

# **STANDARD HIGH SCHOOL ZZANA**

## **DRAINAGE OF AFRICA**

Drainage refers to the hydrological system comprising of rivers, lakes and seasonal or permanent swamps.

Africa is endowed with many rivers e.g. the great Nile (Uganda, Sudan, Egypt), the Niger (Nigeria, Niger, Burkinafaso, Liberia), the Congo (DRC), the Zambezi (Zambia, Zimbabwe, Mozambique), the Orange/Vaal (south Africa), Limpopo (Botswana, south Africa, Swaziland, Mozambique, Shibeli (Ethiopia, Somalia), etc.

Major lakes include Victoria (Uganda, Kenya, Tanzania), Nyasa/Malawi (Tanzania, Malawi, Mozambique), Nasser (Sudan, Egypt), Chad (Chad republic), Tana (Ethiopia), etc with seasonal and permanent swamps like lake Kyoga in Uganda.

### **Factors influencing drainage**

Africa's drainage is determined by four major factors which influence its nature of flow on the earth's surface i.e. relief, nature of rocks, gradient/slope and volume of water.

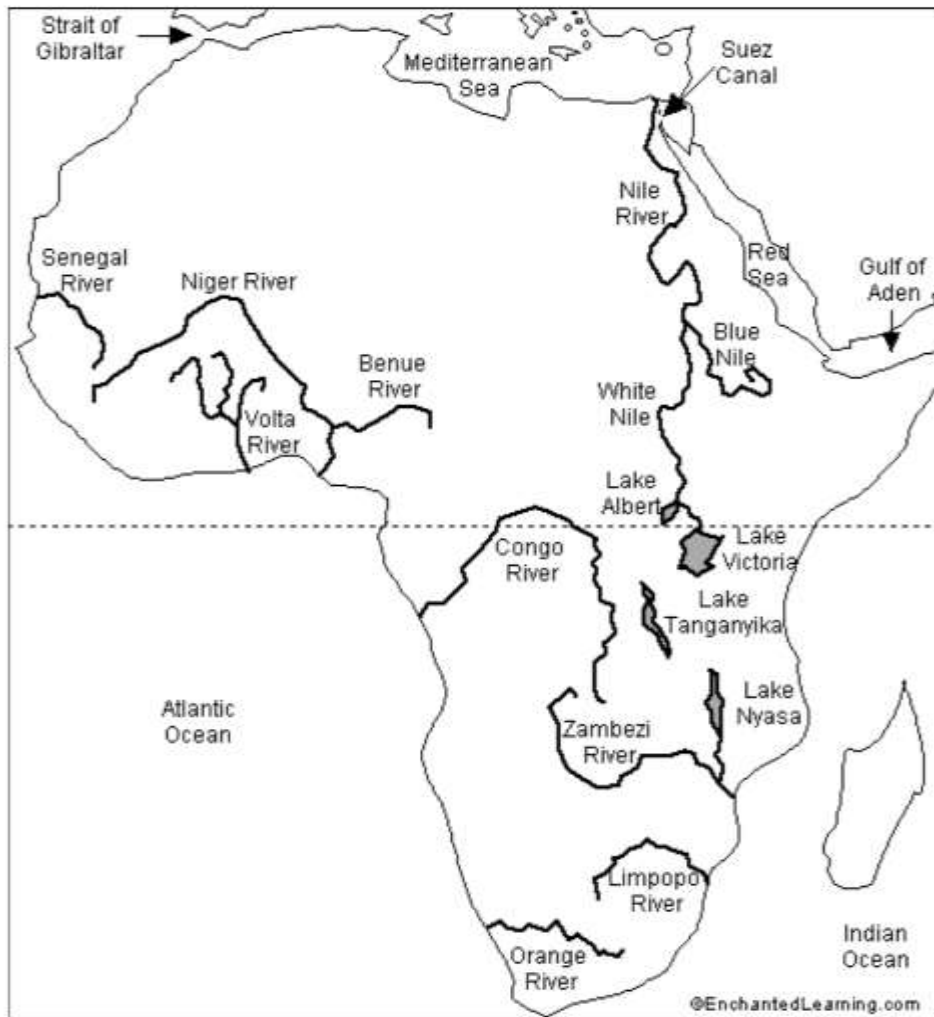
- **Relief-** this refers to the general appearance of the landscape e.g. mountains, valleys, plains, etc. rivers flowing in mountainous areas tend to diverge in the course when trying to avoid raised landforms. However rivers flowing on plateaux and plains tend to develop a regular course due to less interruption in the flow pattern.
- **Nature of rock-** rock composition of the earth's crust influences the flow of a given river. Rivers flowing in areas of hard rocks tend to meander towards areas of soft rocks developing new flow channels or river course. However rivers that flow in areas of soft rocks develop a regular course though others create meanders with ox-bow lakes, flood plains and levees/ braided channels.
- **Gradient/slope-** this refers to the proportionate elevation of a river's course from the source to the mouth. Rivers flowing in areas of high gradient tend to develop a straight course which is supported by gravitational pull and acceleration/ velocity of flow.

However, rivers flowing in areas of gentle or very low gradient easily spread on the earth's surface developing meanders and ox-bow lakes and levees/braided channels.

- **Volume of water-** the amount of water carried by a river at any time in its valley along the course from the source to the mouth affects its flow relating to rejuvenation and river capture. When rivers obtain more water from heavy rainfall they are rejuvenated/strengthened with more erosive power. This may lead to capturing of a neighboring weak river terminating its flow course.

As for the rivers flowing with low volume of water, thus they have low flow speed and erosive power leading to deposition of sediments in the river bed or valley floor.

Sketch map showing major rivers and lakes

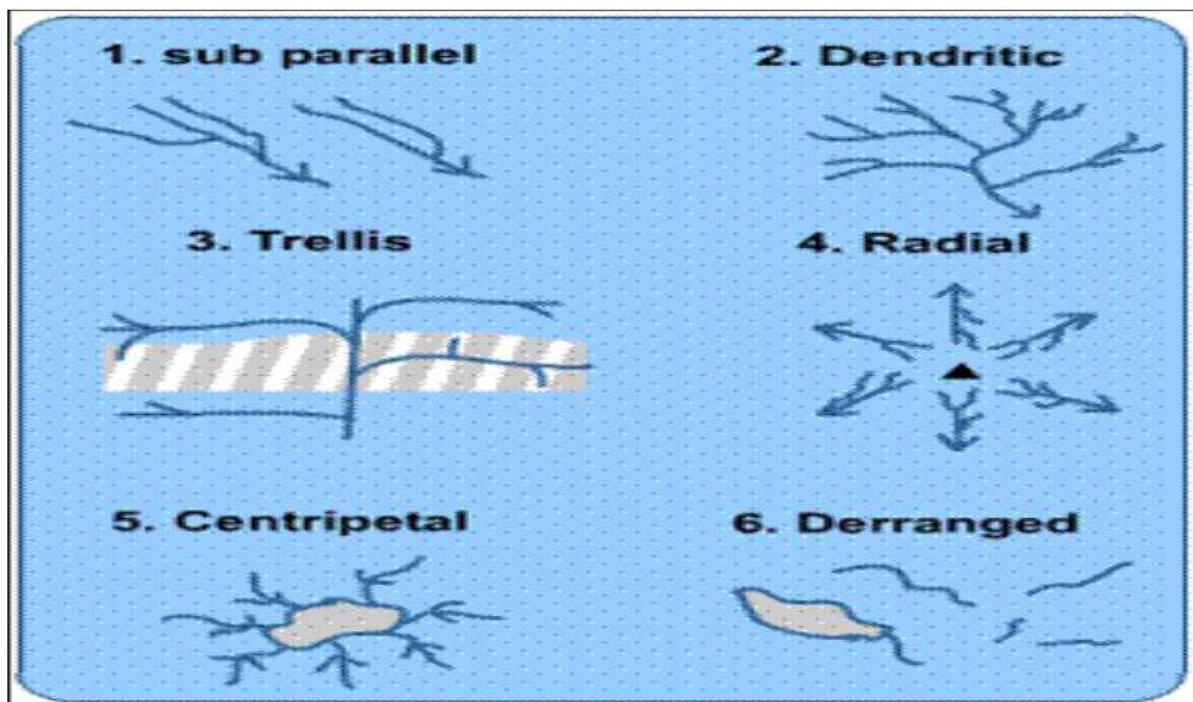


## Drainage patterns

This refers to the general lay out plan made by a river and its tributaries on the surface of the earth.

Africa has got a variety of drainage patterns which include trellis, dendritic, parallel, braided, antecedent, radial, centripetal and fault-guided.

### Illustration



- **Trellis pattern-** this is where the tributaries join the main river at nearly 90 forming rectangular shapes e.g. river Tana and Mara in Kenya, river Charl in Chad and river Orange in South Africa.
- **Radial Pattern-** this is where rivers flow from the same source mainly a mountain top radiating

to different directions. Thus the summit or mountain top is made up of a water shed or water catchment area e.g. river Siti, Koitobos.

- **Centripetal pattern-** this is where rivers and their tributaries discharge water into the same

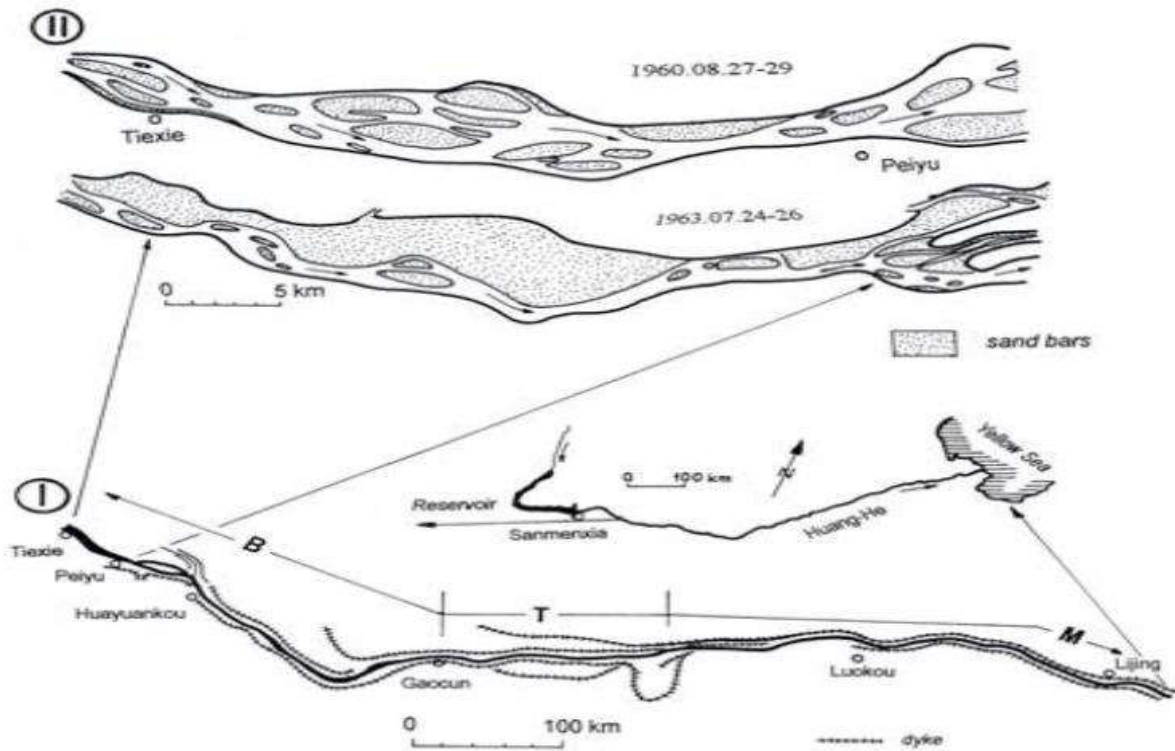
basin originating from different directions common in areas surrounded by raised plateaux and highlands.

- **Parallel pattern-** this is where rivers flow adjacent to one another with neither the same origin (water shed/water catchment area) nor sharing tributaries but may discharge water into a bigger river or ocean/sea. This pattern is common in areas of hard rock structure or gentle flat lands e.g. river Lagh-tula, Chiraman, Galole into main Tana; Lagh-kifulu, Lagh-bar, Lagh- dera towards Somalia and Indian Ocean.

- **Braided pattern-** this is where a river experiences sediment deposition within the valley bed forming interweaving channels/streams separated by deposited sand, gravel, boulders, etc. The deposited material forces the water to erode the banks of the river creating a new flow way thus leaving behind

long narrow bars of deposited sand and gravel with in the valley forming a braided channel.

## Illustration

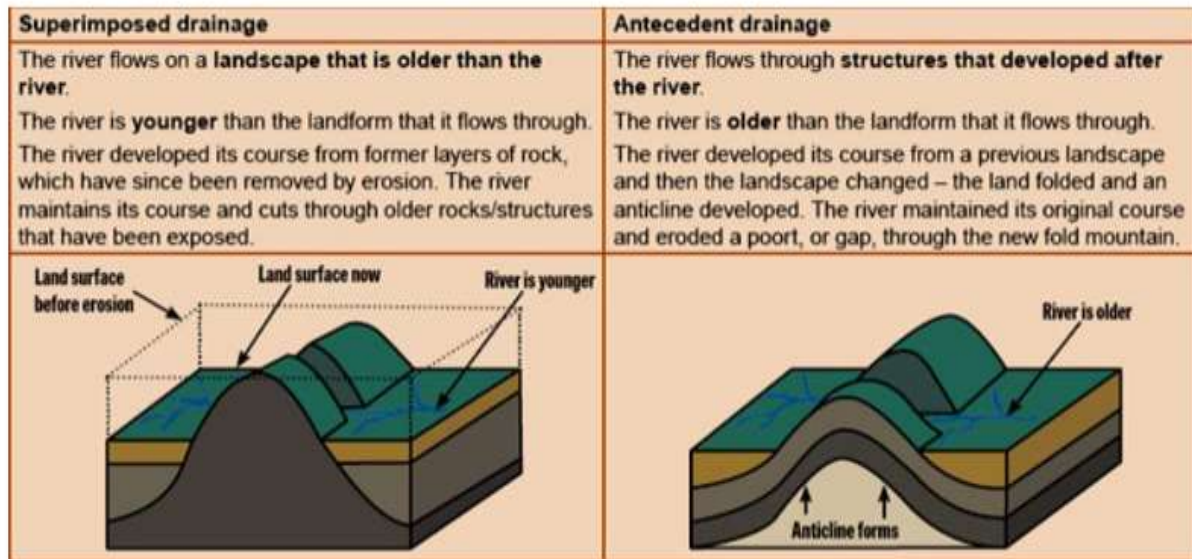


- **Dendritic pattern-** this is where tributaries join a main river at nearly acute angles (less than 90) forming a branch-like or root-like shape e.g. river Niger in Nigeria, Nile in Sudan (White and Blue Nile), Congo in DRC, Zambezi in Zambia, etc
- **Antecedent pattern-** this is where a river flows in an area undergoing uplift creating raised land

in one section of the river's course. This forces

the down-streaming river to cut through the raised land giving rise to a narrow steep sided valley (gorge) e.g. river Gilgil, Malewa.

## Illustration



- **Fault-guided pattern-** this is where a river flows through an area undergoing faulting which stretches across the river channel. This forces the river to divert its water flowing within the cracks or fault lines on the earth's surface thus a new fault guided river valley e.g. river Ewaso-nyiro in nguruman fault, Malewa in Soil-olool fault.



## **Importance of rivers**

- Generation of hydro electricity along the waterfalls e.g. Victoria falls etc.
- Recreation like swimming, game fishing, rafting, etc
- Tourist attraction due to fauna and flora, rapids and falls, etc
- Water for domestic and industrial use
- Climate modification at micro level through evapo-transpiration
  - Navigation for passengers and goods
  - River banks have fertile alluvial soils for cultivation.e.g. in Egypt and Sudan.

- They provide water for irrigation in the dry areas, e.g. in Sudan for the Gezira Irrigation scheme, and Egypt.
- Source of food with proteins with marine animals i.e. fish.
- Mineral mining in the valley bed e.g. gold, petroleum, etc
- Habitat for wild aquatic animals and even around the river banks.
- Conservation of fauna and flora living within the river, at river banks and in the wetlands/swamps around the rivers.
- Research and study in hydrology, marine life, river-related features, etc.