

S.5 GEOGRAPHY P250/3 NOTES

(GEOGRAPHY OF UGANDA)

LANDS FORMS /FEATURES FORMED DUE TO FAULTING IN UGANDA

➤ FAULT SCARPS OR ESCARPMENTS

A fault scarp is steep slope on a raised land.

A fault scarp is a land form of faulting.

A fault scarp is formed a result of tensional forces. The tension forces were caused by radioactive and geo chemical reactions leading to convective currents beneath the earth crust.

The tension forces originated from the common centre pulling the earth's crust towards different directions. This created line of weakness or crack on the crust.

One side block of crust sunk down wards under its own weight, while another block of crust at a higher elevation forming a steep slope known as the fault scarp or escarpment.

The examples of fault scarps in Uganda include; Butiaba scarp, Kichwabwa scarp, in western Uganda.

THE DIAGRAM OF FAULT SCARP FORMED DUE TO FAULTING

➤ GRABENS

A graben is a secondary depression within the rift valley floor.

A graben is due to secondary faulting process. Secondary tension forces developed within the rift valley floor as a result of radioactivity and geochemical reactions.

The tension forces moved from a common centre pulling the earth's crust towards different

directions creating normal faults. The middle block of crust sunk downwards due to its weight creating a secondary depression called the graben.

The example of grabens in Uganda are; Lake Albert graben, Lake George graben and Lake Edward graben.

THE DIAGRAM SHOWING GRABEN FORMED DUE TO FAULTING

➤ FAULT GUIDED VALLEY

A fault guided valley is a depression guided by line of weakness or fault.

During faulting, tensional forces developed in the earth's crust. The forces were caused by radioactivity and geochemical reactions leading to convective currents.

The tensional forces originated from a common centre pulling the earth's crust making it to break forming line of weakness or fault on the crust.

The fault-line was later modified by denudation forces like weathering and erosion forming a depression known as fault-guided valley.

The example of fault-guided valley in Uganda is River Aswa valley in Kitgum in Northern Uganda.

THE DIAGRAMS SHOWING FORMATION OF FAULT-GUIDED VALLEY

THE IMPORTANCE / BENEFITS /CONTRIBUTION OF FAULTING TO DEVELOPMENT OF UGANDA

Faulting has both positive and negative contribution to development of Uganda as explained below;

POSITIVE CONTRIBUTION /BENEFITS OF FAULTING:

- ✓ The faulted landforms like Block Mountains such as Rwenzori Mountains modify the climate of Uganda through rainfall formation. This is where warm moist winds on the wind ward side are forced to rise in to the atmosphere, adding humidity which condenses to form convectional rainfall on the wind ward side. For example, in areas of Ntoroko, and Bundigyo. This promotes agriculture and settlement. Thus, positive contribution of faulting to Uganda.
- ✓ Faulted features like Block Mountains for example Mount Rwenzori, Rift valley lakes like Lake Albert, Lake Edward promote tourism. This provides foreign exchange to the government of Uganda which is used for development of social services like schools, and roads. Hence, positive contribution of faulting to the people of Uganda.
- ✓ Block Mountains like Mount Rwenzori are sources of rivers like River Sebwe, River Nyamwamba, and River Mobuku in Kasese which provide water to people around for domestic and agricultural purposes. Thus, positive benefit of faulting to development of Uganda.
- ✓ Faulting has led to the exposure of the minerals near the earth's surface promoting mining industry in Uganda. For example, copper and cobalt at Kilembe in Kasese on the slope of Mount Rwenzori. This provides revenue to the government of Uganda used for social services like roads, schools and health centres. Thus, positive importance of faulting to Uganda.
- ✓ Rift valley lakes formed due to faulting promote fishing. For example, Lake Albert, Lake Edward and Lake George in Western Uganda which acts as fishing grounds. This provides income to the government used for development of infrastructures like roads, schools. Thus, positive contribution of faulting to development of Uganda.

- ✓ Faulted lakes like Lake Albert, Lake George and Lake Edward promote water transport to the people of Uganda. For example, using ports like Butiaba port in Hoima to Wanseko port in Masindi. This promotes easy movement of people and goods facilitating trade. Thus, positive benefit of faulting to development of Uganda.
- ✓ The slopes of Block Mountains like Mt. Rwenzori in Kasese contain forests. This promotes forestry and lumbering activities which provide income to the local people around improving on their standards of living. Thus, positive contribution of faulting to development of Uganda.
- ✓ Faulted lakes like Lake Albert, Lake Edward and Lake George are sources of food in form of fish proteins. This improves on the people's diet and health, for example in the areas of Ntoroko, Butiaba, Wanseko and Panyimur are Lake Albert. Hence, positive benefit of faulting to the development of Uganda.
- ✓ The rift valley lakes formed due to faulting like Lake Albert, Lake George and Lake Edward are homes for wild animals like crocodiles, hippopotamus which promote wild life conservation. Thus, positive contribution of faulting to development of Uganda.
- ✓ The rift valley floor created by faulting promotes easy settlement and promotes easy mechanization encouraging agriculture. For example, Mobuku irrigation scheme in Kasese. Hence, positive contribution of faulting to Uganda.
- ✓ The Block Mountains like Mt. Rwenzori slopes in Kasese contain hard rock which promotes rock quarrying. This is used for construction purposes and provides local income to the people around. Hence, positive contribution of faulting to development of Uganda.
- ✓ The rift valley lakes like Lake Albert and Lake Edward have swamp vegetation like papyrus which promote art and craft industry. The vegetation are harvested by the local people in the areas of Panyimur in Pakwach district, Ntoroko around Lake

Albert for making craft items like baskets, and mats which provide income to the people. Thus, positive benefit of faulting to the people of Uganda.

However, faulting has some negative effects or disadvantages to the people of Uganda as explained below.

NEGATIVE EFFECTS /DISADVANTAGES OF FAULTING TO UGANDA:

- ✓ The steep slopes on Block Mountains like Mt. Rwenzori and escarpments like Butiaba scarp, and Kichwambwa scarp hinder the development of transport networks like roads. This has made some areas around Lake Albert like Bundibugyo, Ntoroko, and Butiaba very remote and inaccessible. Thus, negative contribution of faulting to Uganda.
- ✓ The steep slopes on Block Mountains like Mt. Rwenzori and escarpments like Butiaba scarp promote severe soil erosion and landslides which destroy people's property like crops, buildings and leading to loss of lives. Thus, negative effect of faulting to Uganda.
- ✓ The Block Mountains like Mt. Rwenzori formed due to faulting create arid or drought condition on the lee-ward side. For example, in the areas of Kasese. This affects people's settlement and agriculture. Thus, negative contribution of faulting to development of Uganda.
- ✓ The rift valley lakes like Lake Albert, Lake Edward and Lake George are habitats or homes for dangerous wild animals like crocodile, hippopotamus which are harmful to people's lives and property. Hence, negative effect of faulting to the people of Uganda.
- ✓ The rift valley floors like along the Albertine region in Western Uganda promote flooding during the rainy seasons which destroy people's lives and property. Thus, negative effect of faulting to Uganda.

- ✓ The faulted features like Block Mountains such as Mt. Rwenzori in Kasese and rift valley lakes like Lake Albert, Lake Edward have occupied large areas limiting land for other human activities like farming and settlement.

In conclusion, though faulting has negative effects to a greater extent it has contributed positively to economic development of Uganda.

REVISION QUESTIONS:

Qn : 1. Explain the influence of faulting on relief landforms in Uganda. (25marks)

Qn: 2. Examine the influence of faulting on development of landforms in Uganda. (25marks)

Approach:

- Define faulting and its causes.
- Identify the landforms and areas where they are found.
- Draw a sketch map of Uganda showing the location of the landforms.
- Identify and explain formation of landforms of faulting with local examples of the areas, including the diagrams.
- Then, conclude the essays.

ANSWERS / LANDFORMS:

- ✓ Rift valleys.
- ✓ Block Mountains.
- ✓ Fault scarps or escarpment.
- ✓ Grabens.
- ✓ Fault-guided valley.

Qn: 3. To what extent has faulting contributed to the development of relief features in Uganda? (25marks)

Approach:

- Define faulting.
- Explain the causes.
- Identify the relief features (landforms) of faulting and where they are located in Uganda.
- Draw a sketch map of Uganda to show the location of the relief landforms formed by faulting.
- State your stand point in regard to the question.
- Explain the formation of each of the landforms of faulting with reference to local examples of the areas and diagrams.
- After wards, also explain other landforms formed by other processes briefly.
- Then, conclude your essays.

Qn: 4. Assess the contribution of faulting to the economy of Uganda. (25marks)

Qn: 5. Discuss the benefits of faulting to the people of Uganda. (25marks)

Approach:

- Define faulting.
- Give examples of the landforms and areas where they are found.
- Draw a sketch map of Uganda to show the areas with the landforms of faulting.
- Explain the importance of faulting (positive and negative) to Uganda.
- Then, conclude your essays.

WARPING PROCESS IN UGANDA

Warping is the deformation or distortion of the earth's crust by up and down movement of forces beneath the earth's crust.

Up and down warping is an endogenic process with the earth's interior caused by convective currents due to radioactivity and geochemical reactions in the earth's interior.

Warping led to uplifts which led to formation of raised land in form of plateaus and down warping led to sagging of the central crust which formed depression or basin known as warped basin.

The examples of the warped basins in Uganda include; Victoria basin, Kyoga basin, Kwana basin, Bisina basin and Wamala basin.

Warping led to river reversals in Uganda. Some rivers like river Katonga, River Kagera that used to flow towards the west reversed their flow in Victoria basin; river Kafue that also used to flow towards the West reversed its flow in to Kyoga basin.

THE DIAGRAMS SHOWING THE FORMATION OF WARPED BASIN DUE TO UP AND DOWN WARPING

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FORMATION OF WARPED LAKES IN UGANDA

Warped lake is a body of water contain in depression or a basin.

Warped lake was formed due warping process.

Warping is the distortion of deformation of the earth's crust due to up and down trust movements.

Warping is an endogenic process in the earth's interior caused by radioactivity and geochemical reactions.

Upward movement or up thrust brought about by convective currents beneath the earth's crust led to formation of raised land or plateaus at the extreme ends of the crust, while downward

movement of the force led to the sagging of the earth's crust in the centre. This created a depression known as warped basin.

The warped basins were later filled with water from underground, rainfalls and nearby streams and rivers like rivers Katonga, Kagera, and Kafue forming lakes known as warped lakes.

The example of warped lakes in Uganda include; Lake Victoria, Lake Kyoga, Lake Bisina, Lake Kwania, Lake Wamala, and Lake Mburo.

THE DIAGRAM SHOWING FORMATION OF WARPED LAKE:

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THE IMPORTANCE / CONTRIBUTION OF WARPED LAKES TO UGANDA:

The contributions or benefits of warped lakes to Uganda are both positive and negative explained below.

POSITIVE BENEFITS / CONTRIBUTION OF WARPED LAKES TO THE PEOPLE OF UGANDA

- ✓ Warped lakes like Lake Victoria, Lake Kyoga, and Lake Wamala facilitate water transport. This promotes easy movement of people and goods which encourage trade. Thus, positive contribution of warped lakes to Uganda.
- ✓ Warped lakes like Lake Victoria and Lake Kyoga promote fishing sector in Uganda. They act as fishing grounds and this provide income to the government used for development of infrastructures like roads, schools. Thus, positive contribution of warped lakes to Uganda.

- ✓ Warped lakes like Lake Victoria, Lake Bisina, Lake Kwanja and Lake Kyoga provide water to the people around for domestic, industrial, and agricultural purposes. Thus, positive benefit of warped lakes to development of Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga and Lake Kwanja are sources of food to the people of Uganda in form of fish proteins. This improves on the people's diet and health. Hence, positive contribution of warped lakes to the people of Uganda.
- ✓ Warped lakes like Lake Victoria and Lake Mburo act as tourist attractions promoting tourism. For example, Lake Victoria has many beautiful sceneries like beaches such as Lido beach , Entebbe Botanical beach and Gabba beach which promote tourism providing revenue to the used for social services like roads, school. Thus, positive contribution of warped lakes to Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kwanja and Lake Wamala are homes for wild animals like crocodiles, and hippopotamus. Thus, promoting wildlife conservation in Uganda.
- ✓ Warped lakes like Lake Victoria and Lake Wamala modify the climate of the surrounding areas through rainfall formation. For example, in the areas of Entebbe, Wakiso, Mukono, and Kalangala around Lake Victoria. This promotes people's settlement and agriculture. Hence, positive contribution of warped lakes to Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga have swampy vegetation like papyrus which promote act and craft industry. They are used by the local people around for making craft items like mats, baskets which provide local income to the people improving on their standards of living.
- ✓ Warped lakes like Lake Victoria, Lake Katwe contain sands along their shores used for construction purposes by the people around. For example, around like Victoria in the areas of Kampala, Entebbe, Gabba and Luzira. Thus, positive contribution of warped lakes to Uganda.
- ✓ Lake Victoria act as natural boundary between Uganda and neighbouring countries like Kenya and Tanzania. This has created good relationship and understanding between Uganda and such countries. Thus, positive benefit of warped lake to Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga have minerals like sands, and clay promoting mining sector. For example, sand mining at Lwera swamp, Luzira, Kasenyi and clay mining at Kajjansi and Lweza on the shores of Lake Victoria. This provides income to the local people around. Hence, positive contribution of warped lakes to Uganda.

However, warped lakes have some negative effects or disadvantages to the people of Uganda as explained below.

NEGATIVE EFFECTS / DISADVANTAGES OF WARPED LAKES TO UGANDA:

- ✓ Warped lakes like Lake Victoria, Lake Kyoga and Lake Kwana are homes for dangerous wild animals like crocodiles, hippopotamus which are harmful to people's life and property. Thus, negative contribution of warped lakes to Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga and Lake Bisina have swamps and stagnant water around them which are breeding grounds for disease carrying vectors like mosquitoes which spread malaria and snails which spread bilharzias to the people leading to loss of lives of the people. Thus, negative effect of warped lake to the people of Uganda.
- ✓ Warped lakes like Lake Victoria and Lake Kyoga have swamp around them which are barriers to the development of transport net works like roads. This has made some areas very remote and inaccessible. Thus, disadvantage of warped lakes to development of Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga are associated with strong winds or storms promoting accidents of the water leading to loss of lives and property of the people. Thus, negative contribution of warped lakes to the people of Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kwana and Lake Wamala have occupied large areas limiting land for other human activities like settlement and agriculture. Thus, the disadvantage of warped lakes to Uganda.
- ✓ Warped lakes like Lake Victoria, Lake Kyoga have promoted growth of fishing ports or landing sites like Kasenyi landing site in Entebbe around Lake Victoria, Lwampanga fish landing site around Lake Kyoga. These have led to growth of slums with associated bad social behaviors like prostitution, murder and drug addiction.
- ✓ Lake Victoria promotes smuggling of goods to other countries like Kenya and Tanzania. This affects the revenue collection by the government of Uganda. Thus, negative effect of warped lake to development of Uganda.
- ✓ The islands in warped lakes like Kalangala is-land in Lake Victoria and swampy vegetations around the warped lakes like Lake Victoria, Lake Kyoga are hiding grounds for wrong doers like the pirates, thieves causing insecurity to the people around.

In conclusion, though warped lakes like Lake Victoria, Lake Kyoga have negative effects, to greater extent they contribute positively to economic development of Uganda.

REVISION QUESTIONS:

Qn: 1. Examine the contribution of warped lakes to development of Uganda. (25marks)

Qn: 2. Explain the importance and disadvantages of warped lakes to the people of Uganda. (25marks)

Qn: 3. (a). For either Lake Victoria or Lake Albert, explain the formation of the lake. (10marks)

(b). Assess the benefits the above lake to the people of Uganda. (15marks)

VULCANICITY / VULCANISM AND ITS LANDFORMS IN UGANDA

Vulcanicity is the intrusion of molten rocks in the earth's crust and extrusion of molten rocks or magma and gases on to the earth's surface.

In other words, it is the ejection of solid, liquid or molten rock materials and gaseous in to the crust or on to earth's surface.

Vulcanism or vulcanicity is an endogenic process that operates in the earth's interior due to intense heat and high temperature as a result of radioactivity and geochemical reactions leading to the melting of the rocks and these are forced to move or erupt due to pressure from the interior of the earth.

Vulcanicity has led to formation of both extrusive and intrusive volcanic landforms.

The extrusive volcanic land forms are the landforms found on the earth's surface and include the following; volcanoes, lava plateaus, explosion craters, calderas, volcanic plug, Ash and cinder cones. Other extrusive volcanic features include; volcanic hot springs and geysers, lava dammed lakes.

The intrusive volcanic landforms are the landforms found interior of the earth's crust. But, some time they can be exposed on to the earth's surface due to denudation processes like weathering and erosion.

The example of intrusive volcanic landforms include; batholiths, sills, dykes, lapoliths, and laccoliths.

The areas in Uganda affected or experienced vulcanicity include; Kisoro, Kabale, in South Western Uganda, Bundibugyo, Bushenyi in Western Uganda, Mbale, Kapchworwa, Tororo in

Eastern Uganda, Napak, and Moroto in North Eastern Uganda.

***A SKETCH MAP OF UGANDA SHOWING AREAS THAT EXPERIENCED
VULCANICITY***

THE EXTRUSIVE VOLCANIC LANDFORMS IN UGANDA:

Qn: 1. Examine the formation of extrusive volcanic landforms in Uganda. (25marks)

Qn: 2. Explain the influence of extrusive volcanicity on relief land forms in Uganda. (25marks)

Approach:

- Define extrusive volcanicity.
- Identify the extrusive volcanic landforms and where they are found in Uganda.
- Draw a sketch map of Uganda showing location of such landforms.
- Explain the formation of the landforms with diagrams and local examples.
- Then, conclude the essays.

Extrusive landforms:

- Volcanoes or volcanic mountains.
- Lava plateaus or lava flow.
- Explosion craters.
- Calderas.
- Ash and cinder cones.
- Volcanic plug.

Extrusive volcanicity is the extrusion or eruption of magma on to the earth' s surface and subsequent solidification of the magma on the earth' s surface due to temperature changes.

Extrusive volcanicity is due to intense heat and high temperature deep in the interior of the earth as a result of radioactivity and geochemical reactions.

The extrusive landforms in Uganda include; volcanic mountains like Mt. Elgon in Mbale, Mt. Muhavura in Kisoro, lava plateaus like Kisoro plains, explosion craters like Lake Katwe crater in Kasese, Calderas like Napak caldera in Napak and volcanic plug like Tororo rocks.

THE SKETCH MAP OF UGANDA SHOWING LOCATION OF THE EXTRUSIVE LANDFORMS

The following are the extrusive volcanic landforms in Uganda.

- Volcanic mountains or volcanoes are extrusive volcanic landforms.

A volcanic mountain is an upland surrounded by steep slope and standing on the earth's surface.

A volcano is formed due to eruption of acidic magma that moves through a vent in the crust up to the earth's surface. The magma cools and solidifies on the earth's surface around the vent due to temperature changes forming a raised land called volcano or volcanic mountain with a depression on top known as the crater.

The examples, of volcanic mountains in Uganda include; Mt.Elgon in Mbale, Mt. Moroto and Mt. Mufimbiro ranges in Kisoso.

DIAGRAM OF A VOLCAO /VOLCANIC MOUNTAIN

- Lava plateaus or lava flows.

A lava plateau is an extrusive landform.

A lava plateau or flow is broad raised land or hill with flat top and gentle slopes.

Lava plateau is formed due to eruption of basic lava through numerous fissures or lines of weakness in the earth's crust.

The very fluid lava moved for long distance but later solidified on the earth's surface due to temperature changes form a broad hill called lava plateau or flow.

The example of lava plateau in Uganda is Kisoro plains in South Western Uganda.

DIAGRAM SHOWING A LAVA PLATEAU

- **Explosion craters are landforms formed due extrusive volcanicity in Uganda.**

An explosion crater is semicircular, shallow and flat floored depression surrounded by rims or layers of pyroclasts on the earth's surface.

Explosion crater is formed as a result of violent eruption that blows of the rocks on the earth's surface creating a depression called the explosion crater.

The examples of explosion craters in Uganda include Lake Katwe crater, Lake Nyamunuka crater, Nyamusingire crater, and Lake Kyamwiga in Western Uganda.

DIAGRAM SHOWING EXPLOSION CRATER

- **Calderas are extrusive volcanic landforms formed due to extrusive volcanicity in Uganda.**

A caldera is wide semi circular depression.

A caldera is formed due to secondary violent explosive eruption which blows of the top of the volcano widening and deepening the crater to form a bigger depression known as the caldera.

The example of a caldera in Uganda is Napak caldera in Napak in North Eastern Uganda.

DIAGRAM SHOWING A CALDERA

- **Ash and cinder cones are extrusive volcanic landforms formed due to extrusive volcanicity in Uganda.**

Ash and cinder cone is a steep sided and symmetrical hill characterized with a crater on top.

Ash and cinder is formed due to explosive eruption and the small fragment of volcanic piles around the vent and form a symmetrical hill called Ash and cinder cone.

The examples of ash and cinder cones in Uganda include Kadam hill, and Napak hill, in North Eastern Uganda and Muganza hill.

DIAGRAM SHOWING ASH AND CINDER CONE

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- **Volcanic plug is a land form formed due to extrusive volcanicity.**

A volcanic plug is a cylindrical or narrow hard rock standing on the earth's surface.

A volcanic plug is formed due to the eruption of acidic magma through the vent. The magma cools and solidifies around the vent due to temperatures changes to form a narrow resistant rock called the volcanic plug.

The examples of volcanic plugs in Uganda are the Tororo rocks in Eastern Uganda.

DIAGRAM OF A VOLCANIC PLUG

OTHER EXTRUSIVE VOLCANIC FEATURES IN UGANDA:

- **Volcanic hot springs and geysers are extrusive volcanic features.**

A volcanic hot spring and geyser is the jetting or up welling of hot water, steam and gases from the interior of the crust or ground up on to the earth's surface.

A volcanic hot spring is formed when water under ground and rain water that enters the ground is super heated by hot volcanic rocks. The water boils and jets out on to the earth's surface forming spring of hot water known as volcanic hot springs.

The examples of volcanic hot springs in Uganda are; Sempaya hot spring in Bundibugyo, Kitagata hot spring in Bushenyi, Semliki hot spring in Bundibugyo, and Amuru hot spring in Amuru.

DIAGRAM SHOWING VOLCANIC HOT SPRING

- **Lava dammed lakes are extrusive volcanic features also found in Uganda.**

A lava dammed lake is a mass of water formed due to ponding or damming of a river channel by solidified basic lava or magma.

Lava dammed lake is formed due to the eruption of basic or viscous lava that flow through the vent , slopes from the volcano and through the river channel then cools and solidifies due to temperature changes blocking the river channel. This encloses the water behind to form a lake called lava dammed lake.

The examples of lava dammed lakes in Uganda are; Lake Mutanda in Kisoro and Lake Bunyonyi in Kabale.

DIAGRAM SHOWING LAVA DAMMED LAKE

INTRUSIVE VOLCANIC LAND FORMS / FEATURES IN UGANDA

The intrusive volcanic land forms are landforms formed due to intrusive vulcanicity.

Intrusive volcanic land forms are formed when acidic magma erupts, cools and solidifies within the earth's crust due to temperature changes.

The intrusive volcanic landforms in Uganda are; batholiths, sills, dykes, laccoliths and lapoliths.

- Batholiths are landforms formed due to intrusive vulcanicity.

A batholith is a mass or large hard granite rock buried at great depth in the earth's crust.

A batholith is formed when mass acidic magma erupts and cools within the earth's crust due to temperature changes form large hard rock in the crust.

A batholith may be exposed on the earth's surface by denudation forces like weathering and erosion removing the weaker surrounding rocks to a hill.

The example of batholith in Uganda is Mubende batholiths.

DIAGRAM SHOWING BATHOLITH

- Sills are also formed due to intrusive vulcanicity.

A sill is a horizontal sheet of igneous or hard rock lying between the rock strata or rock bedding planes.

A sill is formed when acidic magma erupts, rises through the vent from the interior of the earth and spreads horizontally along the rock strata. The acidic magma then cools and solidifies due to temperature changes to hard rock lying horizontally in the crust known as sill.

Examples of sills in Uganda are; Ngora sill, Mubende sill and Sezibwa sill.

DIAGRAM SHOWING SILL

- Dykes are formed due to intrusive vulcanicity.

A dyke is a vertical or steeply inclined hard rock standing in the earth's crust.

A dyke is when acidic magma erupts through the vent from the interior of earth, cools and solidifies due to temperature changes forming a steeply inclined or vertical hard rock called the dyke.

The example of dyke in Uganda is Osukulu dyke in Tororo in Eastern Uganda.

DIAGRAM SHOWING DYKE

- **Laccolith is a land form formed due to intrusive vulcanicity.**

A laccolith is a dome shaped intrusive hard rock in the earth's crust.

Laccolith is formed when acidic magma erupts, cools and solidifies within the earth's crust forming a dome-shaped hard rock known as laccolith.

The example is not yet clear in Uganda, but some landform is developing in North eastern Uganda which researchers believe to be laccolith.

DIAGRAM OF A LACCOLITH

- **Lapolith is also a land form formed due to intrusive vulcanicity.**

A lapolith is a saucer shaped intrusive hard rock in the earth's crust.

A lapolith is formed when large mass of acidic magma erupts through the vent, spread horizontally, cools and solidifies due to temperature changes to form a saucer shaped hard rock called lapolith.

DIAGRAM OF A LAPOLITH

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REVISION QUESTIONS:

Qn: 1. Explain the formation of intrusive volcanic features in Uganda. (25marks)

Qn: 2. Examine the influence of intrusive vulcanicity on relief land forms in Uganda. (25marks)

Approach:

- Define intrusive vulcanicity.
- Give the causes of vulcanicity.
- Identify the intrusive landforms and where they are found in Uganda.
- Draw a sketch map of Uganda to show the areas.

- Explain the formation of each of the intrusive volcanic landforms with illustrations or diagrams and local examples of the areas.
- Then, conclude the essays.

THE INTRUSIVE LAND FORMS:

- Batholiths.
- Sills.
- Dykes.
- Laccoliths.
- Lapoliths.

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THE CONTRIBUTION / BENEFITS OF VULCANICITY TO DEVELOPMENT OF UGANDA

**Qn: 1. Examine the economic significance of vulcanicity to development of Uganda.
(25marks)**

Qn: 2. Discuss the importance of vulcanicity to Uganda. (25marks)

Qn: 3. Assess the benefits of vulcanicity to the people of Uganda.

Approach:

- Define vulcanicity.
- Give the status by identifying some of the volcanic features and the areas in Uganda.
- Draw a sketch map of Uganda to show the areas.
- Identify and explain the importance or benefits of Vulcanicity to Uganda both positive and negative by giving local examples of the areas.
- Then, conclude your essays.

POSITIVE SIGNIFICANCE / CONTRIBUTIONS OF VULCANICITY TO UGANDA:

- ✓ Vulcanicity is led to formation of fertile volcanic soils which promote agriculture in some areas in Uganda. For the growing of crops like Arabica coffee, Irish potatoes, maize in the areas of Mbale, Sironko, Kapchorwa on slopes of Mt. Elgon, and Kisoro in South Western Uganda. This provides food and income to the people around. Thus, positive contribution of Vulcanicity to development of Uganda.
- ✓ Volcanic features like volcanic mountains such as Mt. Elgon, Mufimbiro ranges and volcanic lakes like Lake Katwe in Kasese, Lake Bunyonyi in Kabale promote tourism in Uganda. This provides foreign exchange to the government of Uganda and the revenue is used for social services like schools and roads. Thus, positive significance of Vulcanicity to Uganda.
- ✓ Volcanic mountains like Mt. Elgon and Mufimbiro ranges modify the climate of the surrounding areas through rain fall formation. For example, heavy rainfall received in the areas of Mbale, Manafwa and Bududa which promote agriculture and settlement. Thus, positive benefit of vulcanicity to development of Uganda.
- ✓ Vulcanicity has led to exposure of minerals near the earth's surface which promote mining sector in Uganda. For example, salt in Lake Katwe in Kasese, limestone and phosphates in Tororo which promote mining and this provides income to the government of Uganda used for social services like school, roads and health sector.

Hence, the benefit of vulcanicity to the economy of Uganda.

- ✓ **Vulcanicity has led to formation of hard volcanic rocks like granite rocks which provide construction materials like stones or aggregates. For example, the Tororo rocks, Ngora rocks and Mubende rocks which are used by the people for building houses and tarmacking the roads. Thus, positive economic significance of vulcanicity to development of Uganda.**
- ✓ **Volcanic mountains like Mt. Elgon are sources of water catchment areas. For example, River Manafwa, River Malaba and River Sipi flowing from Mt.Elgon which are used for domestic and agricultural purposes. Thus, positive contribution of vulcanicity to development of Uganda.**
- ✓ **The volcanic lakes like Lake Bunyonyi in Kabale and Lake Mutanda in Kisoro promote water transport. This encourages easy movement of people around and their goods. Thus, positive contribution of vulcanicity to development of Uganda.**
- ✓ **The volcanic mountains like Mt. Elgon in Mbale and Mufimbiro ranges have forests on their slopes. This promotes forestry and lumbering which provide income to the local people around. Thus, positive contribution of vulcanicity the economy of Uganda.**

Further still, some of the vegetation covers like the bamboo trees on Mt. Elgon are harvested by the Bagisu people in the areas of Bududa, Manafwa and Sironko for local food known as “malewa”. Thus, the benefit of vulcanicity to Uganda.

- ✓ **The volcanic lakes like Lake Bunyoyi in Kabale and Lake Mutanda in Kisoro promote small scale fishing. This provides food and local income to the surrounding people. Thus, positive contribution of vulcanicity to development of Uganda.**
- ✓ **Volcanic hot springs like Kitagata hot spring in Bushenyi, Sempaya hot spring in Bundibugyo and Amuru hot spring in Northern Uganda are potential sites for generation of geo-thermal electricity which can be used in future for domestic and industrial purposes. Thus, positive contribution of vulcanicity to development of Uganda.**
- ✓ **The volcanic hot springs like Kitagata hot spring in Bushenyi and Sempaya hot spring in Bundibugyo are medicinal. They contain medicinal substances like sulphur, calcium and magnesium which are used to cure diseases like scurvy and leprosy. Thus, positive benefit of vucanicity to development of Uganda.**
- ✓ **Vulcanicity has stimulated the development of industrial sector in Uganda. For example, the volcanic rocks like Tororo rocks have encouraged the growth of cement factory in Tororo and this has offered employment to the people in Uganda improving on their standards of living. Thus, positive contribution of vulcanicity to development of Uganda.**

However, vulcanicity has some negative effects to the people of Uganda as explained below.

NEGATIVE EFFECTS / DISADVANTAGES OF VULCANICITY TO DEVELOPMENT OF UGANDA

- ✓ Volcanic mountains like Mt. Elgon in Mbale creates arid or drought condition on the lee ward side. For example, in the area of Nakapiripirit in North eastern Uganda. This affects people's settlement and agriculture. Hence, the disadvantage of vulcanicity to the people of Uganda.

- ✓ The steep slopes of volcanic highlands like Mt. Elgon promote severe soil erosion and landslides. For example, in the areas of Bududa, Manafwa, Mbale and Sironko. This leads to loss of lives of people and property. Hence, negative contribution of vulcanicity to the people of Uganda.

- ✓ Volcanic high lands like Mt. Elgon in Mbale and Mufimbiro ranges have hindered the development of infrastructures like roads. This has made some areas like Bududa, Manafwa and Sironko on slopes of Mt. Elgon very remote and inaccessible. Thus, negative effect of vulcanicity to Uganda.

- ✓ Volcanic lakes like Lake Bunyonyi in Kabale and Lake Mutanda in Kisoro are homes for dangerous wild animals like crocodiles which are harmful to people's lives. Thus, the disadvantage of vulcanicity to the people of Uganda.

- ✓ Volcanic features like volcanic mountains such as Mt. Elgon in Mbale and volcanic lakes like Lake Bunyonyi in Kabale have occupied large areas limiting land for other human activities like settlement and agriculture. Hence, negative contribution of vulcanicity to development of Uganda.

- ✓ Volcanic lakes like Lake Bunyonyi in Kabale and Lake Mutanda in Kisoro have swampy vegetation and stagnant water around them. These are breeding grounds for disease vectors like mosquitoes spreading malaria to the people around. Thus, negative contribution of vulcanicity to Uganda.

In conclusion, though vulcanicity has some negative effects, to greater extent it has contributed positively to economic development of Uganda.

ASSIGNMENT:

Instructions:

Attempt only one question.

Qn: 1. Assess the contribution of vulcanicity to economic development of Uganda. (25marks)

Qn: 2. Explain the benefits of vulcanicity to the people of Uganda. (25marks)

Qn: 3. Discuss the significance of vulcanism to the economy of Uganda. (25marks)

Qn: 4. Examine the contribution of vulcanicity on the development of landforms in Uganda. (25marks)

LAKES AND THEIR MODES OF FORMATION IN UGANDA

A lake is a body of water contained in a depression or a basin found on the earth's surface.

Uganda has many lakes varying in sizes, depth and mode of formation. Lake Victoria is the largest lake, while smaller lakes include; Lake Mutanda, Lake Bisina, Lake Kwana, Lake Bisina and Lake Wamala. Lake Bunyonyi is the deepest lake in Uganda.

The examples of shallow lakes in Uganda include; Lake Victoria, Lake Kyoga and Lake Wamala.

There are different modes of lakes in Uganda such as warped lakes like Lake Victoria, Lake Kyoga, Lake Bisina, volcanic lakes like Lake Bunyonyi, Lake Mutanda, Lake Katwe, faulted or rift valley lakes like Lake Albert, Lake Edward, Lake George, depositional lakes like Lake Nabugabo,

glacial lakes like Lake Bujuku, Lake Catherine on Mt. Rwenzori and man-made lake like Kabaka's lake in Rubaga –Kampala.

A SKETCH MAP OF UGANDA SHOWING THE DISTRIBUTION OF LAKES

THE TYPES OF LAKES IN UGANDA:

Uganda has many types or modes of lakes and their formations are described as follows.

- ***Volcanic lakes*** are lakes formed due to vulcanicity. Vulcanicity is the intrusion of magma in to the earth's crust or extrusion of magma and gases on to the earth's surface. Vulcanicity is caused by radioactivity and geochemical reactions within the earth's interior.

Vulcanicity has led to formation of the following types of lakes.

- ***Explosion crater lakes*** are lakes formed due to vulcanicity.

A crater lake is a body of water contains in a depression or basin known as crater.

A crater is a semi-circular depression with surrounded by rims of ash and lava.

Explosion crater was formed due to violent eruptions blowing of the rocks on the earth's surface creating a depression known as explosion crater.

The crater was later filled with water from the nearby streams and rainfall forming lake called

crater lakes.

The examples of crater lakes in Uganda include; Lake Katwe, Lake Nyamunuka, Lake Kyamwiga, and Lake Nyamusingire in Western and South Western Uganda

DIAGRAM SHOWING EXPLOSION CRATER LAKE

- ***Lava dammed lakes*** are also formed due to vulcanicity.

A lava dammed lake is a mass of water formed due to ponding or damming of a river channel by solidified magma or lava.

Lava dammed lake is formed when viscous magma or lava erupts through the vent in the crust, move up on top of a volcano and slopes across the river valley and then solidifies due to temperature changes blocking the river channel.

This enclosed the water behind forming a lake known as lava dammed lake.

The examples of lava dammed lakes in Uganda include; Lake Bunyonyi in Kabale and Lake Mutanda in Kisoro in South Western Uganda.

DIAGRAM OF LAVA DAMMED LAKE

- ***Caldera lakes*** are volcanic lakes formed due to volcanic eruptions.

A caldera lake is a body of water contains in large depression or basin known as the caldera.

Caldera was formed due to secondary violent eruptions blowing off the top of a volcano, widening and deepening the original crater. This created a secondary wide depression known as caldera.

The caldera is lake filled with rain water forming a lake called Caldera Lake.

The example of Caldera Lake in Uganda is Napak Lake in Napak which is usually formed during rainy season.

DIAGRAM SHOWING CALDERA LAKE

- ***Graben or rift valley lakes*** are also found in Uganda.

Graben or rift valley lakes are formed due to faulting process. A graben or rift valley is a body of water contains in a depression known as graben or rift valley.

Tensional forces during secondary faulting within the rift valley floor led to formation of normal faults in the earth's crust. The middle block of crust sunk down due to its own weights and this formed a secondary depression known as the graben.

The graben was later filled with water from underground, rain fall and nearby rivers to form a lake called rift valley or Graben Lake.

The example of Graben lakes in Uganda include; Lake Albert, Lake Edward and Lake George.

DIAGRAM SHOWING GRABEN OR RIFT VALLEY LAKE

➤ ***Warped lakes*** are also lakes found in Uganda.

Warped lake is a body of water contains in a depression or basin known as warped basin.

Up and down warping caused by radioactivity and geochemical reactions in the interior of the earth deformed the earth' crust and this created a depression or basin known as warped basin.

The warped basin was later filled with water from underground, rain fall and nearby rivers to form a lake called down warped lake.

For example, rivers like River Katonga, River Kagera flowing in to Victoria basin led to formation of Lake Victoria. Other examples of down warped lakes in Uganda are; Lake Kyoga in Nakasongola, Lake Wamala in Mityana, Lake Bisina in Soroti and Lake Kwanja in Kwanja.

DIAGRAM SHOWING DOWN WARPED LAKE

➤ ***Depositional lakes*** are also found in Uganda.

Depositional lakes are lakes formed due the process of deposition. The following are the depositional lakes found in Uganda.

- ***Ox-bow lakes*** are depositional lakes in Uganda.

An ox-bow lake is formed due to river meanders through the processes of erosion and deposition.

An ox-bow lake is formed when a small neck of land between the two meander loops is cut off due to continuous process of erosion on the outer bank and deposition occurs on the inside slope.

The cut off apart contains water forming lake known as Ox-bow Lake.

The examples of Ox-bow Lakes in Uganda can be seen around River Rwizi in Mbarara and River Semliki in Western Uganda.

DIGRAMS SHOWING FORMATION OF OX-BOW LAKE

- ***Lagoon Lake*** is another example of depositional lake in Uganda.

A lagoon lake is a body of water contains in a depression known as lagoon.

A lagoon is formed due to wave deposition around the water body like lakes. The continuous process of deposition by waves block some part of the lake forming a depression called lagoon. The deposits lay by wave like sands and gravels encloses water creating a lake known as Lagoon Lake.

The example of Lagoon Lake in Uganda is Lake Nabugabo in Masaka on the western shores of Lake Victoria.

DIAGRAM OF A LAGOON LAKE

➤ **Glacial Lakes** are also lakes formed in Uganda.

Cirque or tan lake is a body of water contains in a semi-circular depression found on glaciated mountains.

A Cirque is a depression formed due to glacial erosion through the processes of abrasion and plucking on the glaciated mountain sides.

The Cirque is filled with water to form a lake called Cirque or Tan Lake.

The examples of Cirque Lakes in Uganda include; Lac Du Speke, Lac Nur and Lac Catherine on Mt. Rwenzori in Western Uganda.

DIAGRAM OF A CIRQUE LAKE

➤ **Artificial or Man-made lakes** are also found in Uganda.

Man-made Lake is a body of water in depression created by man.

Man-made lake is formed through construction or digging depression or hollow on the earth's surface.

The depression is filled with water forming dam or pond, hence forming a lake known as man-made or artificial lake.

The examples of artificial or man-made lakes in Uganda include; Kabaka's lake in Rubaga in Kampala, Kibimba lake in Bugiri and Martyr shrine lake at Namugongo in Wakiso.

THE CONTRIBUTION /ECONOMIC SIGNIFICANCE OF LAKES TO DEVELOPMENT OF UGANDA

(BENEFITS OF LAKES TO THE PEOPLE OF UGANDA)

Lakes in Uganda have both positive and negative contributions to development of Uganda as explained below.

POSITIVE CONTRIBUTIONS OF LAKES TO UGANDA:

- ✓ Lakes like Lake Victoria, Lake Kyoga, Lake Bunyonyi and Lake Albert act as fishing grounds promoting fishing. This provides income to both the government and the local people of Uganda. Hence, positive significance of lakes to development of Uganda.
- ✓ Lakes like Lake Kyoga, Lake Edward, Lake George and Lake Victoria promote water transport. For example, Lake Victoria promotes water transport through Port Bell-Luzira, Gabba port and Kasenyi port encouraging easy movement of people and goods. Thus, positive benefit of lakes to Uganda.
- ✓ Lakes like Lake Victoria, Lake Kyoga, Lake Albert and Lake Kwana are sources of food in form of fish proteins to the people of Uganda. For example, Nile perch, Tilapia, Silver fish caught in Lake Victoria. This improves on people's diet and health. Hence, positive benefit of lakes to the people of Uganda.
- ✓ Lakes like Lake Victoria, Lake Kyoga provide water to the people around for domestic and industrial purposes. For example, Lake Victoria providing water for the people living in the areas of Kampala, Entebbe, and Masese in Jinja used for domestic and industrial purposes. Thus, positive contribution of lakes to development of Uganda.
- ✓ Lakes like Lake Victoria and Lake Kyoga modify the climate of the surrounding areas by forming rainfall through the process of evaporation. This leads to the formation of convectional rainfall which promotes people's settlement and agriculture in the areas of Mukono, Buikwe, Entebbe, and Kalangala around Lake Victoria. Thus, positive contribution of lakes to development of Uganda.
- ✓ Lakes contain minerals promoting mining activities in Uganda. For example salt in Lake Katwe in Kasese, sands in the areas of Luzira, Bukasa, Lwera and clays at Kajjansi on the shores of Lake Victoria promoting mining. This provides income to the local people around. Thus, positive benefit of lakes to the people of Uganda.
- ✓ Lakes like Lake Victoria, Lake Albert, Lake Bunyinyi and Lake Katwe have beautiful sceneries promoting tourism in Uganda. This provides revenue to the

government of Uganda used for infrastructures like schools and roads. Thus, positive contribution of lakes to development of Uganda.

- ✓ Lakes like Lake Victoria, Lake Kyoga, Lake Edward, Lake Mburo and Lake Albert are homes for wild animals such as crocodiles, and hippopotamus promoting wild life conservation. Thus, positive contribution of lakes to development of Uganda.
- ✓ Lakes like Lake Victoria provide water for irrigation of farms. For example, in flower farms like Wagagai flower farm at Kasenyi in Entebbe promoting agriculture. Thus, positive contribution of lakes to economic development of Uganda.
- ✓ Lakes like Lake Victoria, Lake Albert and Lake Kyoga provide construction materials like sands used for construction purposes like building houses. For example, sands around Lake Victoria are used in building houses in the areas of Entebbe, Kampala, and Kajjansi. Thus, positive contribution of lakes to development of Uganda.
- ✓ Lake Victoria and Lake Albert acts as natural boundaries between Uganda and other neighbouring countries. For example, Lake Albert acting as boundary between Uganda and Democratic Republic of Congo. This promotes good trade and diplomatic relationship between Uganda and Democratic Republic of Congo. Hence, positive contribution of lakes to Uganda.
- ✓ Lakes like Lake Victoria, Lake Kyoga and Lake Edward have swamping vegetation like papyrus promoting local art and craft industry. The vegetations like papyrus on the shores of Lake Kyoga and Lake Victoria are harvested by the local people around for making craft items like mats and baskets. This provides local income to the people improving on their standards of living.

NEGATIVE CONTRIBUTIONS / DISADVANTAGES OF UGANDA:

- ✓ Lakes are habitats or homes for dangerous wild animals. For crocodiles, hippopotamus in Lakes like Lake Victoria, Lake Mburo and Lake Edward which are harmful to the people around. Thus, negative contribution of lakes to development of Uganda.
- ✓ Lakes like Lake Victoria, Lake Kyoga, Lake and Lake Bisina contain swampy vegetations like papyrus and stagnant water around them which are breeding grounds for disease carrying vectors like mosquitoes which spread malaria to the people leading to loss of lives of the people. Thus, the disadvantage of lakes to the people of Uganda.
- ✓ Lakes like Lake Victoria, Lake Albert have promoted development of fish landing sites

encouraging development of slums with associated bad social behaviors like prostitution, drug addiction and spread of HIV/AIDS. For example, at Masese fish landing site in Jinja, Kasenyi fish landing site in Entebbe around Lake Victoria.

- ✓ Lakes like Lake Albert, Lake Kyoga and Lake Victoria experience strong winds or storms promoting accidents especially during water transport leading to loss of lives and property of the people. Thus, negative effect of lakes to development of Uganda.
- ✓ The islands in the lakes and swamp vegetations around lakes like Lake Victoria, and Lake Kyoga are hiding grounds for wrong doers or criminals like drug addicts, thieves causing insecurity to the people around. Thus, the disadvantage of lakes to development of Uganda.
- ✓ Lakes like Lake Victoria and Lake Albert promote smuggling of goods. For example, Lake Albert promote smuggling of goods from Uganda to Democratic Republic of Congo by illegal traders in the areas of Panyimur landing site in Pakwach district, and Ntoroko fish landing site in Ntoroko. This affects revenue of the government of Uganda. Hence, negative contribution of lakes to Uganda.

In conclusion, though there are negative effects of lakes to the people of Uganda, to a larger extent lakes have contributed positively to economic development of Uganda.

REVISION QUESTIONS:

Qn: 1. Explain the formation of various modes of lakes in Uganda. (25marks)

Approach:

- Define lake
- Give status of lakes in Uganda.
- Draw the sketch map of Uganda to show location of lakes.
- Identify and explain formation of the different types of lakes in Uganda by illustration in diagrams and local examples.
- Then, conclude.

Modes of the lakes:

- Lava dammed lakes.
- Explosion crater lakes.
- Caldera lakes.
- Graben or rift valley or faulted lakes.
- Warped lakes.
- Ox-bow lakes.
- Lagoon lakes.
- Glacial lake like cirque or tan lake.
- Artificial or man-made lakes.

Qn: 2. (a). Describe the processes that led to the formation of either Lake Bunyonyi or Lake Albat. (10marks)

(b). Examine the contribution of lakes to economic development of Uganda. (15marks)

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