desired response is not got the question can be rephrased.
- ✚ The information collected can be corrected on spot together with the interviewee.
- ✚ It is a fast method of collecting data since the information is got on spot.
- ✚ Sufficient information is got because supplementary answers can be got from the interviewee on spot.
- ✚ Up to date information is got since the data is collected on spot.
- ✚ It allows for clarification and evaluating the validity of the data given there and then.

Disadvantages of interviewing method

- It is limited by language barrier especially where the interviewee may not understand the language used by the interviewer and vice versa.
 - It is limited by hostile respondents who may stubbornly refuse to give information.
 - It is liable to exaggeration and bias especially from some respondents.
 - It is also liable to hoarding of information where some respondents deliberately refuse to give some information due suspicion.
 - It is time consuming where a number of respondents have to be interviewed resulting to limited coverage.
- It is limited by inaccessibility where respondents can be reached.

RECORDING METHOD

This involves the use of stationery like note books, pens, pencils to jot down the collected data in the field. It can be supplemented by other tools like cameras, audio recorders to capture data. The data captured may be in form of notes, sketches and diagrams, tables, videos and still photos etc.



Advantages of recording method

- ⊕ It is flexible and convenient because it can be done in different ways.
- ⊕ It ensures permanent records about the field study for future purposes.

Disadvantages of recording method

- It is time consuming since the researcher has to take notes in the field.
- Sometimes it is difficult to record if the researcher has no skills of recording.
- Some information may be skipped if the respondent is very first and the researcher is slow in taking notes.

SAMPLING METHOD

This involves selecting part of a whole to represent a whole (the rest). The selected portion is studied and its characteristics are taken to represent those of the other with similar characteristics.

Sampling may involve choosing few people from a group who the interviewed.

Sampling may also be through random picking of soil samples from the field of study that are then studied to represent the entire area.

Advantages of sampling method

- ⊕ It is time saving because a portion is selected to represent the rest.
- ⊕ First-hand information is got since information is got on spot.
- ⊕ It is accurate if carefully conducted.
- ⊕ It provides a representative sample that enables the study of a large area.
- ⊕ It gives unbiased information because the researcher comes into direct contact with the phenomena.

- ➡ It yields a lot of information because the sample is studied in details.

Disadvantages of sampling method

- It tends to generalize too much and some of the unique characteristics of geographical phenomena are left out.
- Effective designs of a sample can be difficult and sometimes expensive.

MEASURING METHOD

This involves the use of calibrated tools e.g. tape measure and none calibrated tools e.g. a string, a tin to establish the length, size, height, weight etc. of a geographical phenomenon in the field.



Advantages of measuring method

- ➡ It is very accurate if calibrated tools are used.
- ➡ It is an efficient way of obtaining information.
- ➡ It enables the researcher to get quantitative information about a geographical phenomenon.
- ➡ It is very flexible because different tools and techniques can be used.

Disadvantages of measuring method

- It faces a problem of inaccuracy where none calibrated tools are used.
- It is limited by inaccessibility e.g. presence of flooded swamps, hills that make measuring difficult.

PACING METHOD

This is a form of measurement where distance of a geographical phenomenon is established using relatively calculated strides/paces. This is specifically used to determine distances.

Advantages of pacing method

- ⊕ It is a very quick method of establishing distance.
- ⊕ It is very cheap since it does not require buying measuring tools.
- ⊕ It is time saving since one just needs to take strides she/he counts while counting.

Disadvantages of pacing method

- It lacks accuracy since it is not calibrated and each individual may have varying length of their strides.
- Presence of physical features e.g. swamps, forests may make pacing difficult.

QUESTIONNAIRE METHOD

This is a method of data collection where predetermined questions are used to collect data about a geographical phenomenon. The questions are written down on a piece of papers (questionnaires) that are then mailed/posted/delivered to the respondent who answers in writing and then sends them back to the researcher.

Questionnaire for Tourists		
1	Respondent's name (optional): _____	Sex M / F _____
2	Age: <input type="checkbox"/> 20-29 <input type="checkbox"/> 30-39 <input type="checkbox"/> 40-49 <input type="checkbox"/> 50-59 <input type="checkbox"/> 60-69 <input type="checkbox"/> 70 and above	
3	What is your country of origin? _____	
4	How long is your stay in Singapore? <input type="checkbox"/> 1-3 days <input type="checkbox"/> 4-6 days <input type="checkbox"/> 7-9 days <input type="checkbox"/> 10-12 days <input type="checkbox"/> More than 12 days (Please specify the duration: _____)	
5	How did you get to know about Chinatown? <input type="checkbox"/> Advertisement (e.g. newspaper, magazines, television, cinema) <input type="checkbox"/> Internet <input type="checkbox"/> Travel books (e.g. Lonely Planet, Frommer's) <input type="checkbox"/> Business associates <input type="checkbox"/> Friends/Family/Relatives <input type="checkbox"/> Travel exhibitions <input type="checkbox"/> Others (Please specify: _____)	
6	How did you come to Chinatown? <input type="checkbox"/> Public bus <input type="checkbox"/> Tour bus <input type="checkbox"/> Private car <input type="checkbox"/> Taxi	
7	What is/are the reasons for your visit to Chinatown? (Tick those options that apply.) <input type="checkbox"/> Business <input type="checkbox"/> Food <input type="checkbox"/> Sightseeing <input type="checkbox"/> Shopping <input type="checkbox"/> Religious pilgrimage <input type="checkbox"/> Special events/attractions (E.g. Food Festival, Religious Festival, etc.) <input type="checkbox"/> Others (Please specify: _____)	
8	What did you find attractive about Chinatown? Tick (✓) and elaborate on the items that you selected. Buildings with local architecture (✓) Elaborate _____ Places of worship _____ Memorials _____ Museum _____ Music _____ Cuisine _____ Art and crafts _____ Others _____	
9	Did you make use of these tourist services in Chinatown? <input type="checkbox"/> Accommodation <input type="checkbox"/> Shopping facilities <input type="checkbox"/> Eating outlets <input type="checkbox"/> Entertainment outlets	
10	What is your opinion about these services in terms of cleanliness, safety, availability, etc.?	
11	How did you to find your way in and around Chinatown and obtain the information that you need to get around?	

Advantages of questionnaire method

- ⊕ It helps a researcher to get information from remote areas like flooded areas, areas with poor transport networks etc.
- ⊕ It is cheap because it eliminates transport costs for the researchers.

- ⊕ There is minimized bias because there is no direct contact between the researcher and the respondent.
- ⊕ It is time saving because it can be used to cover a larger area in a short period of time.
- ⊕ Much information is obtained since the respondent is given ample time to give data.

Disadvantages of questionnaire method

- It might be time consuming if the respondents delay to send back the answered questionnaire.
- It can only be used where the respondents are literates because it involves reading and writing.
- Data might be lost because of high chances of getting lost in delivery process.
- Respondents may deliberately refuse to give information therefore hide the questionnaires.

MAP ORIENTATION METHOD

This is a method of data collection which involves turning or rotating a base map/survey map of the area being studied until the features on the base map tally with the features on the actual ground.

Advantages of map orientation method

- ⊕ It enables a researcher to get information about location and position of features in the field.
- ⊕ It saves time because it does not require moving a lot around the field in order to get data.
- ⊕ It enables a researcher to get data about local names of geographical features in the field.

Disadvantages of map orientation method

- It is limited by lack of a survey map/ base map of the area of study.
- It is quite difficult to use if the researcher lacks skills of map reading.

LITERATURE REVIEW/DOCUMENTARY ANALYSIS METHOD

This is a method of data collection in which reference is made to already existing information about the field of study in text books, journals, photographs etc. it involves comparing primary information (information the researcher has gathered from the field) with secondary information(information already published in books).

Advantages of literature review method

- ⊕ It helps in getting background/historical information about the area of study.

- ⊕ The information given has high levels of accuracy because it is got from first source.
- ⊕ It enables one to compare information with the findings of earlier researchers.
- ⊕ It is time saving because the information is got from already published records.

Disadvantages of literature review method

- It is limited by lack of recorded information about the geographical phenomena.
- It might be expensive because it may involve buying the recorded information like text books etc.

FIELD SKETCHING

Field sketching is a form of data recording where data is recorded in books in form of sketches where representations of both physical and man-made features of the environment of the field of study are drawn. Such features may include transport networks, buildings, gardens, vegetation, hills, rivers, swamps etc.

There are three types of sketches which include;

1. Sketch maps

This is **the layout** of the field of study, it is drawn to show location/position of physical and man-made features studied in the field. Sketch a map should bear a key, title, frame, and compass direction. Symbols are used to represent features shown on the sketch map.

2. Cross section

It can also be called a **transverse section/relief section/transect**. Here features of the field are represented along a line drawn from one point (direction) to another of the field of study. It should bear a title, beginning and end point e.g. East to West.

3. Panorama

This can also be called a **landscape sketch or panoramic view**, this is a sketch showing geographical features as drawn from point of view (normally from a raised ground) and pictures are used to represent features as they are seen in the field of study. It should bear a title, boundary and view point.

SKILLS THAT ARE ACQUIRED FROM FIELD WORK STUDY

- A researcher gets a skill of critical observation through the use of the observation technique.
- A researcher gets a skill of interviewing through the use of interview method.
- A skill of recording information is acquired through the use of recording method.
- A skill of developing a questionnaire is acquired through application of the questionnaire method.

- A researcher gets a skill of making measurements through the use of measurement method.
- A skill of researching is acquired through the use of literature review method.
- A skill of report writing through making the report of the findings of the study.
- A skill of analyzing data is acquired through analyzing data collected to get valid information.
- A skill of sampling is acquired through application of sampling method.
- Skill of map reading is developed through the use of a base map in the map orientation method.
- A skill of map drawing is acquired through use of sketching technique.

Assignment

NB. The questions must be attempted after the follow up stage, meaning that the researchers/students have gone through all the three stages of conducting field.

1. *For any field work you have carried out;*

- a) *State;*
 - i. *the topic of study*
 - ii. *Objectives of the study.*
- b) *Explain how you used any three of the methods of collecting information in the field.*
- c) *Outline the problems of using the methods explained in (b) above.*
- d) *Explain the findings of your study.*
- e) *Outline the follow up stage of your field work study.*

2. *For any field work study you have conducted as a group or individual;*

- a) *State;*
 - i. *Topic,*
 - ii. *Objectives of study.*
- b) *Explain the pre-field work stage of the study.*
- c) *Draw a sketch map of the area studied and on it mark and name the physical features and land use types.*
- d) *Explain the relationship between the physical environment and land use types.*
- e) *Outline the recommendations of your study.*

3. *For any field work study you have carried on a farm;*

- a) *State;*

-
- i. *Topic of study*
 - ii. *Objectives of study*
- b) *Describe how you any three of the following techniques of data collection.*
- i. *Questionnaire*
 - ii. *Sampling*
 - iii. *Measurement*
 - iv. *Interview*
- c) *Outline the advantages of using the techniques described in (b) above.*
- d) *Explain the impact of the farm on the surrounding environment.*
4. *For any field work you have carried about fishing;*
- a) *State;*
 - i. *The topic of study*
 - ii. *Objectives of study*
- b) *Draw either a panorama or cross-section of the area studied and it show physical and human features.*
- c) *Explain the relationship between relief and land use types in the area of study.*
- d) *Outline the skills you acquired from the field work study.*

UNIT 7: WETLAND RESOURCES IN UGANDA.

7:00 Introduction

Wetlands refer to areas that have become adopted to permanent and temporary flooding.

Wetlands are commonly referred to us swamps. They are extensive, complex and currently they cover about 11% of the total land area of Uganda.

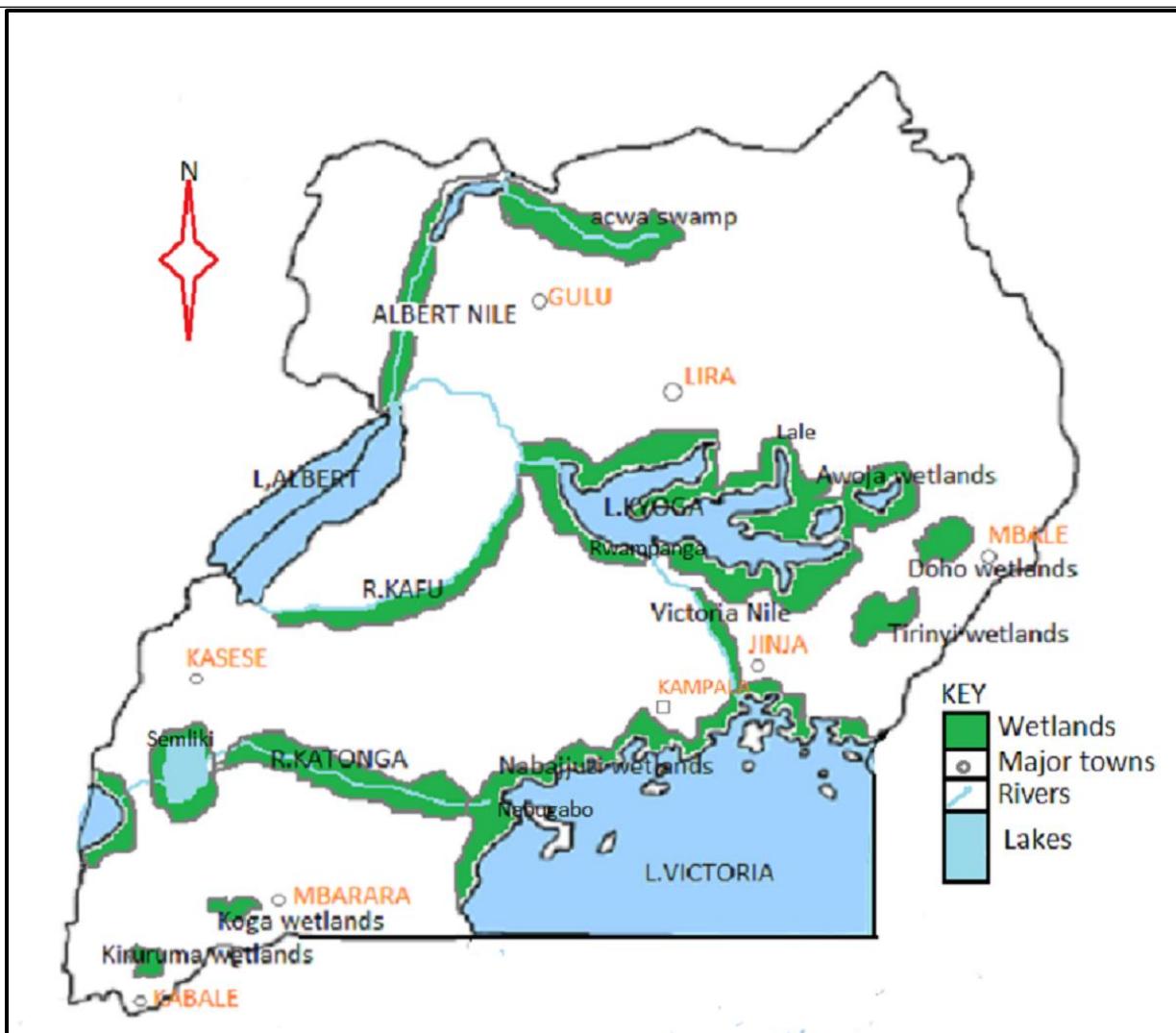
Wetlands are classified into three types namely;

- **Lacustrine wetlands.** These are wetlands found around lakes e.g. Iutembe wetlands in Entebbe, Nabugabo and Nabajjuzi wetlands in Masaka, Luzira wetlands in Kampala all around Lake Victoria, Lwampanga wetlands in Nakasongola around Lake Kyoga etc.
- **Riverine wetlands.** These are wetlands that are found along courses of major rivers e.g. kafu wetlands along R. Kafu, katonga wetlands along R. Katonga, mpologoma wetlands along R. Mpologoma etc.

- **Open valley floor wetlands.** These occupy depressions or low lying areas e.g. Kiruruma wetlands in Kabaale, Walugogo wetlands in Iganga, Doho wetlands in Butalejja, Busega Wetlands in Wakiso, Koga wetlands in Mbarara etc.



Sketch map of Uganda showing the distribution of wetlands.



7:01 Importance/significances of wetlands in Uganda.

Positives.

1. Wetlands filter water and trap the dirt, sediments and toxins from water. This helps to purify water used for both domestic and industrial purposes e.g. Nabajjizi wetlands in Masaka provides clean water to the population in Masaka urban area, Kiruruma wetlands provides water to the people in Kabale town.
2. Wetlands are important sources of fish. Various fish species do well in wetland conditions especially as their breeding grounds examples are cat fish and the mud fish. This has encouraged fishing which is a source of income to the people involved. E.g. lumbuye wetlands in Iganga, Lutembe wetland in Entebbe etc.
3. Wetlands are vital because they help to modify micro climatic conditions of the areas where they exist. This is because they influence rainfall formation through the

evapotranspiration processes resulting into increased amounts of rainfall. This is evident at Koga wetlands in Mbarara, Awojja wetlands in Soroti etc.

4. Wetlands help in charging the underground water sources and also maintaining the underground water table. This has provided constant supply of water in the various water sources like springs or wells for the local communities e.g. Walugogo wetlands in Iganga, Kiruruma wetlands in Kabale etc.
5. They provide extensive land for crop cultivation mainly for the crops that do well in wet conditions. This is evident in Sango bay wetlands for sugarcane growing in Rakai, Kibimba wetlands for rice growing in Bugiri district, Doho wetlands for rice growing in Butalleja district etc.
6. The swampy vegetation i.e. palms and papyrus reeds that grow in wetlands have harvested and used to make craft items that are used domestically and also sold for income to people. They are also used in the construction of houses and also as fuel in people's homes.e.g. Mpologoma wetlands in pallisa, Lutembe wetlands in Entebbe etc.
7. Wetlands provide grazing grounds with palatable pastures for animals. This very important especially during the dry seasons when pastures are scarce in other areas.e.g. Nyaruzinga wetlands in Rukungiri, Lwampanga wetlands in Nakasongola, Awojja wetlands in Soroti, all these are used for animal grazing.
8. Wetlands are tourist attractions that attract many tourists both locally and internationally thus promoting the tourism sector in the country. Wetlands are habitants for various animals e.g. snakes, crocodiles and birds e.g.the crested crane plus different species of plants. All these attract tourists e.g. around kazinga channel wetlands, luzira wetlands around L. Victoria.
9. Wetlands naturally control flooding by accommodating and containing the overflows from rivers and lakes and other water streams and through this they reduce on the risks of that could result from flooding like loss of property and lives.e.g. Kafu wetlands along R. Kafu, Katonga wetlands along R. Katonga and many others.
10. Wetlands are also sources of local medicinal herbs that are used to treat a number of ailments in people. The roots, leaves and stems of some of the plants that grow in wetlands have been harvested and processed into medicines to treat ailments like cough, tooth aches, measles etc. This is evident in Busega wetlands in Wakiso, madi wetlands in Gulu etc.
11. Under sustainable measures wetlands are used for industrial development and this is because they provide extensive flat bottomed floors suitable for the construction of industrial infrastructure like buildings and roads but also they can be used as dumping areas for industrial wastes.e.g. Luzira wetlands, Nakawa wetlands, Kyambogo wetlands all in Kampala.
12. Wetlands are also sources of food in terms of fish, some plant fruits where by the communities around such wetlands harvest for foodstuffs and also they carry out hunting in these areas for wild game. This is seen in Iwampanga wetlands in Nakasongola, madi wetlands in Gulu, Naigombwa wetlands in Iganga etc.

13. Wetlands are used for demarcation of boundaries for districts, counties and other territories. This has made regional administration easier thus reducing inter territorial conflicts.e.g. Koga wetlands separate Bushenyi from Mbarara districts, Awojja wetlands separate Soroti from Kumi districts, Kafu wetlands separates Hoima from Kabarole districts.
14. Wetlands are also important sourced of minerals especially clay and sand therefore they are used for mining activities that have provided employment opportunities to many people who earn income thus improving their standards of living.e.g. Sand mining in Lwera and Nabugabo wetlands around L.victoria in Masaka, clay mining in Kajjansi wetlands.
15. Wetlands are used for construction of important infrastructure especially in the urban areas like Kampala, Jinja etc. This is because the wetland areas provide extensive flat land that makes it relatively cheap to construct and also these wetlands have relatively low settlement density thus less people will be displaced.e.g the northern by pass road passes through Busega, Bwaise, kalerwe wetlands.
16. *Negatives.*
17. Wetlands harbour disease spreading vectors e.g.water snails that spread bilharzia, mosquitoes that spread malaria in human beings. These are common diseases that affect the people who live around wetland areas e.g. around Iwampanga wetlands in Nakasongola, Mpologoma wetlands in Pallisa etc.
18. Wetland hinder the development of transport and communication networks because it is expensive to construct and also maintain the transport networks like roads therefore areas that have extensive wetlands have few well developed roads e.g. Doho wetlands in Butalleja, mpologoma wetlands in pallisa etc.
19. Wetlands are liable to flooding and in many cases it has resulted into destruction of property and sometimes loss of lives. This common with wetlands like Walugogo in Iganga district, Awojja wetlands in Soroti, and many others.
20. Some wetlands have acidic soils that are not suitable for crop growing especially for along period of time thus rendering such wetlands unproductive in terms of arable farming. In most cases their productivity is restricted to only two seasons causing a problem of scarcity of food in those areas e.g. Tirinyi wetlands in pallisa district.
21. Some wetlands have been used as hiding grounds for wrong doers e.g. highway robbers and thieves who cause insecurity in such places. This is common in Lwera wetlands along kampala-masaka highway, Awojja wetlands along soroti-kumi road and many others.
22. Wetlands pollute the environment through emission of poisonous gasses into the atmosphere e.g. the ammonia gas that is very smelly. This is evident around Busega wetlands along kampala-masaka road, Lubigi wetlands along Kampala- Hoima road in Wakiso.

7:02 Major threats to Uganda's wetlands/ wetland destruction.

Most of the wetlands are being misused/destroyed despite the fact that they are protected by National environment statute of 1995. The destruction rate is high that the coverage of wetlands has been reduced from about 13% to 11% in recent times.

Some of the wetlands under severe degradation include the following;

The open valley floor wetlands of Doho in Butalejja, Kibimba wetlands in Bugiri, Pallisa wetlands for rice growing. Mutai wetlands in Jinja etc.

Gabba wetlands, Luzira wetlands, Bwaise wetlands, Nalukolongo wetlands all in Kampala for settlement, industrialisation and infrastructural development.

Lwampanga wetlands in Nakasongola, koga wetlands in Mbarara, Awoja wetlands in Soroti for animal grazing and many others.

Factors that have led to destruction/degradation of wetlands in Uganda.

1. Wetlands have been destroyed to establish land for agriculture especially arable farming in the rural areas. This has been caused by the high demand for foodstuff as a consequence of population increase in the country therefore new land had to be opened up in swamps to grow crops especially those that do well in wetlands e.g. rice growing in Doho wetlands in Butalejja, Kibimba wetlands for rice growing in Bugiri etc.
2. Wetlands have also been degraded due to the need for land for settlement. This is very common in the urban areas where people have settled in wetland areas due high



Rice plantation

population growth rates and therefore urban expansion.e.g kiteezi wetlands, Bwaise wetlands, Bugoloobi wetlands in Kampala city have been cleared for settlement.

3. Mining of clay and sand in the wetland areas has also resulted into wetland degradation. In the process of mining, vegetation is destroyed and also land is excavated creating pits and ditches. This is seen at kajjansi wetlands in Entebbe common for clay mining, Lwera wetlands for sand mining in Masaka.

4. Pollution through the discharge of industrial wastes into wetland areas and also poor disposal of wastes especially from the urban centres.e.g there is discharge of industrial wastes into Luzira wetlands like Uganda breweries industry, kaziire beverage industry in Mbarara discharges wastes into wetlands around river Rwizi etc.
5. Excessive harvests of papyrus reeds and other materials for craft making has also contributed to wetland destruction. The uncontrolled harvest of these items leads to extinction of some plant species thus tampering with the natural set up of the wetlands that leads to degradation e.g. Lubigi wetlands in Wakiso, Kiruruma wetlands in Kabale district.
6. Ignorance of the population about the value of protecting the wetlands.Most people lack knowledge of wetland conservation and some use these wetlands for their own benefits neglecting the role of wetlands to the entire community and this has resulted into destruction of wetlands e.g. Bugoloobi, munyonyo wetlands in Kampala which have been used for settlement.
7. The nature of the land tenure system in some parts of the country has also contributed to wetland destruction. The private ownership of land means that land belongs to private individuals that sometimes wish to use there land in the way they please making it quite difficult by the government to control those wetlands.e.g. Munyonyo wetlands, Bugoloobi wetlands in Kampala.
8. The need to establish transport and communication networks has also contributed to wetlands degradation. Many swamps have been reclaimed to pave way for road construction e.g.the northern by pass road passes through Busega, Lubigi, Bwaise wetlands in Kampala, Entebbe express high way also passes through Busega wetlands, Nakigalala wetlands, kajjansi wetlands and many others.
9. Wild fires started by farmers, hunters and sometimes natural fires also leads to destruction of some wetlands. The fires destroy the vegetation and other inhabitants of wetlands including animals and other micro living organisms. This is common in Lwampanga wetlands in Nakasongola, Pallisa wetlands in Pallisa district, and Madi wetlands in Gulu etc.
10. Corruption of some government officials in institutions NEMA, department of lands, department of environment plus police who connive to give away wetlands to private individuals through bribes and as a result leading to wetland misuse e.g. Munyonyo wetlands in Kampala which have been used for settlement.
11. Need for land for industrial development. Many wetlands have reclaimed for purposes of industrial establishments and this because wetlands provide relatively flat nature of landscape and they also used for dumping of industrial wastes.e.g. Namanve industrial park with industries like coca cola plant, Rwenzori water factory etc. in mukono.

12. Wetlands have also been destroyed due to poor garbage disposal especially in urban centres. Some of the garbage disposed off by people in urban areas do not decompose e.g. the plastics and other polythene e.g. wakalagga wetlands, kinawataka wetlands in Kampala.
13. Some wetlands have been destroyed because on being security threats by harbouring wrong doers like high way robbers, rebels etc. People in such areas tend to clear such wetlands in order to flush out the wrong doers e.g. Awojja wetlands in Soroti, Katonga wetlands along Masaka -Mbarara road.
14. Some wetlands have been deliberately destroyed in a bid to control pests and diseases especially those that harbour vectors like mosquitoes that spread malaria, snails that spread bilharzia.e.g. Part of Nabajjuzi wetlands in Masaka, part of Lubigi wetlands in Wakiso etc.
15. Some wetlands have been degraded because of overgrazing caused by uncontrolled grazing in some areas especially where livestock farming is predominantly practiced. This is common during the dry season when pastures are scarce in other areas and as a result there is extinction of some species of grass. This is seen in Koga wetlands in Mbarara, Iwampanga wetlands in Nakasongola.
16. Poor fishing methods have also contributed to wetland degradation. Sometimes fishing in the swamps involves clearing the vegetation thus tampering with the eco system which results into degradation e.g. Naigombwa and Lumbuye wetlands in Iganga district.



Sand mining in a Swamp

Effects of wetland destruction/degradation.

1. Reclamation of wetlands results into exhaustion of the underground water that leads to the lowering of the water table. This in turn also results into drying up of some water sources like boreholes resulting into water scarcity of water for domestic and industrial use.e.g. Pallisa wetlands in Pallisa.
2. Wetland destruction has resulted into reduced capacity for the wetlands to purify and clean the water and as result affecting the quality of water in the different water sources like wells and springs in these wetlands where people draw water especially for domestic use thus becoming a health risk for their lives e.g. Kiruruma wetlands in Kabaale, Lubigi wetlands in Wakiso.
3. The massive swamp reclamation such as Mpolologoma, Naigombwa, and Lumbuye in Iganga district has resulted into desertification. Since the swamps help in rainfall formation, there destruction results into reduced rainfall amounts thus limiting activities like crop growing in the areas where they exist.
4. The reclamation of wetlands has negatively affected the tourism industry and this is because when the wetlands are destroyed the eco-system and biodiversity will be tampered with leading to death and migration of wildlife that would attract the tourists. This evident at nabugobo wetlands in Masaka, semulik wetlands in Bushenyi and many others.
5. Encroachment on wetlands that results into their degradation has resulted into flooding in those areas because the wetlands can no longer contain water especially after heavy rainfalls. This has resulted into destruction of property and sometimes loss of lives. This is common in Bwaise, kyambogo wetlands in Kampala.
6. Wetland destruction has also resulted into massive siltation of some rivers and streams this consequently results into poor quality water from the streams, blockage of those stream, death of aquatic life also limiting the supply of water especially for irrigation purposes.e.g reclamation of Doho wetlands has resulted into siltation of Manafwa in Butalleja.
7. Massive wetland destruction also has resulted into loss of materials like papyrus reeds and palms for art and crafts making thus depriving many people who stay around wetlands of their livelihoods. This is evident around Lubigi wetlands in Wakiso.
8. Wetland destruction has also resulted into increased incidence of disease outbreaks especially the water borne diseases e.g. cholera, dysentery but also malaria. This is associated with flooding of these degraded wetlands and sometime Pits left after mining that turn into breeding areas for disease spreading vectors like mosquitoes.e.g. Luzira wetlands, Bwaise wetlands in Kampala.
9. Excessive wetland destruction leaves the area barren rendering it a wasteland. This basically as a result of clay and sand mining in the swamps plus other activities of like brick making. These activities tend to leave behind pits and ditches that leaves the area unproductive for any other activities.e.g Nabugabo and Lwera wetlands in Masaka.
10. Massive destruction of wetlands for purposes of agriculture, settlement etc. has resulted in reduced stocks and sometimes total depletion of fish stocks in swamps. This

therefore has limited fishing activities especially for those fish species that survive in wetlands like mud fish.e.g. Kibimba wetlands in Bugiri, Doho wetlands in Butalleja.

11. Wetland destruction has also contributed to shortage of sources for medicinal herbs. Many medicinal herbs that used to treat ailments/diseases like cough, measles etc. are got from the leaves, roots and stems of the swampy vegetation therefore their disappearance has caused the shortage of medicinal herbs.

Measures to control/save/conserve the wetlands.

1. Public awareness has been emphasized through media like radios, television and print media like news papers where programs about the values of conserving wetlands and their importance have been made known to the people. This had been done by government institutions like NEMA and consequently reducing on misuse of wetlands like Busega wetlands in Kampala.
2. Research has been extensively carried out both by government and private individuals to provide adequate information about the systems, functions and values, size and distribution of wetlands throughout the country. This has helped to give better information to all who intend to utilize the wetlands sustainably. This has helped to conserve wetlands like lutembe wetlands, Luzira wetlands around Lake Victoria.
3. Setting up of proper guidelines that are required for sustainable use of the wetland resources. The wetlands require well formulated guidelines of environmentally sound management which will result into conservation of wetlands and this has been done by NEMA resulting into sustainable use of wetlands like Doho wetlands in Butalleja.
4. Training of labour to acquire skills necessary for the provision of technical guidance in form of monitoring and evaluation wetland exploitation and development at all levels .e.g. Makerere university offers degree courses in environmental management, Botany etc.and because of this wetlands have been conserved e.g. Lutembe wetlands, mpologoma wetlands etc.
5. Change in the land tenure systems where by there has been a declaration that all wetlands are owned by the government therefore private individual owners can not utilize the wetlands without guidance from government through NEMA. This has helped to guide on sustainable use of wetlands like Lwera wetlands and Nabajjuzi wetlands in Masaka.
6. There has been establishment of reserve swamps where by such wetlands are not accessible to the public to reduce on their usage e.g. the lacustrine wetlands around L. Kyoga like Lwampanga wetlands, Lutembe wetlands around Lake Victoria.
7. Ensuring strict control and protection of wetlands by training and deploying of guards e.g. the environmental protection unit of police. This has helped to guard against the miss use and encroachment of wetlands like Lubigi wetlands in Wakiso, Busega wetlands in Kampala etc.
8. Fighting corruption by establishing institutions like IGG, the auditor general, state house anti-corruption unit and many other organs that are mandated to check on government

departments against the miss use of government funds. Through this institutions like NEMA are also checked for proper management of wetlands and this has helped to protect wetlands like Luzira wetlands.

9. Improving on security in areas where wetlands are used as hiding places for wrong doers such that these wetlands are not destroyed for that reason. As a result wetlands like Awojja wetlands in Soroti and Tirinyi wetlands have been saved.
10. There has been eviction of encroachers from some wetlands. This has been enforced by NEMA together with environmental protection unit of police. This has been evident in Munyonyo and Bugoloobi wetlands in Kampala.
11. The government through NEMA is encouraging the use of alternative building materials like metal bars, iron sheets, to try and reduce on the exploitation of wetlands for that purpose. Through this wetlands like Nabajjuzi in Masaka have been saved.
12. The government has gazetted specific industrial parks so as to avoid wetland destruction through industrial development e.g. Namanve industrial park in mukono, mbale industrial park etc. This has saved wetlands like Luzira wetlands, Lutembe wetlands in Entebbe.
13. Hunting of wild animals and birds has been banned in some wetlands to try and avoid wild fires that are normally started by hunters. This has been enforced by NEMA together with wildlife Authority and it has minimized on incidence of wild fires that destroy wetlands.e.g. Mpologoma wetlands.
14. There is control of garbage disposal to try and protect the endangered wetlands especially in urban centres e.g. KCCA acquired specific garbage dumping sites at kiteezi in wakiso to protect wetlands like wakaligga in Kampala.
15. The government through NEMA are encouraging filling up of pits left behind after sand and clay mining to try and replenish the exploited wetlands. This evident at kajjansi wetlands, seeta wetlands in Mukono and many others.
16. Emphasis has also been put on treating industrial wastes before being released into the wetlands so that dangerous toxic substances are removed to try and protect the aquatic lives within the wetlands. This done by Uganda breweries at Luzira wetlands in Kampala.

Assignment

1. Explain the economic significances of wetlands in Uganda.
2. (a) What are the causes of wetland depletion in Uganda?
(b) Explain the steps that have been undertaken to curb wetlands depletion in Uganda

UNIT 8: FISHING IN UGANDA

8:00 Introduction

Fishing is the extraction of aquatic life from a waterbody.

In Uganda, it's mainly fish that is caught from the various waterbodies (fishing grounds) which include lakes, rivers, swamps and ponds.

The major fishing grounds in Uganda are;

- a) **Lakes** and these include; Victoria, Kyoga, Albert, Edward, George, Wamala, Bisina, Bunyonyi etc.
- b) **Rivers** which include; Kafu, Katonga, Victoria Nile, Albert Nile, Manafwa, Mpologoma, Acwa etc.
- c) **Swamps/ wetlands** which include; Lubigi, Iutembe, Nabajjuzi, Nabugabo, Naigombwa, Doho, koga, sezibwa etc.

There is also some fishing carried out in **ponds** especially from people practicing fish farming and this is found in Kabaale, Mukono, Pallisa, Luwero etc.

Draw a sketch map of Uganda showing fishing grounds.

Types of fish caught in Uganda include;

Tilapia ("engage"), Nile perch ("mpuuta"), silver fish ("mukene"), mud fish or Eels ("ensonzi"), lung fish ("emmamba"), clarias ("emalle"), haplochromis or sprat ("enkejje"), bagrus ("ssemutundu")

Methods of catching fish in Uganda include;

Gill netting, lampara (light fishing), Angling (baited hook), basket trap, spearing, barrier trap/fencing, long lining

Methods of preserving fish in Uganda are;

Smoking, sun drying, salting, fish canning, deep freezing/icing, deep frying

Status of the fisheries sector in Uganda

- About 80% of fish caught is from L Victoria.
- About 60% of fish caught is sold fresh.
- About 40% of fish is processed and exported.

- Post-harvest losses stand at about 25% due to poor preservation methods.
- Nile perch fish is the most exported fish by value.
- Tilapia is the most caught fish in all waterbodies.
- The fishery sector contributes about 8% to GDP.
- Fishing is the second foreign export earner.
- The fisheries sector in Uganda is growing.

8:01 Significance/ Importance/ contributions of fishing to the economic development of Uganda

Positively

1. Fishing provides food in form of fish that is rich in proteins which improves people's diet and general health. The fish caught from Lake Victoria is consumed by the people in the areas of Kampala, Entebbe, Jinja, Busia, etc and that caught from Lake Kyoga is consumed by people in Lira, Kumi, Nakasongola etc.
2. Provision of foreign exchange, Uganda exports fish to countries like USA, Belgium, China, DRC etc. thus bringing foreign exchange that is later used in international to improve sectors like Health sector through buying medicines and machinery, transport, agriculture and many others. The fish exported is caught from Lake Victoria, Kyoga etc.
3. Fishing provides employment opportunities e.g. Fishermen, fish mongers etc. These people earn income thus improving on their standards of living. This is evident on the various fishing grounds like Kasenyi landing site, Bukakata landing site on Lake Victoria.
4. It is a source of local government revenue through the taxes that are levied from all the activities and people involved in the fishing activities e.g. licenses to fishermen, transporters and processing companies like Green fields in Entebbe around Lake Victoria, in Lwampanga around Lake Kyoga etc.
5. It has promoted industrialisation through providing raw materials to some industries especially those that process fish for export e.g. green fields in Entebbe, Masese fish parkers, Fresh Patch etc but also industries that make animal feeds e.g. Uga-Chick poultry feeds factories, Nuvita industries in Jinja. All these depend on fish from Lake Victoria, Lake Kyoga etc.
6. Fishing has promoted urbanisation where by some places start as fish landing sites then later develop into towns with improved social services like supply of electricity, improved roads, piped water that are enjoyed by the people who stay in those places e.g. Kasenyi landing site, Gaba landing site all on Lake Victoria.
7. It has contributed to economic diversification. This has helped to widen the market base, create more jobs and also to reduce overdependence on agriculture as the main economic activity which faces a number of challenges. This is seen around Lake Albert, Lake Kyoga and many others.

8. It has encouraged the development of transport and communication networks. Roads have been constructed and rehabilitated to help and link various fishing grounds to ease the transportation of fish to market centres however these roads are used for transportation of people and other items e.g. masaka- bukakata road, majanji- busia road, kampala- Gaba road on lake Victoria, Iwampanga- nakasongola road on lake Kyoga.
9. Fishing has promoted research and tourism where by many learners, students visit fishing grounds to study about fishing activities and this has widened their scope of knowledge which is vital for development. This is common on Lake Kyoga, Lake Victoria and many others.
10. Fishing has promoted good international relations especially between Uganda and those countries where fish is exported e.g. China, USA, Japan DRC etc and as a result it has promoted world peace and also foreign direct investment. The fish exported is especially Nile perch and tilapia from Lake Victoria, Kyoga etc.
11. It has promoted agriculture especially livestock farming because it provides raw material especially silver fish for making animal feeds for chicken and pigs. This fish is caught from Lake Victoria, Lake Kyoga and many others.
12. *Negatively*
13. Fishing activities have contributed to air, water and land pollution caused by poor disposal of industrial wastes and gas emissions especially those involved in fish processing like green fields in Entebbe. Land pollution is done by poor disposal of garbage like polythene by the people who live on various fishing villages and this seen at Zengebe and Namasale on Lake Kyoga.
14. Fishing encourages urbanisation that comes with the related social problems that affect the people who live in those urban centres e.g. congestion that facilitates easy spread of diseases, high crime rates like theft, drug abuse among others. This is evident at majanji landing site in Busia, Bukakata landing site all on Lake Victoria.
15. Fishing activities have led to deforestation. This is because forests are often cleared to get wood fuel for preservation on fish i.e. smoking but also to get timber to fishing gear lake boats/canoes used for fishing and as a result some forests like Kalangala forests, Mabira around lake Victoria have been affected.
16. Inter territorial conflicts especially along lakes that are situated along the borders of Uganda and other countries e.g. Victoria shared by Uganda, Kenya and Tanzania, lake Albert shared also with DRC. The conflicts arise over the extent of the fishing areas since there is no clear demarcation on the waters and as a result there has been loss of lives and property.
17. Fishing has limited the performance of other economic sectors because it is usually looked at as a profitable and an easy way of earning a living thus many people have abandoned agriculture, mining for fishing. This is seen at Kasenyi fish landing site, Masese fish landing site all along Lake Victoria.

18. Profit repatriation due to fact that many foreign investors are involved in many fishing activities as businesses e.g. companies like 4 ways limited and green field are engaged in processing and export of fish and they are owned by Asians therefore they send their profits to their home countries instead of investing in the country for further development.
19. Fishing has led to school drop outs because many people look at it as an easy way to make money than going to school which is looked at as time wasting therefore many young people have dropped out of school for fishing especially in communities around fishing grounds like L Vitoria, L Albert, L Kyoga etc.
20. Fishing is prone to water accidents due to numerous reasons like hostile weather conditions like heavy rain storms, strong winds and waves along the fishing grounds plus poor fishing gear like canoes that are quite light on water. This has caused death of fisher men and loss of property e.g. on L Kyoga, L Victoria and L Albert.

8.02 Problems affecting the development of the fisheries/ fishing sector in Uganda.

Physical problems

1. The nature of climate, Waterbodies(fishing grounds) normally receive heavy amounts of rainfall which results into floods that sometimes cause death of the fish within the flooded fishing grounds plus hindering the fishing activities. This is evident on Lake Kyoga and Lake Victoria.
2. The nature of relief, Some fishing grounds are located in the rift valley characterised by very steep slopes/escarpments this has limited the construction of transport networks like roads and in turn it limits fish transportation and marketing e.g. L Albert.
3. The presence of the water weed (water hyacinth) on some fishing grounds, this leads to death of fish and also destroys fish nets when carried away by winds plus limiting navigation on the water body thus limiting fishing activities e.g. on Lake Victoria and lake kyoga.
4. Some fishing grounds have got very irregular shorelines due to numerous in-lets thus making establishment of landing sites and anchoring of water vessels quite difficult and consequently this limit fishing activities. This is evident on Lake Kyoga.
5. The presence of very deep fishing grounds like lake Bunyonyi limits the breeding of fish since most fish species breed in shallow waters and this hinders multiplication of fish on the other hand very shallow water bodies like lake Basina, lake George also limits smooth navigation of boats and canoes used in the fishing thus hindering fishing activities.
6. Diseases are common around fishing grounds and this is basically because these water bodies harbour disease spreading vectors like mosquitoes that transmit malaria, water snails that spread bilharzia etc. These diseases affect the fishermen thus limiting the fishing activities on the various waterbodies like L Victoria, Lake Albert etc.

7. The existence of water predators within the fishing grounds like crocodiles, snakes and the Nile perch fish, these feed on the young and small fish thus reducing on the fish stocks but also scares away the fishermen during fishing thus limiting fishing activities. This is evident on Lake Kyoga, Lake Victoria and Lake Albert.
8. There is also a problem of the floating islands (suds). These destroy the fishing gear when found in water, limits navigation of fishermen on the water body and also leads to death of fish in the waterbody. This is evident on Lake Victoria and Lake Kyoga.
9. The presence of very strong seasonal winds on some fishing grounds, these cause accidents to fishermen especially those that use canoes and other small boats and consequently there is loss of lives and property thus hindering fishing. This is common on Lake Kyoga, and Lake Victoria.

10. Human problems

11. Indiscriminative fishing which involves the use of poor and illegal methods of fishing e.g. beach seining, use of poison, use of undersized nets etc. These methods destroy even the young fish thus limiting sustainable fishing which results into reduced stocks of fish in the water body. This is evident on Lake Kyoga Lake Victoria etc.
12. Smuggling of fish to the neighbouring countries thus causing a shortage of fish on the Ugandan market and also making the country to lose revenues from their exports that would otherwise be invested in the sector for further development. Fish from Lake Victoria is smuggled to Kenya and Tanzania whereas fish from Lake Albert is smuggled to DRC.
13. Shortage of adequate capital to invest in the fisheries sector in form of purchase of modern equipment used in fishing e.g. motorised boat engines, fish nets etc. this in turn has limited the quantity of fish caught e.g. from Lake Victoria, Lake Albert etc.
14. Competition for market from other fish producing countries e.g. Norway, Japan, Canada etc normally fish from such countries is of better quality compared to that from Uganda thus attracting a bigger international market and this has limited fishing from lakes like Victoria, Kyoga etc.
15. The poor preservation methods and storage facilities, The preservation methods like smoking, sun drying, salting that are commonly used to preserve fish before sale are not very effective causing high post-harvest losses. This is common around fishing grounds like Lake Wamala, Lake Edward and Lake Albert.
16. Poor transport and communication networks where by some fishing grounds are linked with poor roads that are almost impassable especially during the wet seasons. This has hindered transportation of fish to market centres e.g. Bukakata- masaka road, kasenyi-nabagereka road on Lake Victoria.
17. Pollution of water in the various fishing grounds especially from the chemicals released in the water bodies from the industries around them. These are toxic chemicals that lead to death of fish in the waterbody e.g. Nile breweries industry and nyanza textile industries dump wastes in Lake Victoria.

18. Insecurity on some fishing grounds caused by the frequent piracy. These normally come from the neighbouring countries who steal boats, fish, and nets from the fishermen thus affecting the fishing activities. This is evident on Lake Albert and Lake Victoria.
19. Corruption in form of embezzling resources directed towards the development of the sector in form of educating the fishermen better methods of fishing and handling fish, purchase of modern fishing gear, protection of the water bodies etc. Sometimes the fisheries officials allow use of illegal methods of fishing through bribes all these are seen on lake Albert, lake Victoria etc.
20. Shortage of skilled man power, Most of the fishermen are not skilled in fishing and handling of caught fish leading to post harvest losses and poor quality fish. Many of them resort to use of poor fishing methods and these limit effective fishing e.g. on Lake Edward, the Albert Nile river etc.
21. Limited local market for fish, This is majorly because many Ugandans are relatively poor therefore cannot afford to buy fish for consumption but also some tribes have cultural values that prohibit fish consumption and as a result it has affected the development of the fisheries sector. E.g. fish caught from Lake Albert and Lake Kyoga go bad due to lack of market.

Measures taken to develop the fisheries sector in Uganda/ solutions to above problems

1. Implementation of government policy to curb/ stop indiscriminative fishing on the various fishing grounds to try and re stock the waterbodies. This is being done by UPDF to stop the use of undersized fish nets, catching of young fish and fishing in prohibited areas. This has helped to increase fish stocks in lakes like Victoria.
2. Introduction of improved and modern fishing equipment like motorised boats, use of legal and sustainable methods of fishing like gill netting for efficient fishing on the various fishing grounds like lake Victoria, lake kyoga etc.
3. Introduction of modern fish preservation methods and facilities e.g. the use of refrigerated trucks to transport fish safely to market centres like processing factories which has greatly reduced on post harvest losses. This is evident at kasenyi fish landing site on Lake Victoria.
4. There has been construction of fish processing plants near the fishing grounds in order to add value on fish so as to fetch high prices especially on the world market. This is evident at masese fish landing site with masese fish packer's factory, Green fields factory around Lake Victoria.
5. Training of fisheries personnel for better management of the sector has been done through institutions like Entebbe fisheries institute that awards diploma and degrees in fisheries but also at Makerere University with courses in aqua culture. This skilled labour has improved fishing activities on Lake Victoria, Lake Kyoga etc.

6. There has been increased research and development in the fisheries sector e.g. at the fisheries research institute at kajjansi, the fishery research organisation in Jinja. Research is done on fish multiplication, better methods of fishing and preservation. This is seen on Lake Victoria.
7. Improvement of transport and communication networks to link the fishing grounds to market centres for easy distribution and marketing of fish. This has been done through grading and tarmacking of some roads e.g. masese- Jinja road, Gaba- Kampala road around Lake Victoria.
8. Sensitisation of communities around the fishing grounds about conservation and proper utilisation of the waterbodies. This has been done through workshops, seminars, radio and through this people have learnt to protect the fishing grounds for sustainable exploitation of the water bodies thus improving on fishing activities e.g. around lake wamala, lake Edward etc.
9. Liberalisation of the fisheries sector where by private investors have come in with adequate capital to invest in the fishing, processing and export of fish to earn high revenues from the sector e.g. kasenyi fish landing site is owned by private investors plus factories like green fields in Entebbe that handle fish from lake Victoria.
10. There has been enlargement of market for fish through educating people about the values of fish consumption, some fish species like silver fish is used to make animal feeds and also through export of fish to other countries like DRC, South Sudan. This has enlarged the market for fish caught from Lake Albert, Lake Victoria etc.
11. Improvement and setting up modern infrastructure on the various landing sites like building piers, weighing shades, ice plants to improve fishing. This is evident at kasenyi fish landing sites, masese fish landing sites on Lake Vitoria.
12. Encouraging and promoting fish farming especially around wetland areas by encouraging individual people to construct ponds to keep fish so as to increase supply of fish in those areas without fishing grounds like lakes and rivers. This is seen in pallisa, kabaale etc.
13. Restocking of some fishing grounds especially lakes with high breed fish species e.g. Lake Victoria and Lake Kyoga have been re stocked with fish from kajjansi research institute and as a result there has been increase in the stocks of fish in these lakes.
14. Improvement on security around fishing grounds to guard against piracy on the different fishing grounds. This is being done through regular patrols done by UPDF and marine police on the different water bodies like Lake Albert, Lake Victoria.
15. Removal of the water weeds and floating islands on lakes like Victoria and Kyoga, this is done to improve on the navigation in those areas covered by the weeds and floating islands so as to improve fishing.
16. Encouraging fishing on the co-operative basis so as to mobilise funds needed to improve on their fishing activities through buying modern fishing gear and preservation equipment. This evident at Lwampanga fish landing site on Lake Kyoga, masese fish landing site on Lake Victoria.

1. [Fisheries Profile Sector.pdf](#)
2. [FI CP UG.pdf](#)
3. [Fishing in Uganda - Wikipedia.html](#)

Assignment

1. Draw sketch map of Uganda and show the fishing grounds
2. Explain the conditions that have favored development of the fisheries industry in Uganda

UNIT 9: AGRICULTURE IN UGANDA

9:00 Introduction

Agriculture refers to the growing of crops and rearing of livestock for both food production and for commercial purposes. The traditional cash crops grown include coffee, cotton, tobacco, tea, sugarcane but of late there has been introduction of other cash crops like vanilla, cocoa, oil palm tree plantation, flowers etc. these are basically grown for sale.

Status of agricultural sector

- The agricultural sector is growing steadily at an average rate of about 2%
- It is dominated by crop growing which cuts across all societies with food crops and cash crops grown in particular area.
- Animal rearing is not very popular and only concentrated in a few areas.
- It employs about 80% of the total population both directly and indirectly.
- It contributes about 44% to GDP thus making it the backbone of the economy of Uganda.
- The sector accounts for about 48% to total exports earnings.
- Coffee is the most exported crop by value.
- It is predominantly subsistence about 68% under subsistence farming.
- It depends mainly on small holder farmers producing both cash crops and food crops.

In Uganda agriculture is categorised into different farming systems/agrarian systems. This simply describes the way how agriculture is practiced in a particular area in the country as explained below;

A farming system can be defined as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar strategies and interventions might be appropriate. Source FAO.

9:01 FARMING SYSTEMS/ AGRARIAN SYSTEMS

1. Intensive banana-coffee system

This is confined along the shores of Lake Victoria mainly in the northern shores (**intensive banana-coffee lake shore system**) in the districts of Wakiso, Kampala, Mukono, Buikwe, Masaka, Mpigi etc. but also in some parts of western Uganda (**western banana-coffee system**) in districts of Mbarara, Bushenyi, Kyenjojo, Hoima, Masindi etc.

Characteristics of intensive banana-coffee system

- The major cash crop grown here is Robusta coffee however tea is also grown on a small scale
- Bananas are grown as the major staple food crop in the region.
- Other annual crops grown include beans, maize, sweet potatoes etc.
- There is also small scale animal rearing e.g. piggery, cattle, goats and poultry keeping.
- The system experiences heavy amounts of rainfall 1000mm which is well distributed because it lies along the equatorial climatic region.
- It also experiences a double maxima type of rainfall which supports the growth of perennial crops like Robusta coffee and bananas annual crops like beans and maize.
- The system is also characterized with modern farming practices like market gardening, floriculture because of urban concentration in the region.
- The land tenure systems here are registered land titles and free hold system which allows modern farming.
- The soils here are mainly the fertile alluvial soils that support the growth of perennial crops like coffee and bananas.
- Farmers here practice inter cropping due shortage of but also as a way maintaining soil fertility.
- Mixed farming is also practiced where crops supplement animal feeds whereas animal dung compliments soil fertility.

2. Montane farming system

This system covers the highland areas of Uganda around mountain Rwenzori in the districts of Bundibugyo, Kasese and Kabarole etc. Mountain Elgon in the districts of Sironko, Bududa, Manafwa, Bukwo, and Kapchorwa etc. also found in Kigezi highlands in around districts of Kisoro, Kabale etc.

Characteristics of montane farming system

- Bananas are grown as the major staple food crop in these regions
- Arabica coffee is grown as the major cash crop in this system.
- Other crops grown in this system include; beans, Irish potatoes, barley, wheat, onions, passion fruits and vegetables.
- There is also small scale animal rearing especially dairy farming.
- This system experiences rainfall amount of above 1200mm p.a. that supports the growth perennial crops like coffee and bananas.
- The land tenure system is majorly customary inheritance and individual ownership of land.
- They practice terracing along the relatively steep slopes to control soil erosion.
- Inter-cropping is also practiced to maintain soil fertility and also due to shortage of land.

Note: medium altitude intensive banana coffee system quite share similar characteristics.

3. Annual cropping-pastoral system

This system is dominant in the Ankole- Masaka dry corridor in the districts of Rakai, Ssembabule, Kiruhura, and Mbarara etc. karamoja region in the districts of Moroto, Kotido, Kaabong, Abim, and Nakapiripiriti etc. also in the district of Nakasongola and Bulisa.

Characteristics of annual cropping- pastoral system

- This system experiences rainfall of less than 600mm per annum.
- The rainfall is fairly reliable and it supports the growth of pastures.
- Livestock keeping is predominantly practiced where animals like cattle, goats and sheep are kept.
- Some farmers practice nomadic pastoralism due to scarcity of pastures and water for the animals.
- Crop growing is practiced on a small scale where annual crops like millet, sorghum, cassava are grown.
- Animals kept are majorly for subsistence where milk, meat are produced mainly for home consumption.
- The system is characterised with prolonged droughts that affects productivity of animals and crops.
- The land tenure system is majorly communal ownership of land where land belongs to no individuals but the community.

4. Annual cropping and cattle Teso system

This system is dominant in the eastern region of the country in the districts of Soroti, Kumi, Katakwi, Bukedea, Kaberamaido etc.

Characteristics of annual cropping and cattle Teso system

- This system experiences rainfall of slightly above 760mm per annum which mainly supports annual cropping.
- Cotton is grown as the major cash crop in this system.
- Millet is grown as the major staple food crop but is complimented with other crops like cassava, maize, ground nuts etc.
- Animals are also kept on a small scale where animals like cattle, goats are reared.
- Ox-ploughing is used to cultivate the land as a form of labour because the relief is generally flat.
- The land tenure system is mainly customary inheritance system.

5. Banana-millet- cotton system

This system covers districts of Tororo, Pallisa, and Kamuli etc. it is found between intensive banana coffee system and annual cropping and cattle teso-system.

Characteristics of banana-millet-cotton system

- The major cash crop grown here is cotton.
- The major staple food crop grown is millet but complimented with cassava, maize, bananas etc.
- Annual crops are mainly grown and these include; maize, cassava, ground nuts, sweet potatoes etc.
- Small scale livestock farming is also practiced.
- Rainfall received is moderate of about 700-1000mm per annum.
- The land tenure system is mainly customary inheritance.

6. Annual cropping and cattle northern system

It covers part of the northern region in the districts of Gulu, Lira, Kitgum, Pader, Amuru etc.

Characteristics of annual cropping and northern system

- Cotton is the major cash crop grown in this system.
- The area receives reliable rainfall of slightly above 760mm per annum.
- Millet is the main food crop in this system but supplemented by other crops like sim-sim, cassava, ground nuts etc.
- The area receives a single maxima type of rainfall which only allows growing of annual crops.

- There is individual ownership of land and customary inheritance.
- Ox-plough is used as a source of labour especially in cultivating land.

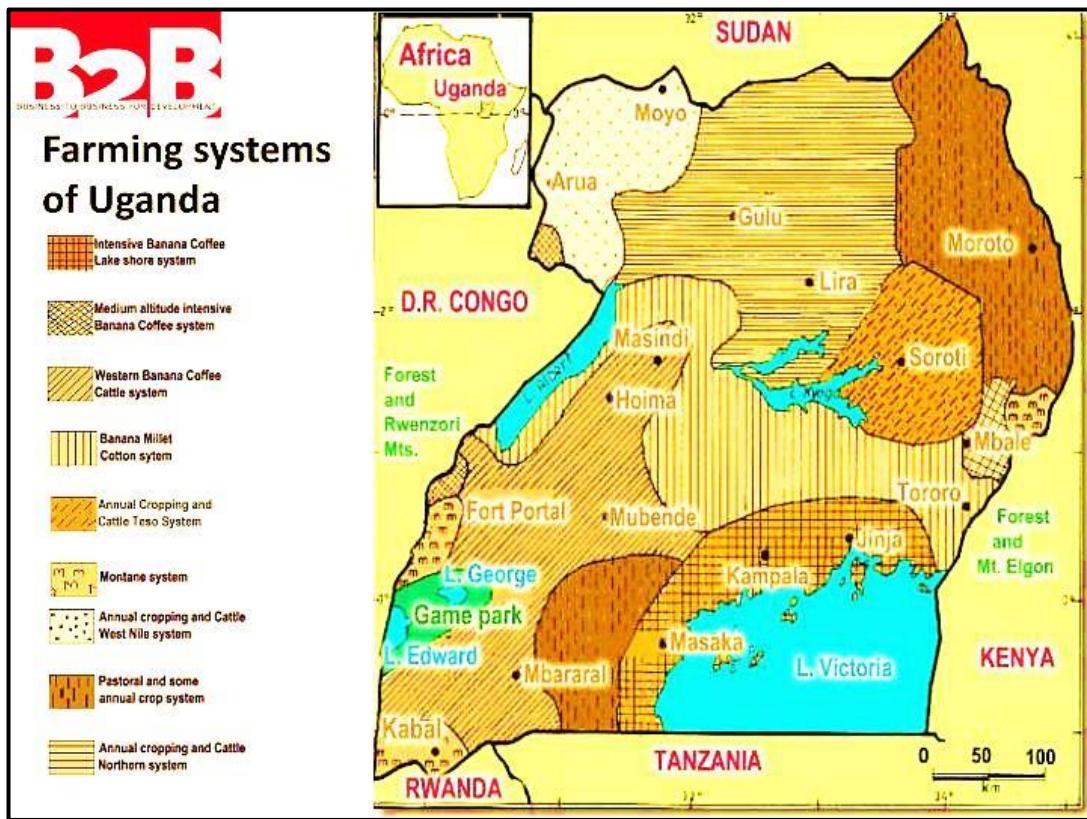
7. Annual cropping and cattle west Nile farming system

This system is practiced in west Nile in the districts of Arua, Moyo, Koboko, and Adjuman etc.

Characteristics of annual cropping and cattle west Nile system

- The crops grown include; tobacco, cassava, sim-sim, cotton Arabica coffee etc.
- Tobacco is the major cash crop grown in this system.
- Cassava is the major food crop grown here.
- Crops are mainly grown on rotational basis to maintain soil fertility.
- Cattle rearing is scattered throughout the region.
- There is largescale use of simple tools by farmers.
- Crops are grown mainly on relatively flatlands.
- The area receives reliable rainfall of about 1000mm per annum.

MAP OF UGANDA SHOWING THE DISTRIBUTION OF FARMING SYSTEMS



9.02 FACTORS INFLUENCING AGRICULTURE/FARMING SYSTEMS IN UGANDA

Physical factors

1. Climate, the amount of rainfall and its reliability determines the farming system. Areas that receive rainfall above 1500mm per annum with high temperatures support the growth of perennial crops like coffee, bananas thus favouring the intensive banana coffee system in districts of Masaka, Mpigi, Mukono etc. and montane farming system in areas of Kabarole, Bundibugyo and Mbale etc. On the hand areas that receive rainfall below 650mm per annum very high temperature support the growth of pastures that encourages livestock farming thus the annual cropping pastoral system in areas of Kotido, Moroto, Nakasongola etc.
2. The nature of relief, this influences the type of farming system e.g. the highland areas because of the heavy rainfall received around, support the growth of perennial crops like Arabica coffee, bananas, tea and vegetables thus the montane system around mountain Elgon in the districts of Mbale, Sironko, Kapchorwa and around the Mtn Rwenzori in Kabarole, Bundibugyo districts etc. the relatively flat areas encourage livestock farming e.g. in the areas of Nakasongola, Moroto etc.

3. The nature of soils, the fertile alluvial soils around the shores of lake Victoria have encouraged growing of perennial crops like tea at mukono, sugar cane at Jinja, Robusta coffee in Masaka, oil palm trees in Kalangala bananas in Buikwe districts etc. thus the intensive banana coffee system. The rich volcanic soils around Mtn Elgon in areas of Sironko, Mbale Bududa have encouraged the growing of crops like Arabic coffee, bananas, beans, passion fruits etc. however the poor sandy soils in Kotido, Moroto only support the growth of pastures thus promoting livestock farming.
4. Nature of vegetation cover, areas around tropical rainforests receive heavy amounts of rainfall over 1500mm per annum and this encourages the growing of perennial crops e.g. tea, coffee, bananas e.g. around Mabira forests in Buikwe district, around Bwindi impenetrable forests in Kanungu and Rukungiri districts etc., areas with scanty vegetation cover do not influence formation of heavy rainfall therefore are relatively dry with abundant pastures encouraging the pastoral system e.g. in Kiruhura, Nakasongola, Moroto etc.
5. Drainage, the presence of lakes is associated with heavy amounts of rainfall which encourages the growth of both perennial crops like sugarcane, coffee, bananas and annual crops like beans, maize, vegetables thus encouraging the intensive banana coffee system e.g. around mukono, Jinja Wakiso districts. The well rained area also suitable for the growth of cassava, millet, cotton evident in the annual cropping and cattle northern system in the districts of Gulu, lira etc. on the other hand the poorly drained area also encourage growth of water loving crops like yams, rice, e.g. Kibimba rice scheme in Bugiri, Doho irrigation scheme in Butalejja district.
6. Altitude of the area, different agricultural activities and crops do well at different heights above sea level. For example the higher altitude areas (1800-4000m above sea level) with cooler temperatures have encouraged the growing of specific crops like Arabica coffee around Elgon in the districts of Mbale, Sironko etc. Barley and wheat in Kapchorwa and Bukwo districts, apples in Kabale and on the other hand Robusta coffee only thrives in the mid altitude areas (600-1200m above sea level) with warmer temperatures e.g. areas of Masaka, mukono, crops like cotton do well at lower altitude areas (below 900m above sea level) e.g. in areas of Soroti, Gulu etc.
7. Pests and disease, areas that are relatively free from pests and diseases have encouraged various agricultural activities like annual crop growing maize, millet cassava, ground nuts, tobacco in the districts of Arua, Pader, Zombo etc. in the annual cropping cattle West Nile farming system on the other hand the occurrence of pests and diseases limit agricultural productivity e.g. the cassava mosaic has affected cassava growing in Soroti and Kumi, animal diseases like foot and mouth disease has affected cattle rearing in Kiruhura, Ssembabule swine fever that affects piggery in Masaka etc.

Human factors

8. Culture, some cultures support the practice of certain farming practices e.g. the Karamojongs believe that keeping livestock is part of their culture customs thus the practice of pastoralism in areas of Kotido, Moroto, etc. the baganda relate coffee and bananas to their culture and customs thus encouraging the growth of coffee and bananas in districts of Mityana, Masaka and Mpigi etc.
9. Government policy, the government through the program of modernisation for agriculture in conjunction with NAADS have encouraged through giving seedlings, advice, fertilizers etc. different agricultural practices in different areas of the country through the policy of zoning e.g. citrus growing in Soroti, banana and coffee growing in Masaka, dairy farming in Bushenyi and Mbarara districts etc.
10. The land tenure system, the way how land is owned influences the farming system in a particular area. The free hold system in districts of Mukono, Mpigi, Masaka have encouraged the intensive banana-coffee system where farmers grow perennial crops like coffee, tea, bananas own their permanently owned land however communal ownership of land in areas of Kotido, Moroto has encouraged nomadic pastoralism.
11. Urbanisation, areas that are highly urbanised have encouraged modern farming systems like floriculture, horticulture, poultry farming, green house farming, zero grazing etc. this is due to the ready market provided by the big urban population e.g. in around Kampala city, Jinja city, Mbarara city etc.
12. Availability of abundant supply of agricultural labour both skilled and unskilled, some agricultural practices are labour intensive e.g. tea growing, sugarcane growing under plantation farming therefore they have been established in areas of high population where labour can easily be got e.g. Lugazi sugar estates in Lugazi, Kakira sugar estates in Jinja, tea growing in Mityana etc.
13. Availability of advanced technology, this has encouraged largescale and modern farming practices e.g. plantation farming like sugarcane growing in Lugazi and Jinja, oil palm tree growing in Kalangala, rice schemes like Doho in Butalejja and Kibimba in Bugiri etc. where machines are used in opening land, weeding, harvesting and processing the crop.
14. Transport and communication networks, efficient transport means encourage largescale farming because it makes transportation of agricultural produce to market centres and agricultural inputs to the farms easy e.g. bananas, coffee, beans, milk can easily be transported to Kampala from areas of Mbarara, Masaka etc. through Kampala-Masaka-Mbarara road, flowers are grown in Entebbe because they be easily exported through Entebbe international Airport.
15. Capital, availability of adequate capital to invest in farming has also influenced farming systems. Some farming practices like plantation farming require relatively huge amounts of capital to establish especially in buying land, machinery, paying labour etc. therefore such practices have been confined in areas where farmers can afford to invest e.g. Kasaku tea estates in Buikwe, Kakira sugar estates, oil palm tree plantation in Kalangala, Kaweri coffee plantation in Mubende etc.

16. Market farming is also influenced by availability of ready market e.g. practices like market gardening, horticulture, floriculture, dairy farming are highly market based that is why such practices are normally near areas with high concentrations of people like urban centres so as to easily reach the market because the produces like vegetables, flowers are perishable.
17. Political atmosphere, areas that have politically stable with relatively good security have encouraged intensive agricultural activities like plantation farming e.g. coffee, banana, tea growing in the districts of Jinja, Mukono, Masaka encouraging the intensive-banana-coffee farming system. Areas like Gulu, Lira that experienced political turmoil due to LRA rebels, agricultural activities were limited resorting to only seasonal crops like maize, millet.
18. Innovation and research has also influenced farming, research has been done to improve on the quality of existing crop like grafting and animal varieties through cross breeding to improve on productivity and disease resistance but also new varieties have been made e.g. clonal coffee variety, new banana variety etc. grown in areas of Luwero, Masaka etc.
19. Availability of land, Areas with large unoccupied land have encouraged establishment of extensive plantations thus encouraging practices like plantation agriculture e.g. Atiak sugar estates near Gulu, oil palm tree plantations in Kalangala, Kaweri coffee plantation in Mubende. Also the presence of large expanses of unoccupied land has encouraged largescale animal rearing in areas of Nakasongola, Ssembabule, Moroto etc. areas with limited large encourage small holding farming e.g. in Wakiso, Masaka, Iganga etc.

9:03 ANIMAL HUSBANDRY (LIVESTOCK FARMING) IN UGANDA

Livestock farming/Animal husbandry is the rearing of animals and birds.

The animals reared in Uganda include mainly cattle, goats, sheep, pigs and poultry especially chicken, Turkeys and ducks etc. Livestock farming in Uganda is categorised into the following;

- **Nomadic pastoralism**, common in districts of Moroto, Kaabong, Kotido, Nakapiripiriti, Nakasongola, Buliisa, Kiruhura etc.
- **Ranching**, common in districts of Mbarara, Rakai, Lira, Mpigi, Kabale, Masindi, Nakasongola etc.
- **Dairy farming**, common in Bushenyi, Wakiso, Mbarara, Kabale etc.
- **Zero grazing**, common in many urban areas e.g. Kampala, Mukono, Mbarara, Jinja, Kabale etc.
- **Poultry**, in areas of Kampala, Jinja, Gulu, Lira, Soroti, Wakiso and many other areas throughout the country.
- **Piggery**, commonly practiced areas Masaka, Luwero, Gulu, Jinja etc.

MAP SHOWING AREAS WHERE LIVESTOCK FARMING IS CARRIED OUT IN UGANDA

Status of livestock industry

- ✓ Livestock farming is largely practiced at subsistence level.
- ✓ The industry is poorly developed.
- ✓ The industry contributes about 5% to GDP.
- ✓ Livestock products e.g. milk, meat, hides, are mainly sold in raw form.
- ✓ The industry is dominated by unskilled people.
- ✓ The indigenous low quality animals are mainly kept.
- ✓ Efforts are being undertaken to use more scientific methods like deworming, spraying, Ranching, Cross breeding to improve.

9:04 NOMADIC PASTORALISM

This is a form of subsistence livestock farming which involves the keeping of animals where a farmer moves with animals from one place to another in search for water and pasture for the animals.

It is practiced in districts of Kaabong, Kotido, Moroto and Nakapiripiriti by the Karamojongs, Parts of Mbarara, Rakai, Kiruhura, Ssembabule, Mubende (Ankole -Masaka dry corridor) mainly by the Bahima and also parts of Nakasongola by the Baruuli.

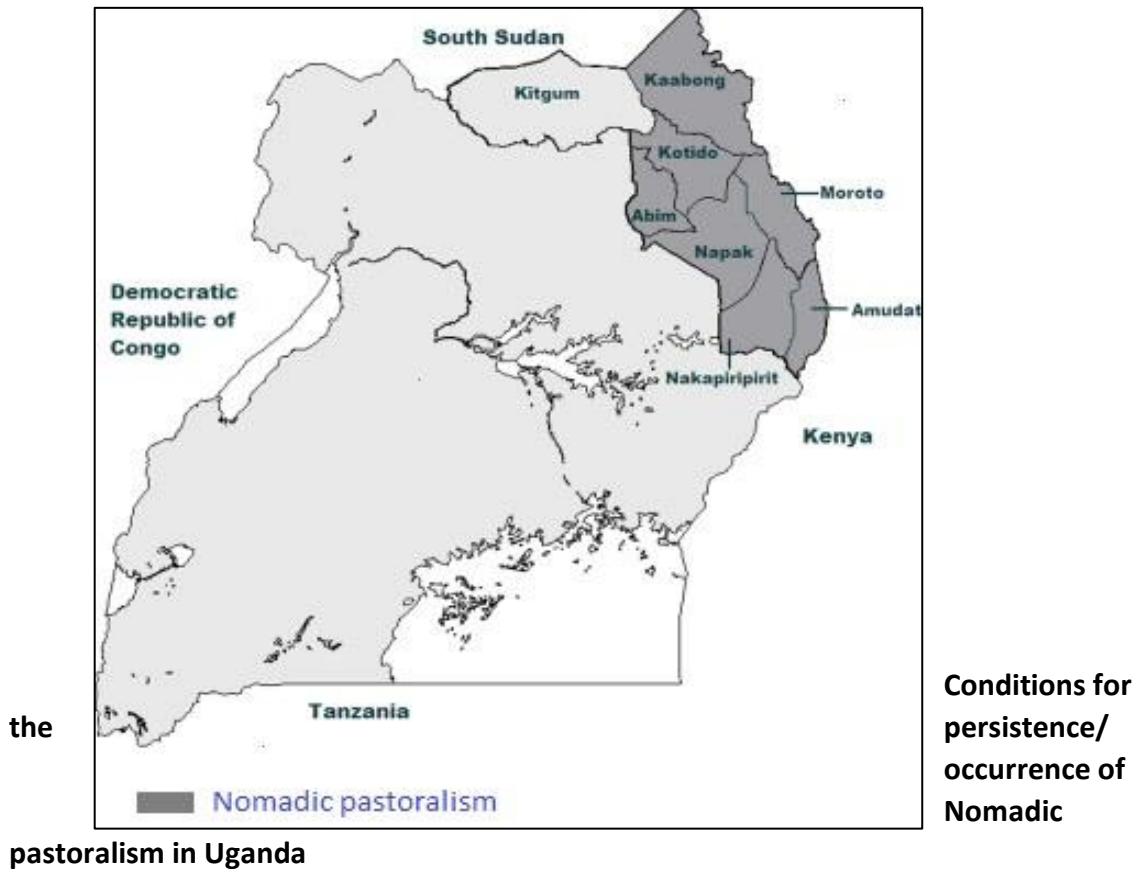
Characteristics of nomadic pastoralism in Uganda

- Animals are mainly kept for subsistence i.e. milk, meat and blood for home consumption.
- Different types of animals are kept e.g. cattle, goats and sheep.
- Large herds of low quality animals are kept for prestigious reasons.
- Transhumance is practiced i.e. seasonal movement in search for water and pasture.
- Animals depend on natural pastures for grazing.
- Burning of bushes is done at the end of the dry season in anticipation of fresh new grass at the beginning of the wet season.
- Local breeds of animals are kept e.g. zebu by the Karamojongs and Ankole long horned cattle by the Bahima.



Nomadic pastoralism

Map of Uganda showing areas where nomadic pastoralism is practiced.



1. Climatic conditions, areas that experience low amounts of rainfall below 650 mm per annum cannot support arable farming, rather supports the growth of abundant pastures hence encouraging nomadic pastoralism. This is evident in Moroto, Kotido districts.
2. Severe prolonged droughts also encourage nomadic pastoralism because they result into shortage of pastures and therefore the livestock farmers are forced to move from one place to another on search for water and pastures for their animals. This is common in Kotido, Nakapiripiriti .etc.
3. The sparsely populated areas that provide adequate grazing land for the pastoralists, this is evident with areas that are sparsely populated e.g. karamoja region in districts of Moroto, Kaabong with population density of less than 50 persons per/km.
4. Availability of adequate pastures in the areas where nomadic pastoralism is practiced that are nutritious and palatable for grazing animals also has encouraged nomadic pastoralism in places⁸ like Nakasongola, Kiruhura etc.
5. The presence of infertile skeletal soils with low moisture that do not support arable farming but can support the growth of pastures has also encouraged people to carry out nomadic pastoralism. This is evident in Rakai, Buliisa districts.
6. Culture and belief. The nomads believe that keeping livestock is part of their culture and tradition this therefore has encouraged the continuity of nomadic pastoralism. This is seen in the districts of Abim, Nakapiripiriti and many others.
7. Conservatism, the nomadic pastoralists are very rigid about their traditional way of lifestyle and therefore they are not willing to change to modern ways of looking after animals and has also encouraged the occurrence of the practice e.g. at Moroto, Mbarara etc.
8. The communal ownership of land in areas where livestock farming is common, since the land is owned communally this encourages farmers to move from one place to another in search of pastures and water without any restrictions. This is common in Kotido, Moroto districts.
9. The poor methods of looking after the animals like overstocking, communal grazing which results into overgrazing and consequently shortage of pastures forcing farmers to move to different places for the search pastures thus nomadic pastoralism. E.g. at Nakasongola, Buliisa etc.
10. Limited capital to invest in livestock farming, Farmers lack adequate funds to buy better breeds of animals, establish ranches, to pay for veterinary services etc. This has encouraged the existence pests and diseases that force people to practice nomadism.
11. Limited support from the government. The government had not done enough to address limitations in the livestock sector in terms of funding and education to farmers to change their ways of living. This also has caused continuity of nomadic pastoralism in areas like Kotido, Moroto etc.
12. The presence of undeveloped transport and communication networks in areas where nomadic pastoralism is practiced. This has rendered such areas to remain remote thus

being left behind for development with poor social services and as a result people have resorted to nomadic pastoralism e.g. Nakapiripiriti, Moroto etc.

13. Insecurity caused by cattle rustling and raids which is common in areas where nomadic pastoralism is practiced. People tend to move from one area to another in a bid to secure their animals and lives from the cattle rustlers who normally come from their neighbouring communities. This is common in Kaabong, Amudat etc.
14. The presence of dangerous wild animals like lions, Leopards etc., these animals attack the animals and the farmers sometimes causing deaths and as a result nomads move from those areas to other places to run away from the wild animals thus causing nomadic pastoralism.
15. The presence of pests and diseases, many of those areas where pastoralism is common are infested with pests like tsetse flies that spread nagana in animals and sleeping sickness in human, ticks that cause the east coast fever in animals and many other diseases like foot and mouth disease. Farmers tend to move away from such infested areas resulting in nomadism.

9:05 RANCHING IN UGANDA

This refers to keeping of livestock mainly cattle for beef production and for commercial purposes.

Ranching in Uganda is mainly practiced in the districts of Kiruhura, Rakai, Masaka, Mpigi, Gulu, Kitgum, Mbarara, Mubende, Lwengo etc.

Characteristics of commercial Ranching in Uganda

- Cattle are mainly kept for beef.
- The livestock kept is mainly for sale.
- Farms are sub divided into paddocks.
- The animals are rotated around the paddocks to control grazing.
- There is no over grazing because the carrying capacity is strictly followed.
- Animals are grazed on permanent farms/ ranches.
- There are permanent water sources on the farms for the animals.
- Selective breeding to produce high quality breeds is done.
- Scientific methods of animal keeping are provided e.g. cattle dipping, artificial insemination etc.
- Record keeping on the farms is done.

Draw sketch map of Uganda showing the main Ranching schemes.

❖ Make brief notes on the economic significances of livestock farming in Uganda.

Consider the following outlines.

Positively

- Source of food
- Raw materials
- Foreign exchange
- Local revenue to government
- Employment
- Infrastructural development
- Research
- Economic diversification
- Promoted tourism
- Source of fertilizers
- Used for bride price
- Source of labour-ox plough
- Promoted art and craft
- Promoted international relations
- Etc.

Negatively

- Over grazing
- Bush burning
- Insecurity- cattle rustling
- Famine
- School drop outs
- Land conflicts.
- Etc.

9:06 Problems affecting livestock farming in Uganda

1. Unfavourable climatic conditions associated with lower and unreliable rainfall which causes scarcity of surface water resulting into shortage of water for the animals and farmers at different water points. This leads to low animal yields like milk, poor quality beef from the livestock. This is evident at Moroto, Nakasongola etc.
2. Shortage of pastures normally caused by prolonged droughts and over grazing, this forces farmers to move with their animals to trek for long distances in search for water which affects the health and productivity of the livestock e.g. at Buliisa and Nakapiripiriti districts.

3. Poor methods of animal keeping e.g. overstocking of animals which causes overgrazing thus shortage of pastures, bush burning is also common especially with nomadic pastoralism which results into soil erosion affecting the growth of pastures e.g. Lyantonde and Moroto districts.
4. Poor quality breeds of animals kept. The animal breeds kept by most farmers take long to mature and also have a low productivity capacity like milk, beef and many others and as a result they are not economically viable to be reared e.g. the Zebu cow in Moroto, the Ankole long horned cow in Mbarara.
5. Presence of animal pests and diseases that affect all kinds of animals in the country e.g. swine fever disease in pigs in Masaka, the foot and mouth disease that affects the cattle in Nakasongola, The tsetse flies that spread Nagana in animals in the areas of Kiruhuru. These affect the health of animals thus affecting productivity and in many cases cause death of animals.
6. Inaccessibility to veterinary services and this is due to the fact that many animal farms are located in remote areas with poor roads to allow veterinary doctors to visit the farms for advice and treating the animals. This has affected the health and productivity of the animals. E.g. nomadic pastoralism in Abim and Kaabong districts.
7. Cattle rustling which is common with nomadic pastoralism, This is as a result of tribal raids especially among the nomads who occasionally raid their neighbours' animals which sometimes lead to loss of lives and general insecurity in those areas e.g. Turkana from Kenya raid Karamojongs in the districts of Kotido and Kaabong.
8. There is a problem of conservatism and rigidity especially among the nomads who are not willing to abandon their traditional subsistence methods of looking after animals to more modern productive methods so as to improve on animal productivity e.g. in areas of Moroto and Kotido districts.
9. Limited government support in form of extending veterinary services to farmers, funding of the livestock sector, research in livestock farming extension of transport and communication networks in areas that predominantly practice livestock farming. This has resulted into farmers resorting to traditional methods that are not very productive e.g. cattle keeping in Nakasongola and Buliisa districts.
10. Shortage of capital to invest in livestock farming, the majority of livestock farmers cannot afford to buy the necessary input like buying improved breeds of animals, pay for veterinary services, buy chemicals for spraying against pests etc. This therefore forces farmers to stick to traditional ways of rearing animals that are not productive e.g. piggery in Masaka and Jinja, Ranching in Mubende.
11. Less developed transport and communication networks characterised by poor roads with potholes especially in the rural areas where livestock farming is common, This has limited transportation of animal products like milk, eggs to market centres leading to losses to farmers e.g. poultry farming in Lira and Gulu.
12. The land tenure systems like the communal ownership of land in areas common with nomadic pastoralism that encourages communal grazing results to easy spread of

diseases and overgrazing all these affect the health and productivity of animals e.g. Nakapiripiriti.

13. Shortage of market for the animal products like milk, eggs, beef, hides etc. This is because many people cannot afford due to poverty and also due to inaccessibility to market due to poor transport networks consequently farmers make losses e.g. dairy farming in Kabaale and Bushenyi districts.
14. The nature of relief, Some areas are mountainous with steep slopes which makes the movement of animals quite difficult and also such steep slopes discourage growth of pastures therefore there is very limited livestock like cattle farming in such areas e.g. Sironko and Bududa areas around mtn Elgon, Bundibugyo around mtn Rwenzori.
15. Corruption through embezzlement of funds directed to the development of livestock farming. This is seen through the government programs and institutions like NAADS where the officers swindle the funds meant to buy better breeds of animals, and for advisory purposes E.g. Poultry farming in Tororo, cattle keeping in Luwero etc.
16. Shortage of land for grazing especially in areas that are densely populated, In such areas land is usually used for other activities like settlement, industrialisation crop growing to support the big population consequently it has discouraged ranching that require large land e.g. in Wakiso, Iganga districts.
17. Less developed technology that results into the use of poor methods/technology of livestock farming that are not very efficient e.g. lack of milking machines, lack of cooling plants to store the animal products like milk and beef, processing factories have also not developed due to poor technology in the country.

Measures taken to improve on livestock farming in Uganda

1. Construction of valley dams and underground tanks to work as water reservoirs for the surplus water during the rainy season so that it can be used during the dry season when the water for the animals is scarce. There is also sinking of boreholes to provide permanent sources of water for both the farmers and animals e.g. in Nakasongola, Kitgum etc.
2. Establishment of processing plants for the animal products so as to preserve and improve on the quality of products for increases returns but also to provide market for the products e.g. GBK milk processing factory in Mbarara, Jesa dairies in Wakiso.
3. Improvement in transport and communication networks ensure easy transportation animal products to markets and also farm inputs and services to the areas where livestock farming is commonly practiced e.g. Mbarara-Masaka-Kampala road, Nakasongola- Luwero-Kampala road etc.
4. Diversification of livestock farming where by different types of animals are reared e.g. pigs, goats, rabbits etc. This is done to reduce on overdependence on cattle keeping that may be prone to problems like disease outbreaks resulting into losses e.g. Arua, Gulu districts.

5. Research and development of scientific methods of livestock farming e.g. artificial insemination and cross-breeding are encouraged to improve on the quality of animals that are more productive and therefore profitable but also resistant to diseases and harsh climatic conditions. This is done with cattle, piggery in Mbarara and Gulu respectively.
6. Importation of improved animal breeds in order to cross breed with the local breeds, This is done to improve on the quality and productivity of the animals e.g. Frisian, jersey cows from Netherlands, Goats from South Africa this is seen in areas of Mbarara, Bushenyi.
7. Extension of credit facilities to livestock farmer through micro finance institutions and banks, This is done to provide farmers with funds to invest and improve on the livestock sector e.g. Bank of Uganda has a special loan offer to large-scale farmers, Centenary bank also has a special agricultural loan to farmers and livestock farmers in Mbarara, Mpigi have utilised these facilities.
8. Promotion of more efficient methods of keeping animals especially cattle like zero grazing, and rotational grazing to ovoid things like overgrazing and easy spread of diseases caused by other methods like communal grazing e.g. in Mukono, Kabale etc.
9. Control of pests and diseases, This is done through vaccination of animals lie pigs, cattle, poultry against various diseases like rinderpest, foot and mouth disease, and also spraying against pests like tsetse flies, ticks etc. This in turn has improved the health and productivity of the livestock e.g. Nakasongola, Lyantonde etc.
10. The government has enforced the disarmament of the pastoral communities in a bid to control insecurity caused by cattle rustling among the nomads and as a result there has been reduced cases of cattle rustling. This is evident in Kotido, Nakapiripiriti.
11. The government has also has improved on security in areas that had general insecurity problems caused by political upheaval. This has been done by UPDF, Police and other security agencies and as a result there has been restored peace thus promoting livestock farming e.g. Kasese and Bundibugyo areas were being disturbed by ADF rebels, Gulu, Lira , Kitgum were destabilised by LRA rebels for over 20 yrs.
12. Introduction of improved and exotic pastures, these grow very fast and are very nutritious, thus improving the quality and productivity of animals. E.g. Napier grass, alfa-alfa grass, elephant grass etc. This is common with ranching in Masindi, Mbarara etc.
13. Mixed farming is emphasized where farmers keep animals at the same time growing crops. This helps in such a way that crop residues e.g. maize are used as animal feeds but also the animal residues are used as organic fertilizers for the crops and in this way they solving the problem of shortage of pastures e g. In Mbale, Mukono, Mbarara.
14. Sensitization of the masses on the modern methods of livestock farming that are more efficient. This is done by NAADS and programs like plan for modernisation of agriculture through seminars and workshops, the media like radios and newspapers plus exhibitions like the annual agricultural show in Jinja. This has helped cattle farmers in Jinja, poultry farmers in Wakiso etc.

15. By encouraging private investors to invest in the sector since they come with sufficient funds, skilled man power e.g. Uga-chick poultry farming in Gayaza by ssekalaala, Kisozi cattle ranch in Mpigi by H.E Museveni, Jesa dairy farm in Wakiso by Mulwana family.
16. Formation of livestock farmers cooperative unions to enable farmers to get loans at low rates and other farm inputs at subsidized prices like milk cooling plants but also help in the marketing of their animal products like milk, eggs and meat e.g. Uganda national local chicken farmers association. This has encouraged poultry farmers in Masaka, Mityana etc.
17. Widening of both local and international markets for the livestock products by both the government and private individual farmers and traders, this has been done through organising agricultural exhibition for the local market but also through export e.g. eggs are exported to South Sudan and Kenya, milk is exported to Tanzania and DRC. This has encouraged poultry farmers in Gulu, Arua and cattle keepers in Mbarara, Bushenyi etc.

9:07 CROP HUSBANDRY (ARABLE FARMING)

This is the growing of crops. Arable farming involves the growing of both food crops and cash crops and in Uganda some the major traditional food crops grown include maize, bananas, cassava, sweet potatoes, beans, Millet, grounds nuts, Irish potatoes, soya beans, fruits like oranges, pineapples, pawpaw, vegetables like cabbage, tomatoes etc. however there has also been introduction of new food crops like apples, grapes etc.

Most of these crops are grown on a subsistence level for home consumption but many have been commercialised and are being grown for sale e.g. maize, beans, tomatoes, onions, bananas and



Family members attending to a garden (subsistence farming)

SUBSISTENCE CROP GROWING

This is the growing of crops mainly for home consumption and very little is sold. In Uganda it is basically carried out in the rural areas by the peasant farmers.

Characteristics of subsistence farming

- Farms are usually small less than 5 hectares.
- Simple tools are used for cultivation e.g. hand hoes, machetes etc.
- Usually farms are made of several scattered plots of land which may be quite distant.
- Unskilled labour is used mainly comprised of family members i.e. children, husband and wives.
- Mixed farming is also carried where crops are grown with a few animals.
- Inter cropping is also common due to scarcity of land.
- Annual crops are mainly grown to provide food for the family.
- Some cash crops may be grown on a very small scale to provide some income in the home.
- Fallowing of land is normally practiced to as a way of maintaining soil fertility.

9:08 COMMERCIAL CROP FARMING

This involves growing of crops mainly for commercial purposes. This is divided into two which include;

- ❖ Intensive commercial crop farming
- ❖ Extensive commercial crop farming

INTENSIVE COMMERCIAL CROP FARMING

This is a type of farming where high amounts of capital and skilled labour are used to increase yields that can be obtained per unit area of land. This system aims more on getting the most output per unit area by using high input strategies like irrigation, high use of fertilizers, herbicides and pesticides plus use of improved seed varieties. This system in Uganda is seen with floriculture around Entebbe, fruit and vegetable growing in areas of Kabale, green house farming around major urban centres e.g. Kampala etc.



EXTENSIVE COMMERCIAL CROP FARMING (PLANTATION FARMING)

This is an agricultural production system that involves use of small inputs of labour, fertilizers and capital, relative to the land area being farmed. It is commonly referred to as largescale crop growing where farmers normally specialise in growing a single crop for commercial purposes.

In Uganda extensive commercial crop farming is normally done under plantation farming which involves the growing of a single perennial crop on a largescale for commercial purposes. Crops grown in Uganda under plantation farming include;

1. **Tea**; grown in districts of Mityana, Mukono, mubende, Bushenyi, Kyenjojo, Kabarole, Buikwe, Kabale etc.
2. **Sugarcane**; grown in the districts of Jinja (kakira sugarcane estates), Buikwe (Lugazi sugar estates), Masindi (kinyara sugarcane estates), Rakai (Sango-bay), Kamuli, Mayuge, Atiak near Gulu etc.
3. **Bananas**; in areas of Masaka, Mbale, Sironko, Mbarara, Isingiro, Bushenyi etc.
4. **Oil palm tree plantations** mainly in Kalangala district.

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5. **Coffee;** in areas of Masaka, Mityana, mubende (kaweri coffee plantations), Mbale, Sironko etc.

Characteristics of plantation farming in Uganda

- The farms are usually large extending to hundreds and thousands of hectares.
- A single crop is usually grown on the farm.
- The crop is entirely produced for sale.
- It employs a big number of labourers both skilled and unskilled.
- Large capital is invested to buy machinery, land, pay labour and other operations.
- Modern methods are used on the farm e.g. use of machines, fertilizers etc.
- Social facilities like health centres, accommodation houses, and schools are provided on the farm.



Tea plantation

Contributions of plantation farming to economic development of Uganda

Positive contributions

1. Plantation farming has provided employment opportunities, many Ugandans are employed on these both skilled and unskilled working as engineers, managers, agriculturalists, drivers, and estates attendants etc. these earn income therefore improvement on their standards of living. This is evident at Lugazi sugar estates in Buikwe, kasaku tea estates in Mukono etc.

2. It has promoted industrialisation through provision of raw materials to various manufacturing industries that produce consumable goods e.g. kakira sugar processing factory that gets sugarcanes from kakira sugar estates and the surrounding areas in Jinja, oil palm plantations in Kalangala provide raw materials to BIDCO industries that produces cooking oil and other products etc.
3. It has promoted out growers through encouraging farmers in the locality to grow the same type of crop and also providing them with seedlings, fertilizers also buying their produce. This has helped farmers to earn income that has improved their standards of living e.g. around kinyara sugar estates in Masindi, Mayuge sugar estates etc.
4. Plantation farming improves on social services in areas where they are found since they normally establish these facilities to cater for their workers but the people in the surrounding communities also benefit from the same e.g. Lugazi secondary and primary schools at Lugazi sugar cane estates in Buikwe, kasaku health centre at kasaku tea estates in mukono etc.
5. Source of government local revenue through direct taxation of the estates and its employees e.g. ground rent tax, income tax like per as you earn from the workers plus local government taxi. This tax has been used to fund other sectors of the economy like health sector, education sector etc. this is evident at kaweri coffee estates in mubende, Kamuli sugar works in Kamuli etc.
6. It is a source of foreign exchange to the government, the crops grown in this system are usually processed and exported thus bringing foreign exchange e.g. tea from Kabarole, Bushenyi is exported to India and UAE, the sugar from kakira sugar estates is exported to South Sudan, DRC. The foreign exchange is used to develop other sectors in the economy e.g. health, education etc.
7. It has encouraged improvement of transport infrastructure and services this is because where it is practiced government will try to improve accessibility through opening and rehabilitation of road to promote the activity but also the estates normally establish their own transport networks for easy transportation of the crop from the gardens to the processing plants and markets and also easy mobility of labour. E.g. Lugazi sugar estates manages Lugazi- kawolo road, kakira sugar estates has an airfield etc.
8. It has encouraged development of a monetary economy since the produce is basically for commercial purposes thus reducing on subsistence farming which is vital for economic development e.g. coffee farming in Mbale, Masaka, oil palm tree plantation in Kalangala district.
9. Plantation farming has ensured efficient utilisation of land resource, this is because the land that would be idle has been used to grow productive crops in this system e.g. sugar cane growing at Sango bay in Rakai, tea growing on the slopes of Kabarole and Kyenjojo etc.
10. Plantation farming has promoted skills development of labour, many workers on these farms acquire various skills on job as technicians, managers, and agronomists etc. these skills have promoted further development of other farming practices but also other

sectors like transport contributing to economic development. This is evident at kakira sugar works in Jinja, kaliro sugar estates in kaliro district.

11. It has promoted research and tourism, many people especially students in higher institutions of learning and secondary schools visit these plantation farms for study tours, this has widened their scope of knowledge and on the other hand these farms also engage in research and innovation which has enhanced further development of the agriculture sector e.g. at kasaku tea estates in mukono, Lugazi sugar estates in Buikwe district.
12. It has promoted urbanisation, this is as a result of many people who are attracted to the plantation for job opportunities and this in turn attracts other activities like trade and improvement of social services which results in an urban centre e.g. Lugazi town near Lugazi sugarcane estates etc.
13. It has promoted economic diversification which has helped reduce on overdependence on a few sectors like fishing, mining, tourism thus generating more revenue to the economy and jobs to many people that have improved on their standards of living this is evident in Bushenyi and Kanungu where there is tea growing.
14. Promotion of international relations between Uganda and other countries that import Ugandan produce of plantation farming, e.g. tea from Kabale which is exported to china, sugar from Jinja which is exported to South Sudan etc. and in turn this has promoted both direct and indirect investments from such countries to Uganda but also promoted international peace.
15. *Negatively*
16. This type of farming is associated with monoculture which results into soil degradation in terms of soil loosing fertility this in turn has limited agricultural productivity in areas where it has been practiced e.g. sugar cane growing in Jinja, Masindi, coffee growing in Mityana etc.
17. It encourages rural urban migrations where many people move from rural to urban centres near these plantation farms in search for jobs on these estates thus resulting into social issues like family neglect but also neglect of other activities like food crop production e.g. people migrate from rural districts of lira, Kitgum to go and work in kinyara sugarcane estates.
18. Profit repatriation, most plantation farms are owned by foreigner investors therefore a lot of profits that are made from these farms are sent back to their home countries. These profits would be re-invested in the country for further development e.g. kakira sugarcane estates in Jinja are owned by an Asian madhivan family, BIDCO which is owned by Asian owns oil palm tree plantation in Kalangala.
19. It has encouraged urbanisation which has come with its related problems that come with big populations concentrations like high crime rates e.g. robbery, development of slums associated with poor sanitation and easy spread of diseases. This is evident in urban centres like Lugazi near Lugazi sugarcane plantations.

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20. It has led to encroachment of marginal lands like wetlands, forests etc. these are cleared to pave way for the establishment of the extensive plantation farms which has contributed to environmental degradation e.g. Kalangala forests were cleared to plant oil palm tree plantations in Kalangala, butamira forests were cleared to extend kakira sugarcane estates in Jinja, part of Mabira forests were cleared to plant part of Lugazi sugarcane estates in Buikwe.
 21. Some farms have been used to hide wrong doers causing insecurity in the surrounding areas for example Lugazi sugarcane plantations along Kampala- Jinja road has been used as a hiding place for highway robbers.
 22. Large-scale losses are incurred in case of calamities like pests and diseases, outbreak of fire, hail stones etc. this is because the plantations cover a large area which is concentrated in the same place e.g. the rampant fire outbreaks at Lugazi sugarcane estates in Buikwe and kakira sugarcane estates in Jinja that destroy hundreds of hectares covered with sugarcanes.

Reference questions

Describe the factors that have favoured plantation agriculture in Uganda.

Consider the following factors

- Climate
- Soils
- Drainage
- Vegetation
- Relief
- Land
- Capital
- Labour
- Market
- Research
- Technology
- Political atmosphere
- Transport
- Government policy
- Pests and diseases
- Power

9:09 COFFEE PRODUCTION IN UGANDA

Coffee is one of the traditional cash crops grown in Uganda. It is mostly grown under intensive banana-coffee system in the districts of; Mpigi, Masaka, Mityana, mubende, Jinja, mukono, Mbarara.



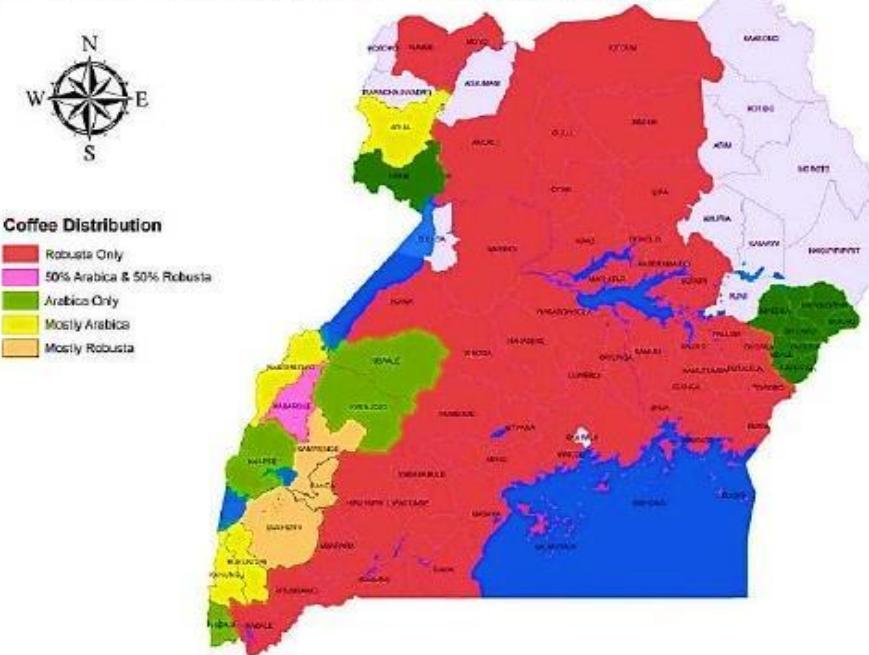
Coffee plant

There are two major varieties of coffee grown in Uganda and these include; **Robusta coffee** majorly grown in the mid- latitude areas of Masaka, mukono, Mityana, mubende, etc. and **Arabica coffee** which is majorly grown around highland areas in the districts of Mbale, Bududa, Sironko, Kabarole, Bundibugyo, Kasese, Kabale, Kisoro but also around Nebbi and Zombo etc. however due to innovation and research there was **Clonal Robusta coffee** which is a high yielding variety mostly grown in areas where Robusta coffee thrives.

Coffee is the major cash crop grown and exported in Uganda making it the major agricultural foreign exchange earner (16% of total exports) of the country. it is mainly produced by small holder's farmers with very few largescale farmers.

The Uganda Coffee Map

There are two coffee supply chains – Robusta and Arabica:



Importance of coffee production in Uganda

Positively

1. It provides employment opportunities to many Ugandans who work in form of coffee farmers, buyers, transporters and processors. Such people rely on coffee production as their source of income thus improvement in their standards of living e.g. in Masaka, Mityana and Mbale districts.
2. It is a major source of domestic revenue through taxation of companies involved in the buying, transportation and processing of coffee e.g. operational licenses, income tax, export duties etc. from companies like nsanba coffee factory, great lakes coffee factory in Kampala, kabalungi coffee factory in Mityana etc. This revenue is used to develop other sectors of the economy like constructing roads, Schools etc.
3. It is a major source of foreign exchange to the country through coffee exports to countries like china, japan, USA etc. this foreign exchange is used in international trade which is important for development of other sectors like buying machinery and drugs in the health sector etc. e.g. coffee is exported from Mbale, mubende etc.

4. Coffee production has promoted industrialisation in the country where by many coffee processing factories have been established e.g. kaweri coffee processing plant in mubende, Bugishu coffee co-operative processing factory in Mbale etc. this has helped to widen the taxi base and employment opportunities in the country.
5. It has encouraged improvement on the transport sector in terms of road construction and rehabilitation, this is done to ease transportation of coffee produce to market centres however these roads are used for other purposes in such communities e.g. Sironko-Mbale road, Mbarara- Masaka-Kampala road etc.
6. Coffee production has encouraged diversification of the economy and this has helped to reduce on over dependence on a few sectors like fishing, mining and services for country's employment, taxes, foreign exchange etc. this is evident in mukono, Masaka, Bushenyi where many farmers are engaged in coffee farming.
7. It has encouraged research especially in the agricultural sector and through that there was development of a new improved and fast growing variety of clonal Robusta coffee which has further boosted agricultural productivity in the country. This new variety is grown in mubende, Luwero, Mpigi etc.
8. It has promoted international relations between Uganda and the countries importing Uganda's coffee like china, USA, Britain etc. I turn this has promoted international peace but also it has promoted both direct and indirect investments in the country.
9. The incomes derived from coffee production by people who have invested in in the sector are not only re-invested in info agriculture but also in other sectors e.g. people have sold coffee and started trading, have built hotels, have built schools thus promoting economic growth and development e.g. in Mbale, Masaka and Mityana etc.
10. Coffee production has promoted development of skills, many people are involved in coffee farming, processing have improved on their skills in various activities and these have also been extended to other subsectors within agriculture but also others like transport etc. this evident in Sironko, Mbale mubende where coffee farming is common.
11. Coffee growing has ensured efficient utilisation of resources especially land, land which would be idle has been used to grow coffee e.g. at kaweri coffee plantation in mubende, in Bundibugyo, Mityana etc.
12. Coffee husks are used as a source of fuel both for domestic and industrial purposes e.g. clay factories like Kajjansi clays factory in Kajjansi town council use it to burn the clay tiles and bricks, it also used for tobacco curing in Nebbi and Arua. These husks are got from coffee factories like kabalungi coffee factory in Mityana, great lakes coffee factory in Kampala etc.
13. Coffee production has also promoted other subsectors; coffee husks are in as litter in poultry farming but also as mulch in crop growing like banana plantation thus promoting those sectors that have also contributed to economic development of the country. This is seen in mukono, Kayunga, Masaka etc.

Negatively

14. Coffee growing as a cash crop and major source of income to the farmers especially in areas where coffee growing is predominantly practiced, it has resulted into neglect of farming other food crops such as maize, cassava, bananas etc thus resulting into food shortages and consequently famine e.g. in Mbale, Mukono, Mbarara etc.
15. Most coffee plantations are grown on large pieces of land under monoculture which results into soil exhaustion. This in turn has affected agricultural productivity leaving soils barren not suitable for growth of other crops. This is evident in Mbale, Jinja, Mukono etc.
16. Coffee growing has led to the problem of labour shortage especially in other sectors like fishing, mining, and forestry in areas where coffee farming is common thus resulting into under development of such factors e.g. Kayunga, Sironko, Mityana etc.
17. It has contributed to environmental degradation through clearing forests to establish plantations and also through emission of toxic gasses into the atmosphere resulting into global warming and related problems examples of such places include Masaka, Kayunga districts etc.

Problems affecting coffee production

1. Pests and diseases that affect the quality and quantity of coffee yield, also may lead to even destruction of the crops themselves. Some of the diseases may include coffee rust, coffee berry disease etc. this is common in Kyenjojo, Luwero, Mbale etc.
2. Harsh climatic conditions like prolonged droughts, hail stones etc. that destroy large coffee plantations reduce on the quality and quantity of coffee produced that result into losses to farmers seen in Nebbi, Mubende, Masaka etc.
3. Soil exhaustion due to monoculture that commonly used with coffee growing, this results into loss of soil productivity that reduces on the quantity and quality of coffee produced e.g. in Jinja, Mbarara, Mukono etc.
4. Shortage of productive land to establish coffee plantations, this is due to increased population putting pressure on available land for other activities like settlement, growing of food crops, industrial development etc. it is seen in Masaka, Sironko, Mbale, Jinja etc.
5. Shortage of adequate capital to invest in the establishment of coffee plantations like buying land, seedlings, paying labour, etc. this has made many farmers to remain small holders which limit coffee productivity and this is evident in districts like Kabarole, Bundibugyo, Mukono etc.
6. Poor state of transport and communication networks especially the feeder roads in the rural areas of the country including where coffee is being produced. This limits easy transportation of coffee to market centres and also movement of farmers to their plantations. This is evident in Sironko, Manafwa, and Bundibugyo etc.
7. Shortage of coffee processing factories to add value on coffee so it may fetch higher profits to coffee farmers, this has left coffee to be exported in raw form resulting into

thus low profits which has discouraged many farmers in the different parts of the country e.g. in Luwero, mukono etc.

8. Shortage of skilled labour force, there inadequate skilled agriculturalists to guide and advice coffee farmers on the best methods of coffee growing this in turn has limited the potential of coffee production in various areas e.g. Nebbi, mubende, mukono etc.
9. Price fluctuations especially on the world market, Uganda's coffee competes for market with that from brazil, Ethiopia, Vietnam etc. this sometimes results in low incomes when the prices go low which directly affects farmers thus discouraging them even to produce more, for example in the districts of Kyenjojo, Jinja, Kabarole etc.
10. The low technological advancement has limited coffee production in such a way that it has limited value addition in terms of processing and packaging of the coffee for international market so that it brings more profits due to lack of the necessary technology. The coffee produced from Mbale, Masaka is sold in raw form.
11. Coffee theft and smuggling, many coffee farmers are facing a problem of coffee theft especially when coffee is still in gardens but also sometime coffee is smuggled to our neighbouring countries resulting into loss of revenue in form of export duty which would be re invested in the sector for further development. This is common in the districts of Kisoro, Kabale, and Mbale etc.
12. Unfavourable government policies towards coffee production, this is exhibited in the inadequacy of addressing problems affecting coffee farmers e.g. poor funding, limited marketing, research etc. this has rendered farmers to resort to small scale production for example in kalungu, Kanungu, Manafwa etc.

The Ugandan Smallholder Coffee Farmer

Characteristics

Why low income



13. Low domestic demand for coffee as a beverage in the country, this is because many Ugandans cannot afford but also there are many substitute beverages that are even more affordable e.g. tea, soya cup etc. this is seen in Mukono, Kabarole etc.
14. Shortage of improved storage facilities, many farmers lack better storage stores to keep their coffee after harvesting, this has resulted in high post-harvest losses and also poor quality coffee which has contributed to lots of losses to farmers e.g. in Kayunga, Sironko, Mityana etc.
15. Insecurity in some areas where coffee is grown, some areas were insecure for a long period of time due to rebel insurgencies that disrupted agricultural activities including coffee farming greatly limited coffee production e.g. Bundibugyo, Kasese that were disrupted by ADF rebels.

Measures taken to improve on coffee production

1. The government through institutions like NAADS is encouraging agricultural modernisation by supporting coffee farmers through giving advice to farmers, giving improved seedlings, fertilizers so as farmers improve on their productivity. This is seen in the districts of Kabarole, Kasese etc.
2. There has been liberalisation of coffee sales and buying which has enabled farmers to look for their own markets even outside the country thus eliminating the exploitative coffee marketing boards. This has helped farmers to get markets with better prices thus making more profits. This is seen in Mbale, Sironko etc.
3. Farmers have been encouraged to use better farming techniques like use of organic fertilisers, mulching, irrigation etc. to improve on their productivity. This has been done by agencies like Uganda coffee development authority evident in Mityana, Mukono etc.
4. Strengthening of coffee research at stations like Kawanda research station in Wakiso district in order to avail farmers with better information about better coffee production but also come up with better coffee varieties that are resistant to diseases and droughts e.g. Clonal Robusta coffee grown in Kayunga, Mukono etc.
5. The Uganda coffee development authority through market research has opened up new coffee shops to market Uganda's coffee globally e.g. in the UAE, Germany, China etc. this in turn has created demand for coffee from Uganda in the districts of Masaka, Mubende etc.
6. The Uganda coffee development authority is encouraging organic Robusta coffee growing, this type of coffee is particularly in high demand in countries like USA and its prices are usually higher than the other types this is done in Mubende, Mityana etc.
7. Large-scale production of coffee is also being encouraged because this reduces the cost of production and also large quantities attract relatively high prices of coffee thus making more profits on the side of the farmers e.g. Kaweri coffee plantation in Mubende.

8. Sensitization and education of farmers is also being done by government through the use of agricultural extension officers that are based on every sub-county throughout the country. They are taught on the modern methods of farming, harvesting and storing of coffee to meet the international standards. This is evident in Luwero, Jinja, and Masaka etc.
9. Government is encouraging individual investors with large capital to invest in coffee growing, processing and exportation of coffee in order to put in more capital for effective coffee production in the country e.g. Kaweri coffee plantation is fully owned by a private investor.
10. Improving on security to curb the rampant stealing of coffee especially when still on gardens and also smuggling, this has been done by security agencies like police, local defence units etc. in the different areas like Mukono, Bushenyi etc.
11. Government is improving on transport and communication networks, especially the feeder roads to ease the transportation of coffee to coffee stores, and processing plants, for example Masaka-Kyotera road, Sironko-Mbale road etc.
12. Disease control measures have been emphasized for example spraying against diseases and pests but also farmers are advised to destroy the infested coffee plantations and plant the improved varieties that are more resistant and high yielding. This is evident in Kyenjojo, Bundibugyo, and Zombo etc.
13. Training of labour has been done through high institutions of learning like Makerere University with a full faculty of agriculture where agronomists and other agriculturalists are trained in other colleges like Bukalasa Agricultural College in Luwero. These have helped to guide coffee farmers improve on their productivity e.g. in Luwero, Mbarara, Kabarole etc.

Assignment

1. Assess the contributions of coffee growing to the economic development of Uganda
2. Explain the problems affecting coffee growing in Uganda
3. What are the steps being taken to improve coffee growing in Uganda?

Note: Carry out a research study about cotton growing in Uganda.

9:10 The general contributions of the agricultural sector to the economic development of Uganda

Positively

1. Source of food, most of the foodstuffs needed in the country are produced here locally through agriculture thus sustaining the whole population of the country. E.g. bananas

from Mbarara, Bushenyi, Mbale etc. maize from Iganga Mityana etc. millet from lira, Gulu etc. milk and meat from Mbarara etc.

2. Provision of employment opportunities, the agricultural sector employs about 75% of Ugandans. Making it the biggest employment sector in the country, people work as farmers, transporters, processors and some as agricultural officers, all these income which has improved their standards of living, e.g. banana farmers in Masaka and Mbale, cattle keepers in Kiruhura etc.
3. It is a source of raw materials to agro-based industries which has promoted industrialisation in the country, most of the industries depend on agricultural raw materials e.g. GBK milk processing plant depends on milk from Mbarara, Rukungiri etc. juice factory depends on fruits in areas of Soroti, Kumi etc. textile industries depend on cotton from Apac, Jinja etc. sugar industries depend on sugarcanes from Jinja, Mayuge, Iganga etc.
4. Source of foreign exchange, the agricultural sector is one of the major foreign exchange earners through export of agricultural produce like coffee from Mityana, cotton from Kamuli, maize from Kasese, tea from Buikwe, flowers, fruits and vegetables. The foreign exchange earned has been used to develop other sectors in the economy e.g. importing medicines in the health sector, construction of roads etc.
5. Source of local government revenue, the government has imposed various taxes on companies and individuals engaged in agricultural related businesses e.g. VAT on the consumer goods like sugar, tea, soft drinks, margarine etc. produced from agricultural produce, operational licenses paid by companies involved in processing, transportation, and sale of agricultural produce e.g. kakira sugar corporation in Jinja, BIDCO in Jinja etc. income tax like PAYE paid by all workers in the agricultural sector. This income is used to develop other sectors like road construction, paying of salaries of civil servants, etc.
6. It has promoted development of the transport sector through encouraging the construction, rehabilitation and upgrade of communication network, especially roads in a bid to ease the transportation of the agricultural produce to market centres and also the inputs to farms e.g. transportation of coffee, bananas, milk, vegetables along Kabale-Mbarara-Masaka-Kampala road.
7. It has promoted technological advancement, this has been done in the process of trying to improve on the techniques of production, storage, transportation, value addition and processing. Through that many technologies have been invented and some imported e.g. processing milk into other products like yoghurt, cheese, done by fresh dairies and Jesa industries, use of irrigation machinery at mobuku irrigation scheme in Kasese, fertilizer manufacturing plant at Tororo etc. use of combined and planters at Doho rice scheme in Butalleja.
8. It ensured efficient utilisation of resource. A lot of fertile land has been put to arable farming e.g. alluvial fertile soils around the shores of lake Victoria which has promoted bananas, coffee, tea, maize, beans growing in the districts of mukono, Masaka, Jinja etc. the grasslands have been used for animal rearing e.g. in Nakasongola. Kiboga,

Ssembabule etc. phosphates are being used to make fertilizers in Tororo, wetlands in Butalleja and Bugiri are being used to produce rice etc.

9. It has encouraged urbanisation, agricultural activities like plantation farming, processing and sale attract people as they try to search for jobs around, this results in high concentrations of people in such places which change into urban centre i.e. townships e.g. Lugazi town developed partly due to existence of Lugazi sugarcane plantation, kinyara township due to kinyara sugar estates etc.
10. Diversification of the economy, the agricultural sector has diversified the economy of the country thus reducing dependency on a few sectors like fishing, tourism, mining etc. for taxes, Jobs, foreign exchange which has further promoted economic development e.g. many people are employed in coffee production in Mbale, Sironko, etc. plantation estates like Lugazi sugarcane estates, Kaweri coffee plantation are sources of local tax and foreign exchange etc.
11. Promotion of good international relations especially between Uganda and other countries the import Uganda's agricultural products like coffee, tea, hides and skins etc. but also those that export to Uganda agricultural inputs like fertilizers, seeds and machinery. This has promoted both regional and international peace which is vital for economic development of any country.
12. The sector has contributed to the development of social services especially in areas that have plantation estates, these normally provide social services like education, medical care, leisure, water to their workers by building those facilities however people in the surrounding communities also enjoy those services. This is evident around Kakira sugarcane estates in Jinja, Lugazi sugarcane estates in Lugazi etc.
13. The sector has promoted the development of power and energy sector, some agricultural by-products are used to produce power thus complementing the power needs of the country for example the residues of coffee like coffee tree stems, husks are used as a fuel for domestic and industrial purposes, animal dung of cows and pigs is being used as biogas to provide power for domestic and institutional purposes, this is common in Mbarara, Mukono etc. Kakira sugar works also produces electricity from sugarcane by-products in Jinja.

Negatively

14. It has promoted urbanisation which has come along with the negative effects for instance high crime rates in form of theft and robbery, drug abuse and trafficking, pick pocketing etc. congestion of people that come with poor sanitation, easy outbreak and spread of diseases, poor accommodation due to shortage of houses etc. This is evident in Lugazi town in Buikwe district.
15. Plantation agriculture encourages rural-urban migration where many people move from rural areas to towns near their plantation estates to look for jobs. This has resulted in neglect of economic activities in the areas where such people come from thus leaving them underdeveloped e.g. people migrate from Kayunga, Kamuli, Iganga rural areas to Kakira sugarcane estates in Jinja.

16. The sector has promoted profit repatriation; this is because many foreign investors are engaged in agricultural production, processing and sale of agricultural produce and inputs. These send back the profits to their home countries instead of re-investing into the country for further development examples are Lugazi sugar corporation, kakira sugar corporation, BIDCO are owned by Asians from India, kaweri coffee plantation in mubende is owned by a German, NSIMBE flower estates owned by the Dutch, TILDA rice scheme Bugiri owned by Asians etc.
17. The sector has contributed to environmental degradation especially through clearing vegetation to establish gardens but also through overgrazing, use of chemicals in form of herbicides, pesticides, inorganic fertilizers etc. these have degraded soils, air, vegetation and water resulting into issues like global warming and occurrence of catastrophes like floods, droughts etc. e.g. Doho swamps have been used to grow rice in Butalejja, forests in Kalangala where destroyed to plant oil palm trees etc.
18. Some agricultural activities have led to displacement of people; sometimes people are displaced to pave way for establishment of plantation farms, ranches and irrigation schemes. This causes inconveniences and sometime loss of property for such people e.g. many people were displaced in the process of establishing oil palm tree plantations in Kalangala.
19. It has promoted regional imbalance in terms of economic development, some areas that are more engaged in commercial agriculture e.g. tea, coffee growing in the districts of mukono, Masaka, Kabarole have developed more than those that are entirely under subsistence farming e.g. Kotido, Nakapiripiriti etc.
20. The agro-based industries that have been established due to agriculture have also contributed to pollution of air through emission of toxic gasses into the atmosphere water, through releasing affluent into water bodies like swamps, rivers and lakes e.g. nyanza textile in Jinja, Nkambi coffee factory in Mityana etc. this has exposed people to diseases in such areas.

Problems affecting the development of agricultural sector in Uganda

1. Unfavourable climatic conditions, agriculture in Uganda mostly depends on nature especially climate there any variations in terms of low and unreliable rainfall, excessive rainfall, prolonged droughts will automatically affect effective growth of crops and animals which will consequently limit productivity of crops and animals e.g. prolonged droughts have limited milk production in Nakasongola, Mbarara etc. unreliable rainfall received in parts of Kitgum, lira, Gulu has limited arable farming especially the growth of millet, maize, sorghum etc.
2. Unfavourable relief, steep slopes especially around mountainous areas limit arable farming because they experience severe soil erosion but also limit mechanisation e.g. on the steep slopes of Mtn Elgon in the districts of Manafwa, Bududa etc. on the other hand the low lands are associated with severe flooding which also limit crop growing and animal grazing e.g. in the districts of Pallisa, Soroti, Kumi etc.

3. Drainage, poorly drained areas like wetlands have poorly drained soils like clay and also associated with floods that can only favour limited crop growth like yams, sugarcanes, rice but it limits growth of perennial crops and use of mechanisation this is evident in Butalejja district, Bugiri district, Pallisa district etc.
4. Infertile soils, areas dominated by generally infertile soils have discouraged arable farming because most of the crops require highly fertile soils for their growth this is evident in the districts of Nakasongola, Moroto, Kotido etc.
5. Thick vegetation cover, areas that are covered by the tropical rainforests and savannah woodland forests limit agricultural activities because of the difficulty in clearing the vegetation. Example of such areas include the tropical rainforests like Kalangala forests in Kalangala, Mabira forests in mukono, Budongo forests etc.
6. Pests and diseases, crops and animals are affected by pests and diseases which affect the quality and quantity of the yield, sometimes they lead to death of crops and animals e.g. the swine fever which is deadly in pigs, common in Masaka, mukono etc. tsetse flies that transmit nagana in animals common in Moroto, Kotido, the coffee wilt disease that has affected coffee production in mubende, Masaka etc.
7. Tradition and customs, this has been a hindrance because some people attach cultural values to some agricultural practices thus making the very rigid to change to modern production techniques which has limited the quality and quantity of their produce e.g. the Karamojongs in Kotido, Moroto associate keeping the local zebu cattle as part of their custom and also keeping large herds of animals for prestige.
8. The land tenure system, in areas land ownership has affected agriculture negatively e.g. in the districts of Gulu, lira were land is majorly customary owned it has limited establishment of plantation farming, in the districts Moroto, Kotido where there is communal ownership of land it has contributed to nomadic pastoralism.
9. Inadequate capital, this makes it difficult for farmers to purchase the necessary inputs in terms of acquiring land, improved seed varieties and animal breeds, pesticides, fertilizers and machinery which has made farmers to remain at small holder production level thus limiting productivity e.g. small holder's coffee and banana farming in Mbale, Masaka etc.
10. Inadequate skilled man power, most of the people who are engaged in agricultural production are not skilled and many of them lack knowledge about modern techniques of production which has limited the quantity and quality of the agricultural produce, for example nomadic pastoralism in Moroto, Kotido districts.
11. Shortage of land to carry out agricultural activities like establishing large plantations, this due to the high population growth rates that has caused high demand for land for settlement, industrial development etc. it has also caused land fragmentation that results into soil exhaustion limiting agricultural productivity e.g. This has affected coffee growing Mbale, Jinja etc. it has limited livestock farming in Iganga district, Kamuli districts etc.

12. Corruption in form of embezzling funds earmarked for the development of the agricultural sector, this is common with the agencies, NAADS, ministry of agriculture, responsible for agricultural development. This has left the sector less developed depending on subsistence production e.g. maize, millet, cassava production in the districts of Gulu, lira, Arua etc.
13. The poor state of transport and communication networks, many of the transport networks especially the feeder roads in the rural areas are in a poor state some almost impassable during the rainy seasons, this has limited accessibility to market centres causing high post-harvest losses thus discouraging many farmers. This has affected vegetable growing in Kisoro and Kabale, milk production in Bushenyi etc.
14. Shortage of market for some agricultural produce especially during the bumper harvests this is partly because many Ugandans are poor therefore cannot afford to buy the produce but also due to poor transport networks which makes it difficult to access to the far markets resulting to losses especially for perishable produce like vegetables in Kisoro, milk from Nakasongola, fruits from Mbale etc.
15. Limited storage facilities, many farmers still use traditional ways of storing produce like granaries, tins, jerry cans, pots etc. to store maize, millet, ground nuts, cassava etc. these are not very effective and cannot store perishable produce for long, they therefore lead to high post-harvest losses to many farmers and this has affected milk production in Mbarara, Kiruhura, Ssembabule where many farmers lack milk freezers to store the milk.
16. Insecurity, some places have been insecure caused by political insurgencies like rebel activities which limited agricultural productivity in such places e.g. ADF rebel activities in Kasese, Bundibugyo affected coffee and banana growing, the LRA rebels in Gulu, lira, Kitgum also limited the arable farming for over 20 years until recently there has been relative peace.
17. Occurrence of natural calamities like floods in Kasese, Soroti, landslides in Bududa, Bundibugyo, hail stones etc. these destroy crops and animals thus negatively affecting agricultural productivity e.g. coffee and banana growing has been affected by landslides in Bududa and Bundibugyo.
18. Shortage of power supply, shortage of power supply especially hydroelectric power has limited establishment of processing and preservation plants to process and preserve agricultural produce especially in the rural areas e.g. grain millers, milk cooling plants, dryers etc. this has resulted into some agricultural produce going bad before reaching markets this has affected livestock farming in Mbarara, Buliisa, Moroto etc.
19. Competition for international markets, Uganda competes for market with other countries that produce similar agricultural produce e.g. coffee also produced by Brazil and Ethiopia, this results into price fluctuations which results into losses in case the prices are very low. This has affected coffee farming in Mbale, mubende, cotton growing in lira, Gulu etc.

20. Counterfeit agricultural inputs, farmers face a problem of very poor quality and fake inputs like seeds, herbicides, fertilizers, pesticides and other medicines sold on the market in the country. This sometimes results into death of animals and destruction of crop fields when such products are used leading to losses. This has affected maize growing in Kamuli, Iganga, vegetable growing in Kabale etc.

UNIT 10: AGRICULTURAL MODERNISATION IN UGANDA

10:00 Introduction

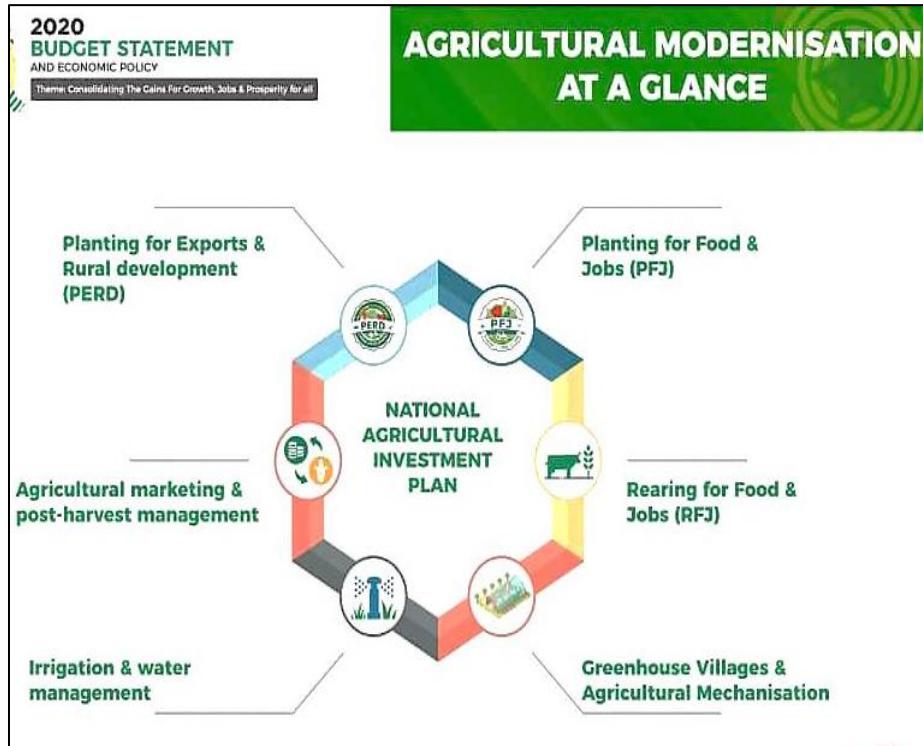
It refers to the use of more scientific methods of crop and animal husbandry in an attempt to increase production.

It can also refer to the transformation of the subsistence sector into an economically dynamic structure that responds to market demands and one that can provide a livelihood to feed the nation, generate surplus for foreign exchange.

Modern agricultural system is characterised by the following;

- A shift from subsistence to commercial agriculture that responds to market opportunities of demand.
- A shift from low to high value farming systems e.g. market gardening.
- A shift from low to high yielding technologies e.g. tractors
- Use of improved crop seed varieties and animal breeds which can ensure high output with minimal inputs.

- Sustainable utilisation of natural resources i.e meeting the current demands of people but at the same time preserving the same for future generations e.g. agro forestry.



In Uganda there have been efforts to modernise agriculture through improvement of quality and quantity of the agricultural produce and this is evident at the following areas;

- ✓ Sugarcane plantations at Kakira, Lugazi, Kinyara etc.
- ✓ Oil palm tree plantations at Kalangala.
- ✓ Rice irrigation schemes at Doho in Butalejja, Kibimba in Bugiri etc.
- ✓ Tea plantations at Kasaku, Lugazi, Mityana, Kabarole etc.
- ✓ Floriculture in Entebbe, Mpigi etc.
- ✓ Ranching schemes in Mbarara, Nakasongola, Arua etc.
- ✓ Coffee plantation in Mubende, Masaka, Mityana
- ✓ Demonstration farms and research stations at Kawanda, Namulonge etc.

*Irrigation farming***ASSIGNMENT**

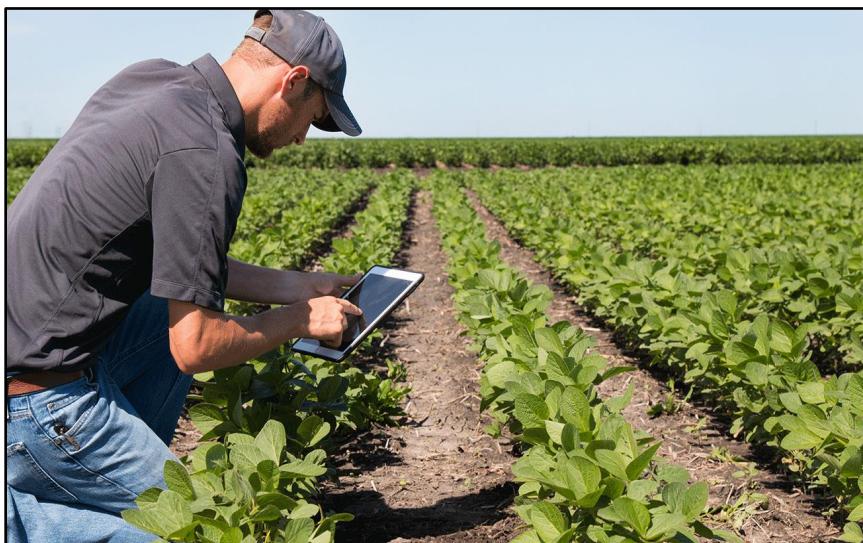
Draw a sketch map of Uganda showing areas where agricultural modernisation has been undertaken.

10:01 Measures that have been undertaken to modernise agriculture in Uganda.

1. Establishment of agro-based industries to add value on the agricultural produce so as to improve on the marketability even beyond Uganda for higher revenues e.g. GBK milk processing plant in Mbarara, fruit processing plant in Soroti, Maganjo grain mills in Kampala etc.
2. Provision of credit facilities to farmers, this has helped farmers to acquire improved agricultural inputs such as fertilizers, agricultural machinery, veterinary services etc. The credits have been extended to individual farmers and farmer groups through programmes like modernisation of agriculture through NAADS, Youth livelihood funds etc.
3. Empowering women by educating them about better methods of agricultural production, this is because women take up the biggest percentage of agricultural labour force so through there has been improvement in the quality and quantity of the agricultural outputs. This is seen in coffee growing in Masaka and mubende.
4. Encouragement of zonal production where several farming zones have been identified in order to help farmers engage in agricultural activities that do well in those particular areas where they have a comparative advantage e.g. citrus growing in the districts of Soroti, Kumi, coffee growing in the districts of Masaka, Mityana, dairy farming in Mbarara, Bushenyi etc.
5. Extensive awareness programmes have carried out to continuously advise farmers on new and modern agricultural practices and this has been spearheaded by government

institutions like NAADS, NARO but also through agricultural exhibitions like the Annual agricultural show in Jinja, pakasa exhibitions in Kampala etc.

6. Environmental conservation methods have been encouraged so as to ensure continuous productivity of land and reduce on environmental degradation through avoiding soil erosion by terracing and inter cropping, maintenance of soil fertility through use of manure etc. This is evident in coffee and banana growing in Mbale, Masaka etc.
7. Improvement in transport and communication networks to ease the transportation of the agricultural produce from producing areas to market centres and processing plants so as the produce will reach markets easily e.g. milk, meat, bananas from Mbarara, Masaka to Kampala to through Mbarara-Masaka-Kampala road.
8. Encouraging intensive farming practices like market gardening to target urban areas which requires small pieces of land using scientific methods so as to get high yields e.g. in Mukono, Kabale, Mbale etc.



Embracing technology in farming

9. Training of skilled labour is being done from various agricultural colleges and universities to provide agricultural technical services to farmers in the different areas e.g. extension workers at sub county levels in Mukono, Iganga, and Isingiro etc.
10. Diversification of crops grown is being done by introducing new crops besides the traditional ones e.g. introduction of wheat growing in Kapchorwa, Apple growing in Kabale, Vanilla growing in mukono etc.
11. Encouraging group farming i.e. co-operative unions, SACCOs which has helped farmers to market their produce and also get farm inputs on subsidized prices e.g. send a cow project in mukono, Bugisu co-operative union for coffee growing in Mbale.
12. Increased mechanisation of agriculture to improve on the quantity and quality of the agricultural produce e.g. use of ox-ploughs, tractors, in Moyo, Nebbi etc.



Mechanisation of farming

13. Introduction of irrigation farming to cater for farming even during prolonged droughts and in relatively dry areas and this is evident at mobuku irrigation scheme in Kasese.
14. Importation of improved seed varieties and animal breeds plus fertilizers is being done to increase agricultural productivity e.g. Boer goats from South Africa to areas of Kabale, mubende etc.



Use of improved seeds for high yields

15. There is improved research aimed at coming up with high yielding, disease resistant varieties of crops like clonal coffee, bananas , cassava and animal breeds like pigs, goats etc. this is done at kawanda research station, namulonge research station etc.
16. Disease control measures on farms are being done through regular spraying of crops and animals against pests that cause diseases, vaccination and deworming of animals all these are done to improve the quality and quantity of agricultural produce e.g. in Mbarara, Bushenyi etc.
17. Improving on security by deploying security personnel to encourage farming activities to take place especially in those areas that have been previously destabilized by rebels e.g. Kasese, Bundibugyo, and Gulu etc.
18. Use of both inorganic and organic (manure) fertilizers is being encouraged to improve on soil fertility for high productivity e.g. tea growing in Kabarole, Banana growing in Mbarara etc.
19. Establishment of better storage facilities e.g. cotton stores in Kamuli, milk cooling plants in Bushenyi, Tobacco stores in Arua, maize stores in Mityana etc. These have been established to reduce on the post-harvest losses that results into losses.
20. Encouraging population control measures e.g. use of family planning methods in the densely populated areas like Kabale, Mbale, and Iganga to reduce on pressure on land for settlement so as it is saved for large-scale farming.

10:02 Factors limiting agricultural modernisation in Uganda

Physical limitations

1. Unreliable rainfall received in some parts of the country. This has hindered the success of modernisation because it affects proper growth of crops this limiting the quality and quantity of agricultural produce e.g. in areas of Soroti and Kumi it affects citrus growing, Mityana and Mubende it affects maize growing etc.
2. The poor infertile soils in some Parts of the country yet effective agricultural practices require fertile soils to adequately support crop growth and pasture growth for the animals this therefore has limited the quantity and quality of agricultural produce e.g. cattle keeping in Buliisa and Kaabong, maize growing in Kamuli etc.
3. Some parts of the country are characterised with very steep slopes which discourages mechanisation thus limiting used of improved technology. This is evident especially in the mountainous areas like Bundibugyo and Kabarole districts limiting banana growing, Mbale and Sironko limiting coffee production etc.
4. Severe soil erosion in some parts of the country, this is common around mountainous areas that receive relatively high amounts of rainfall resulting in high run off that washes away top soils leading to soil exhaustion. This has limited vegetable and tea growing in Kabale and Kisoro.

5. High altitude areas experience very cool temperatures which cannot support crop growth thus limiting the average land available for agriculture. This is evident around the high mountains of Rwenzori in districts of Bundibugyo and Kasese limiting banana growing, around Mtn Elgon in districts of Bududa, Manafwa limiting coffee growing etc.
6. Low land areas that are associated with relatively high temperatures and low rainfall has also limited crop growing e.g. at the rift valley floor at Muhokya in Kasese has affected cotton and maize growing, in areas of Buliisa and ntoroko it has hindered pasture growth for livestock farming.
7. The poorly drained areas, some areas are poorly drained with very extensive swamps which limit the range of crops grown in those areas only allowing the water loving crops like yams, sugar can, rice etc. Such areas are also not suitable for livestock farming due to associated flooding e.g. In Pallisa, Kumi, Bugiri districts,
8. Pests and diseases that attack and destroy crops and animals have also limited modernisation of agriculture in various areas of the country. Pests like tsetse flies that cause nagana in animals around Kotido, Moroto, Nakasongola etc. Cassava mosaic disease has affected cassava growing in Gulu, lira etc.
9. Natural calamities have also occasionally affected agricultural modernisation in the various parts of the country e.g. landslides in areas of Bududa and floods in Kasese have limited coffee and banana growing in those areas, locusts invasion in districts of Amudat, Nakapiripiriti affecting cassava growing, prolonged droughts affecting livestock farming in Buliisa, Nakasongola districts.

Human limitations

10. Tradition and customs attached to farming practices in some communities have hindered adaption of some modern agricultural practices e.g. in the Teso community in areas of Soroti and Kumi farming is taken to be a job for women hence limiting labour force, the Karamojongs believe in rearing their traditional zebu cattle etc.
11. The unfavourable land tenure system in some parts of the country Some forms of land ownership like the communal ownership of land in the pastoral areas like in Kotido, Moroto makes it hard to control grazing for livestock farmers and also to establish gardens for crop growing like sorghum and cassava.
12. Limited capital to invest in modern machinery, improved seed varieties and animal breeds, paying labour force necessary for modern farming and as a result farmers have resorted to small farms with low productivity capacity e.g. coffee growing in Masaka and Mbale, sugar cane growing in Mayuge and Iganga districts etc.
13. Shortage of market for some agricultural produce, some prices of some agricultural produce are still low with high fluctuation rates which discourage farmers to grow the on a large-scale e.g. maize in areas of Kamuli and Iganga, Bananas in Bushenyi and Mbarara, cotton in Lira etc.
14. The poor transport and communication networks like roads, railways, and air transport have hindered the transportation of agricultural produce to market centres and

processing factories plus farm inputs to different farms. Some roads are almost impassable during the rainy seasons e.g. Bududa- Manafwa-Mbale road which has limited banana and coffee growing etc.

15. Shortage of storage facilities which has resulted into post-harvest losses especially during bumper harvests thus discouraging large-scale production and this has affected maize growing in Mityana, cassava growing in Gulu etc.
16. Insecurity in some parts of the country has also limited agricultural activities and therefore modernisation. Some areas have been unsafe due to rebel insurgencies which cannot allow people engage in productive agricultural activities e.g. ADF rebels in areas of Kasese and Bundibugyo affecting bean and passion fruit growing.
17. Corruption where resources like funds that are earmarked for agricultural development ends up being embezzled therefore not doing what is meant to do. This is common with government institutions and programmes engaged in the agricultural sector like NAADS, programme for modernisation of agriculture etc. affecting tobacco growing in Arua, dairy farming in Kiruhura etc.
18. Low technological advancement yet agricultural modernisation requires advanced technology like use of tractors, combined harvesters, planters, water pumps for irrigation etc. Most of these are imported which makes it quite expensive thus limiting sugar cane growing in Jinja, rice growing in Doho Butalejja district etc.
19. Shortage of skilled man power in form of agronomists, veterinary doctors, mechanical engineers help farmers with technical services on the different farms throughout the country. This has limited livestock farming in Nakasongola, Rakai etc. it has also affected citrus growing in Soroti and Kumi etc.
20. Limited research due to inadequate funds and limited scientists to carry out research, this in turn has affected innovation and improvement on the methods of farming, breeds of animals and varieties of crops leaving farmers to resort to traditional practices that are not efficient thus limiting coffee growing in Masaka, groundnuts growing in Soroti etc.
21. Inadequate government support in form of funding where by the agricultural sector still takes small share on the national budget less than 6%, failure to implement policies like easy access to loans and other farm inputs like fertilizers, pesticides to farmers throughout the country. This has limited modernisation of livestock farming in Nakasongola, Moroto, and cotton growing in Lira etc.
22. Population pressure caused by high population growth rates in many parts of the country that has caused high demand for land for settlement and other economic activities thus leaving limited available land for agricultural modernisation. This has affected plantation farming like tea growing in Kabale, sugarcane growing in Jinja, Kamuli etc.
23. High rates of rural-urban migrations where mainly the youths move to urban areas for economic and social reasons, this has left the rural areas with limited agricultural labour

to enhance agricultural modernization and this has affected maize production in rural areas of Mubende, Mityana, and tobacco growing in Arua etc.

Assignment

Describe the ways through which agriculture has been modernized in Uganda.

UNIT 12: TOURISM IN UGANDA

12:00 Introduction

It is the activity of people travelling to places outside their used environment for leisure, study purposes and sometimes business.

Status of tourism.

- The tourism industry or sector is one of the highest growing sectors in the country.
- It receives over 1.5 million tourists annually.
- It employs over 50,000 Ugandan shillings.
- The sector is the highest foreign exchange earner with about 23% of the foreign earnings.
- It contributes about 7.3% to the GDP.
- Uganda was ranked as the leading tourist destination the whole world in 2012, 2015, and 2017.
- Wild life is the leading tourist attraction in Uganda.
- The national parks have increased from 4 in 1980 to 10 today.

Tourist attraction in Uganda

1. Wild life

Many tourists come to Uganda to carryout activities like bird watching along kazinga channel, gorilla tracking especially in British and Mgahinga national parks. They also conduct game hunting. The wild life is concentrated in National parks e.g. queen Elizabeth N.P in Kasese, kidepo valley N.P with animals like hippopotamus, lions, hyenas, zebras etc. Some tourists come to carry out research on ecology i.e at UWEC in Entebbe, others enjoy the wild dishes e.g. crocodile meat, edible rats etc.

2. Historical sites
E.g kasubi tombs in Kampala, Nyero rock paintings in Kumi, other stone-age sites at Sango bay in Raai.
3. Cultural diversities from the different tribes e.g. local traditional dances e.g kadadi from Bugisu, kiganda dance from Baganda, kizino from Banyankole etc. dressing styles e.g Gomesi from Baganda, Mushanana from Bakiga.
4. The beautiful scenery or relief features characterized by volcanic mountains e.g Mt. Elgon, block mountains e.g Mt. Rwenzori, rift valleys with activities like climbing etc.
5. Drainage features characterized with fresh water lakes e.g Victoria, grabens e.g Albertine rivers e.g R.Nile.
6. The unique and beautiful climate characterized with warm sunny conditions especially warm sunny conditions throughout the year and this is because of the apparent movement of the sun and it is influenced by Uganda lying astride the equator and this encourages activities like filming, sun bathing.
7. The different vegetation type's e.g tropical rain forests e.g Budongo, Mabira, savannah, desert, and montane veg. All these attract the tourists.

12:01 Factors influencing the development of tourism industry in Uganda.

1. Unique climate characterized by the equatorial climate which is experienced around the Northern shores of L. Victoria, temperature climate around Mt. Rwenzori, semi-arid climate in areas of moroto, Kotido etc. Uganda also receives sunshine throughout the year because it lies astride the equator. All these attract tourists especially from the cold regions.
2. Availability of the different wild life for instance carnivorous animals like lions, hyenas, herbivorous animals e.g. giraffes, kobs, zebras, reptiles like crocodiles, snakes, birds like crested cranes, ostriches, aquatic life e.g Nile perch etc. All these attract tourists for activities like game hunting, gorilla tracking, and bird watching in the different national parks e.g Queen Elizabeth NP, Bwindi impenetrable N.P.
3. Presence of the different vegetation types i.e. the tropical rain forests e.g. Bugoma forest, Mabira forest in Mukono, the savannah grasslands in the western and Northern Uganda, montane vegetation e.g. around Mt. Elgon, Mbale etc. All these attract tourist for purposes of holiday camping, picnics, research adventure etc.

Other factors

- 4 Presence of historical sites e.g. the Old Stone Age sites at Sango bay in Rakai, nyero rock paintings in Kumi, kasubi tombs in Kampala. All these attract tourists for purposes of study, research, adventure and therefore have contributed to the development of the sector.

- 5 Presence of different cultures and traditions and this is due to the fact that Uganda has different tribes. The cultures are exhibited in the traditional dances like kizino, ekitagururo, kiganda dance, dressing styles like gomesi, mushanana etc.
- 6 Improved and rehabilitated transport and communication networks that connect to different tourist attractions to ease the movement of tourists to such places e.g. Kampala – Mityana – Fort portal roads leading to Queen Elizabeth NP, Mbarara – Kisoro road leading to Mt. Mufumbira etc., Entebbe international airport is also under going expansion to cater for the tourists entering the country and also air fields e.g Kasese air field.
- 7 Improved accommodation facilities especially near the tourist attractions. This has been done through encouraging investors to establish, hotels, lodges, dormitory etc. e.g. Serena hotel, Pretoria hotel, Mt. Elgon hotel near Mt. Elgon NP, Mweya lodge in Kasese near Queen Elizabeth N.P, source of the Nile in Jinja. Most of these hotels suite the international standards hence attracting tourists.
- 8 Availability f abundant supply of skilled labour and these are trained from higher institution of learning e.g. Makerere University e.g. Bachelor of Arts in Tourism, Bachelor of Arts in hotel management and hospitality and other institutions.
- 9 The hotels have also taken a step in training their staff especially customer care services.
- 10 Intensive advertisement of the sector and this has been done by the Uganda wildlife Authority and Uganda tourism board through the use of magazines, newspapers, televisions, radios etc. This has greatly improved on Uganda's image especially abroad.
- 11 Hospitality of same Ugandan tribes e.g. Batooro around Queen Elizabeth NP, Baganda near kasubi tombs, Busoga around source of the Nile, bagisu around Mt. Elgon. These people are willing to guide tourist for free.
- 12 Political stable atmosphere in most parts of the country were the tourist attractions are located e.g. around Queen Elizabeth NP, L. Mburo N.P in Mbarara. This has attracted tourists to come into the country thus favoring the development of the sector.
- 13 Presence of a variety of organized tour and travel companies that help in taking care of the tourists in form of hotel bookings, travels and tours e.g. matooke travelers, safari travelers, Bwindi safari, spear tour and travel company. These link tourists to Bwindi N.P.
- 14 Preservation of the endangered species of animals e.g. white rhinos, mountain gorillas, crested cranes etc. other places have been gazette to avoid encroachment e.g. Mt. Elgon and Mt. Rwenzori forest. This has helped to conserve wild life which is the most tourist attraction.

- 15 Foreign investors have also been encouraged to come and offer international services to the tourist sector and this has been achieved through privatization policy of the gov't and as a result, hotels have been built e.g. Serena hotel.
- ✓ Supportive gov't policy
 - ✓ Adequate capital provided by investors.
 - ✓ Research

Assignment

1. To what extent have the physical factors led to the development of the tourism sector?
2. "Uganda's tourism is not based on tourist attractions only" Discuss.

12:02 Factors for the low development of the tourism industry (problems)

1. Poor transport and communication networks in some areas where tourist attraction centres are located. Some of these areas are inaccessible and therefore remote and this limits tourists from accessing them e.g kidepo valley NP in Kaabong, Bwindi impenetrable forest in Kanungu district etc.
2. Poor accommodation facilities. Most of the accommodation facilities in Uganda are in a poor state offering services which do not meet the international standards as regards to the tourism sector e.g. hotels are kidepo NP e.g. Moroto hotel etc.
3. Poaching around national parks e.g people around Mgahinga N.P kill the mountain gorillas, hyenas, leopards etc. Animals around Queen Elizabeth NP are sometimes poisoned and this is because sometimes these animals escape from national parks and prey on people and their domestic animals and sometimes these animals are hunted for wild meat e.g. antelopes, kobs etc.
4. Inadequate funding of the tourism sector. This brings about shortage of funds to invest in the sector thus limiting establishment of facilities like hotels, transport and communication networks as well as marketing. This in turn has hindered effective attraction of tourists e.g. Mt. Kei sanctuary in Yumbe etc.
5. The poor image of the sector especially abroad from countries like USA, UK, Canada. Tourists from these countries have a poor image about Uganda as their immediate tourism destination and this is partly because of the poor political atmosphere, occurrence of diseases like Ebola, cholera, Marburg. This has hindered the tourists from going to some places like Budongo forest, around Queen Elizabeth NP.
6. Possible solutions to the problems (measures). Security has been improved upon by UPDF and other security agencies e.g they have fought against ADF rebels around Mt. Rwenzori, Queen Elizabeth NP. LRA rebels have been defeated in Northern Uganda e.g. patiko fort in Gulu.

7. Uganda is a signatory to a number of multi-lateral environmental agreements related to conservation of bio diversity e.g CBD (Conversion of Bio Diversity). This has helped in the conservation of bio diversity thus promotion of tourism.
8. The government has set up strong institutions concerned with conservation of bio diversity / nature e.g the UWA, NEMA, NFA etc. This has helped in ensuring the existence of wild life hence promoting the tourism industry.
9. The government has trained skilled personnel to help in the management of the sector e.g game rangers, tour guides, game wardens etc. It has helped in training the people in international languages to solve the problem of language barrier.
10. The government has improved on transport and communication networks e.g the roads linking to the different tourist attractions e.g Kampala – Masaka – Mbarara road to L. Mburo road, Kampala – Jinja road to R. Nile. There is an upgrade of Entebbe international airport to accommodate a big number of tourists, revival of Uganda airlines, reviving of airstrip e.g Kasese to access Queen Elizabeth NP, Soroti to access Nyero rock painting.
11. Extensive advertisement of the industry both locally and internationally in a way trying to improve on the image of the sector thru print media, magazines, newspapers, televisions etc. This turn has led to great improvement of the poor image of the sector especially abroad.
12. Fighting of corruption and embezzlement of the funds which have been set aside for running the sector. This has been done through institutions like IGG, Police, Anti-corruption court etc.
13. The government has also encouraged the private investors to invest in the tourism sector and this has been seen through construction of hotels which meet international standards e.g. Bweya safari lodge which belongs to Madhvani family.

Assignment

Explain the challenges facing the tourism sector in Uganda.

12:03 Significance of the tourism sectors in Uganda

1. Provision of employment opportunities to the people both directly and indirectly e.g people work as game rangers, tour operators, hotel managers etc. this has helped to improve the standards of living of such people.
2. It is a source of foreign exchange since many tourists come from foreign countries such as Britain, China, and Canada etc. This foreign exchange has been used to develop the other sectors in the economy like education, transport etc.

3. It is a source of government local revenue through the taxes levied on the various tour companies e.g hotels like Sheraton, Serena hotel in Kampala and other tour operators or agencies e.g. Mweya safaris. This revenue has been used to develop other sectors within the economy e.g health sectors etc.
4. It has encouraged urbanization in some areas that are near the tourist attraction centres e.g Jinja town developed partly because of the presence of the source of the Nile, Bujagali falls, areas like Kayawe town along Kampala – Masaka road due to the presence of the equator, Kasese town because it is near Queen Elizabeth National park . Such areas provide social services to the tourists like accommodation thus urbanization.
5. It has also provided market for the local products e.g the food stuffs, art and craft, textiles etc. These are normally sold near the tourist attraction centres to target the tourist e.g UWEC in Entebbe, source of the Nile etc.
6. It has encouraged development of social, economic infrastructures especially in area near the tourist attractions centres e.g. hotels like Margerita hotel in Kasese, Mweya safaris lodge, roads Jinja – Kampala road etc.
7. It has encouraged the development of the film industry e.g around Mgahinga and Rwenzori National park and around Kazinga channel where animals and plants are photographed and filmed for commercial purposes.
8. Promotion of international relatives with countries like USA, Canada where foreign tourists are coming from. In return it has resulted into receiving grants and donations for social – economic development e.g guiding schools, hospitals etc.
9. It has promoted skills development where many people are trained in the different skills in order to promote the development of the industry e.g people have gained skills of hotel management in the various institutions of learning e.g. Makerere university.
10. It has promoted the diversification of the economy thus reducing on over dependence on a few sectors like agriculture and as a result widening the tax base and also creation of more employment opportunities e.g people are employed in hotels like Mweya safari lodge in Kasese.
11. Promoted research in wildlife conservation in a bid to promote tourism.

Negatively

12. It has led to environment degradation in some tourist attraction centres .g overgrazing of the wild animals in the different National parks like Kidepo national park, Murchison falls national park and also the poor disposal of wastes by the tourists e.g. polythene, plastics at the different tourist attraction centres e.g Mgahinga national park, Lake Mburo national park etc.
13. It has led to profit repatriation. This is because many foreign investors are interested in the tourism sector and in most cases they repatriate the profits instead of reinvesting in

the economy e.g. Madhvani family that owns Mweya safari lodge in Kasese, Serena hotel, Grand imperial hotel that belongs to Salim etc.

14. It has increased the cost of living especially in the areas near the tourist attraction centres. This is evidenced by the increase of prices of certain items sold in such areas. This is normally done to target the foreign tourists but the local people in those areas cannot afford them e.g near the source of the Nile.
15. Cultural degradation where by many Ugandans are adopting the foreign lifestyle centrally to their cultures e.g the dressing style, eating style etc.
16. Displacement of the people from area which have been gazetted as tourist attractions e.g. Bafumbira and Bakiga communities of people were forced to shift from Mgahinga national park where they used to purchase agriculture some people have been displaced from wetland areas etc.
17. It has promoted criminal activities and also immorality e.g drug trafficking things like money laundering, prostitution, robbery and theft, homosexuality. These activities are common in areas of Kampala, Jinja and Entebbe.
18. The sector is inconsistent due to the unreliable flow of tourists because it mainly depends on foreign tourists who come during winter seasons in their countries and during summer they are few. This makes the tourism system to be under-utilized hence increasing the operation costs.

Assignment

1. Assess the role of tourism to the economic development of Uganda
3. How justifiable is the idea of allocation of such large land areas to National parks in Uganda.

UNIT 13: URBANISATION IN UGANDA

13:00 INTRODUCTION

Urbanisation is a process where by an increasing number of formerly rural residents become residents in towns or urban centres.

It can also be defined as a process where by the rural areas develop into towns or cities.

In Uganda there are basically four types of urban centres and these include the following;

- Cities with Kampala city as the only city in Uganda.

- Municipalities e.g. Jinja, Mbale, Kabale, Tororo, Masaka, Arua, Gulu, Fort portal, Mukono, Masindi, Iganga, Soroti, Mbarara etc.
 - Town councils e.g. Katakwi, Napak, Lukaya, Buwenge. Kyenjojo, Buwama, Kajjansi, Wobulenzi, kaliro etc.
 - Town boards/ Trading centres e.g.Bulopa, kasenyi, Namulesa etc.

Characteristics of urban centre

- They are trade and commerce centres with banks and insurance companies
 - They are industrial centres e.g. Kampala and Jinja
 - They have the necessary infrastructure e.g. improved roads, hospitals etc.
 - They are administrative centres e.g. districts head quarters.
 - They normally have high population concentrations.
 - They have relatively improved social amenities e.g. electricity, running water etc.



- They have residential facilities e.g. planned settlements.

13:01 FACTORS THAT HAVE FAVOURED UBARNISATION IN UGANDA

1. Climate, the central region is more urbanised than any other part of the country partly due to its favourable climatic conditions. The relatively hot and wet climate attracts activities like settlement and other human activities like agriculture that provides food to the big urban population e.g. Kampala city, Mukono municipality, Masaka and many others.
2. The generally flat and gentle slope landscape have also favoured development of urban centres. This is because this kind of landscape makes it easy and relatively cheaper for the establishment of the necessary infrastructures like residential building, roads that consequently encourage urbanisation e.g. Jinja and Masaka municipalities.
3. Drainage, the well-drained areas encourage the development of urban centres. Such areas are suitable for settlement thus attracting relatively high population concentrations in those particular areas that consequently develop into town councils e.g. Kyenjojo and municipalities like Fort portal.
4. Areas that are covered by relatively light or scanty vegetation cover especially grasslands are easy to clear for establishment of the necessary infrastructure like roads, residential settlements such areas have attracted relatively high population making such areas to develop into urban centres examples of such areas include Gulu municipality, lira municipality, Katakwi town and many others.
5. The nature of soils, the areas with relatively fertile soils have also favoured urbanisation in such away that such areas support crop growing that provides adequate food stuffs on which the big urban population feed e.g. Kampala city, Mukono municipality partly developed because people depended on the food from the alluvial fertile soils around the lake Victoria shores e.g. Kayunga, Mpigi, Wakiso etc. Mbale municipality depends on food from the fertile volcanic soils around mt. Elgon in Sironko, Manafwa etc.
6. Migrations, this has encouraged urbanisation in such away that people move from one area to another for various reasons more likely for economic and social. The resultant effect of this is that many of those go to urban centres thus increasing the rate of urbanisation even more. E.g. people move from Ibanda to Mbarara municipality, from Sironko to Mbale municipality.
7. The government policy of gazetting new districts, municipalities and town councils, this attracts a big population in such areas due to the associated job opportunities and improved social services like supply of electricity and water, improved security. This in turn has boosted the process of urbanisation in areas like Kisoro municipality, Gulu municipality etc.
8. Industrialisation has also favoured urbanisation. Areas that have industrial establishments and services attract many people who seek for employment opportunities and other related activities. This partly explains why areas like Jinja, Tororo, Kasese municipalities developed into major urban centres.

9. The availability of trade opportunities and markets, People are always attracted to areas that avail to them trade opportunities especially those engaged in trade and commerce as a business therefore areas with such opportunities have attracted big concentrations of population and consequently such areas have turned into major urban centres e.g. Busia municipality, Arua municipality and Kampala city.
10. The presence of improved infrastructure like roads, electricity and power stations, housing, banks etc. Many People tend to settle near such facilities because of the convenience that comes along with such. Such areas begin like small trading centres then later into town councils and finally into Municipalities e.g. Jinja municipality, Kabale municipality etc.
11. Availability of adequate supply of clean water for both domestic and industrial use. Water is a basic need for life therefore its presence in a particular area attracts human settlement and this partly explains why urban centres like Jinja municipality, Entebbe municipality, Kampala city that are near lake Victoria that provides water have become major urban centres.
12. The presence of mining activities have also favoured the development of different areas into major urban centres. This is due to the fact that mining activities attract human settlement due to available job opportunities and other related businesses and consequently those areas have turned into major urban centres e.g. Tororo and Kasese municipalities due to limestone mining, Kajjansi town council due to clay mining, Hoima municipality due to oil exploration and mining etc.
13. The influence of the agricultural activities. Areas with large plantation farms have turned into major urban centres because people tend to settle around due to the available job opportunities in the plantation farms and also the improved social facilities and services provided by the plantation farms e.g. lugazi municipality, kinyara trading centre due to sugar cane plantations.
14. Some areas have developed into major urban centres partly because of the tourism activities. These activities have led to establishment of facilities like hotels, hostels and other related tourism related businesses that attract high concentration settlements. Such areas include Kasese municipality near Queen Elizabeth national park and mt.Rwenzori, Jinja municipality near the source if the Nile etc.
15. Availability of vast vacant land for establishment of the necessary infrastructure like residential houses, roads, recreational facilities and also for further expansion. Areas with vast land therefore have encouraged urbanisation foristence Mbale municipality, Masaka municipality, Gulu municipality etc.
16. Some areas have developed into urban centres as a result of the influence of the already existing urban centres. As the population increase in the existing town, it spreads over the surrounding areas and as a result there will be also development of other urban centres that starts with a few shops and some residential houses then later into a major urban centre.e.g. Mukono municipality, Nansana municipality, Nsangi trading centre due to the existence of Kampala city.

17. Proximity to borders. Some areas that are located at the borders of the country are used as handling points for imports and exports this is also associated with other related businesses that attract many people who intend to benefit from such businesses and as a result these areas have developed into urban centres e.g. Busia, Tororo, and Malaba along Uganda – Kenya border.
18. The presence of fishing activities in a particular area can also facilitate urbanisation. Areas that are associated with fishing activities like ports and landing sites tent to attract a big population due to the job and business opportunities around such areas and with time some of those areas have developed in urban centres e.g. kasenyi trading centre, Bukakata trading centre around L Vitoria and many others.
19. Improved security also encourages urbanisation. People are always attracted to areas where they feel secure for settlement and business therefore with time such areas that are secure facilitate high urbanisation rates and this partly explains why Kampala city, Jinja municipality, Iganga municipality have developed into major urban centres.
20. The presence of research and education centres has also facilitated urbanisation in some areas. Areas that have high institutions of learning like colleges, universities and secondary schools attract a big population that seek for those services and as a result other related services crop up like accommodation facilities, supply of electricity, water etc. This is evident in Kampala city, Mbarara municipality and many others.
21. The influence of improved technology. Areas where there is relatively improved technology are associated with better mechanisms of production thus facilitating things like industrialisation together with innovativeness and these attract many people who come with different skills thus encouraging urbanisation e.g. Kampala city, Jinja municipality etc.
22. Availability of skilled labour. The skilled labour helps in building the necessary infrastructure like roads, supply of water and electricity plus managing the urban administrative authorities all these facilitate urbanisation therefore many areas with skilled labour have developed into major urban centres e.g. Mbarara municipality, Mbale municipality etc.
23. Natural increase in population in some areas, In some areas there are relatively high population growth rates and consequently high population and such areas have also attracted supply of essential services provided by the government e.g. hospitals, electricity, water thus developing into major urban centres e.g. Iganga municipality, Mbale municipality, Jinja municipality etc.
24. Availability of adequate capital that is used in the construction and establishment of the necessary infrastructure like roads, electricity, water for the urban population. Capital is also important in the day to day running of the urban centre like paying salaries and wages to the workers and many other things therefore areas with adequate capital have developed into urban centres e.g. kabale municipality, Masaka municipality etc.

FUNCTIONS OF URBAN CENTRES IN UGANDA

- Urban centres have administrative functions where by many of them have administrative centres like district head quarters, county and sub county head quarters while others like Kampala city have ministry headquarters and the parliament.
- They have commercial functions with collection, selling and distribution centres of goods.e.g. Nakasero and Owino market in Kampala city, Jinja Central market in Jinja municipality etc.
- Many urban centres have industrial functions. Many towns have industrial establishments e.g. Kampala city with Mukwano industries, Jinja municipality with textile industries, Mbale Municipality.
- Residential functions. Towns provide accommodation and residential facilities where by many people settle and reside in the urban centres e.g. Kampala city with residential areas like Bugolobi, Muyenga, Naguru etc. Mbale with senior quarters etc.
- Resort and recreation functions. Urban areas in Uganda have such facilities like cinema halls, theatres, stadiums, golf course and many others. These are evident in Kampala city, Mbale municipality etc.
- Social functions where by many urban centres have Educational institutions e.g. Kampala city with Makerere University, health services like mulago hospital in Kampala, churches and many other social facilities.
- Transport and communication functions. Many urban centres in Uganda also serve as transport and communication terminals e.g. Entebbe municipality with the international airport, Kampala city with taxi and bus terminals.
- Tourism functions where by many towns in Uganda are tourism destinations with various tourist attractions and hotels e.g. Kasese near Queen Elizabeth, Jinja near the source of the Nile etc.
- Some towns provide mining functions especially those near mining centres e.g. Hoima municipality because oil mining, Tororo and Kasese municipalities sue limestone mining.
- Security functions where by many towns house various security organs and agencies e.g. police head quarters in Naguru, UPDF head quarters at Mbuya all those in Kampala city.

13:02 PROBLEMS ASSOCIATED WITH URBANISATION

1. High rates of unemployment which is basically caused by the high increase in population in the urban areas which does not much with the rate of job creation thus rendering many urban dwellers unemployed. This is evident in Kampala city, Arua municipality and many others.
2. High rates of crimes foristence pick pocketing, theft, drug sale and abuse etc. These are mainly caused by the problem of unemployment where by people don't have sources of

income yet they have to meet the costs of living therefore they try to look for alternative means of survival in the urban centres. This is evident in Gulu municipality, Lira municipality etc.

3. There is also a problem of inadequate provision of social services like health care, supply of electricity and water, collection of garbage. This is because of the high pressure mounted by the high population concentrations in these urban centres yet the government can not meet the demands due to limited resources.e.g. Masaka municipality, Kamuli municipality etc.
4. Shortage of accommodation facilities which is as a result of high population and people remaining poor due to unemployment. Therefore they can not afford to build or buy houses for better accommodation thus resorting to crowded slum areas that are associated with many social and health problems e.g. Katanga and kasenyi areas in Kampala city. Kasokoso in Iganga municipality.
5. There is also a problem of traffic congestion especially during the rush hours when people are either going to their work places in the morning or when they are returning home in the evenings. This causes delays in transportation and delivery of goods and services e.g. in Kampala city, Mukono municipality etc.
6. Pollution of air, water and land. This basically caused by the poor disposal and emission of industrial wastes since urban centres tend to have high concentrations of industries but also the pollution is caused by poor disposal garbage by the high population. This has posed health risks but also environmental degradation e.g. Jinja and Mbarara municipalities.
7. High costs of living in urban centres and this is caused by the expensive costs of goods and services like food stuffs, clothes, health and education due to high demand by the big urban population but the poor people in these areas can afford such costs. This is evident in Kampala city, Mbarara municipality etc.
8. Shortage of land for expansion. As towns grow geographically, there has been limited land for further expansion and as a result the nearby marginal lands like wetlands and forests have been encroached upon for settlement, infrastructural development and industrial establishment however this has resulted into environmental degradation. E.g. Bwaise, Bugolobi areas in Kampala city where wetlands have been reclaimed.
9. High government expenditure due to the fact that the government has to provide the essential social services and facilities to the urban population in form of health care, supply of water and electricity, roads etc. e.g in Mityana municipality, fort portal municipality etc.
10. There is also problem of poor urban management associated with corruption yet many people come to towns from different places with different backgrounds and behaviours therefore controlling them become difficult. This has been worsened by the political differences, tribal and cultural differences plus income inequalities emanating into urban violence in urban centres like Kampala city, Jinja and Gulu municipalities.

11. There is also a problem of shortage of food stuffs in urban centres and thus is because of the high population in these areas yet most of them are not involved in food production yet they have to feed. This is worsened also worsened by the high cost of living rendering many poor urban dwellers go hungry.
12. The growth and development of urban centres has resulted into displacement of people. People are always displaced to give way for the establishment urban developments in form of building roads, industrial parks, recreations grounds and many people. This in turn has caused loss of property and inconveniences e.g. in Mbale municipality, Kampala city etc.
13. Poor sanitation in the urban areas and this is basically due to poor management of industrial and human wastes. Many urban centres have failed to manage the disposal of wastes leading to poor sanitation and hygiene posing health risks to the people staying in those areas. This is common in Kampala city, Gulu municipality, Mbale municipality where people get diseases like cholera, dysentery due to poor hygiene.
14. There is also a problem of rapid spread of diseases especially air and water borne diseases in the urban areas. This is mainly caused by human congestions due to high population concentrations in these areas and also contamination of water sources due to poor disposal of wastes. This has resulted into loss of lives in towns like Kampala city, Masaka municipality etc.
15. There is also a problem of poverty to many urban dwellers and this is because many people especially the youths migrate to urban centres in anticipation of getting better paying jobs but because of the high number of people looking for the same jobs, many remain jobless with no source of income and together with the high costs of living they become even poorer. This seen in the slum areas of Bwaise, kisenyi in Kampala city.

Assignment

1. (a) Describe the factors that have favored high rates of urbanization in Uganda
(b) Explain the problems that are caused by high urbanization.

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3. There is also a problem of inadequate provision of social services like health care, supply of electricity and water, collection of garbage. This is because of the high pressure mounted by the high population concentrations in these urban centres yet the government cannot meet the demands due to limited resources. E.g. Masaka municipality, Kamuli municipality etc.
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10. There is also problem of poor urban management associated with corruption yet many people come to towns from different places with different backgrounds and behaviours therefore controlling them become difficult. This has been worsened by the political differences, tribal and cultural differences plus income inequalities emanating into urban violence in urban centres like Kampala city, Jinja and Gulu municipalities.

11. There is also a problem of shortage of food stuffs in urban centres and thus is because of the high population in these areas yet most of them are not involved in food production yet they have to feed. This is worsened also worsened by the high cost of living rendering many poor urban dwellers go hungry.
12. The growth and development of urban centres has resulted into displacement of people. People are always displaced to give way for the establishment urban developments inform of building roads, industrial parks, recreations grounds and many people. This in turn has caused loss of property and inconveniences e.g. in Mbale municipality, Kampala city etc.
13. Poor sanitation in the urban areas and this is basically due to poor management of industrial and human wastes. Many urban centres have failed to manage the disposal of wastes leading to poor sanitation and hygiene posing health risks to the people staying in those areas. This is common in Kampala city, Gulu municipality, Mbale municipality where people get diseases like cholera, dysentery due to poor hygiene.
14. There is also a problem of rapid spread of diseases especially air and water borne diseases in the urban areas. This is mainly caused by human congestions due to high population concentrations in these areas and also contamination of water sources due to poor disposal of wastes. This has resulted into loss of lives in towns like Kampala city, Masaka municipality etc.
15. There is also a problem of poverty to many urban dwellers and this is because many people especially the youths migrate to urban centres in anticipation of getting better paying jobs but because of the high number of people looking for the same jobs, many remain jobless with no source of income and together with the high costs of living they become even poorer. This seen in the slum areas of Bwaise, kisenyi in Kampala city.

Assignment

2. (a) Describe the factors that have favored high rates of urbanization in Uganda
(b) Explain the problems that are caused by high urbanization.

UNIT 14: ENVIRONMENTAL DEGRADATION IN UGANDA

14:00 Introduction

It refers to the decline in the productivity of the available renewable and non renewable resources like air, soil/land and water.

There are different forms of degradation in Uganda and these include the following;

- Pollution of air, water, and land (especially in urban areas like Kampala, Jinja, Mbale etc.)
- Soil exhaustion (especially on plantation farms due monoculture at kasaku tea estates, Lugazi sugar estates etc.)
- Mass wasting/soil erosion (especially in the highland areas like Mtn Elgon, Mtn Rwenzori, Kigezi highlands etc.)
- Deforestation (in Mabira forest, Budongo forest, Bugoma forest etc.)
- Swamp reclamation (in Kampala, Bugiri, and Soroti etc.)
- Over fishing especially in the major water bodies like Lake Victoria, Lake Kyoga, Lake Albert and major swamps etc.)
- Overgrazing (especially in areas where livestock farming is dominant like Moroto, Kotido, Buliisa, Nakasongola etc.)
- Land excavation/mining (especially the open cast method of mining like clay mining, sand mining limestone mining etc.)



Figure 1. Rice growing in a swamp



Figure 2. Deforestation



Figure 3. Industrial emission



Figure 4. Industrial affluent

14:01 CAUSES OF ENVIRONMENTAL DEGRADATION IN UGANDA

1. Overgrazing. This is common in areas where livestock farming is predominately practiced. It is basically caused by overstocking of livestock i.e. Keeping high population more than what land can accommodate. This results into loss of plant cover that leaves the land bare thus exposing it to agents of erosion like wind and water run-off thus resulting land exhaustion. This is evident in Nakasongola, Kiruhura and Kotido etc.
2. Poor methods of cultivating land for arable farming, e.g. cultivating down and up the slope, burning of bushes to clear land for gardening, etc. these expose the soil to agents of erosion like water run-off, wind thus leading to loss of soil fertility. This common along the slopes of Mtn Elgon in the districts of Mbale, Manafwa, Sironko and Kigezi highlands in Kisoro and Kabale etc.
3. Deforestation, many forested areas are being destroyed in Uganda due to the high demand for timber and its products but also due to the need to clear to do activities like settlement, farming etc. and this is attributed to high population growth rates of people. After clearing, the land is left bare exposing it to soil erosion but also results into low amounts of rainfall e.g. around Mabira forest in Buikwe, Bugoma forest in Hoima etc.
4. Swamp reclamation, many swamps have been cleared in Uganda for various reasons like settlement, industrialization, infrastructural establishments etc. this has resulted into a number of effects like shortage of surface for domestic and industrial use, destruction of

biodiversity hence limiting swamp productivity in the different areas e.g. Bugoloobi, Luzira and Bwaise swamps in Kampala, Awoja swamp in Soroti etc.

5. Bush burning, this commonly practiced in the areas where cattle keeping is common. It is usually done in anticipation of fresh grass at the beginning of the rainy season but results into extinction of some species of grass and of course leads to destruction of biodiversity. This evident in Nakapiripiriti, Moroto, Nakasongola etc.
6. Industrialization, this has resulted into pollution of air through emission of dangerous greenhouse gasses and dust into the atmosphere e.g. cement industries in Tororo and Kasese, pollution of water through dumping of dangerous industrial affluent into water bodies like swamps, rivers and lakes e.g. Uganda breweries dumps its wastes in Luzira wetland, kaziire health products factory in Mbarara releases water wastes into river Rwizi etc.
7. Overfishing, this mainly due to the use of unacceptable and illegal methods of fishing e.g. use of poison, use of undersized nets etc. done by selfish fishermen on the different fishing grounds especially Lake Victoria, lake albert, lake Kyoga etc. this has resulted into reduced fish stocks and extinction of some fish species in the fishing grounds.
8. Land fragmentation, this is as a result of high population growth rates that has led to diving of the available land into increasingly small plots belonging to different individual. This has encouraged over cultivation of land which results into loss of soil fertility. This is evident in areas of Kisoro, Mbale, Iganga districts where there is high population densities.
9. Sinking of bore holes/wells, this lowers the water table underground and as a result it inadequate supply of water in the soils thus limiting efficient growth of plants/vegetation and consequently loss of vegetation. This is seen in the districts of Nakasongola, kitgum, etc. where boreholes are common.
10. The inadequate government support in terms of putting policies to protect the environment. The government policies available have not been fully implemented to enforce sustainable use of resources and this has been worsened by the vice of corruption within the government institutions that are meant to protect and monitor the utilization of resources e.g. ministry of lands that has given forested land and wetlands to individuals etc.
11. Urbanization, the growth of towns and cities is associated with big population of people and development of infrastructure like roads, play fields, industries, settlements etc. all these result into poor management of wastes, pollution, congestion that contribute to environmental degradation e.g. in Kampala city, Mbarara city, Jinja city etc.
12. Mining, especially through the methods that require excavation and opening of land to expose the mineral e.g. the open cast method of mining limestone in Tororo and Hima,

sand mining it the wetlands of Lwera in Masaka, clay mining in Kajjansi, murrum soil etc. this in most cases leaves big pits that render the land barren.

13. Infrastructural construction especially roads, the construction of roads leads to destruction of vegetation, reclamation of swamps, destabilization of the nature of slope which may cause landslides etc. e.g. the northern by pass in Kampala was constructed in busega, namugoona, rubigi, Bwaise, kalerwe swamps, Kampala-Jinja road passes through Mabira forest.
14. Poaching of wildlife, this selfish act has resulted into reduced stocks and extinction of some animal species in national parks and game reserves e.g. there was extinction of the white Rhino in Murchison Falls national park.
15. The land tenure system, some form of land ownership like communal ownership of land has encouraged activities like communal grazing that results into overgrazing thus exposing soil to agents of soil erosion that leads to loss of soil fertility e.g. in Kotido, Moroto etc., the "mailo" land ownership has also given rise to land squatters who tend to over exploit the little pieces of land they own e.g. in Wakiso district, Kampala etc.
16. The occurrence of pests and diseases, these destroy plants/vegetation and also animals e.g. locusts, caterpillars that eat every green that they find common in the districts of Amudat, Moroto, Abim, Soroti etc. pests in animals like ticks, tsetse flies also affect the productivity of animals and sometimes leads to their death.
17. Climatic hazards like prolonged rain storms that trigger landslides that leads to destruction of vegetation, animals but also leads to contamination of water sources common in areas of Bududa districts, prolonged droughts that cause death of animals and drying up of vegetation and some surface water sources. This evident in the districts of Kumi, Soroti, Nakasongola, Moroto etc.
18. Natural fire outbreaks, this very common especially with swampy vegetation. The natural fires are occasionally caused by lightning but on a rare occasion by the combustion of dry swampy vegetation in combination with gasses. This leads to destruction of vegetation and the eco-system with the swampy areas. This common in Tirinyi swamps in Kibuku district.
19. The invasion of water weeds i.e. water hyacinth, when water is covered by the weed the intrusion of oxygen and penetration of light into the water is limited this leads to death of the aquatic life within the waterbody. This common on Lake Victoria and Lake Kyoga.
20. Overstocking of wild animals in the national parks, game reserves, sanctuary etc. this will lead to overgrazing that leaves the land bare and therefore exposed to agents of soil erosion like running water and wind which leads to soil exhaustion. This common in Kidepo Valley national park in Kaabong, Queen Elizabeth national in Kasese.

14:02 EFFECTS OF ENVIRONMENTAL DEGRADATION

1. It leads to soil exhaustion especially where monoculture is practiced e.g. Kasaku tea plantations in Buikwe, Lugazi sugarcane plantation in Buikwe, coffee plantations in mityana, banana plantation in Masaka and Mbarara etc. this has resulted into decline of agricultural productivity in those areas.
2. It results into shortage of wood fuel i.e. fire wood and charcoal for domestic and industrial use. This is caused by the clearing of vegetation for various reasons e.g. in Luwero, Nakasongola, Gulu etc.
3. It has resulted into severe soil erosion caused by over grazing and other poor methods of arable farming, this creates gullies especially in hilly areas thus making such land un productive. This common in Kasese, Bundibugyo etc.
4. It has accelerated mass wasting especially landslides caused by clearing of vegetation and also over cultivation along the mountainous slopes. This has resulted into death of people and destruction of property plus crop fields e.g. in Bududa along the slopes of Mtn Elgon, Kasese and Bundibugyo along the slopes of Mtn Rwenzori.
5. Lowering of the water table caused by clearing of wetlands and sinking of bore holes, this in turn limits plant growth thus causing shortage of food but also results into scarcity of surface water needed for domestic and industrial purposes. This is common in Masindi and kiboga districts.
6. Loss of productive agricultural land. This is as a result of activities like bush burning, overgrazing, quarrying that facilitates soil erosion and consequently soil exhaustion thus leaving the land barren. This evident in sukuru hills in Tororo that have been used for mining, Buliisa due to over grazing etc.
7. Loss of water catchment areas mainly caused by reclaiming of swamps, this in turn has resulted into disappearance of some streams and shallow wells thus causing scarcity of surface water which is vital for domestic and industrial purposes. This is common in swampy areas like Bwaise, Busega, and Bugoloobi in Kampala where swamps have been cleared for settlement.
8. It has caused the contamination of water sources like shallow wells, streams, rivers, lakes etc. this is mainly caused by silting due soil erosion but also due poor waste disposal especially in urban areas. The contaminated water is dangerous for human consumption resulting into diseases like dysentery, cholera that may cause death of people. This is common in Mbarara city, Jinja city etc.
9. Loss of biodiversity i.e. flora and fauna which sometimes change from their original form in the process of trying to adapt to the new environment but in many instances will die and become extinct. This is mainly caused by clearing vegetation. Clearing swamps and

overfishing etc. This is evident in Tirinyi and Doho swamps in Kibuku and Butalleja districts respectively.

10. Flooding due to increased siltation, destruction of wetlands and increased water run-off. This flooding has caused death of people and loss of property and it is evident in areas of Kasese, Bwaise, Nateete, Kyambogo etc. in Kampala.
11. It has resulted into desertification where there has been decrease in rainfall amounts received, low humidity and general increase of atmospheric temperatures which is attributed to severe loss of vegetation and clearing of swamps. This is seen in Nakasongola, Rakai Buliisa etc.

MEASURES TO PREVENT ENVIRONMENTAL DEGRADATION IN UGANDA

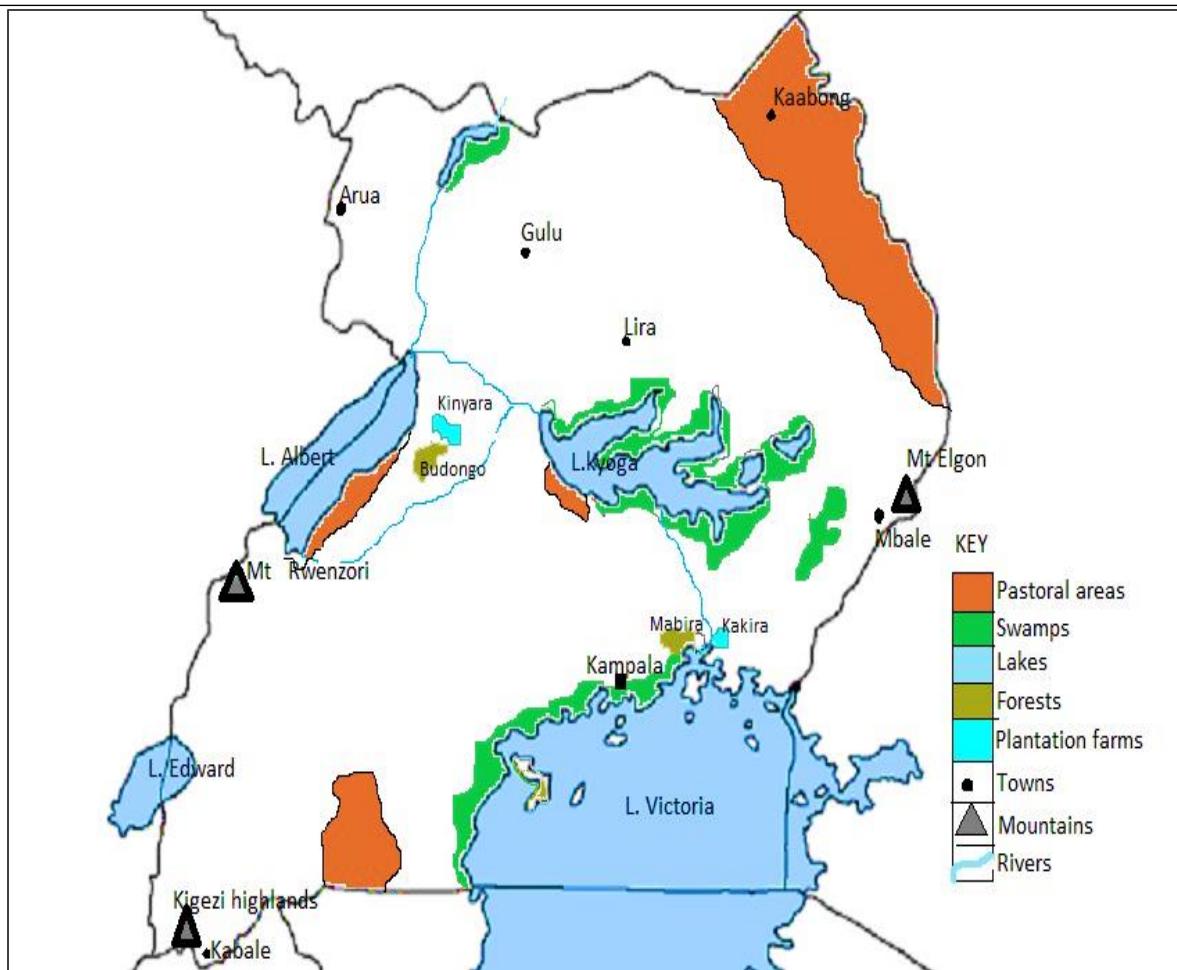
1. Afforestation and re-afforestation programs are being encouraged to check the problem of deforestation. This has been done by the government through the national forestry authority that supports people interested in planting of trees by giving advice, providing land and seedlings. Examples include lendu forest in Zombo district, Katugo forest in Nakasongola etc.
2. There has been establishment of institutions responsible for legislative, economic sustainability and regulatory measures of the natural resources e.g. the National Environment Management Authority (NEMA). This has been seen evicting encroachers on forests and swamps e.g. nabajjuzi swamp in Masaka, mountain forest in Mbale etc.
3. Encouraging use of improved and better farming method that promote sustainable use of land e.g. agro-forestry evident with cocoa growing in Bundibugyo, vanilla growing in Mukono, terracing along the slopes of highlands in Kabale.
4. Mass education about the values and measures to protect the environment is being carried out by the government and civil society organisations. This has encouraged people to engage in tree planting and community participation in environmental conservation e.g. around Bwindi impenetrable forest in Kanungu district.
5. Encouraging research in environment management, this has helped to identify the causes and solutions to the problems pertaining environmental degradation. This is evident at higher institutions of learning like Makerere University with courses like Bachelor of Science in environmental management.
6. Proper waste management especially in urban areas like Kampala, Jinja, Mbale etc. such urban centre local authorities are being encouraged to have a proper plan for waste management e.g. Kampala city has got one central place in kiteezi where waste is dumped after cleaning the city every day.
7. Recycling of wastes like plastics and metal that can be recycled, this has been done through encouraging individual local entrepreneurs to invest in the same e.g. the plastic

recycling plants in Kampala. These have helped to reduce on negative effects of plastic dumping.

8. There has been enforcing of regulations that require industrial plants to treat their wastes before releasing them back to the environment. This has been done by Uganda breweries in Luzira Kampala and nyanza textiles in Jinja.
9. Developing other sources of energy to try and reduce on the pressure created by a high demand for fuel wood in form of firewood and charcoal. For example encouraging people to use hydro-electricity, gas and use of coffee husks etc. this is common in urban centres like Kampala, Masaka, and Mbarara etc.
10. Population growth control, the population pressure of demand for needs like food, shelter etc. has immensely contributed to environmental degradation therefore there has been efforts to control population growth through sensitization of people about the use of family planning methods e.g. in Jinja, Kabale, Iganga etc.
11. Enforcing regional cooperation especially among the countries that share resources like water bodies e.g. the institute of Lake Victoria environmental management program (LVEMP) was set up by the three East African countries that share Lake Victoria to formulate policies that would guide sustainable use of the lake, kagere basin organization was also initiated to enforce effective utilization of lake Victoria etc.

Environmental Degradation		
Causes	Effects	Solutions
<ul style="list-style-type: none"> ▪ Overpopulation ▪ Deforestation ▪ Landfills ▪ Consumption behavior ▪ Waste production ▪ Lack of education ▪ Illegal dumping ▪ Agricultural pollution ▪ Littering ▪ Mining ▪ Plastic pollution ▪ Resource depletion 	<ul style="list-style-type: none"> ▪ Acid rain ▪ Biodiversity loss ▪ Floods ▪ Landslides ▪ Soil erosion ▪ Endangerment of species ▪ Natural disasters ▪ Global warming ▪ Public health problems ▪ Loss of livelihood for many people ▪ Famine ▪ Wars ▪ Spread of diseases ▪ Loss in tourism ▪ Economic effects 	<ul style="list-style-type: none"> ▪ Stop deforestation ▪ High fines for illegal dumping ▪ Stricter government regulations ▪ Nature reserves and biotopes ▪ Reduce consumption levels ▪ Reduce waste production ▪ Refrain from plastic packaging and disposable cups ▪ Education ▪ Convince others

MAP SHOWING AREAS UNDER GOING SEVERE DEGRADATION

**Assignment**

1. Describe the factors that have caused environmental degradation in Uganda
2. Explain the measures that have been put forward to control environmental degradation in Uganda



COVID-19 RECOVERY AND RESILIENCE PROGRAMME





COVID-19 RECOVERY AND RESILIENCE PROGRAMME

