S6- GEOGRAPHY PAPER 3 NOTES **MON/11/APRIL/2022**

RELIEF AND LANDFORM DEVELOPMENT IN UGANDA

- ✓ Uganda lies on the African plateau at an average altitude of 1200m above sea level. In Uganda, the lowest altitude is found along L. Albert i.e. 620m above sea level and the elevated areas are found in Rwenzori Mountains i.e. 5000m above sea level.
- ✓ Other elevated relief areas are Elgon, Muhavura, and Moroto and much of the western Uganda i.e. Kigezi highlands of between 900m -1500m above sea level.

Uganda's relief is divided into related divisions i.e.

- Relief below 900m above sea level which constitutes 9% of the total land area of Uganda mainly found around L. Albert in the western rift valley arm.
- Relief between 900m-1500m above sea level which constitutes 84% of the total land area of Uganda majorly found in central, north and north east of Uganda.
- Relief between 1500m-2000m above sea level which constitutes 5% of the total land area of Uganda mainly found in the foot hills of Mt. Elgon and the Kigezi and western Uganda hills.
- Relief above 2000m above sea level which constitutes 2% of the total land area of Uganda majorly found at the peak of Mt. Rwenzori, Elgon Muhavura and Moroto.

Land forms

These were formed mainly due to **Tectonism** and **Denudation** processes.

Tectonism

Tectonism/ earth movement refers to all the disturbances of the endogenic origin. The endogenic processes which form what is referred to as tectonism include; Faulting, Vulcanicity, Crustal warping (down warping and uplift), Folding and Earth quakes.

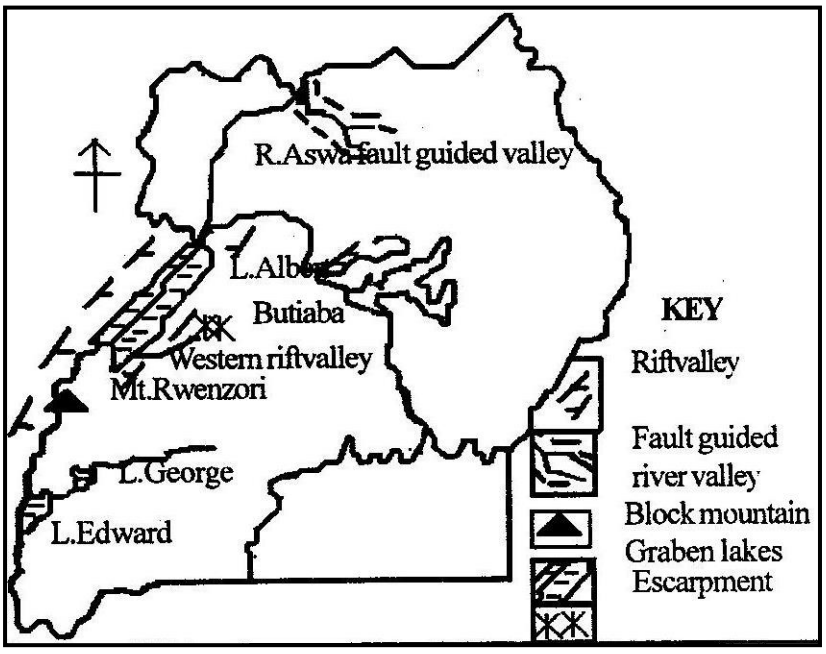
Faulting

- ✓ It refers to the process through which the rocks within the earth's crust are fractured, broken and displaced along the fault lines.
- ✓ This form fault land forms such as; The rift valley, Grabens, Rift valley lakes, Block Mountains, Fault scarps, Tilt blocks, Fault guided valley, etc.
- ✓ Indirectly, faulting lead to crustal warping, vulcanicity, earth quakes and glaciations.
- ✓ Faulting occurs due to increased internal pressure and stress within the crust which is brought about by tension and compression forces.
- ✓ These forces cause the rock strata to fracture and break into large cracks or joints known as fault lines**.** There are mainly three types of faults produced i.e.

- Normal fault which is produced by tension forces
- Reversed faults which is produced by compression forces
- Tear faults/strike/wrench which is produced by lateral forces i.e. forces which acted past one another.

It should be noted that tear faulting led to formation of **R. Aswa** which is a fault guided valley.

Distribution of landforms of faulting in Uganda



The rift valley and its formation

This is an elongated trough or depression which is boarded by in facing fault scarps on either side.

The western rift valley branch in Uganda covering **Kanungu, Rukungiri, Bushenyi, Kasese, Nabbi, Masindi**, etc was formed by faulting process.

The formation of the western rift valley

There are different theories put forward to explain the formation of the rift valley. These include;

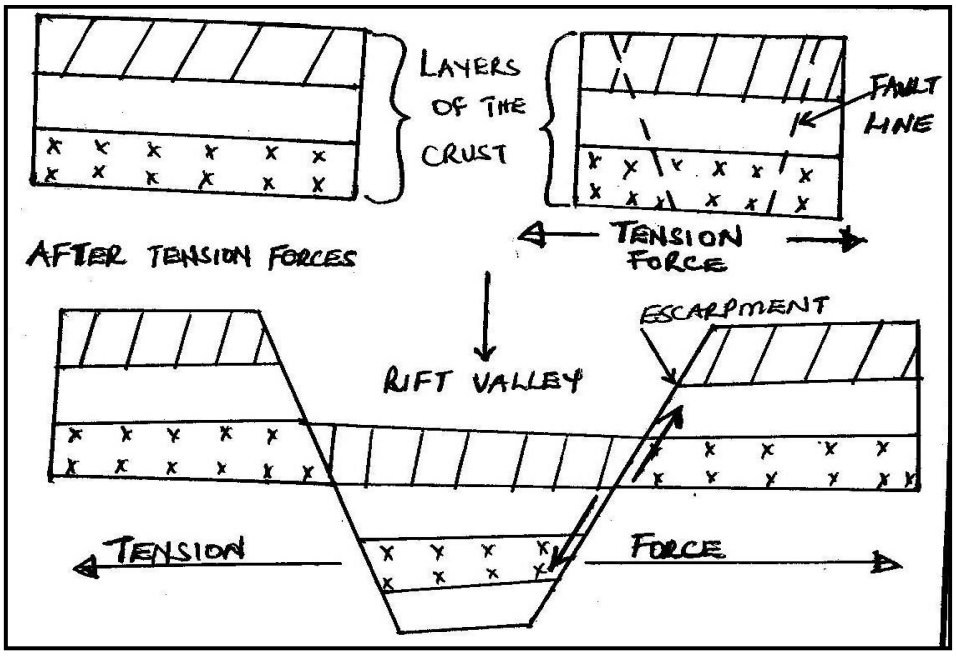
- The tension force theory.
- The compression force theory
- The plate tectonism theory
- The differential uplift theory
- The basin and swell theory

The tension force theory

According to this theory, the existence of tension forces within the crust led to stretching/pulling of rocks forming fault lines.

This later led to sinking of the middle block along the fault lines to form a trough or an elongated depression as illustrated.

Before tension forces **During faulting**

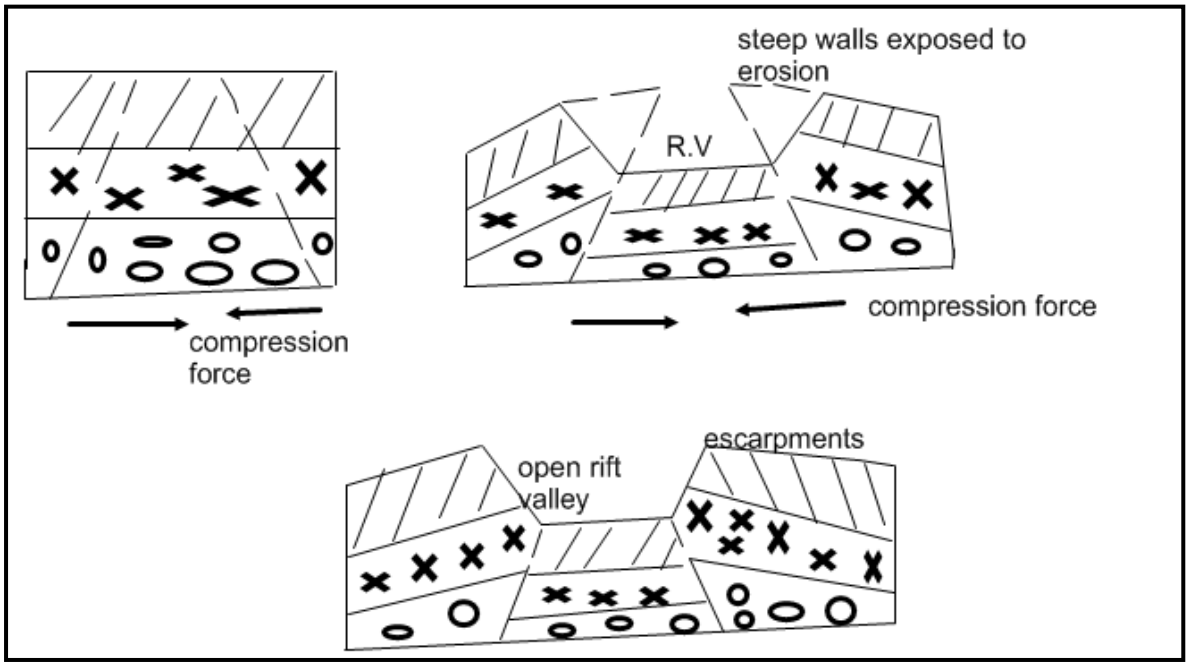


The compression force theory

According to this theory, the existence of compression forces within the crust acted upon/pushed the adjacent blocks forming fault lines.

The central block thrusted against the adjacent blocks forming an elongated depression/rift valley as illustrated.

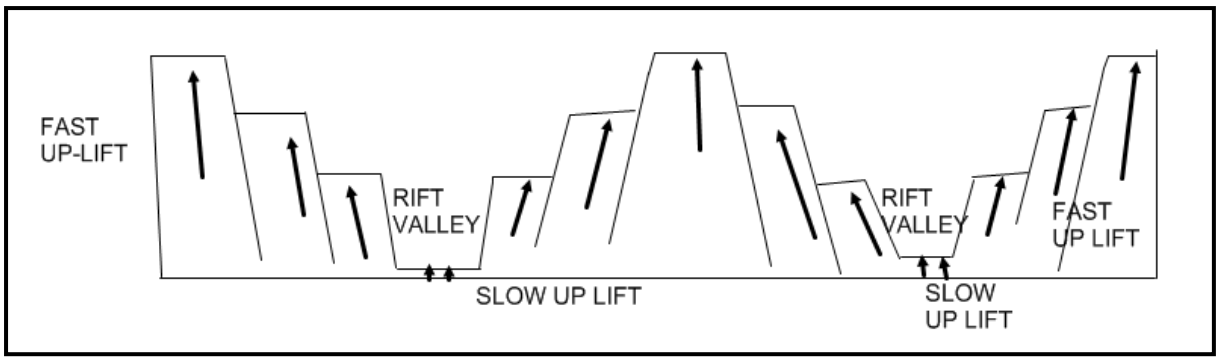
Before compression forces **During faulting**



The differential uplift theory

According to this theory, the rift valley was formed due to vertical movement or uplift of various plates/crust along the fault lines.

During the uplift, some plates were slowly uplifted to form a rift valley while other plates were quickly uplifted to form uplands or escarpments as illustrated.



2. The block/horst mountain and its formation.

A horst is formed due to faulting process. It is an upland which is boarded by fault lines on one or more sides and which stands above the general surrounding land.

Mt. Rwenzori in Uganda is an example of a horst and it is sometimes referred to as **mountains of the moon** due to its high altitude. It has its peak at **Margherita** i.e. 5110m above sea level.

Formation of a horst

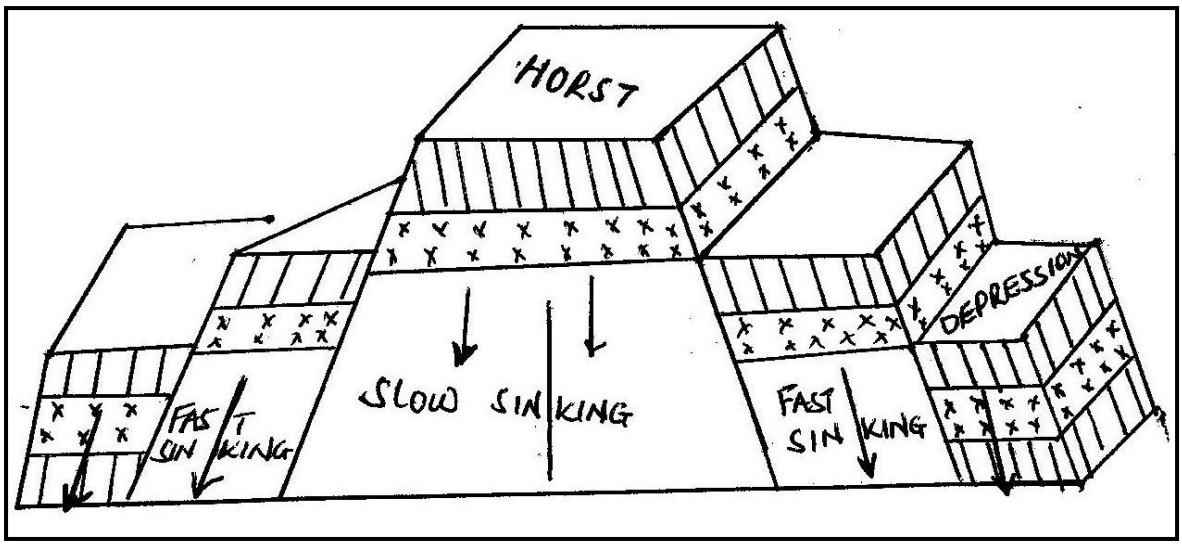
There are several theories put forward to explain the formation of Block Mountains. These include:

- The theory of relative sinking
- The theory of differential uplift
- The theory of topographical inversion.

The theory of relative sinking

This was put forward by **Suess** and according to him, the earth contracted and some fault blocks settled more slowly than others.

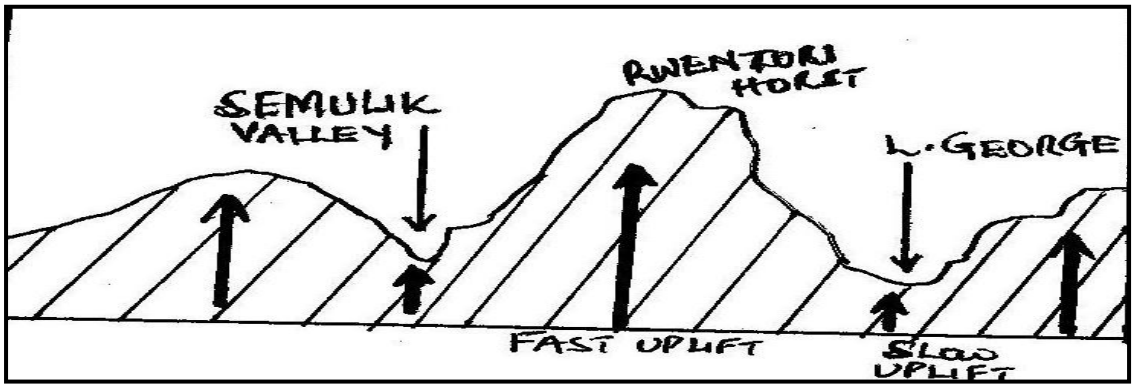
The part of the crust that sunk fast formed depressions while those which sunk slowly formed Block Mountains as illustrated.



The theory of differential uplift

According to this theory, block faulting occurred extensively which was followed by a general uplift in the faulted region.

The areas which were uplifted very fast formed block mountains while those which were slowly uplifted formed depressions as illustrated

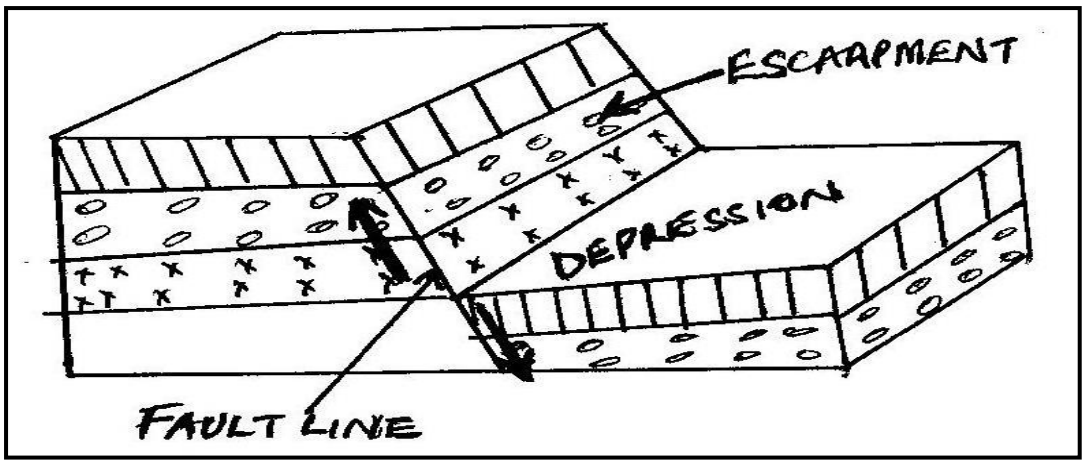


3. Escarpments/fault scarps.

This is a steep slope where the land falls from high to low level. It is a wall of a rift valley.

Examples of escarpments in Uganda include; **Kyambura** and **Bunyaruguru** fault scarps in s. western Uganda, **Butiaba** scarp along and near L. Albert.

Since fault scarps are steep, they are normally destroyed by erosion and weathering agents.



4. Fault guided valley

These are formed due to displacement of rocks along a fault line. The rocks are eroded by the river to create its own valley and channel.

R. Aswa in the north and **R. Manafa** in the eastern are the best examples of fault guided valleys.

5. Rift valley lakes and grabens.

Grabens are formed due to secondary faulting with in a rift valley. The former rift valley is shaped to become a more defied depression know as a graben.

When grabens are filled with water, they become rift valley lakes. These lakes in Uganda include; **L. Albert, L. Edward and L. George.**

QN. Examine the influence of faulting on landform development in Uganda.

QN. Give an account of the tectonism process of faulting on relief and landform development in Uganda.

Approach

- Define faulting.
- Mention the three faults, and the features formed by faulting and where they are found.
- Locate the above features on the map of Uganda.
- Explain the formation of all the features mentioned above with aid of diagrams.

Economic importance of faulting in Uganda

The features of rift valley, escarpments, Block Mountain, rift valley lakes, etc formed by faulting have got the following positive and negative contributions to Uganda's development.

- ✓ Development of the tourist industry due to the spectacular sceneries of the **western rift valley, Rwenzori horst and fault lakes like Albert**. This has helped to develop infrastructure, provision of foreign exchange and jobs to Ugandans.
- ✓ The rift valley lakes of **Albert, George, and Edward** provide great fishing potentials where Ugandans are assured of fish proteins/food, job opportunities and incomes thus high standards of living.
- ✓ **Rwenzori** horst is a source of **R. Mubuku, Semulik, and Nyamwamba** which provide water for HEP generation like at **Mubuku power station**, water for irrigation at **Mubuku irrigation scheme**, industrial water like for **Hima Cement factory**, etc.
- ✓ The rift valley floor has been gazetted into national parks such as **Queen Elizabeth**, and this has conserved wildlife, boosted tourism for foreign exchange and provided jobs to Ugandans.
- ✓ The western rift valley floor provides suitable land for farming, settlement and infrastructural development. For example, **Mubuku irrigation scheme** is well known for crop growing in Kasese thus reduced famine in Uganda.
- ✓ The steep slope of **Rwenzori horst** has favoured the growth of dense forests. Such forests have led to climatic modification i.e. heavy rains for crop growing and development of the forestry industry.
- ✓ Rift valley lakes of Albert, Edward and George provide great water transport potential. For instance, L. Albert link Uganda from Butiaba port to Muhanga port in DR Congo. This has led to flourishing trade and international relationship.
- ✓ Faulting indirectly influenced the formation of volcanic soils of Kigezi and Mt. Elgon. These soils are very fertile for crop growing

like iris growing in kabala and coffee in Mbale. It has also attracted dense settlement in such areas.

- ✓ The Rwenzori horst foot hills provide a great potential for mining activities. There was mining of copper in Kilembe-Kasese and now cobalt, this earns Uganda foreign exchange, jobs to Ugandans and infrastructural development.
- ✓ Faulting indirectly led to formation of crustal warped lakes of Victoria and Kyoga which are source of fish, navigation and water for industrial use like to Uganda breweries in Luzira, water to Kampala city and for Kajjansi clay crafts.

The short comings of faulting include;

- Faulting increases the rate of earth quakes which leads to loss of property and lives. For instance, Fort Portal and kasese have been frequently affected by earth quakes.
- Due to high altitude of Rwenzori horst, there is desertification in some parts of Kasese on the lee-ward side of the mountain. This affects crop production in the area.
- The steep escarpments of Rwenzori horst has contributed to the remoteness and inaccessibility of the area around the mountain and this limits trade.
- Faulting leads to formation of deep rift valley lakes such as Albert which restrict fishing activities and navigation. Many people lost their lives while navigating on L. Albert in 2013.
- The steep escarpments like Butiaba scarp of L. Albert and Kicwamba scarp accelerate the rate of erosion which affect crop growing and lead to siltation of water bodies.
- Rift valley soils tend to be poor in terms of crop growing since they are saline. This leads to low agriculture output.
- The rift valley floor is at a low altitude i.e. 900m above sea level like around Albert flats. This causes the area to become dry and with high temperatures.

QN. Assess the contribution of land forms of faulting to the development of Uganda

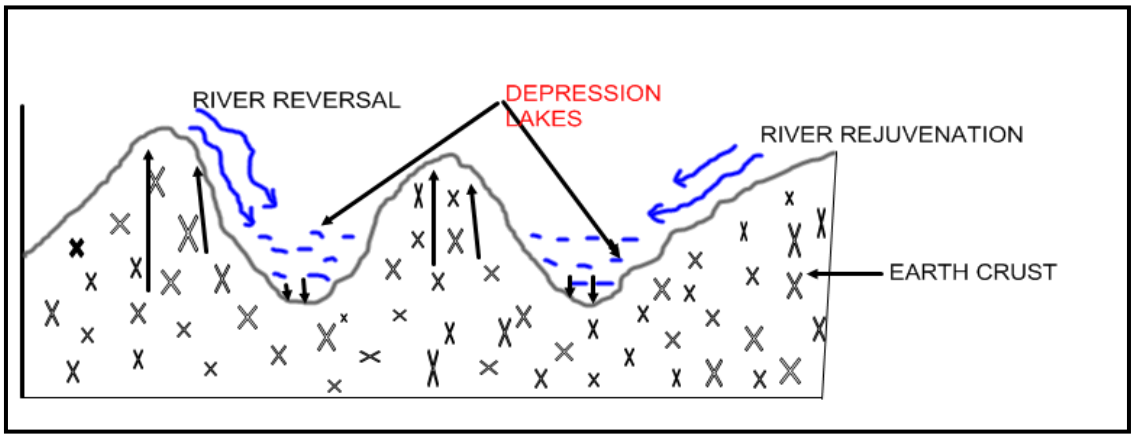
Approach

- Define faulting and mention the forces of tension and compression.
- Identify the land forms formed by faulting and where they are found.
- Locate the above on the map of Uganda.
- Examine the positive contribution and also the negative.

Crustal warping /Down warping and Up-warping

- ✓ The down warping and up-warping of the landscape in Uganda occurred due to an increase in the lateral compression force which affected the earth crust over a wide area.
- ✓ Down warping led to the formation of a great basin i.e. Victoria-Kyoga basin and the uplift led to the formation of uplands/plateau.
- ✓ Crustal warping also led to a general reversal in the drainage system of Uganda. Rivers such as Katonga, Kagera, Kafu, Mayanja which were originally flowing towards Atlantic Ocean reversed their water due to uplift of western Uganda to over flood the central basin. This led to formation of L. Victoria and Kyoga.
- ✓ Other rivers like Ruizi, Nzoia also reversed their flow due to uplift of the eastern Uganda. Other lakes formed include Wamala, Kachera and Kijanabarora.

Illustration of crustal warping



Folding

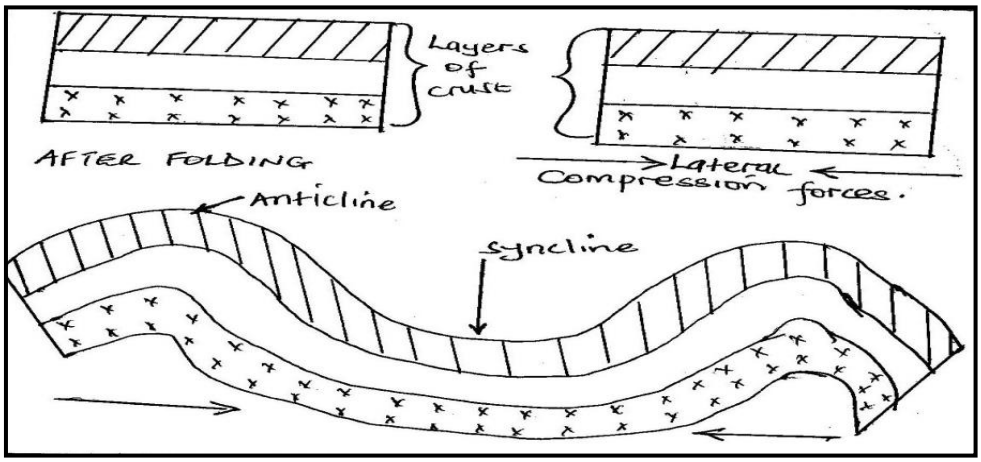
This is the process through which rocks of the earth's crust are forced to bend due to lateral compression forces.

Folding process led to formation of anticlines and synclines. It also led to formation of monoclonal folds, asymmetrical folds, and simple folds and over folds.

Folding mainly affected the central, west Nile, Kigezi and Northern Uganda.

Illustration of folding

Before folding **During compression forces**

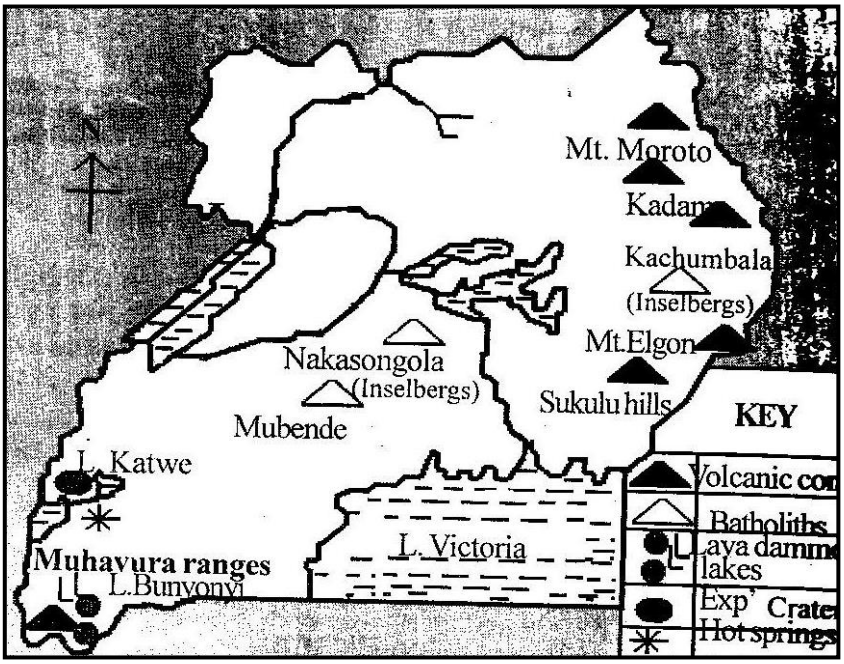


Vulcanicity

It refers to all the total process through which lava and other gaseous materials are either erupted into or onto the earth's surface to form various relief features.

Vulcanicity leads to formation of two types of relief features i.e. extrusive and intrusive volcanic features.

Distribution of volcanic landforms



1. Extrusive volcanicity

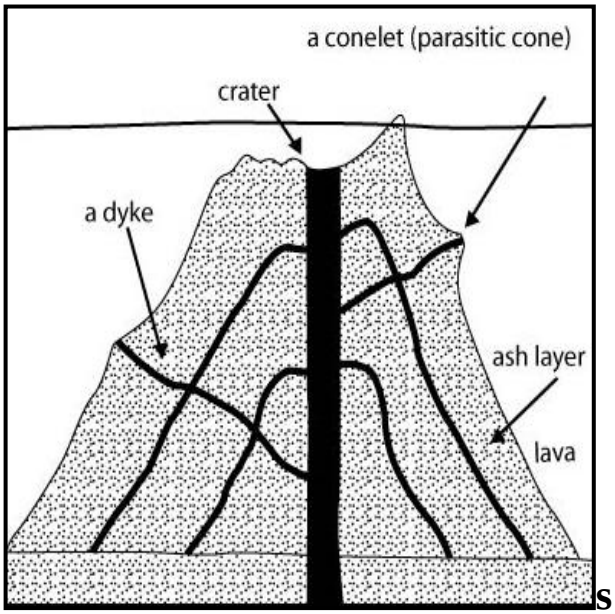
This is the process through which flowing lava and other gaseous materials through a vent are erupted to the earth surface, cools and solidifies to form relief features. Such features include volcanoes, calderas and caldera lakes, explosion craters and crater lakes, volcanic plugs and necks, scoria cones or ash and lava cones, lava dammed lakes and volcanic mud flows, volcanic hot springs, geysers and fumaroles.

a. Volcanoes.

This is a hill or mountain which is formed when lava flows through a vent and builds around it into successive layers to form a cone-shaped feature with a crater on top.

Examples of volcanoes include Mt. Elgon, Muhavura and Moroto.

STRUCTURE OF A VOLCANO



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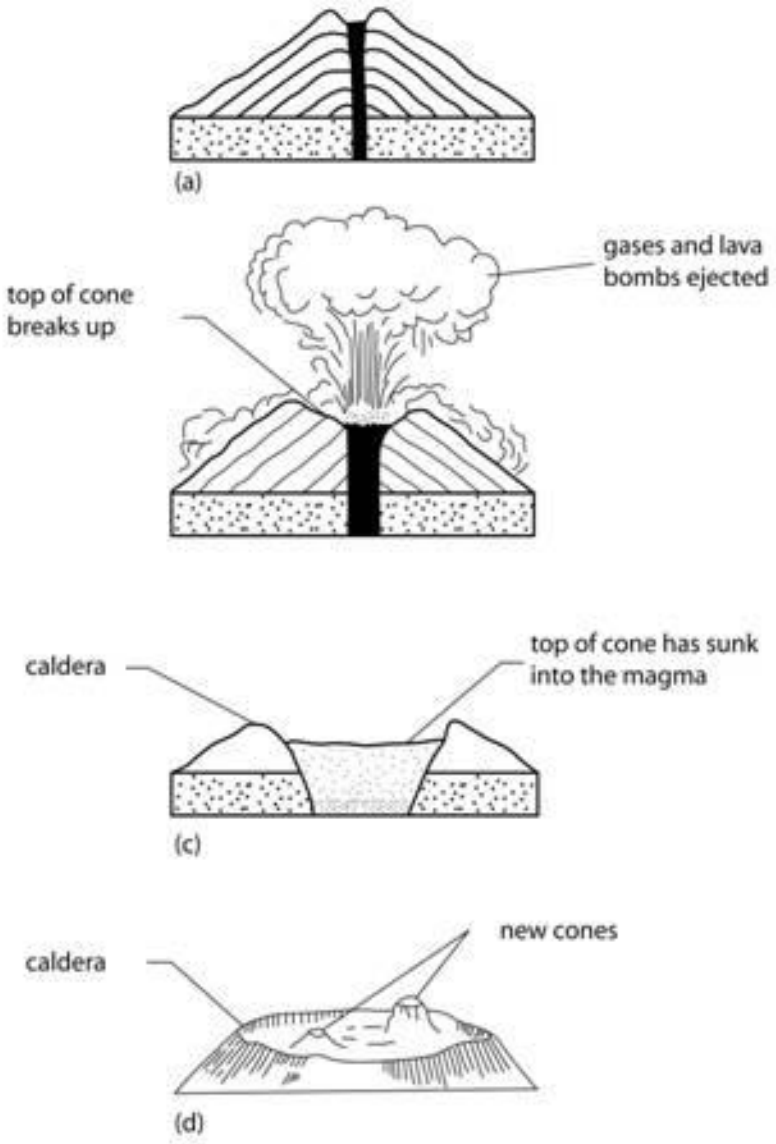
Volcanoes can be active, dormant, composite, or basalt dome volcanoes. It should be noted that active volcanoes are thought to have erupted recently while dormant volcanoes have not erupted. Composite volcanoes are made up of alternating layers of ash and lava while basalt domes are large flat topped convex hills formed by basic lava with gently sloping sides like Virunga hills of south western Uganda.

b. Caldera and caldera lakes

This is a large rounded depression which is formed when the upper part of a volcano is destroyed by a violent eruption.

When a caldera is filled with water it becomes a caldera lake like Napak caldera in Karamoja. Illustration;

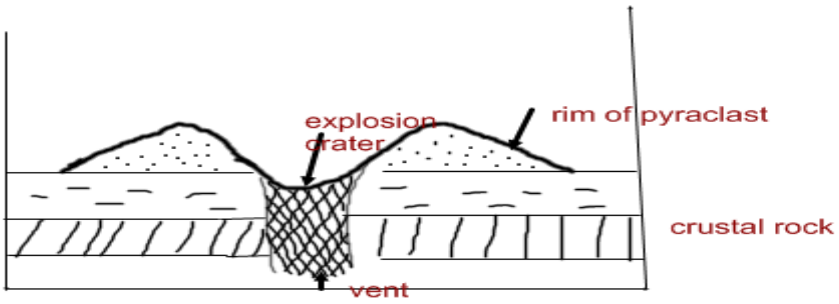


c. Explosion crater

It is a shallow flat floored depression which is surrounded by a low rim of pyro clasts (ash and lava) and rock. This is formed as a result of its vent being blown off.

When craters are filled with water it forms crater lakes like L. Katwe, Nyungu, Nyamusingira, Kyamwoga, Nyamunuka, etc in sw Uganda.

Illustration;



d. Volcanic plugs.

This is a cylindrical volcanic feature which is formed by lava which is so vicious and therefore forced to cool and solidify quickly within the vent. Examples include Tororo rock in eastern Uganda, a plug around L. Katwe explosion crater.

When a volcanic plug is destroyed by denudation processes such as erosion, what remains is called a **volcanic neck.**

e. Lava plateau/lava flows.

This is upland with a generally level summit which is made up of successive layers of lava. They are formed due to basic lava

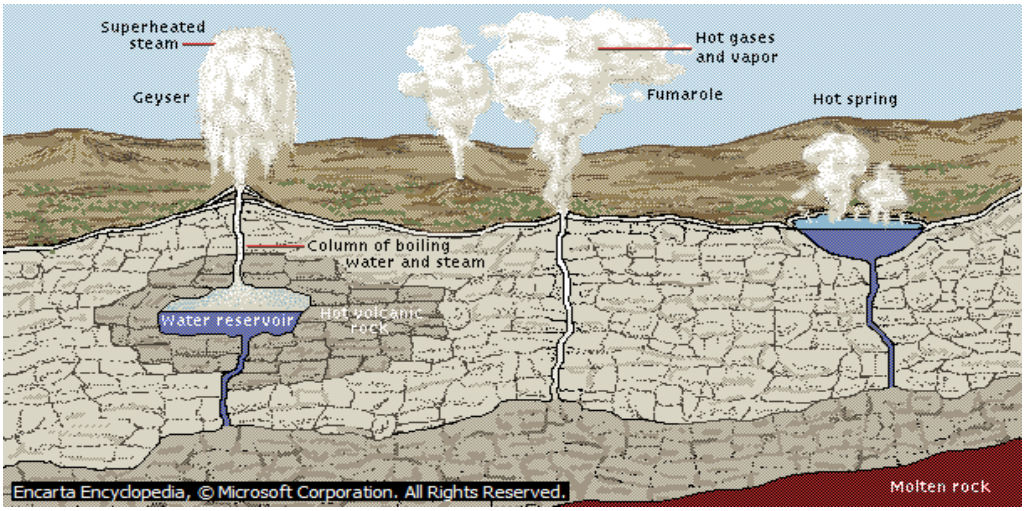
f. Lava dammed lakes.

These are formed when flowing lava blocks part of the river valley, forcing it to over flood its valley like L. Bunyonyi in Kabale.

g. Volcanic hot spring.

This is formed when water come into contact with heated rocks underground and they result into a spring of hot water on the earth's surface. Examples include sempaya hot sping in Bundibugyo, Kitagata in Bushenyi, Rubaale hot spring in Ntugamo.

Illustration;



h. Geyser.

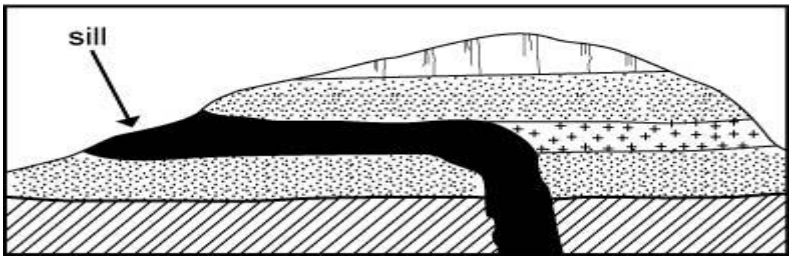
This is formed when hot water and steam are ejected out of the earth crust periodically in a violent form.

2. Intrusive volcanicity.

This is a process by which flowing magma fails to reach the earth's surface but instead cools and solidifies within the crust to form relief features. Such features include sills, dykes, batholiths, laccolith, ring complex, etc.

a. Sill.

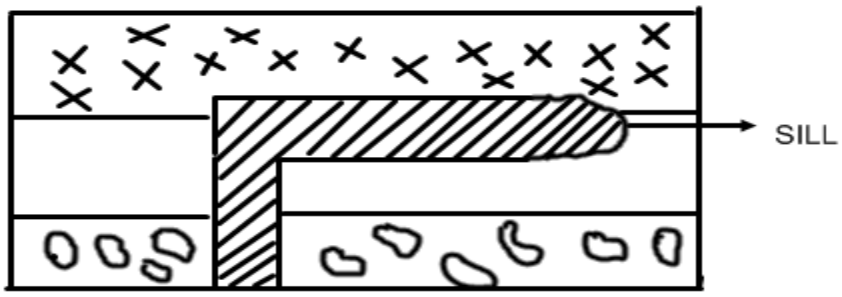
It is formed when flowing lava flows along the bedding planes of sedimentary rocks by forcing them apart. Examples include Mubende hills in western Uganda, sukulu hills near Tororo in eastern Uganda. Illustration;



b. Dyke.

This is a wall like structure which is vertically inclined rock sheet. Examples are found in Mubende hills and Sukulu hills.

Illustration;

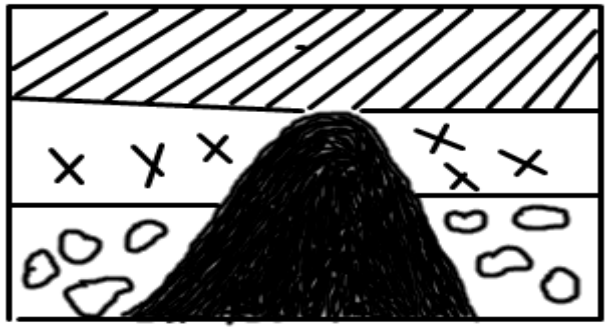


c. Batholiths

This is formed when flowing lava cools and solidifies at a great depth within the crust forming a massive volcanic rock.

When batholith rocks are exposed to the surface by denudation forces of weathering and erosion, they form granitic tors or inselbergs.

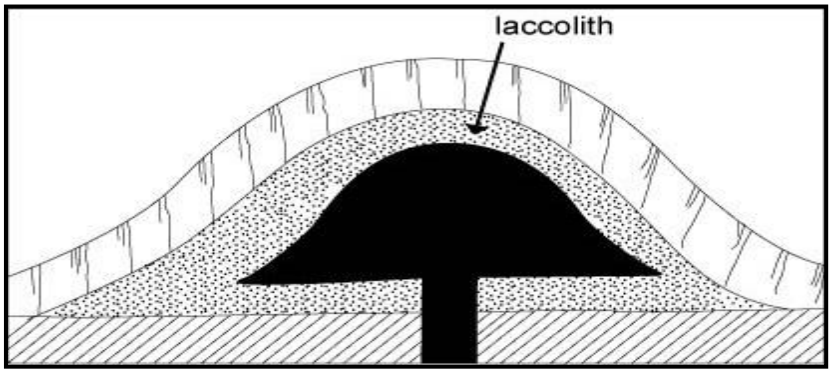
Examples of batholiths include Mubende hills, Kikandwa and Kawungere batholiths in central Uganda, Singo batholiths, Laabowr ranges and Parabong ranges in Northern Uganda, Nakasongola batholiths, etc. illustration;



d. Laccolith

This is a dome shaped intrusive volcanic feature with a flat topped floor. It is formed when vicious lava fails to spread out and therefore accumulates in a large mass and solidifies very quickly.

Illustration;



QN To what extent has volcanicity influenced landform development in Uganda?

Approach

- Define volcanicity
- Identify the extrusive volcanic features and where they are found.
- Identify the intrusive volcanic features and where they are found.
- Locate the above on the map of Uganda
- Explain the formation of extrusive volcanic features with aid of diagrams.
- Write that; 'however there are other processes responsible for landform development in Uganda'
- Then explain the formation of intrusive volcanic features.
- Then explain the formation of features formed by faulting, warping, folding and denudation forces (NB. Here be brief)

The role played by Volcanicity in the Economic development of Uganda.

The features of volcanoes, crater lakes, calderas, hot springs, batholiths etc formed by volcanicity have got the following positive and negative contributions to Uganda's development.

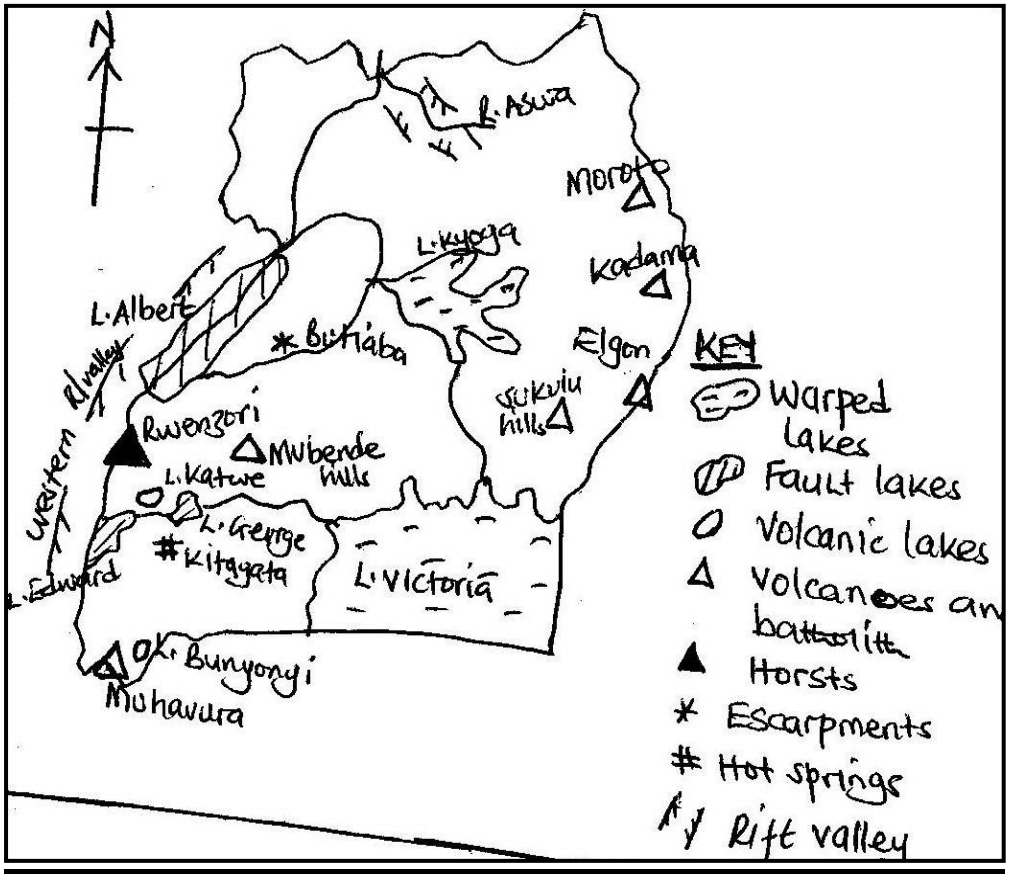
- ✓ Development of the tourist industry due to the spectacular sceneries of the volcanoes like Elgon, Muhavura, hot springs of Sempaya, Kitagata, craters like Nyungu, etc. This has helped to develop infrastructure, provision of foreign exchange and jobs to Ugandans.
- ✓ **Elgon volcano** is a source of **R. manafa, masaba, and siti** which provide water for domestic use like in mbale and Sironko, water for irrigation at **Doho irrigation scheme**, industrial water like for **Tororo Cement factory**, etc.
- ✓ The fertile volcanic soils of Kigezi hills, Elgon volcano are suitable for farming, settlement and infrastructural development. For example the slopes of Mt. Elgon are well known for coffee growing thus incomes and forex to Uganda, Kigezi for food crops like vegetables, iris potatoes thus reduced famine in Uganda.
- ✓ The slope of **Elgon volcano** has favoured the growth of dense forests. Such forests have led to climatic modification i.e. heavy rains for crop growing and development of the forestry industry. Also Bwindi impenetrable forests on Muhavura slopes has conserved Mountain golliras and chimpanzees thus development of the tourist industry.
- ✓ There is mining of salt in L. Katwe crater, this has earned Uganda foreign exchange, jobs to Ugandans and infrastructural development.
- ✓ Hot springs and geysers like sempaya and kitagata are a potential source of geo thermal power. This can be used for home consumption reducing on deforestation for bio mass.
- ✓ The wind ward sides of Elgon volcano and kigezi highlands block moist winds for relief rainfall for crop growing. This has ensured constant food production in such areas.

Short comings of volcanism to Uganda's development

- ✓ Volcanic soils lose fertility quickly which affect crop growing since constant cultivation means application of fertilizers which are expensive.

- ✓ The lee-ward side of Mt. Elgon in the northern parts of the volcano are dry a disfavor to the development of agriculture.
- ✓ Rivers such as Manafa which originate from Elgon volcano do flood during rainy seasons like in 2008 it flooded its banks leading to destruction of people's property.
- ✓ There have been landslides on the slopes of Elgon volcano like in Bududa and Bulambuli killing many people and destroying property.
- ✓ Crater lakes water like that of L. Katwe is saline less suitable for domestic use. The water is also dangerous to the people carrying out mining activities especially women.

Distribution of landforms formed as a result of Tectonism



Economic importance of tectonism in Uganda

Tectonism through its processes of faulting, volcanicity, crustal warping, earth quakes, etc, led to formation of different land forms in

Uganda such as rift valley, horsts, volcanoes, craters, plateau, basins, grabens, etc.

Such features formed have got both positive and negative contributions to Uganda's development as discussed below.

- ✓ Volcanicity led to formation of very fertile volcanic soils like around M.t Elgon, Kigezi and Muhavura. This has flourished farming especially plantations like tea in Mubende, rice in Kibimba, food crops in Kigezi, etc.
- ✓ There is mining of salt in L. Katwe, copper and cobalt on the foot hills of Rwenzori horst, sand and clay mining from L. Victoria shores, limestone in Tororo rock thus jobs, incomes and foreign exchange to Uganda.
- ✓ Volcanoes like Mt. Elgon, Rwenzori horst and fault lakes like Albert, crustal lakes of Victoria and Kyoga, hot springs of kitagata, all provide beautiful scenery for tourism attraction. This has earned Uganda foreign exchange, jobs and international relationship for development.
- ✓ Crustal warped lakes of Victoria and Kyoga, rift valley lakes like Albert and George are potential source of fish which provide proteins, jobs to fishermen, and develops fishing industry for economy diversification.
- ✓ Lakes formed as a result of tectonism like Victoria connect Uganda to Kenya and Tanzania, L. Albert link Uganda to DR Congo, this has promoted trade and led to international relationship.
- ✓ The glaciated Rwenzori horst and Elgon volcano are source of rivers such as Mubuku and Manafa respectively. Such rivers are potential source of HEP like Mubuku power station in Kasese and water for irrigation like to Doho by R. Manafa for industrial growth and food respectively.
- ✓ The slopes of uplands formed such as Rwenzori, Elgon and Muhavura ranges, facilitates the development of a dense forest which conserve wildlife, wild birds like Mgahinga forests (Mt.

golliras) on Muhavura ranges. Forests also provide wood fuel and timber especially to rural people of Kisoro and Kasese.

- ✓ The Rwenzori horst, Elgon volcano, etc modify the climate through relief rainfall formation which is heavy and reliable on the wind ward side. This facilitates flourishing farming like on the foot hills of Mt. Elgon.
- ✓ The folded highlands provide excellent grounds for population settlement. For example, the folded hills of central Uganda like in Kampala have attracted settlement on Ntinda, Mengo, Rubaga and Namirembe hills.

The short comings of tectonism include;

- ✓ The uplands formed tend to be steep limiting the construction of transport networks. This tends to lead to remoteness and inaccessibility of some areas in Uganda like some parts of Kasese and in kisoro s.w Uganda.
- ✓ Volcanoes such as Elgon are prune to landslides as it was in Bududa eastern Uganda and Sironko district. This leads to property destruction and loss of life.
- ✓ The highlands formed such as Rwenzori and Moroto create a negative climatic situation of rain shadow (lee-ward effect). The absence of rain in such areas discourages crop growing and settlement in some parts of Kasese.
- ✓ Young soils formed through the volcanic process tend to be porous and easily eroded once produced like in Kisoro. Such soils are infertile limiting crop growing.
- ✓ Mountains such as Rwenzori and Elgon are source of rivers like Nyamwamba and Manafa respectively which flood leading to loss of lives and property as it was in Kasese in 2014.

QN. Examine the role played by tectonism in the economic development of Uganda.

Approach

- Define tectonism.

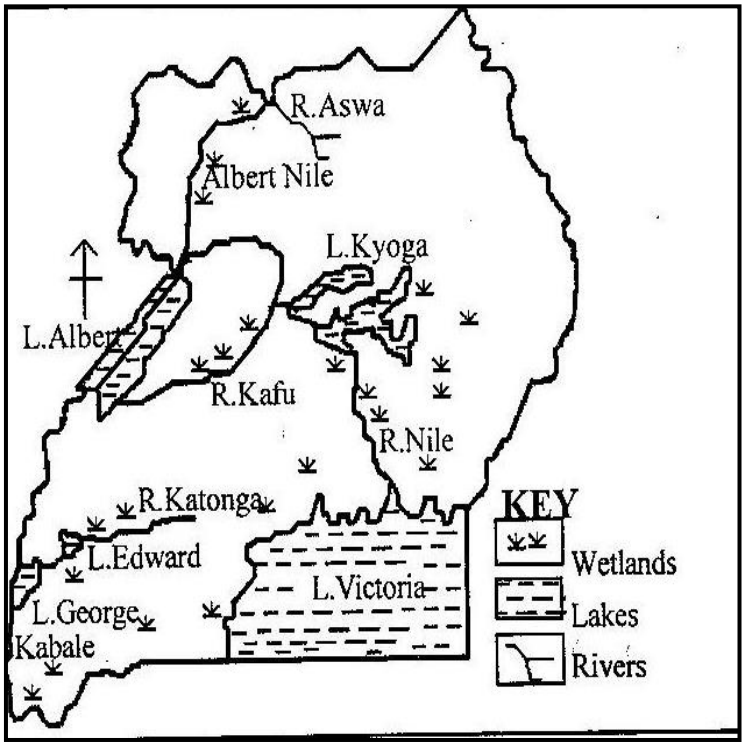
- Mention the processes of tectonism and identify the land forms formed by such processes and where they are found.
- Locate the features identified on a map of Uganda.
- Explain the positive and then the negative contributions of the features.

THE DRAINAGE OF UGANDA

Drainage refers to water logged areas of rivers, lakes and swamps. It is the different water sources in a country.

Uganda has got different drainage systems of lakes such as Victoria, Kyoga, Albert, Bisiina, Wamala, etc rivers such as Nile, Katonga, Kagera, etc. and Swamps like along rivers and lakes, others like Rubigi, Nabajuzi, kirihili, etc.

Distribution of drainage system in Uganda



Lakes

A lake is a body of water contained in a hollow with in a basin.

The size, depth and permanence of a lake depend largely on the nature of the basin on which it's located. In Uganda, there are

various lakes like Victoria, which is the largest, Kyoga, Wamala, Albert, George, Edward, Mburo, Bisiina and other volcanic lakes found in south western Uganda.
Lakes can be classified as;

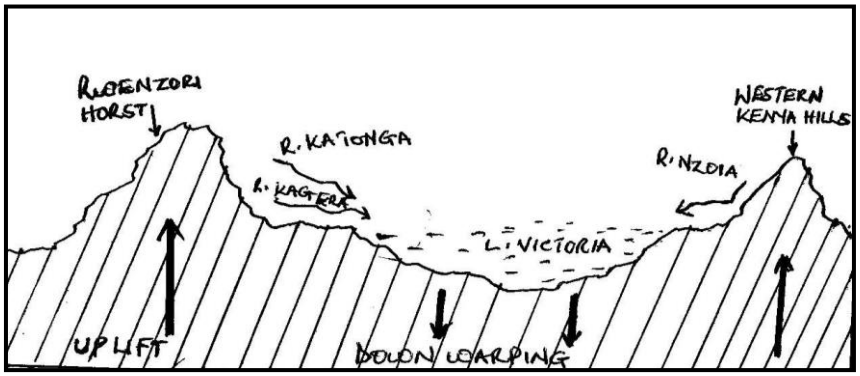
a. Depression/crustal warped lakes.

These include L. Victoria, Kyoga, Wamala and Bisiina. They are formed due to crustal warping in down warped basins. Such lakes are generally large and irregular in shape, shallow in depth, surrounded by swamps and their shorelines show influence of drowning inform of numerous inlets.

Formation of Lake Victoria

- Lake Victoria is a crustal warped lake located in a down warped basin in south eastern Uganda.
- Down warping and up-warping of the landscape in Uganda occurred due to an increase in the lateral compression force which affected the earth crust over a wide area.
- Down warping led to the formation of a great basin i.e. Victoria-Kyoga basin and the uplift led to the formation of uplands/plateau.
- Crustal warping also led to a general reversal in the drainage system of Uganda. Rivers such as Katonga, Kagera, Kafu, Mayanja which were originally flowing towards Atlantic Ocean reversed their water due to uplift of western Uganda to over flood the central basin. This led to formation of L. Victoria.
- Other rivers like Ruizi, Nzoia also reversed their flow due to uplift of the eastern Uganda to fill L. Victoria.

Illustration of crustal warping



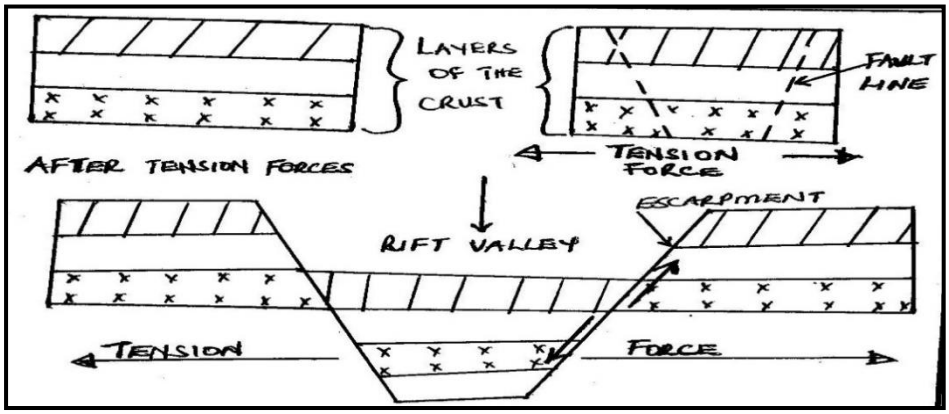
b. Tectonic lakes/ fault lakes.

- ✓ These are located in the rift valley occupying gradens formed by secondary faulting which was initially caused by tension and compression forces.
- ✓ Fault lakes are narrow and elongated in shape, boarded by steep sides or fault scarps, their waters are usually saline and inlets and outlets tend to be confined at their extreme end.
- ✓ Such lakes include Albert, George and Edward.

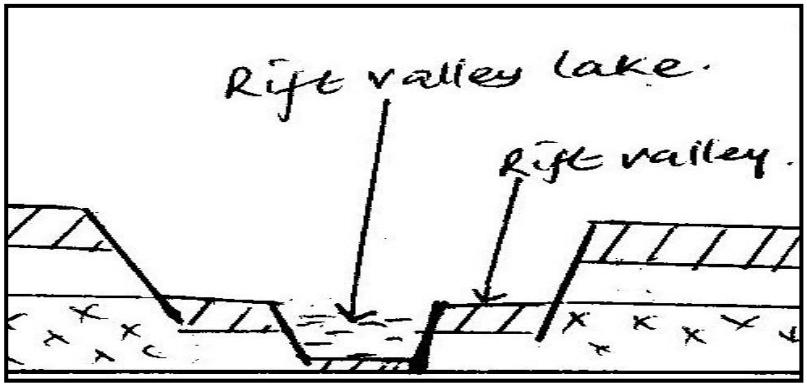
Formation of L. Albert

- ✓ L. Albert is a fault lake formed by faulting process due to tension and compression forces in the grabens within the rift valley.
- ✓ L. Albert found in western Uganda in the western rift valley is majorly believed to have been formed by compression forces due to its steep Butiaba escarpments.
- ✓ According to compression force theory, the existence of compression forces within the crust acted upon/pushed the adjacent blocks forming fault lines.
- ✓ The central block thrusted against the adjacent blocks forming an elongated depression/rift valley as illustrated.

Before faulting **during faulting**



- ✓ Later secondary faulting acted upon the rift valley forming a graben/ a more defied depression.
- ✓ When the graben was filled with water, it became a rift valley lake known as L. Albert.



c. Volcanic lakes.

These are formed by volcanicity and occupy craters and calderas formed as a result of eruption.

When the created craters or calderas are filled with water they form crater lakes or caldera lakes.

These include Lakes like Katwe, Nyungu, Nyamurangira, Nyamunuka, Kyamwoga, Munyanyange, and Nyamusingira all-in south-western Uganda.

Lava dammed lakes are formed where lava flow blocks the flowing river and floods a valley to form a lake such as Bunyonyi in Kabale, L. Mutanda, Butera, Muhondo, Mulehe, Ndalaga, all-in south-western Uganda.

d. Glacial lakes.

These occupy cirques on high mountains of Rwenzori formed by glaciations process. The constant erosion caused by glaciers on this snowcapped mountain of the moon, shallow steep sided depression are created known as cirques. When these are filled with water, glacial tarns are formed. Examples include Lac du Speke, Lac Catherine, Lac Noir and Lac Vert all on slopes of Mt. Rwenzori in western Uganda.

e. Weathered lakes.

Chemical weathering act on some rocks especially limestone and make them break. In such places large pits are created/formed, when the pits are filled with water small lakes known as solution lakes are formed like in Nyakasura south western Uganda.

f. Manmade lakes.

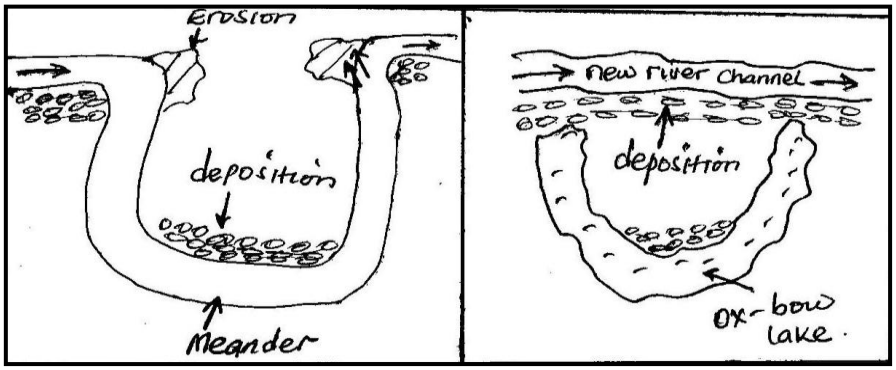
These are lakes made where man digs large depressions like Kabaka's lake in Rubaga-Kampala and L. Kibimba in eastern Uganda.

Other lakes were formed through digging fishing ponds like in Mawogola and Kapchorwa in eastern Uganda. Others were formed as valley dams like in Nyabushozi, Kashari and Isingiro in south western Uganda.

g. Deposition lakes or ox-bow lakes.

These are formed as a result of erosion and subsequent deposition along the lower course of a river. Such lakes are usually shallow and small and sometimes temporary. Ox-bow lakes formation is guided by meandering of a river as illustrated;

Meandering river and deposition



Examples of ox-bow lakes in Uganda have been found on rivers such as Semulik near Rwenzori and on R. Ruizi near Mbarara town.

Economic values of lakes in Uganda

- ✓ Lakes in Uganda have got both positive and negative values to the economic development of Uganda and these include;
- ✓ Lakes such as Victoria modify the climate of the surrounding areas along its shores of Mukono, Buikwe, Jinja, etc. through the process of evaporation and its breezes it forms heavy and reliable convectional rainfall supporting tea growing at Kasaku and sugar at Kakira for foreign exchange.
- ✓ Lakes provide water for irrigation at Lugazi sugar estate from L. Victoria, water to cool machines in steel rolling in Mukono and as a raw-material in Uganda breweries at Luzira from L. Victoria. Such industries have been source of consumer goods to Uganda reducing on imports.
- ✓ The water provided by lakes like Mburo has been used for animal consumption by the pastoralists in Kiruhura and by Mburo National park animals. This has diversified Uganda's economy through tourism and livestock farming. Also water from L. Victoria is used by Kampala and Masaka for domestic purpose.
- ✓ Lakes provide cheap water transport which has helped to promote trade and international relationship. Forexample L. Albert link Butiaba in Uganda to Muhanga in Congo, L. Victoria connects Jinja and Port bell of Uganda to Mwanza in Tanzania and Kisumu of Kenya.
- ✓ Lakes makes it possible for the generation of HEP like L. Victoria act as a reservoir for R. Nile where Owen falls dam and Bujagali dam are built.

  HEP in turn has led to industrialization in Jinja and Kampala for jobs and government revenue.
- ✓ The papyrus vegetation and other swampy vegetation around lakes Kyoga and Victoria has led to the development of the craft industry

were mats, roofing papyrus mats, etc are made. This has availed jobs to locals earning incomes for better living standards.

- ✓ The fresh water lakes of Kyoga and Victoria have provided fish such as Tilapia and Nile perch for proteins and development of the fishing industry. This has led to growth of fishing site like Lambu, Kasenyi, Jinja, Luzira, on Victoria and Lwampanga on Kyoga thus infrastructure development.
- ✓ Due to reliable rainfall provided by lakes such as L. Victoria, there has grown a dense forest within i.e. Karangara and Ssese islands forests and around the lake like Mabira. This has developed the forestry industry for job provision and economy diversification.
- ✓ Sand which is found at the shores of L. Victoria is used for construction purpose and glass making. Salt mining in L. Katwe, oil Prospects in Albert shores, clay mining in Kajjansi for ceramics on L. Victoria shores, all provide jobs to Ugandans, foreign exchange and infrastructure development.
- ✓ Lakes provide natural habitats for millions of plants, animals and birds. This promotes eco-system like at L. Mburo and George. The above coupled with the blue waters and beautiful scenery f lakes like Bunyonyi in Kabale, coastal features of beaches like Liddo, Nabugabo, on Victoria attract tourists for foreign exchange.
- ✓ Lakes provide great opportunities for research and study purpose in relation to fisheries, forestry, navigation and soils. There is also a meteological department at Entebbe thus weather studies which all help Ugandans understand their environment and make proper planning especially in the farming sector.

The short comings of lakes to Uganda's development include;

- ✓ Lakes are dumping grounds for industrial wastes like Uganda breweries factory at Port Bell in Luzira dump its wastes into Lake Victoria which pollutes its waters becoming un condusive for domestic use and fish existence.

- ✓ Navigation on lakes is associated by a number of accidents caused by strong winds like on L. Albert claiming a lot of important labor in form of people who would be productive for development.
- ✓ Lakes are barriers to construction of transport networks of roads and railway. For instance, L. Bunyonyi has made some parts of Kabale remote and backward. The low levels of infrastructure in such areas lead to low trade development and low Uganda's development.
- ✓ The swampy vegetation on crescents of lakes like Kyoga are breeding grounds for dangerous pests like mosquitoes and tsetse flies. Such pests transmit human diseases such as malaria and sleeping sickness respectively to people in Lwampanga on Kyoga.
- ✓ Sometimes lakes over flood their shorelines and this leads to property destruction and loss of lives. For instance, L. Bisiina flooded in 2007 causing water borne diseases to people in the area.
- ✓ Lakes that are shared by different countries like Albert and Edward by Uganda and Congo, Victoria by Uganda, Kenya and Tanzania, cause conflicts especially during usage of the lake in fisheries, transport and mining as it was between Uganda and Kenya over Mijingo island and on Albert with Congo.
- ✓ The changes in water levels lead to submergence and emergence of water which leads to destruction of ports as it has been on L. Albert.
- ✓ Some lakes like Albert and George fault lakes have got saline water and fault scarps along their shoreline which discourage fishing activities hence low development of the fishing industry.
- ✓ Lakes also harbour dangerous wild animals such as snakes, crocodiles and hippos which destroy crops and claim people's lives like in L. Albert and Edward.

QN. Discuss the formation of Kyoga basin and examine the economic viability of the lake to the region where it is located.

Approach

Define a lake.

Identify where Lake Kyoga is found and some of the landing site on the lake.

Locate the lake differently shaded on the map of Uganda with other lakes. Make sure you indicate its landing sites.
With aid of diagrams explain its formation.
Explain with examples the positive and negative importance of the lake MAJORY to the region where it is located.

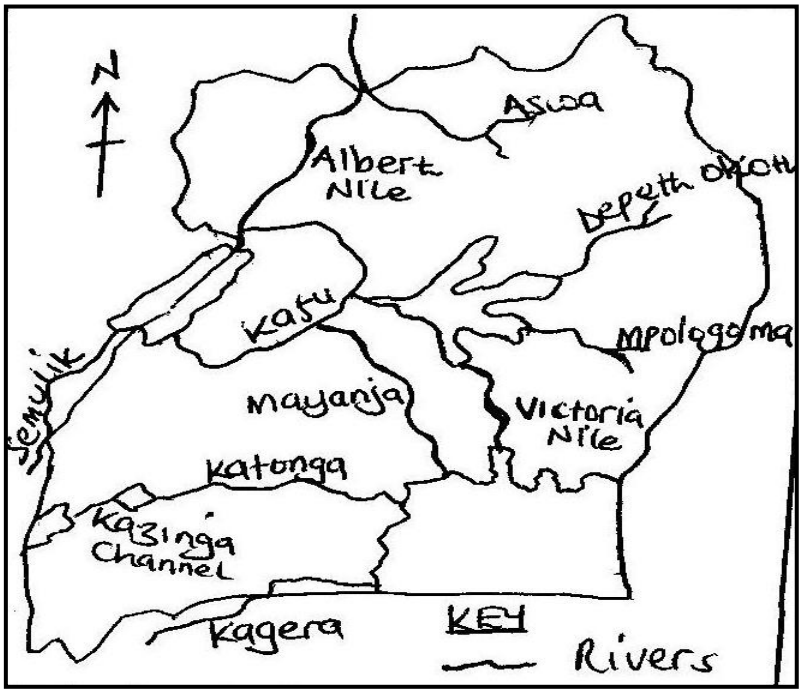
Rivers

Uganda is drained by various rivers almost the entire landscape of the country. They are majorly nine rivers which include;

1. R. Nile which includes Victoria Nile and Albert Nile. It has its source in L. Victoria and its mouth in Mediterranean Sea.
2. R. Katonga which flows from L. George to L. Victoria.
3. Mpologoma-Manafa River, which originates from Mt. Elgon to L. Kyoga.
4. Mayanja-Kato River, which has its source in L. Victoria and its mouth into Kafue.
5. Aswa-Moroto River, it originates from north eastern Karamoja areas to R. Nile.
6. R. kafue which originates from L. Kyoga to L. Albert.
7. R. Kagera, it originates from Rwanda hills to L. Victoria.
8. Depeth-Okoth which originates from Karamoja hills to Kyoga.
9. R. Semulik and Mubuku.

Other rivers in Uganda include R. Rwizi, R. Sezibwa, R. Okere, Birira River, Nyamwamba, etc.

Major rivers in Uganda



River profile

This refers to the measured slope along the bed or surface of the river from its catchment area to its mouth. A river profile is divided into three sections i.e.

- The youthful stage
- The mature stage
- The senile stage.

During the erosion and deposition of a river there are different features formed i.e.

Waterfalls such as Owen falls, Bujagali falls and Muchison falls on R. Nile, Sezibwa falls on R. Sezibwa, Kisiizi falls, etc are formed by river erosion.

River deposition especially in its lower stage form ox-bow lakes as at R. Rwizi, deltas, etc.

Drainage patterns

A drainage pattern is a lay out plan which is made by a river and its tributaries on the landscape. In Uganda, the different patterns can be identified;

- Dendritic drainage pattern

- Radial
- Trellis
- Centripetal
- Annular
- Barbed

N.B River rejuvenation refers to a renewed river capacity in a river valley. Rejuvenation can be caused by heavy rains and river capture.

River capture or piracy refers to the diversion of part of a river course or whole of it into the system of another adjacent powerful river.

Economic value of rivers in Uganda

- ✓ Rivers are source of water for domestic, industrial and recreation purpose. For instance, Mbarara town get water for domestic use from R. Rwizi, Nile breweries use water from R. Nile as raw-material in making beer hence provision of jobs to Ugandans and government revenue.
- ✓ The water from rivers like Mubuku and Manafa is used to facilitate irrigation at Mubuku irrigation scheme in Kasese and Doho in eastern Uganda respectively. Such schemes have increased on food production and foreign exchange after rice and vegetable exports.
- ✓ Rivers facilitates generation of HEP like Owen falls dam and Bujagali dams on R. Nile, Mubuku power station on R. Mubuku, etc. HEP has led to industrial development thus infrastructure development and jobs to Ugandans.
- ✓ Rivers provide cheap water transport by ferry means like on Victoria Nile. This has developed local trade, provided incomes to transporters hence improved living standards.
- ✓ The papyrus swamps which develop along river banks such as on R. Katonga and Mpologoma are potential raw-materials for paper, packing, cardboards, roofing materials and the general development of the craft industry thus employments to Ugandans.
- ✓ Rivers are tourist attraction especially waterfalls of Murchison, Bajagali, Sipi and Karuma falls. The meandering nature of R. Rwizi

attracts tourists for foreign exchange in terms of invisible export which is used for further development.

- ✓ Rivers like Nile provide fishing grounds and fish caught for local consumption and for sale. The swampy areas along R. Katonga provide mud fish, which provide proteins and sold for better incomes to Ugandans.
- ✓ The swampy areas and wetlands along river channels are natural habitats for wild animals, birds and other marine life. Shoe bills and crested cranes survive in R. Nile wetlands attracting tourists for foreign exchange.
- ✓ There is clay mining along rivers like Katonga and Mpologoma for brick laying thus development of small-scale industries for jobs to Ugandans.
- ✓ Rivers like Nakivubo channel help to regulate the environmental impurities that would directly enter L. Victoria leading to its pollution. Also rivers modify the climate where they exist like river Manafa form reliable rainfall which supports rice and other crop growing in eastern Uganda.
- ✓ River banks like Albert Nile have got fertile soils in West Nile areas supporting tobacco and other crop growing. This also has attracted settlement in the areas of Nebbi, Arua, etc. the grown crops have contributed foreign exchange to Uganda through exportation.

The short comings of rivers include;

- ✓ Some rivers tend to over flood their valleys during rainy seasons as it was in 2007 in north eastern Uganda and in 2014 in Kasese by R. Nyamwamba. This cause property destruction, loss of lives and interfere with transport networks since floods wash away bridges.
- ✓ Most rivers contain waterfalls and rapids like along Nile at Karuma which make navigation impossible thus resulting into remoteness and inaccessibility of such areas.

- ✓ Most rivers like in northern Uganda make the construction of feeder roads hard like at Karuma Bridge which makes such areas remote and inaccessible especially during rainy seasons.
- ✓ The swampy vegetation along river channels like along Katonga harbour disease vectors such as mosquitoes and tsetse flies which cause diseases such as malaria and sleeping sickness respectively to human beings.

N.B The economic importance of the drainage system of Uganda includes;

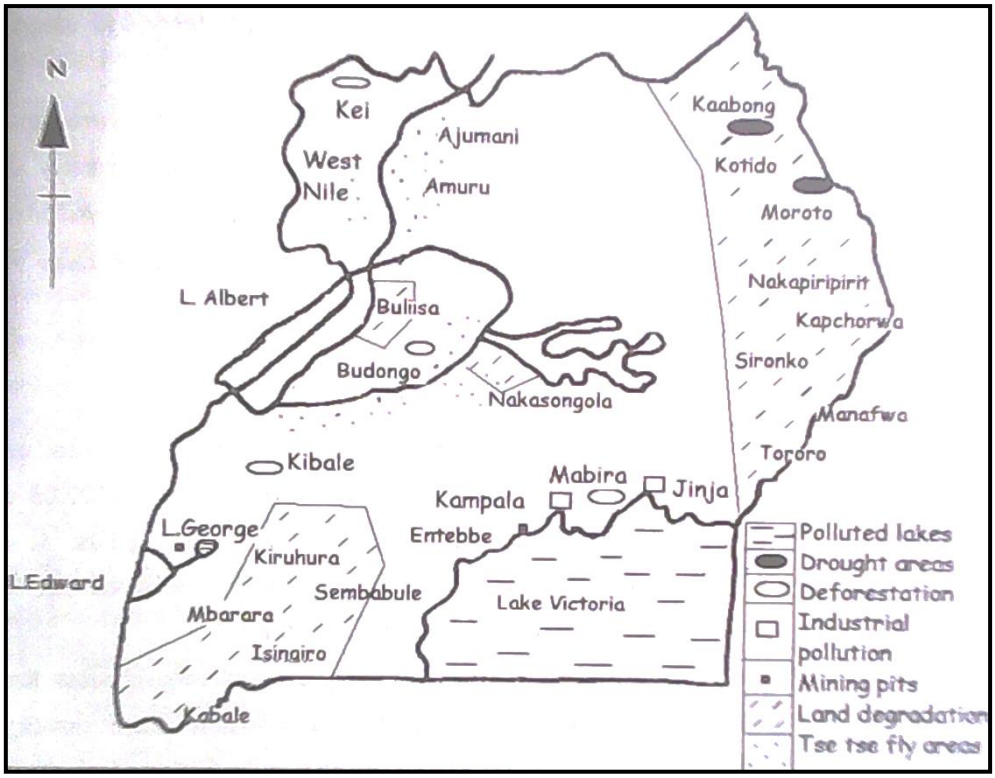
- Values of lakes
- Values of rivers
- Values of swamps

Environmental degradation

Environmental degradation is the deterioration of the available renewable and non renewable resources. It is the decline of the productive value of man's environment.

- ✓ The degraded resources in Uganda include water, atmospheric air, soils/land, vegetation and forests, swamps/wetlands, minerals, etc.
- ✓ The degradation in Uganda is in form of water pollution, deforestation, mineral exhaustion, soil erosion and exhaustion, swamp reclamation, air pollution, etc.
- ✓ It should be noted that by 2001, 4-12 of Uganda's GDP was lost due to environmental degradation
- ✓ By 2004, 10-11% of the biodiversity was lost.

Map of Uganda showing areas of environmental degradation



Causes of environmental degradation in Uganda

Environmental degradation in Uganda has been a result of both human and physical factors explained below.

- ✓ Over grazing due to overstocking by pastoral tribes like Karamajong in Kaabong, Kotido, Moroto and Hima of Kiruhura, Sembabule, Mbarara, etc. This has led to devegetation exposing land to soil erosion and loss of fertility thus land degradation.
- ✓ High population pressure in areas of Kisoro, Kabale, Mbale which has led to land fragmentation thus over cultivation of land leading to reduced soil productivity causing land degradation.
- ✓ Extensive swamp reclamation like in Nabajjuzi wetland in masaka for settlement, Mpologoma and lumbuye wetlands for cultivation, this has led to loss of birds and animal habitats, drying up of streams, reduced land productivity and arid conditions.
- ✓ Monoculture has led to depletion of soil nutrients and a general loss of soil productivity. Coffee and banana growing areas of Mukono, Masaka, Mbale, tea growing at Kyamuhunga in Bushenyi, sugar

cane growing at Lugazi season by season has all led to land degradation.

- ✓ Deforestation for purposes of wood fuel and timber in Mabira, Budongo, mt. Elgon forests has led to loss of forests. The continued loss of forests has led to soil erosion and degradation and low and unreliable rainfall in such areas.
- ✓ Bush burning by pastoral tribes of Hima in Isingiro, Kiruhura, Karamajongs in Kaabong, Kotido, has led to loss of vegetation leading to soil erosion and degradation.
- ✓ The use of pesticides and over use of fertilizers in rice growing at Doho, kasaku tea in Mukono, coffee growers in Masaka and Mpigi all at the end leads to pollute soils, leads to death of soil living organisms which are responsible for soil formation thus land degradation.
- ✓ Industrialization has led to water and air pollution especially in industrial cities and towns of Jinja, Kampala, Kasese, Tororo, etc. This emanates from industrial fumes and wastes like Uganda breweries at Luzira pollutes Lake Victoria leading to death of aquatic life thus degradation.
- ✓ The effect of poor disposal of industrial products like plastic bottles, polythene bags, which takes long to decay causing soil deterioration. Companies such as coca cola, Nile house of plastics are responsible for accumulation of plastic products into soils thus land degradation.
- ✓ Mining of minerals like copper at Kilembe-Kasese has led to mineral exhaustion and land deformation, clay at Kajjansi-Wakiso has deteriorated swamps affecting rain formation and ecosystem thus swam reclamation.
- ✓ The continued road construction which involves excavating of the landscape leading to soil erosion and landslides. Roads like Kampala-Kabale, Kampala-Gulu, Northern-by pass, Entebbe express high way, have reclaimed swamps, deformed land and cleared forests.

- ✓ Political instabilities in Uganda since 1970s, with 1980s Luwero triangle war, the 20-year LRA Kony war in Gulu, ADF-Kasese threats, Kampala city demonstrations all leads to loss of lives, vegetation and land degradation. Also the tear gas affect man, animals and insects as well as the ozone layer.
- ✓ The practice of indiscriminate fishing and use of poison during fishing has affected the aquatic life leading to exhuastion. On lakes such as Victoria, Kyoga, Albert, fish has reduced and water contaminated by poison affecting human life.
- ✓ Increasing use of second hand motor vehicles, computers and other machinery which emits nitrogen-oxide and other fumes leading to air pollution. In congested towns such as Kampala, Jinja, human life is affected by such fumes causing cancer, acidic rains received and global warming.
- ✓ Floods due to heavy rains have destroyed agricultural land, crops and settlements. Elnino rains of 1997-98 in Uganda led to floods which caused diseases like cholera in Kampala, killed people in Bwaise and kalerwe, destroyed crops in soroti, caused erosion in Kisoro thus land degradation.
- ✓ Mass wasting inform of landslides in Bududa and Bulambuli have buried and destroyed a variety of fauna and Flora. Such slides have caused deforestation, deformation of landscape and death of people.
- ✓ Weeds such as water hyacinth on lake Kyoga and Victoria has affected fish existence since it absorbs oxygen gas from water thus fish death. The weeds also affect boat movement and the general fishing industry.
- ✓ Crop pests like locusts, caterpillars, and diseases such as coffee wilt, banana wilt, all attack and destroy Flora in form of crops and trees in Mabira, Mpigi, Luwero, etc. This reduces crop productivity and changes natural vegetation.
- ✓ In addition to above are animal pests like ticks, tsetse flies, which attack and reduce the quality of animals both domestic in Kaabong, Kiruhura, mbarara and also diseases such as foot and mouth, East

coast fever killing animals in Queen Elizabeth and Kidepo national Park. This lowers the productivity of fauna in Uganda.

- ✓ Drought ie prolonged sun shine in karamoja areas of Moroto, Kaabong, western rift valley of Kasese, has caused land degradation. Drought leads to wind erosion, reduced vegetation cover and affects the water table thus degradation.
- ✓ Heavy rains characterized by hailstorms have destroyed crops and killed animals in Isingiro, Iganga, Kamuli, Kayunga, etc. Such strong winds have reduced productivity in crops, led to famine and general effect to wildlife.

Effects of environmental degradation

- ✓ These effects are majorly negative and they include
- ✓ Siltation of rivers and streams due to soil erosion ran off into streams like Birira, Ishasha and lakes such as Bunyonyi and Mutanda. This eventually leads to death of aquatic life and water contamination.
- ✓ Lowering of the water table due to destruction of wetlands of Lumbuye, kirihiri, Mutai, leading to drying up of streams like in Kabale. This reduces water for domestic purpose, affects aquatic life and leads to unreliable rainfall.
- ✓ Degradation leads to desertification since forests, wetlands and atmospheric air is endangered through blocking the process of evapo- transpiration and evaporation. This reduces rainfall received and its reliability in areas like Kaabong, Sembabule, Kiruhura, etc.
- ✓ Reduction in soil productivity due to soil erosion in Mbale, soil exhaustion at Kasaku in Mukono and overgrazing in Kiruhura. This leads to reduced crop and animal yields thus famine in Kabale, Mubende, etc.
- ✓ Reduction in fish from water bodies like Victoria and Kyoga due to increased water pollution and indiscriminate fishing. This has affected local incomes at Kasenyi, Uganda's GDP due to reduced fish exports and reduce animal proteins from fish.

- ✓ Increased health hazards such as heart diseases, high blood pressure, cancer due to pollutant gasses from industries, vehicles in Kampala, Jinja, etc. This has led to death of many Ugandans.
- ✓ There is reduction in wildlife in Kisoro, Kasese, Hoima where Lions, gorillas, chimpanzee, since its habitats are destroyed due to deforestation.
- ✓ Landslides have blocked roads like in Bundibugyo, Bududa, Bulambuli, etc. These impassable roads like Kabale-Kisoro have hindered trade and communication in Uganda.

Measures to overcome environmental degradation and it's effects

- ✓ Afforestation and reforestation programs have been under taken in areas of Mbarara, Kabale, Ntungamo which have controlled soil erosion.
- ✓ Terracing is widely practiced in Kigezi highlands of Kisoro, Rukungiri which has reduced on soil erosion and thus controlled soil exhaustion.
- ✓ Crop rotation has been under taken in Kumi, Pallisa where farmers grow maize, beans, cotton, cassava, etc. this has enriched the soils.
- ✓ There has been controlled grazing through establishing of ranches in Mbarara, Nakasongola, Kiruhura, etc. This has reduced on vegetation destruction and soil erosion.
- ✓ Agro-forestry is going on in Kabale, Kabanyoro in Wakiso, Bushenyi, etc. This practice of growing crops with in trees has modified climate and controlled erosion.
- ✓ Production of more power through dams of Bujagali in Jinja, Karuma, Bugoye, has helped to conserve forests. Also energy saving stoves has saved trees thus controlling soil erosion and modification of the climate.
- ✓ Massive education is being done in order to create awareness on the dangers of environmental degradation and how to combat it. This has helped to conserve forests and wetlands in Manafa,Bukwa and Kabale.

- ✓ Regional co-operation between Uganda and her neighbours of Kenya and Tanzania over protection of L. Victoria fisheries (LVEMP) L. Victoria Environmental Management Programme. This has ensured sustainability of L. Victoria fisheries.
- ✓ There has been enacting of laws to protect the environment. It is not allowed to settle in wetlands and NEMA was set up to enforce such laws which protect swamps of Lubigi in Wakiso, Nabajjuzi in Masaka, etc.
- ✓ The government of Uganda has set up NEMA and NFA to manage wetlands and forests respectively. NEMA has already evicted wetland encroachers in Lubigi in Wakiso, Bugolobi and Ntinda in Kampala, etc.
- ✓ There have been population control measures to reduce on population pressure on land, forests and other resources. The introduction of UPE and USE, use of condoms, pills in Kamuli, Kalangala, etc has indirectly conserved the environment.
- ✓ Improved security through the use of Uganda police and UPDF. The disarming of the Karamajong pastoralists in Kaabong and Moroto as well as peace in Gulu and west Nile has reduced on environmental degradation caused by insecurity.
- ✓ Spraying using chemicals of pesticides and insecticide to locusts in Amudat, Nakapiripiriti, etc, to tsetse flies in Mayuge, Nakasongola and Kiruhura, which has controlled death of wildlife as well as destruction of vegetation.
- ✓ There has been discouraging of bush burning in many parts of Uganda like in Lwera, Moroto, Mbarara in order to protect the soils against soil erosion.
- ✓ Recycling of scrap products especially steel to avoid dumping and land pollution. Industries like Shumuk in Kampala and Rwenzori beverages as well as nice house of plastics have recycled plastic bottles and polythene bags thus preserving environment.
- ✓ Application of fertilizers, organic manure and mulching has helped to enriched the soils in many parts of Uganda. The use of artificial

fertilizers at Kakira sugar estate in Jinja has reduced on soil exhaustion and erosion.

Tourism and wildlife resources

Tourism is the practice of travelling for purpose of either pleasure or curiosity. Tourism involves movement from one area to another within or outside the country.

Uganda's tourist potentials

The potentials for Uganda's tourism industry are categorized as;

1. **Mountain and drainage scenery (landscape).** This includes physical features of Uganda such as;

- Great rift valley/western rift valley and its associated features of escarpments like Butiaba and kicwamba, Rwenzori horst, rivers like Mubuku, lakes like George and Edward. These attract tourists to western Uganda.
- Volcanic features of Mt. Muhavura, Elgon, and Moroto, Napak caldera, explosive craters of Nyungu, Katwe, hot springs of Kitagata and geysers.
- Glacial features of Pyramidal peaks like Margarita, arêtes, glacial troughs like Lac du Speke, Lac Catherine, all on Mt. Rwenzori with activities of ice skating and mountain climbing.
- Coastal features such as spits, cliffs and caves like on Kasenyi landing site on L. Victoria, beaches such as Lutembe, Lido, Aero and Botanic, on L. Victoria.
- Blue water lakes of Victoria and Kyoga where swimming activities take place, game fishing, boat rides, etc.
- Rivers such as Nile, Katonga, Aswa with spectacular attractive waterfalls of Owen falls, Karuma and Bujagali on R. Nile, Sezibwa falls, Siipi falls Kisiizi falls, etc.

2. **Wildlife (fauna and flora).** These include;

- **Fauna**, Uganda has a variety of wild animals which are gazetted into National parks and game reserves. Such parks include Mt. Rwenzori

N.P, Queen Elizabeth N.P, Kidepo N.P, L. Mburo N.P, Mgahinga N.P, Bwindi Impenetrable N.P, Semuliki N.P, Kibale N.P and Toro N.P.

The game reserves include Pain-upe, Bukora, Karuma, Matheniko, Bugungu, Kigezi, etc. there are also sanctuaries in Uganda such as Jinja sanctuary for hippopotami, Entebbe sanctuary, Bwindi impenetrable forest for Mt. golliras, Mt. kei in Arau for white Rhinos. Also zoos like Entebbe Wildlife Education Centre.

Uganda has got avi-tourism i.e. bird watching with various bird species along Kazinga channel, Queen Elizabeth N.P, Semulik N.P, etc.

- **Flora**, Uganda has got an impressive vegetation cover which attracts tourists from abroad. These include the dense tropical rain forests like Mabira in Mukono, Budongo, Kalinju, etc,

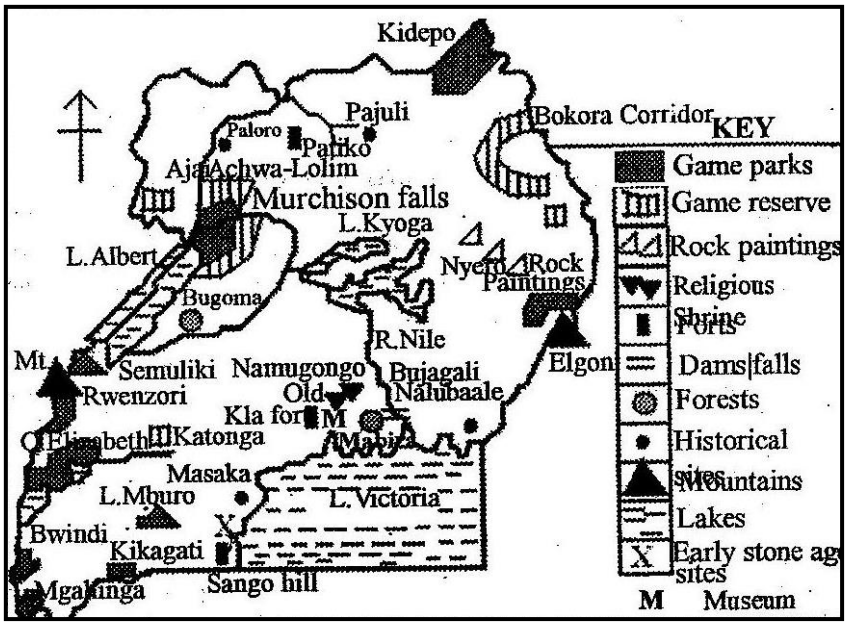
  Also the swampy vegetation along rivers like Mpologoma and Katonga, the dry savannah of Kitgum, Kaabong, Moroto and savannah grass land in the western rift valley all attract tourists.

3. **Climate,** the tropical climate of Uganda in districts of Kampala, Wakiso, Mpigi has attracted tourists from abroad for sun bathing activities on beaches of Nabinonya, Aero on L. Victoria. Also tourists during November-February come for 'refugee' in Uganda due to the winter season thus benefiting from Uganda's tropical climate.
4. **Culture potential,** Uganda is rich in cultural heritage of traditional dances of Baganda, dressing style of Banyankole, traditional dishes like 'Oluwombo', burial grounds like Kasubi tombs of Buganda kingdom which all attract both local and foreign tourists.

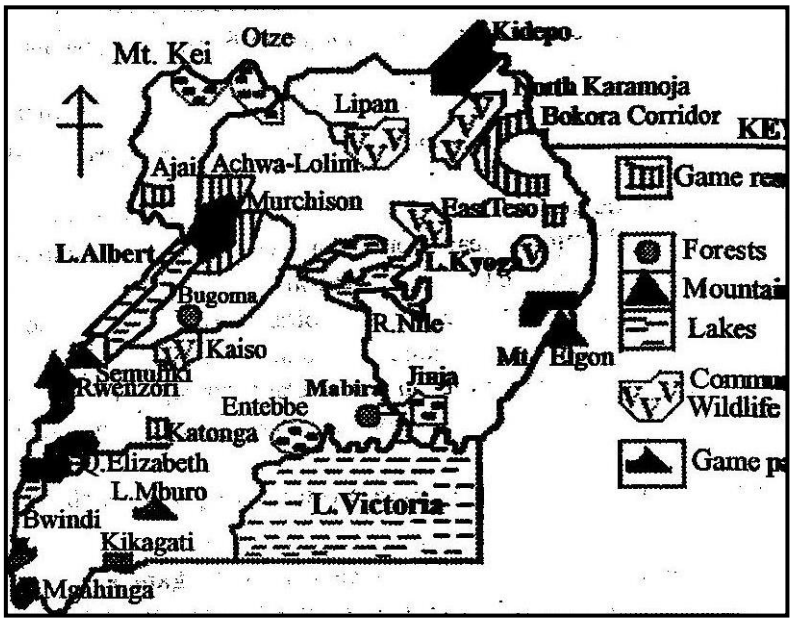
   Other heritages include Namugongo martyrs shrines in Wakiso, Nyero rock paintings in Kumi, artifacts, wood carvings and hand crafts all attract tourists.
5. Historical attractions, these include Uganda museum in Kampala, Sango Bay, Oruchinga valley, Bigobyamugenyi and Kagadi in Mubende, Lugard's fort at Old Kampala all attract tourists.

6. The equator, many local tourists and foreign visit areas in Uganda where the equator crosses for photographs and feel of the equator thus important tourist potential.

Map of Uganda showing its tourist potentials.



Map of Uganda showing her national parks, game reserve historical site and resorts.



Status of Uganda's tourist industry

- The sector majorly depends on wildlife of fauna and flora.
- More game parks and reserves have been gazetted up to over 22 in total.

- The sector contributes 25% of Uganda's export earnings per year and the number of tourists is constantly increasing per year.
- The sector has employed many people over 70,000.

Factors that have favoured the development of Uganda's tourism sector

✓ Presence of a wide range of tourist attractions which ranges from physical to human aspects. These include land forms such as spectacular lakes and rivers like Victoria with beaches like Lido, Botanical, and water falls on river Nile such as Karuma, Murchison, etc, all attract tourists.

✓ The presence of fauna and flora within the forest reserves and natural forests like Mabira, national parks like Kidepo with different animal species such as giraffes, lions, zebras attract tourists thus development of the industry.

✓ Historical sites of Uganda museum in Kampala, kasubi tombs in Mengo, martyrs shrines in Wakiso, Kinyankole dressing style, Baganda dances, all attract tourists to Uganda leading to development of the industry.

✓ The climate of Uganda being warm and wet tend to attract people especially from European countries during winter seasons between November and February each year contributing a lot of income for the development of the industry.

✓ Improved transport network of roads like from Kampala to Kasese, air transport of Entebbe international airport to Kotido air strip help to transport tourists to tourist potentials.

✓ Well developed and maintained hotels and lodges like Mweya Safari lodge in Rwenzori N.P, hotels in Kampala like Africana, Sheraton, Equatorial, etc, which provide accommodation services to the tourists.

✓ A wide capital base provided by the government of Uganda and foreign investors for establishment and maintenance of modern

tourist facilities like accommodation, advertisement and transport facilities.

- ✓ Well established advertisement network over local TVs like Bukedde TV, radios like Simba, newspapers like Monitor and in magazines so as to inform tourists of what Uganda can offer.
- ✓ Hospitality of local people to foreign tourists who come into Uganda for tourism purpose. The Baganda and Basoga are hospitable which encourage tourist to visit Uganda again and again.
- ✓ The prevailing peaceful political atmosphere especially in central, East and southern Uganda which has attracted tourists from abroad and within to visit all tourist potentials throughout the whole country.
- ✓ Availability of skilled labour produced by Makerere and other Universities and semi-skilled labour in the tourism industry to work in the hotels like Africana, game guides like in Kabalega N.P, transport tourist, etc.

Importance of the tourist industry to the economy of Uganda

- ✓ Uganda has earned foreign exchange in form of invisible export from thousands of tourists who visit the country from Europe, Asia and from other continents due to her tourist potentials. Such income has been used to rehabilitate roads, set up heath units, etc.
- ✓ The industry has provided employment opportunities to many Ugandans such as those working in Hotel like Serena, tour and travel agencies, game guides like in Queen Elizabeth N.P. This has earned income to workers and thus improved standards of living.
- ✓ It has led to conservation of wildlife of flora and fauna through gazetting and restricting of areas such as Bwindi impenetrable, Semulik N.P, forest reserves, etc. this has helped to modify Uganda's climate by forests and protecting her heritage for future generation.
- ✓ Tourism facilitates the development of important infrastructure such as air fields like Kasese air field to link Queen Elizabeth N.P, roads like Kampala-Gulu-Kitgum to access Kidepo N.P, health units,

lodges like Mweya Safari lodge in Semulik N.P for tourist accommodation. These have led to the development of Uganda.

- ✓ It has promoted and reflected the cultural heritage of Uganda i.e. historical sites like Bigobyamugenyi, museums like Uganda museum in Kamwokya-Kampala, cultural sites like Kasubi tombs, all protect Uganda's image abroad.
- ✓ Tourism has led to development of the craft industry and agricultural sector through providing market to the products of such sectors like at the source of the Nile. This means provision of more jobs and income from craft industry thus improved living standards of Ugandans.
- ✓ Tourism has led to diversification of Uganda's economy from over dependence on the agricultural sector. This has resulted into increased foreign exchange used to set up schools and health centers thus Uganda's development.
- ✓ It has improved on international relationship between Uganda and the countries like Norway, Germany and Britain, where tourists come from. This has helped Uganda to become politically stable.
- ✓ Training of skilled man power like hotel attendants, game guides, etc.
- ✓ Government revenue through taxing tourist transport companies, tourists hotels, etc.
- ✓ Growth of urban centers like Kasese town
- ✓ Promoted environmental conservation through forest reserves, gazzetting of national parks like Kidepo.
- ✓ It has promoted education and research in botany and zoology.

Negative importance includes;

- ✓ Foreign tourists bring in Uganda social evils like homosexuality, promotes prostitution in small towns like Kayabwe and Nakasero which hinder Uganda's cultural heritage.
- ✓ Tourism promotes terrorism as such people pretend to be a tourist leading to death of people as it was at Lugogo bombings.

- ✓ Profit repatriation caused by foreigners like Madhvan group who invest in Mweya Safari lodge
- ✓ Displacement of people to reserve parks and forests like in Kiruhura due to L. Mburo
- ✓ The wildlife in parks destroys people's property and leads to loss of lives.
- ✓ Conserved areas for tourism habour and multiplies tsetse flies like in Queen Elizabeth Park.
- ✓ The overgrazing in parks has led to environmental degradation
- ✓ Encourages smuggling out of rare animal species and birds like parrots and monkeys from Bwindi

Problems facing the tourist industry in Uganda

- ✓ Political instabilities experienced in Uganda for a very long time. Foristance the LRA and ADF scared away tourist from visiting Kabalega N.P and Queen Elizabeth N.P respectively. This also reduced on the total number of tourists in Uganda since they were scared of visiting the country.
- ✓ Increased poaching in national parks and game reserves like Kibale N.P and L. Mburo N.P which has led to reduction and depletion of some animal species like white rhinos, elephants and hippos.
- ✓ Population encroachment like in Masindi and Luwero on Kabalega N.P. the cattle keepers like in Kiruhura has encroached on L. Mburo N.P in search for water and pasture for their animals especially during dry seasons. All this affect the wellbeing of wildlife and yet it's the major tourist attraction of Uganda.
- ✓ Inefficient transport network especially air and road transport, roads during rain seasons are impassable like a road linking to Kidepo N.P in north eastern Uganda, the air strips like Kasese have limited handling facilities thus affecting the industry.
- ✓ Insufficient accommodation facilities of hotels, lodges and the well-established ones like Sheraton and Serena are located far away from major tourist attraction. The available resorts are also too expensive discouraging local tourists.

- ✓ Inadequate advertisement to outside world of the tourist potentials available in Uganda for visiting. Also there is inefficient local advertisement rate thus many people are green about the tourist potentials in the country.
- ✓ Insufficient support from the government of Uganda to the Uganda Tourism Board (UTB) which is responsible for advertisement of Uganda's tourist potentials both to local and abroad, which explain the low development of the tourist industry.
- ✓ Low domestic tourism due to poverty and ignorance of the locals, this has left tourism in Uganda dominated by foreign visitors like British, Germans, thus its low development.
- ✓ Hostility of some tribes in Uganda like the Karamajongs who are un friendly to Whites and this has continued to scare away visitors to Kidepo N.P making the industry to lose.
- ✓ Competition for foreign tourists with other African countries which has relatively similar tourist potentials like those of Uganda like Kenya has got relatively similar fauna, flora and climate. This claims a lot of tourists.

Measures to curb down the above problems

- ✓ Re-equipping and rehabilitation of existing tourist lodges such as Mweya, Chobe and Paraa. Other resort centers should be constructed with modern facilities to attract more tourists into Uganda.
- ✓ More training of labourers employed in the industry such as game wardens to fight poaching, hotel attendants to offer excellent service to tourists, so as to attract more tourists.
- ✓ Extensive advertisement to the international world about the existing tourist potentials with an aim of making the outside people aware of such existing potentials. This will fetch a lot of visitors into Uganda.
- ✓ The government has encouraged the development of the private local tour operations so as to provide efficient and modern reliable facilities in transportation.

- ✓ Massive campaign and education has been launched targeting local people especially encroachers and poachers to avoid their acts and protect wildlife resource.
- ✓ Privatization has resulted into an increased capital flow resource into the tourist industry. Also private Tours and travel agencies have helped to improve on the industry.
- ✓ There has been a check on political instabilities in Uganda. Today the LRA and ADF rebel groups no longer exist and now tourists access the once affected areas of North West and western Uganda parks like Mt. Rwenzori N.P.
- ✓ Anti-poaching units in the major parks in Uganda have been established like in L. Mburo N.P, and also strict laws dealing with encroachers on existing gazette areas have been enacted.
- ✓ Population pressure which has caused encroachers on fauna and flora has been checked through family planning awareness especially to local rural people and also resettlement of people from densely populated areas to sparsely populated areas.

END