

LAKES IN EAST AFRICA

A lake is a large body of water that occupies a basin or hollow on the earth's surface. Some lakes are big and others are small. Some are permanent and others are seasonal. For a permanent lake to form, the following conditions must prevail;

- The hollow or basin must be deep enough so that it can store a sizeable amount of water.
- For it to remain permanent, there must be a fill or supply of water permanently in form of rainfall or in form of inlets like streams and rivers.
- The nature of the hollow is also important in that if the hollow is made of permeable rocks, the lake will not remain permanent but instead water will seep through the beds of rocks and eventually the lake will dry up. Therefore, the depression or lake should have impermeable lakes.

Although the above factors may exist in a particular hollow, the volume of water may fluctuate because of other factors like evaporation rates, number of outlets in form of rivers or streams and rainfall seasonality thus the occurrence of seasonal lakes for example Lake Chad whose waters decrease drastically during the dry season.

Lakes in desert regions are relatively small in size because of high rates of evaporation caused by desert winds and as such, most lakes in this regions tend to be seasonal. E.g Lake Rukwa and Lake Turkana.

Lakes with salt tend to be small in size as most lakes in the rift valley in East Africa. They tend to reduce in size because they have a salt content. Some lakes disappear entirely as when they are seriously drained by rivers. E.g River Saum on the Elgon led to the disappearance of a crater lake on the mountain.

Man's activities on the lakes greatly determines the size and volume of water. His pursuit for HEP, irrigation, mining, lower the water table hence less volume in lakes

Excessive deposition of river load leads to the shrinking of the lake basin. this also leads to existence of small lakes as a result of great siltation. E.g Lake Victoria is decreasing in size.

CLASSIFICATION OF LAKES

Lakes can be classified according to the make or origin of formation of the hollow or depression which is latter filled by water to form a lake. The origin might be due the earth movements both endogenic processes like faulting, volcanicity, warping etc. and exogenic processes like erosion, deposition, and glaciation among others.

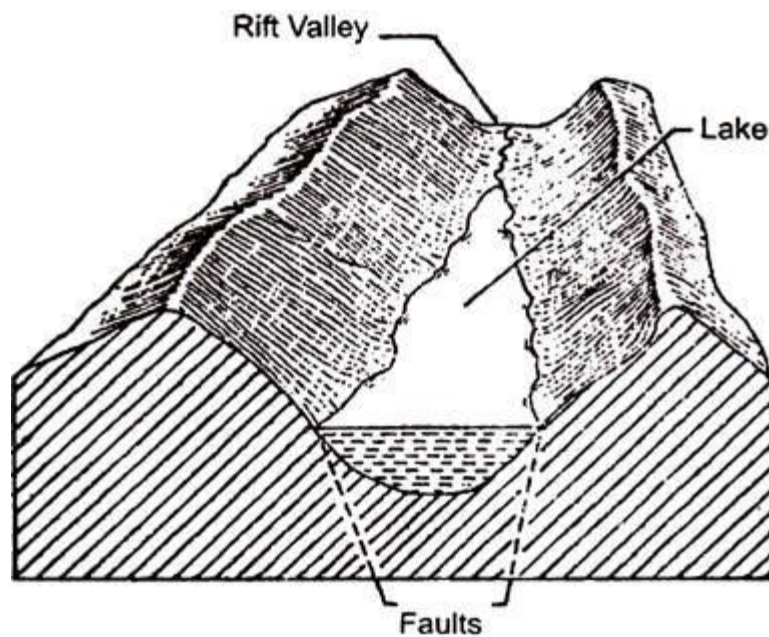
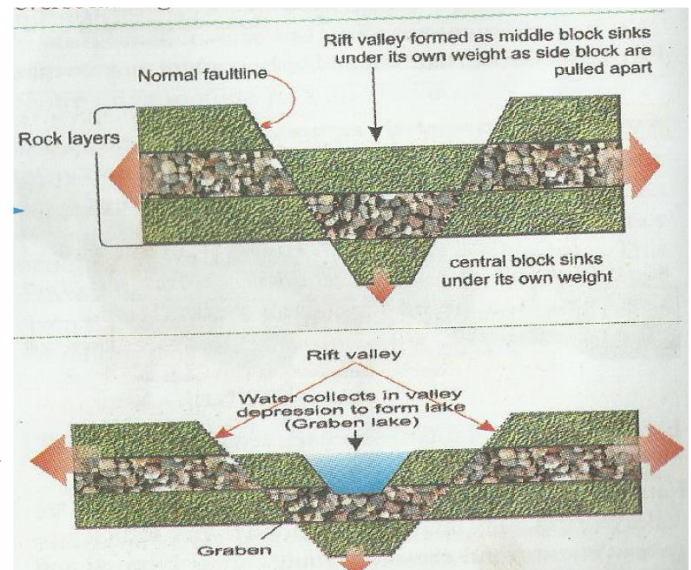
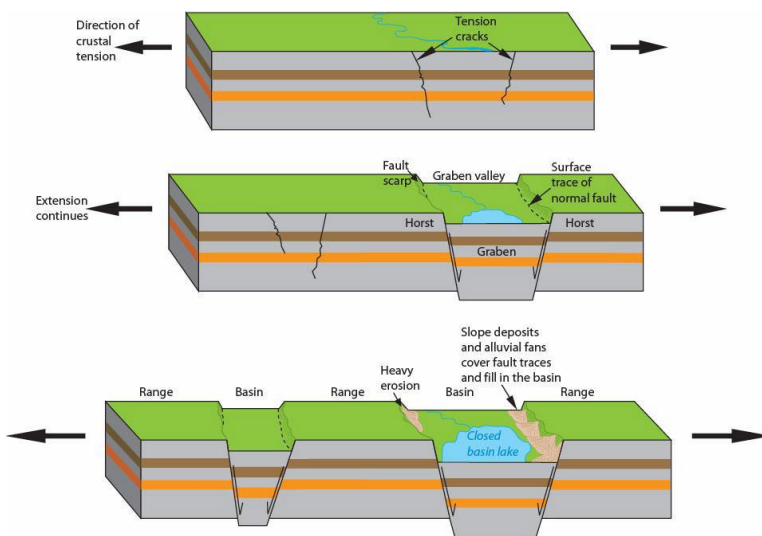
ACCORDING TO THEIR ORIGIN OR FORMATION (tectonic adjustments)

Lakes formed as a result of faulting

Rift valley or Graben lakes

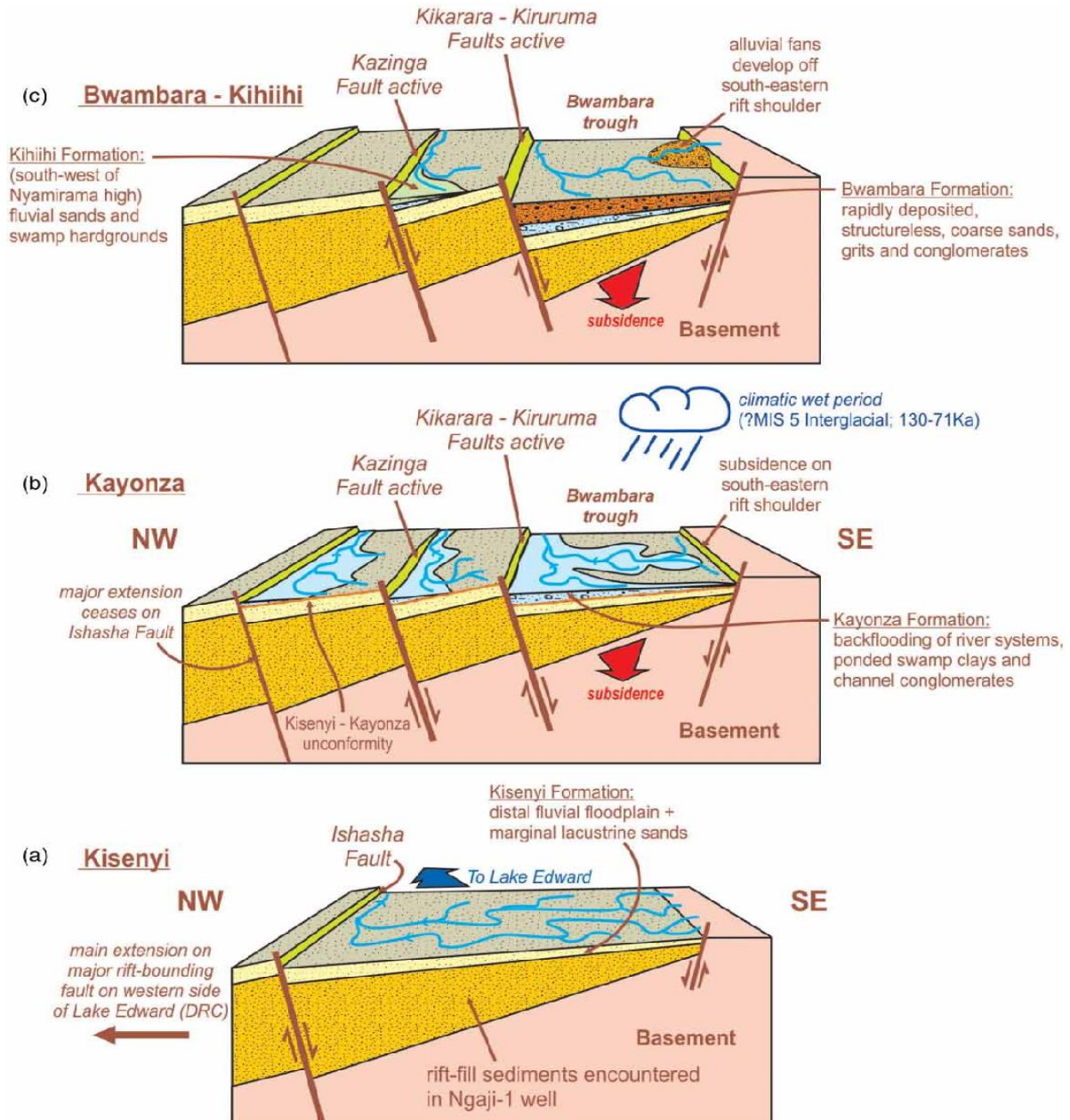
These are lakes that are formed from the earth movements associated with faulting across a rift valley. After the formation of a rift valley, **secondary or further faulting** occurs or takes place on some parts of the rift valley floor making them to be faulted further and therefore are lowered compared to other parts of the rift valley. After these depressions are filled with water and a rift valley lake is formed. Rift valley lakes are steep sided, elongated, deep and narrow for example lake Albert, Tanganyika, Malawi, Turkana, Magadi, Naivasha. These lakes are characterized by having elongated outlines, being narrow, deep and having steep scarps at the sides .

It can be illustrated as below



Tilt block lakes

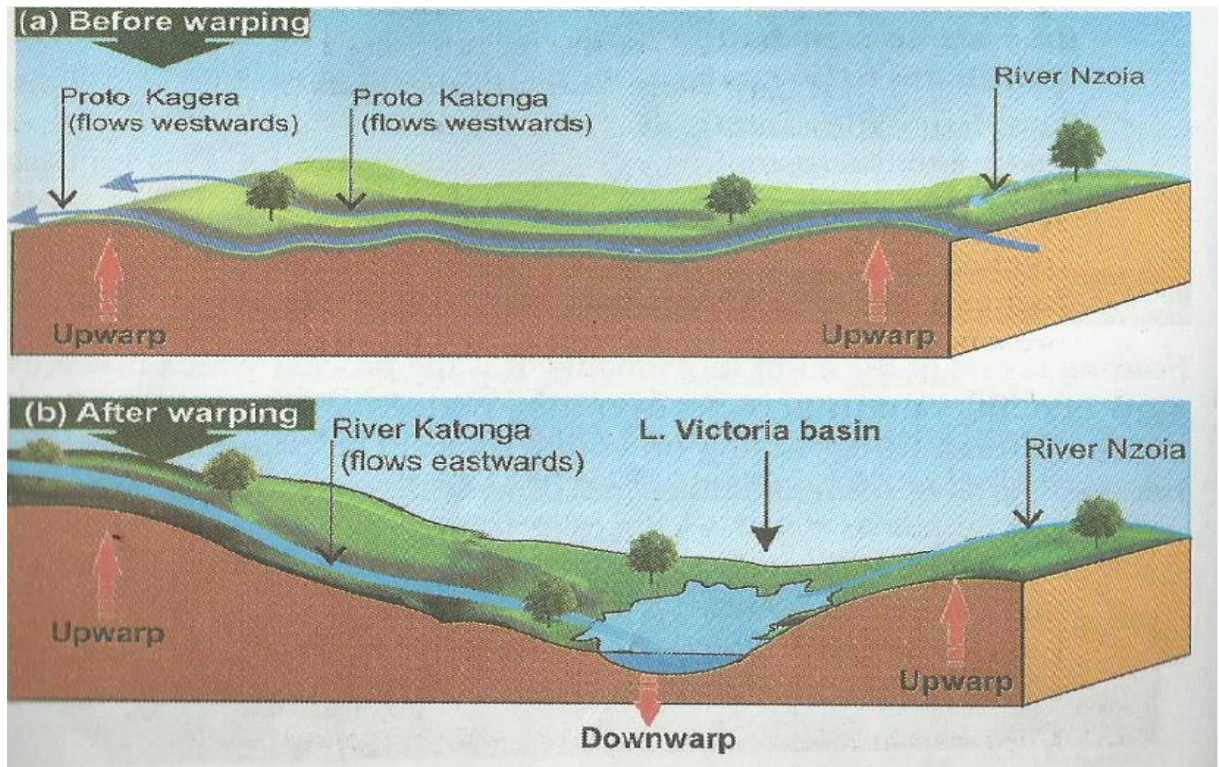
These are formed during block tilting. Some blocks are raised to form angular ridges while others are lowered to form depressions. Water is then collected within these depressions to form tilt block lakes for example lake Ol-bolassat on the western Abadere ranges in Kenya.



Lakes formed due to crustal warping

These lakes occupy basin like depressions which are formed by down warping e.g. L. Victoria and L. Kyoga. L. Victoria lies in a broad shallow down warped basin between the Eastern and Western rift valley. The down warping was caused by the up warping of the west and the east which caused river reversal e.g. R. Kagera, Katonga and Kafu were originally flowing to Congo but reversed their course due to warping, water from the rivers accumulates in the depression leading to the formations of a lake. On

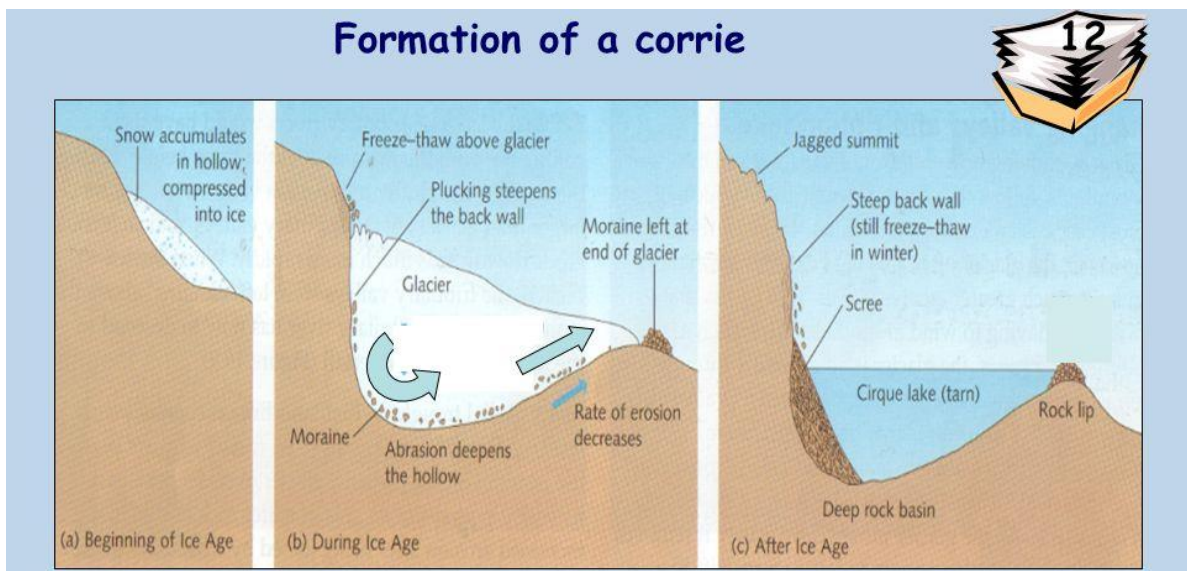
the eastern side, rivers like Nzoia were reversed and flowed backwards into the depression hence leading to the formation of crustal warped lakes. Down warped lakes are very shallow and large. Warping is as a result of convective currents radiating back into the earth's core. Radioactivity is a result of convective currents generated by the geochemical and physiochemical reactions in the upper mantle of the crust



LAKES FROM EROSION

a. Cirques lakes/ corrie lakes/ cwm lakes/ tarn lakes

These are semi-circular steep sided rock basins which have been cut into the sides of a glaciated mountain. It is formed when water enters the rocks and freezes breaking them down. The joints become enlarged. Abrasion drags the debris over the rock floor deepening the depression, back wall cutting or recession also enlarged the depression as well as steepening the sides. Plucking also steepens

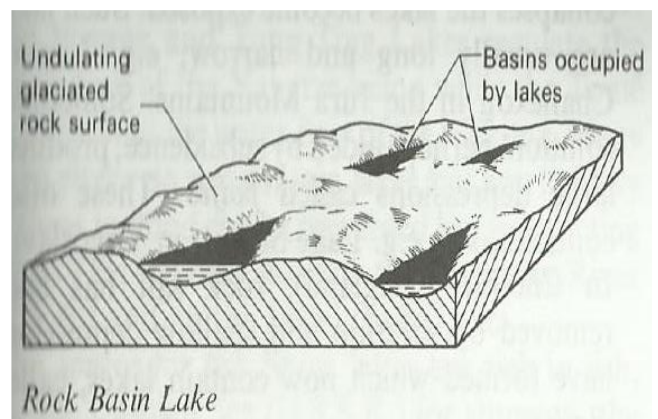
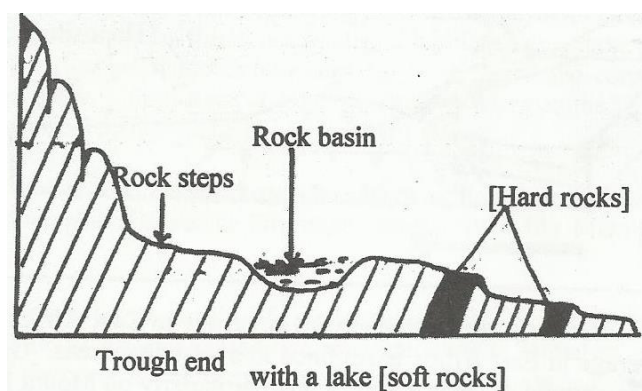


the cirque, when filled with water, it forms a tarn (lake) such as Teleki, Hidden tarn, Thompson tarn, Nanyuki, Harid and Hanging tarn on mountain Kenya and Mawenzi on Kilimanjaro. Others are Lac du Noah, Lac du Catherin and Lac du vent on mountain Rwenzori.

b. Rock basin lakes

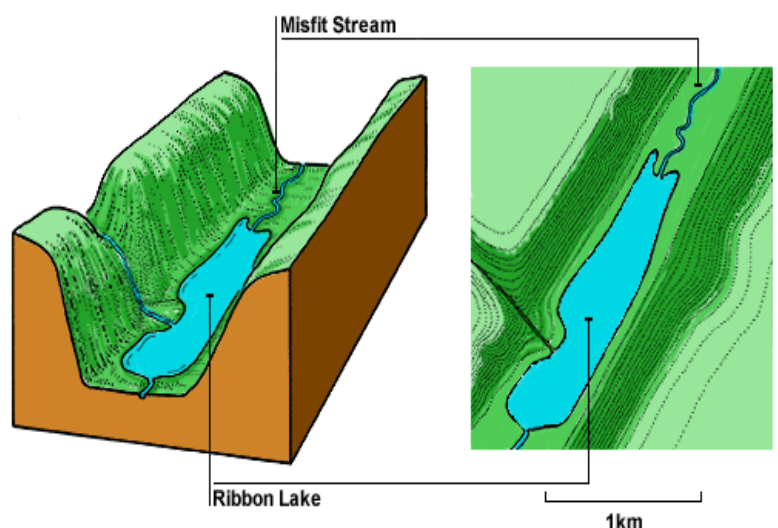
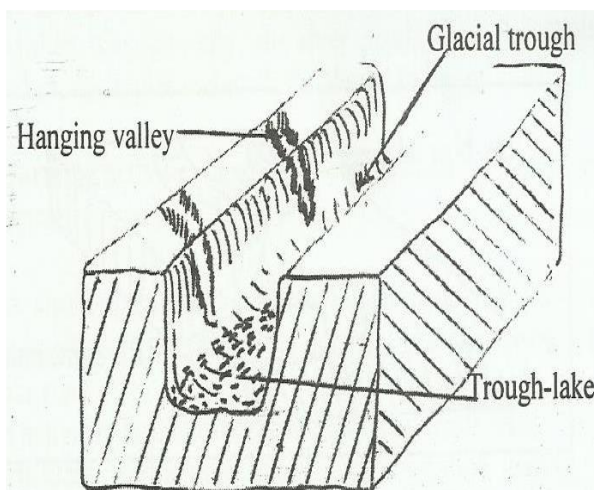
This is caused by unequal vertical erosion through Abrasion on the floor of the U-shaped valley due to differing rock resistance and many contain lakes e.g. Kitandara on Kamusoso valley on Mt. Rwenzori, L. Michelson on Mt. Kenya.

Its formed when the thickness and weight of a glacier increases to cause increased erosion on the valley bed with soft rocks. When the undercut is filled with water it forms a lake.



c) Trough lakes

These occupy elongated basins or holes excavated on the valley bottoms. They are formed in areas of extensive glacial activity where there is unequal vertical erosion in the unshaped valley leading to the formation of rock basins which become sites for lakes after the glacier melting. These lakes are commonly known as ribbon or finger lakes e.g. L. Micheaslon and Ellis on Mt. Kenya, Lac Nuir and Lac vert on mountain Rwenzori.



d) Solution lakes

These are common in limestone areas formed by weathering and erosion through solution. Rain water percolates into joints of limestone rocks. As it percolates, it slowly dissolves the rocks in solution. As

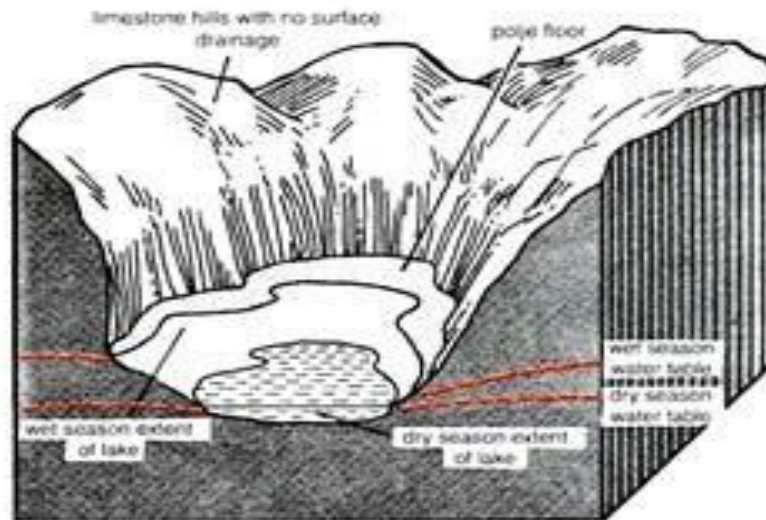
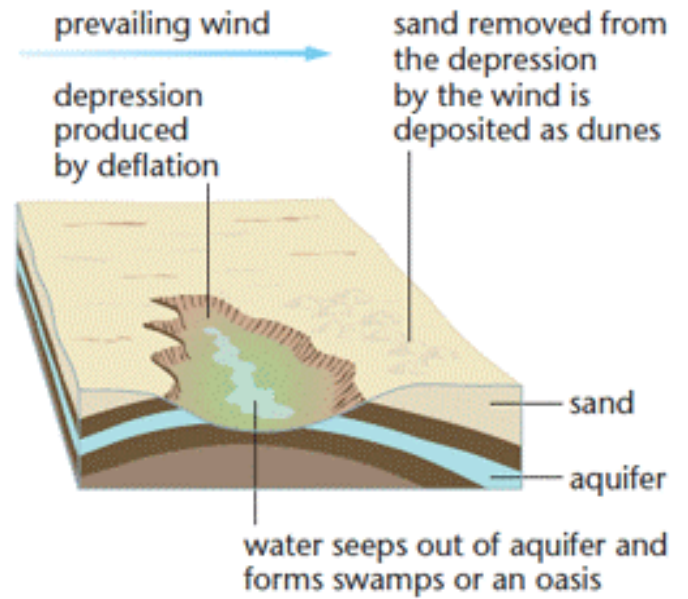
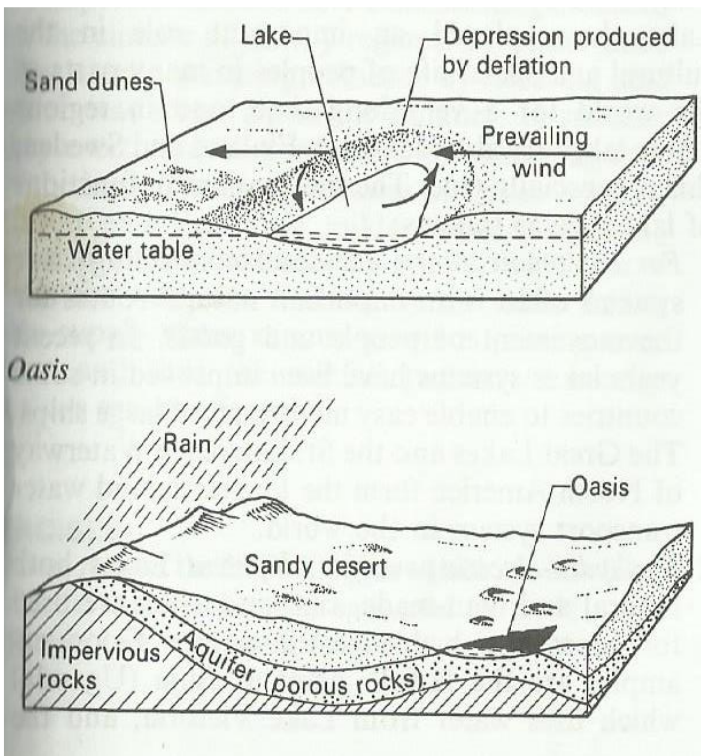


Fig. 70 A karst lake formed above the ground water table in a limestone region.

the rock gets dissolved, a small basin is formed. Continued solution enlarges the basin to form large depressions called polje. These lakes are long, narrow and have flat floors covered by clay e.g. Nyakasura in Uganda, Azigza in Morocco.

e) Deflation hollow lakes

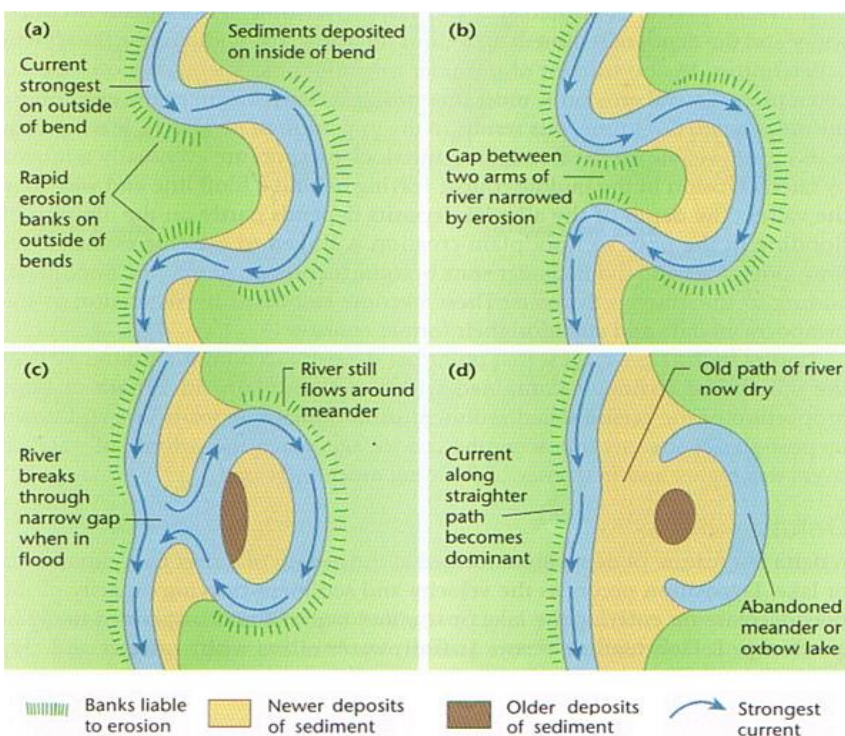
These are formed as a result of wind deflation leading to the formation of deflation hollows which when filled with water forms deflation hollow lakes. Wind deflation blows away loose unconsolidated materials leading to formation of deflation hollow. Chemical weathering further deepens the hollow until it reaches the water table then water seeps into the hollow forming an oasis or a lake e.g. the Qattara Depression in Egypt.



LAKES PRODUCED BY DEPOSITION

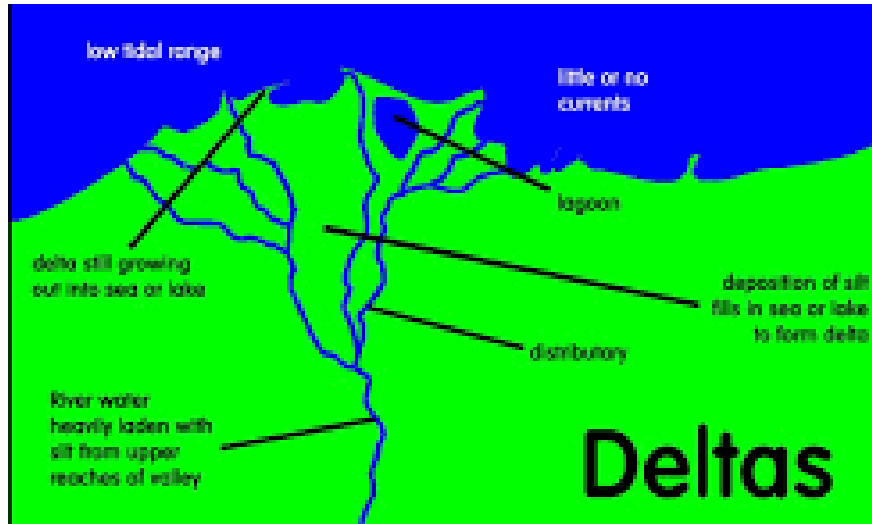
a) Ox-bow lakes

Rivers in their old stage have winding loops called meanders. If a meander is cut off from the main stream, it makes an ox-bow lake. Ox-bow lakes are formed due to river meander, which lead to deposition on the inside bank and erosion on the outside bank hence cutting off the meander loop to form temporary ox-bow lakes e.g. R. Rwizi, R. Nzoia, R. Tana etc.



b) Delta lagoons

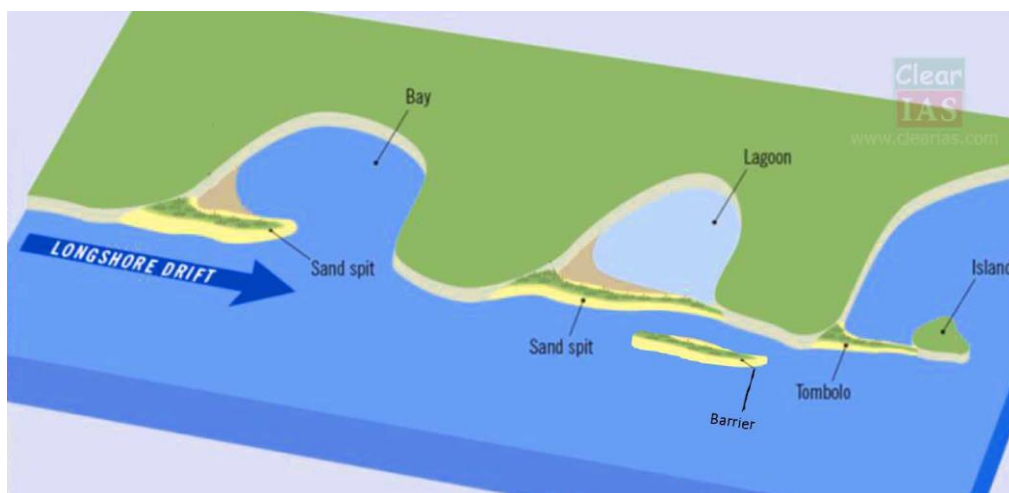
These are a result of deposition of material at the mouth of a river. Deposition of material at the mouth leads to the formation of deltas and distributaries. When some of the distributaries are blocked by the river sediments they then form a shallow irregular water body called a delta lagoon. These lakes are usually surrounded by deposited sediments and swamp vegetation. Delta lakes are found at the mouth of R.



Tana.

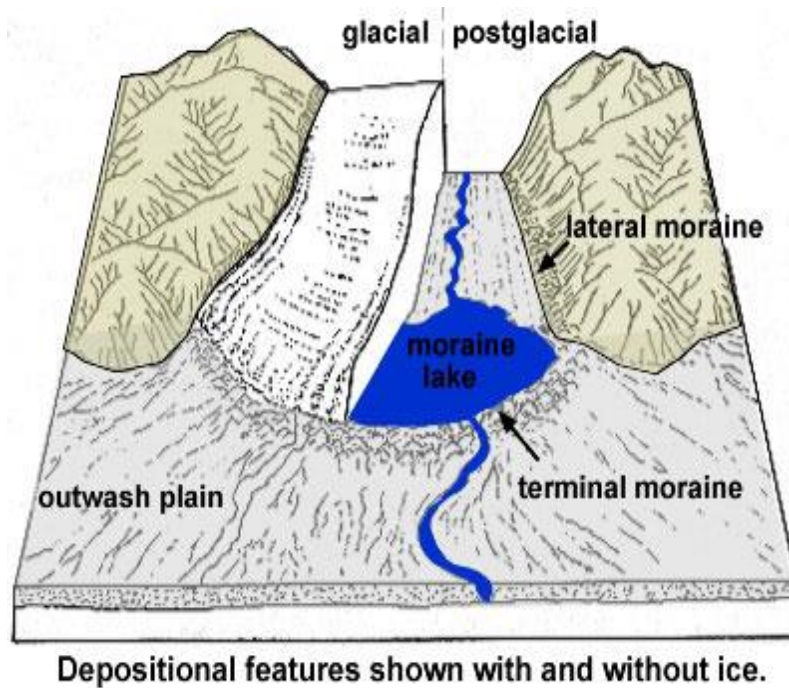
c) Wave depositional lakes / Lagoon lakes

These are formed by long shore drift lakes which break before reaching the coast due to an obstacle in water leading to deposition of material which pile around the underneath obstacle forming a sand bar which cuts off large volumes of water to form independent lakes. Examples include Lake Nabugabo which was cut from Lake Victoria. These lakes are normally surrounded by swamps like lake Nabugabo is surrounded by Lwamunda swamp., and Tanga Lagoon lake on L. Albert.



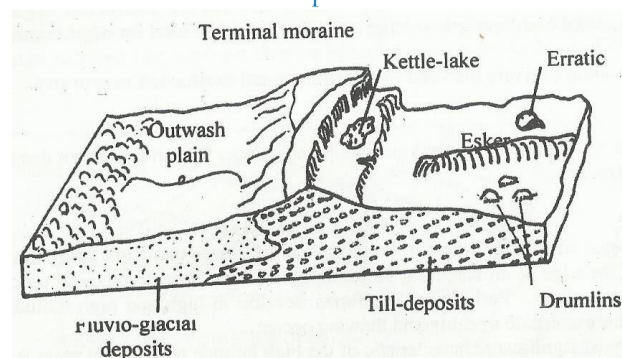
d) Moraine Dammed lakes

These are formed when accumulation of moraine forms a terminal moraine ridge which dams back the flow of water. As the ice melts, the melt water accumulates behind the terminal moraine ridge leading to the formation of moraine dammed lakes e.g. L. Alice on Mt. Kenya.



e) Kettle lakes

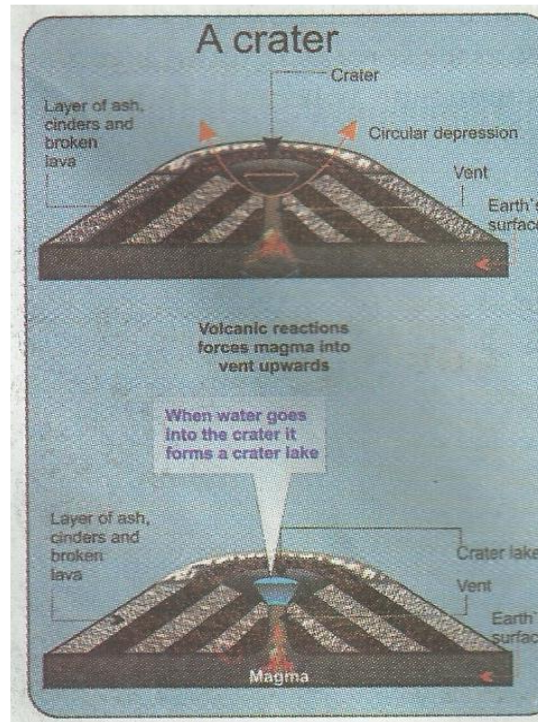
These are depressions formed when a mass of till encloses a block of ice and moves with it down the plain. When this block of ice eventually melts, it leaves behind a depression in the plain called a kettle and this may contain water to form a kettle lake or may remain dry e.g. in the Mobuku valley where L. Mahoma is a kettle lake. Kettles are therefore depressions filled with water to form kettle lakes



Lakes produced by volcanicity.

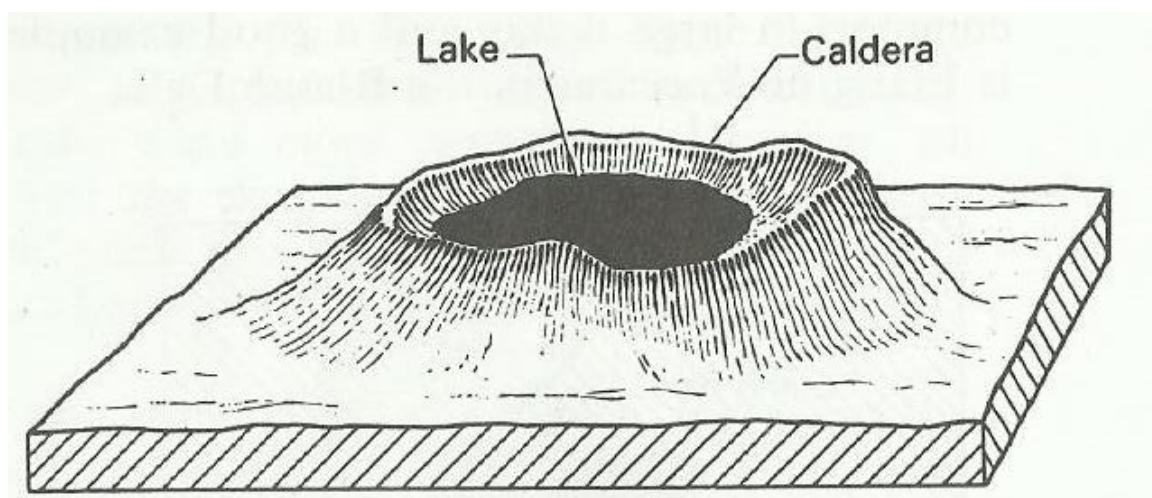
a) Crater lake

A crater lake is a steep sided depression with roughly a circular appearance. It is formed as a result of an explosive eruption that blows off the top part of a volcano creating an opening called a crater. When it's filled with water, it then forms a crater lake. A crater lake stretches to about 500m in diameter.

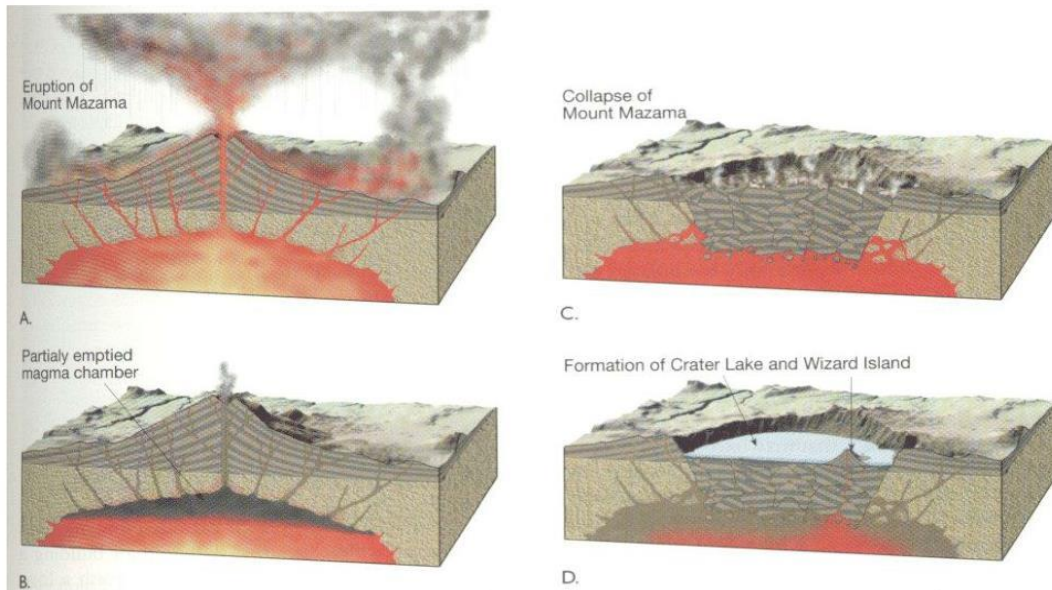


b) Caldera lakes

A caldera is a wide depression or a big crater which is formed by either explosiveness of an eruption which causes the top part of the volcano to be blown off or the subsidence of the top part of a volcano into a chasm/ large depression that has been left behind by magma erupting on top of the earth's surface. When it's filled with water, a caldera lake is formed for example lake Ngonzi in southern Tanzania, Suswa in Kenya, Ngorongoro in Tanzania. It should be noted that calderas extent to almost 1 km in diameter



The caldera is formed by removal of material in the eruption and by collapse of the surface into the magma chamber. Crater Lake, Oregon, is the site of the former volcano Mt. Mazama which erupted explosively about 6800 years ago.

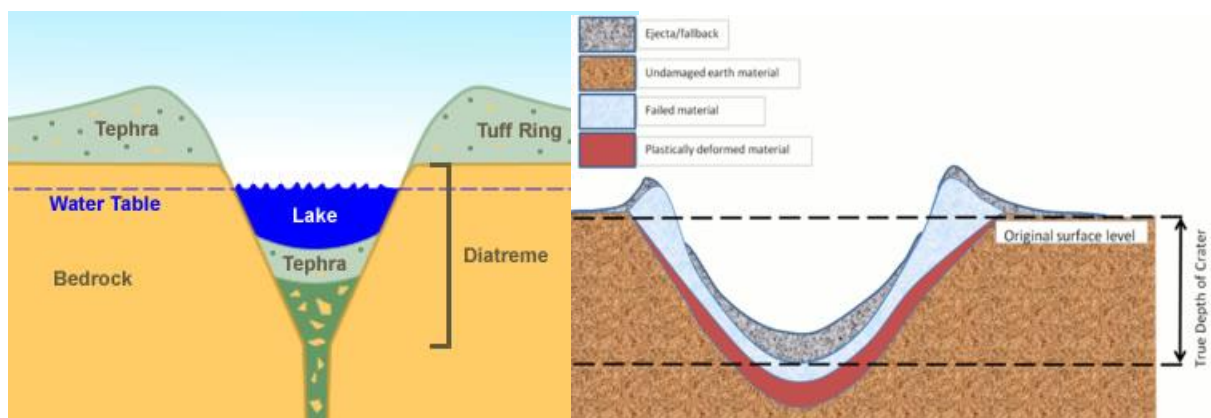


a) Explosion crater lakes

Explosion crater lakes are formed when gaseous materials are ejected in a violent eruption through a country rock as a result of geo chemical and geo physical reactions. An explosion crater is a shallow flat floored depression which is surrounded by a low rim of pyroclasts and local rock. Craters are usually less than 50m deep. Explosion craters may appear singly or in groups. Their formation can be described basing on two theories;

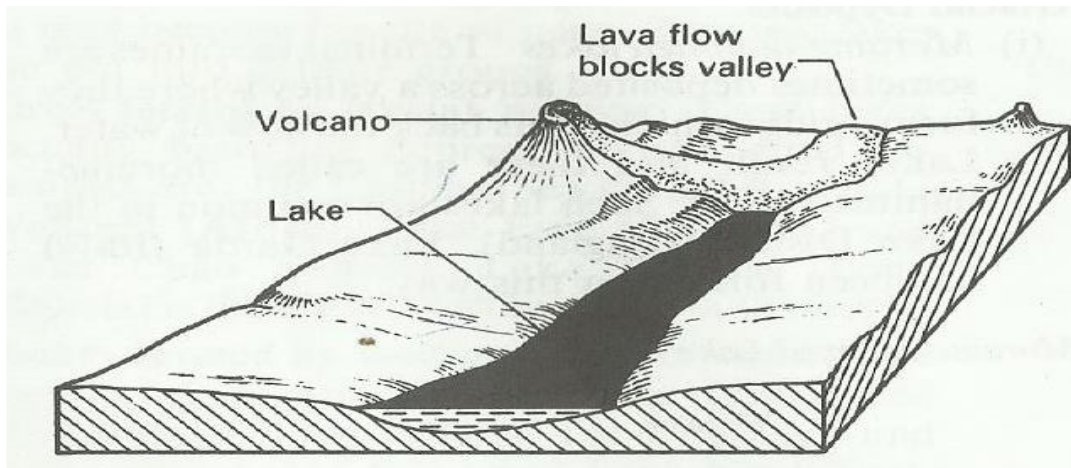
The first theory states that a crater may be formed as a result of explosive eruption which blows off the upper part of the earth's surface creating a small depression called a crater.

The second theory states that as magma is poured onto the earth's surface from the earth's interior, a chasm (empty space) is created and with the weight of the material, the volcanic plug sinks in creating a depression called a crater. This process of sinking is called caldera subsidence. Examples include Lake Kigere and Nyabikere in fort portal, lake Nyamunuka, Rutoto in Rubirizi and lake katwe in kasese



d) Lava dammed lakes

These are formed when lava flows from volcanoes and blocks a river – valleys to form a lake. e.g. L. Bunyonyi, L. Mutanda, L. Kayomba in Western Uganda and lake Saka at Nyakasura in Kabaloro district. Some lava flows contain large amounts of gases and as cooling takes place, these gases may escape creating a vacuum within the lava. If the lava surface collapses a hollow or depression is formed which may become a site for a lake when filled with water. This is what is called a lava subsidence lake.



MAN MADE LAKES

Numerous lakes in East Africa have come into existence through man's activities for example man has dammed rivers to create water reservoirs for irrigation. Man has dug valley dams to store water for irrigation, animals and for fishing activities such as Lake Kibimba, others are traced on river pangani in Tanzania.

Man has dug lakes for cultural purposes like Kabaka's lake in Mengo, Kampala. Others are depressions that have been left behind by the mining process and have been filled with water to form lakes for example in the areas of Kajjansi along Kampala-Entebbe road. Others are dug for religious purpose for example the martyrs' lake at Namugongo

The construction of dams across narrow steep sections of a river valley has led to the back pounding of water creating a lake e.g. L. Kindaruma on R. Tana, L. Masiga on R. Pangani.

IMPORTANCES OF LAKES

- Lakes are a source food ie. Fish in lake Victoria, Kyoga etc.
- Lakes are useful for transport e.g. L. Victoria has ferry services, L. Kyoga is used for inland water transport.

- Lakes are good climate modifiers and lead to the formation of conventional rainfall in adjacent areas i.e areas around L. Victoria.
- Lakes supply water for irrigation. Although the irrigation systems are not well developed in East Africa, many areas take that advantage e.g. Kakira sugar works arising water from L. Victoria for irrigating sugarcane.
- Some lakes have valuable minerals and have favoured mining e.g L. Magadi and Katwe etc.
- Some lakes act as tourist attractions especially crater and caldera lakes e.g. L. Katwe.
- Lakes act as reservoirs for some rivers e.g. during the dry season, they act as a source of water supply to rivers.
- Lakes act as sources of raw materials for the craft industry especially papyrus vegetation around L. Victoria and Kyoga.
- They provide water for domestic and industrial use.

Negative importance

- Lakes are barriers to transport and communications like road construction.
- Lakes act as breeding grounds for mosquitoes and snails which cause diseases to man.
- Lakes promote illegal activities like smuggling.
- Areas around lakes are liable to flooding, this leads to loss of life and property.