

OUR KHETIWE

TO

SOCIAL STUDIES 1

(GEOGRAPHY TOPICS)

TEACHING AND LEARNING NOTES-8&9

BY

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FIRST DRAFT@2020 IN PROGRESS

SOCIAL STUDIES 1

TOPIC 1: INTRODUCTION TO SOCIAL STUDIES

A. What is Social Studies?

It is a subject that studies the Physical, Social, Political and Economic environment of a given society.

B. What are the components of Social Studies?

Part 1: Geography (Social Studies Part 1-SS1)

Part 2: History (Social Studies Part 2-SS2)

Part 3: Civic Education (Social Studies Part 3-SS3)

C. What is the Examination format of Social Studies?

1. Section A (40 marks of multiple choice questions)

Part 1: SS1-Questions 1-14 (14marks)

Part 2: SS2-Questions 15-27 (13marks)

Part 3: SS3-Questions 28-40 (13marks)

2. Section B (30 marks of diagrams, pictures, charts, maps or story based questions)*

Part 1: SS1 Q1 (10marks)

Part 2: SS2 Q2 (10marks)

Part 3: SS3 Q3 (10marks)

3. Section C (30 marks of essay questions)*

Part 1: SS1-There are 3 questions but choose & write 1 question only (10marks)

Part 2: SS2-There are 3 questions but choose & write 1 question only (10marks)

Part 3: SS3-There are 3 questions but choose & write 1 question only (10marks)

D. How is Social Studies taught to pupils by teachers?

It is taught through shift teaching as follows

Part 1: SS1 (Week 1-3) teaching

Part 2: SS2 (Week 4-6) teaching

Part 3: SS3 (Week 7-9) teaching

Part 1: SS1 (Week 10) revision

Part 2: SS2 (Week 11) revision

Part 3: SS3 (Week 12) revision

E. How do pupils write the notes of Social Studies?

All Social Studies notes are to be written in one exercise book as follows

Part 1: SS1 (Week 1-3) notes

Part 2: SS2 (Week 4-6) notes

Part 3: SS3 (Week 7-9) notes

F. How do pupils write the Social Studies different tasks given to them by teachers?

All pupils should have a separate exercise book for writing homework, class tests, exercises and essays.

By so doing the teacher will be creating a trail of questions and answers in a book for pupils to use by the time they reach grade 9. Moreso, the idea of using one book for everything deprives learners the exercise books for studying

while the exercise books are away for marking of work given by the teacher. Also the idea of writing on pieces of papers is long gone as pupils easily lose those pieces of papers.

G. What are the topics that make up Social Studies?

1. Social Studies Part 1 (SS 1) topics

1. Physical and Cultural Features
2. Weather and Climate
3. Forest and their products
4. Farming
5. Fishing
6. Tourism
7. Population
8. Mining industry
9. Manufacturing and processing industries
10. Power and Energy
11. Maps and Diagrams
12. Map Reading

2. Social Studies Part 2 (SS2) topics

1. Learning about the past
2. Origins and development of man
3. Origins and movement of the Bantu Speaking People
4. Historical settlement areas of the Bantu Speaking People in Zambia
5. Farming and Iron Working in Zambia
6. Decentralized Societies
7. Centralized Societies
8. Development of Slavery and Slave Trade
9. Arrival of Europeans
10. European occupation of Central Africa
11. African reaction to European occupation of Central Africa

3. Social Studies Part 3 (SS3) topics

1. Introduction to Civic Education
2. Zambia's path to Independence
3. Symbols of National identity
4. Types of Governance (Bad & Good)
5. Systems of Governance (Democracy & Dictatorship)
6. Constitution
7. Citizenship
8. Political organization
9. Elections
10. Central Government

11. Local Government
12. House of Chiefs
13. Human Rights
14. Corruption
15. Conflict
16. Money
17. Inflation
18. Law of Demand and Supply
19. Money Laundering
20. Budget
21. Local and International Trade
22. Regional Organization
23. International Organization
24. Voluntary Organization and Donor Agencies

H. How can we learn social studies?

- i. By reading books, newspapers, novels and magazines
- ii. By listening to radio and TV station
- iii. By reading news on internet
- iv. By visiting historical sites such as museum
- v. By learning in class
- vi. By studying pictures and maps

I. Why do we learn Social Studies?

- i. To learn about the past
- ii. To learn about the earth
- iii. To learn about how life began on earth
- iv. To learn about civic education which include elections, citizenship, political party and system of governments?
- v. To learn on how to take care of our environment

TOPIC 1: PHYSICAL AND CULTURAL FEATURES OF ZAMBIA

1. POSITION OF ZAMBIA

A. LOCATION OF ZAMBIA

Zambia is located in the **Central Southern Africa**.

B. SIZE OF ZAMBIA

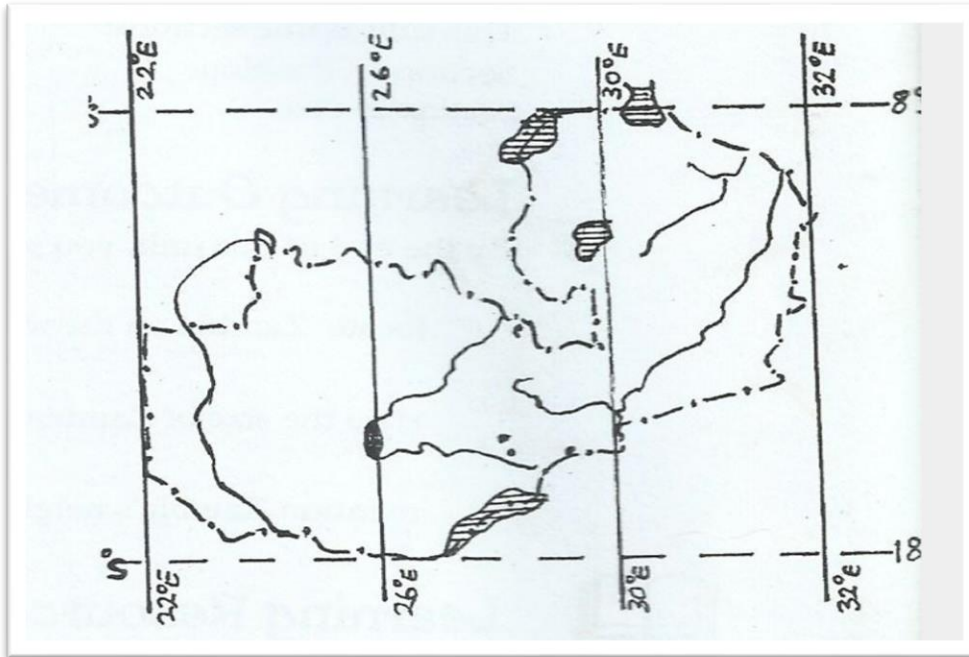
The total area of Zambia is about 752000 square kilometres (sqkm²)

C. LATITUDINAL POSITION OF ZAMBIA

Zambia lies between 8°S to 18°S.

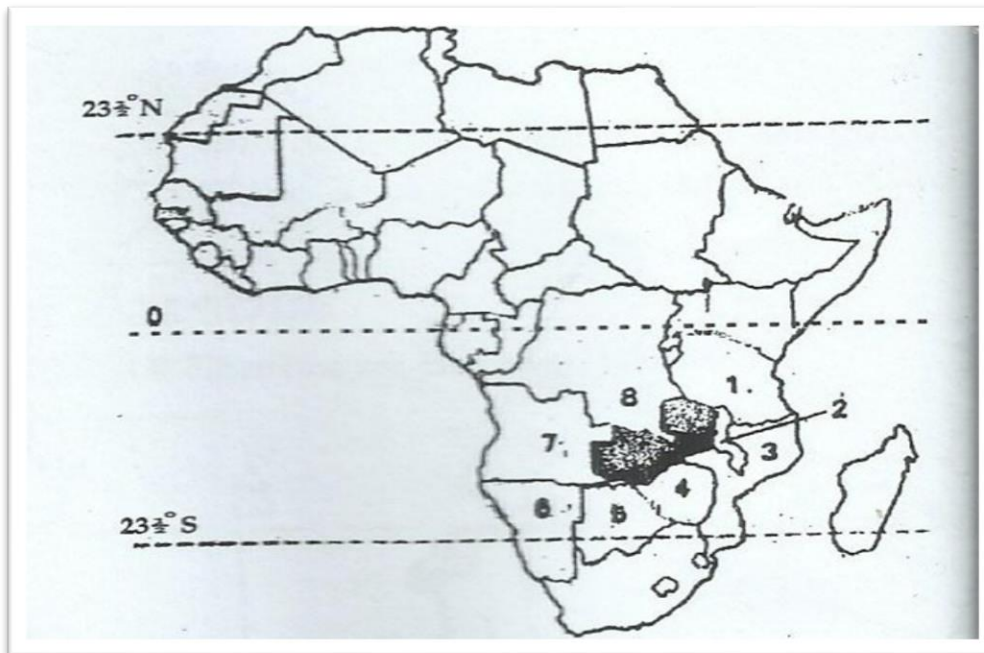
D. LONGITUDINAL POSITION OF ZAMBIA

Zambia lies between $22^{\circ}E$ to $32^{\circ}E$.



E. ZAMBIA AND HER NEIGHBOURS

Zambia is completely surrounded by 8 neighbouring countries namely Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia, Angola and Democratic Republic of Congo (DRC)



Key	
1--	Tanzania
2--	Malawi
3--	Mozambique
4--	Zimbabwe
5--	Botswana
6--	Namibia
7--	Angola
8--	Democratic Republic of Congo (DRC)

F. What is a land locked country?

It is a country surrounded by other countries and has no sea coast.

List down the advantages of Zambia's land locked country position

- i. It is easy to import and export goods to and from neighbouring countries
- ii. Zambia's tourism is promoted through package tours arrangement in collaboration with countries. Eg Zimbabwe
- iii. It houses a number of regional and international organisations due to its central location. eg Zambia houses COMESA headquarter.
- iv. It hosts a number of regional and international conferences.

List down the disadvantages of Zambia's land locked country position

- i. Zambia hosts a lot of refugees due to war in the neighbouring countries
- ii. Zambia has to pay tax for using other countries' ports and other transport networks
- iii. Goods are sometimes smuggled in and from the neighbouring countries. Eg Millie meal and maize
- iv. Cross border crime is high because of long borders with neighbouring countries.

TOPIC 2: RELIEF OF ZAMBIA

A. What is relief?

It is the height of the land above or below sea level. It is how high or low land is

B. Name the relief levels of Zambia

Zambia is divided into three (3) three levels as follows

(i). Land above 1200 metres (High Veld)

This is the highest land in Zambia. It consists of Zambezi-Congo and Luangwa-Lake Malawi watersheds. Also others include Mbala highland, Makutu, Mafinga Mountains and Tonga Plateau.

(ii). Land between 900 and 1200 metres (Middle Veld)

This is the second highest land in Zambia. It consists of swamps such as Bangweulu, Lukanga, Busanga and Mweru-Wa- Ntipa swamps.

(iii). Land below 900 metres (Low Veld)

This is the lowest land in Zambia. It consists of river valleys such as the Luangwa, Zambezi Valleys and Lake Tanganyika basin.

C. Describe the relationship between Relief and Temperature

There are two types of temperature regions influenced by relief.

(i). Low land and Hot region

This region covers the Luangwa and Zambezi valleys. The temperature in these regions goes as high as 35°C in summer. In short this region is the hottest and coldest region in Zambia. Eg. Areas like Livingstone, Maamba, Gwembe, Chipepo, Sinazongwe, Siavonga and Luangwa.

(ii). Highland and Warm region

This region covers the rest of the country. It is neither too hot nor cold but with normal hotness and coldness. Eg areas like Lusaka, Ndola, Kitwe, Choma, Mazabuka, Kabwe, Solwezi and Mbala.

TOPIC 3: DRAINAGE OF ZAMBIA

A. What is drainage?

This is the movement of water over the earth's surface or down in the soil.

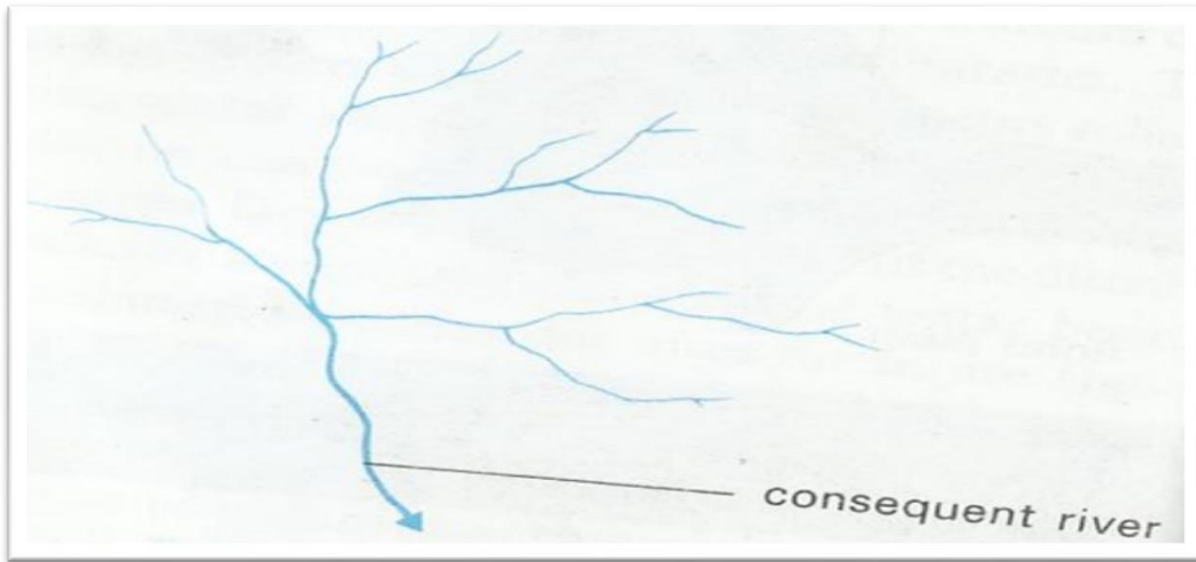
B. Name the types of drainage patterns

There are many different types of drainage patterns or systems however, the most three common ones are

Dendritic, Trellis and Radial drainage.

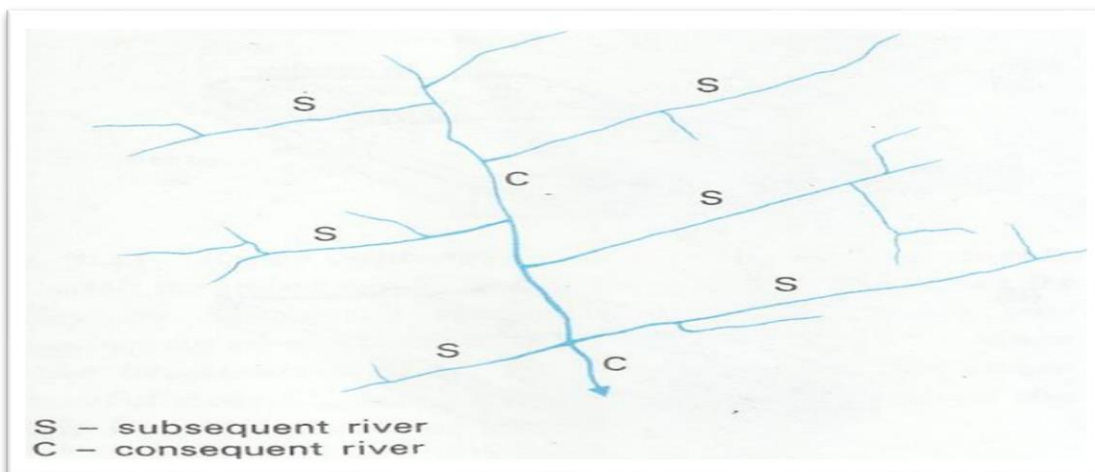
i. DENDRITIC DRAINAGE

The word **Dendritic** is a Greek word **Dendron** meaning **Tree**. Water moves off the earth surface in a tree like pattern



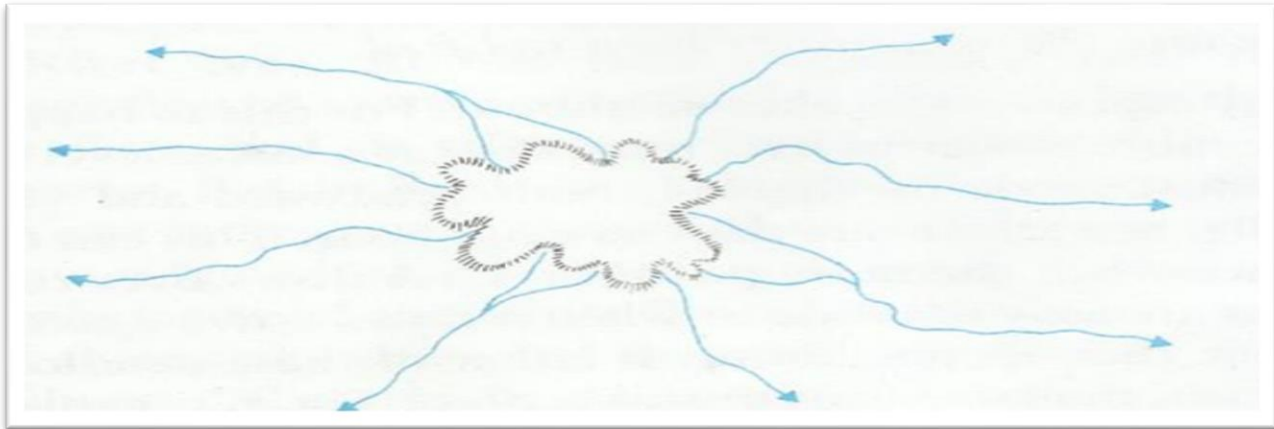
ii. TRELLIS DRAINAGE

This pattern is rectangular in shape. The small streams or a small river (subsequent) joins the big streams or big rivers (consequent) at right angle.



iii. RADIAL DRAINAGE

This pattern develops on a dome or volcanic cone. The river radiate outwards from the central point like the spokes of a wheel. At times rivers radiate from the top of the mountain or highland



TOPIC 4: RIVERS, LAKES AND SWAMPS OF ZAMBIA

A. Name the main rivers of Zambia

i. The Zambezi River

It is the longest river in Zambia and all other big rivers in Zambia end in it. Zambezi River starts from kalene hills in Mwinilunga in the North Western province of Zambia. It flows into Angola and re-enter Zambia near Chavuma. It then flows through Western province, Southern and Mozambique before entering the Indian Ocean.

ii. The Kafue River

It is the second largest river in Zambia. It starts from the Zambezi-Congo watershed in the North West of Chingola. It then flows South wards through the Copperbelt and then south west wards towards the Lukanga swamps in Central province. Thereafter, it flows west and south wards and forms the Kafue flats, then east wards into the Zambezi River near Luangwa (Feira) district.

iii. The Luangwa River

It starts at from Luangwa- Malawi watershed in Mafinga Hills. It joins Zambezi River at Luangwa district. A **tributary** is when a small river joins a big river.

iv. The Chambeshi-Luapula River

The Chambeshi-Luapula river is regarded as one river because in the Northern Province it is called Chambeshi while the same river is Known as Luapula in the Luapula Province. It starts from the Mbala Highlands, as Chambeshi river enters lake Bangweulu and re-emerges as Luapula River. It then enters Lake Mweru and from Lake Mweru it joins the Luvua River which flows into the Congo River.

B. Name the Lakes of Zambia

i. What is a Lake?

It is a body of water that collects in hollow or depression inland.

ii. Lake Bangweulu

It is one of the lakes not shared with another country and it is found in Luapula province

iii. Lake Tanganyika

It is a rift valley lake found in Northern Province. It is shared by Tanzania, Congo DRC and Zambia.

iv. Lake Mweru

It is a depression lake found in Luapula province. It is shared between Zambia and Congo DRC.

v. Lake Kariba

It is a man-made lake or artificial lake found in Southern Province. It is shared between Zambia and Zimbabwe. A man-made lake is created by building a dam (wall) across a river to block the water. The water that collects behind the dam wall forms a lake.

vi. Lake Mweru-wa-Ntipa

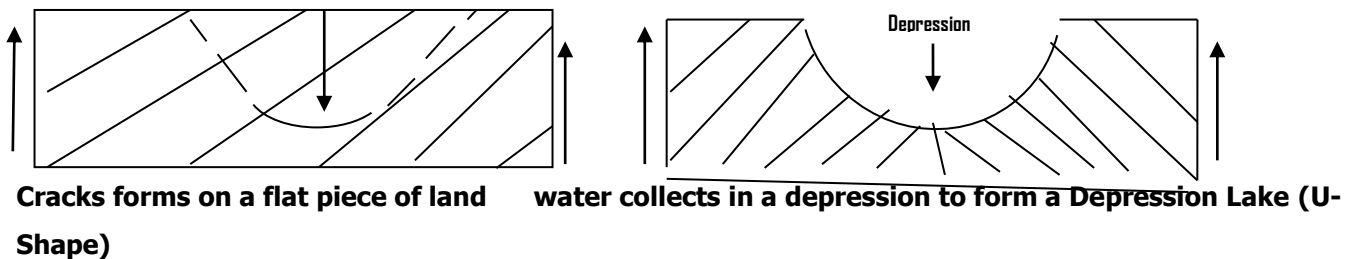
It is a depression lake found in Northern Province. It is not shared with any other country.

C. Name the types of Lakes of Zambia

There are three types of lakes found in Zambia.

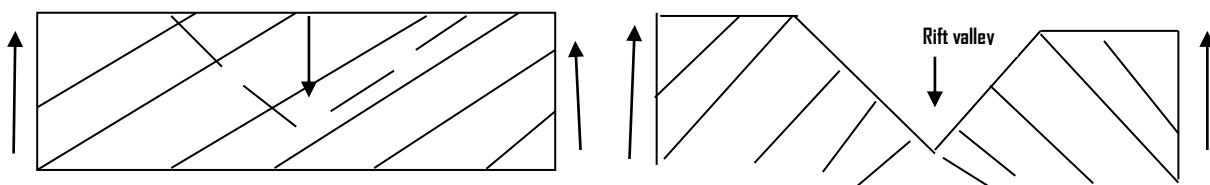
i. Depression Lakes

These are lakes formed by erosion of the land forming a hollow or depression. Water then collects in the depression forming a lake; such lakes include Lake Mweru, Mweru-wa-Ntipa and Bangweulu.



ii. Rift Valley lakes

These are lakes formed as a result of land sinking down forming a deep depression. Water then collects in the valley forming a lake; such lakes include Lake Tanganyika.

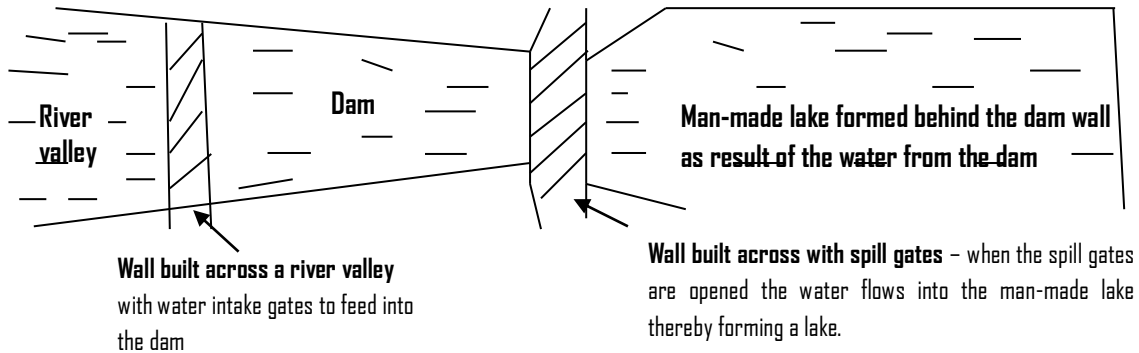


**Cracks forms on a flat piece of land
Shape)**

water collects in a rift valley to form a Rift valley Lake (V-

iii. Man-made or artificial lakes

These are lakes formed when a dam is built across a river valley. Water collects behind the dam forming a lake; such as lake includes Lake Kariba



D. Name the main uses of rivers and lakes in Zambia

1. Farming

Rivers are used to supply water for irrigation and drinking by farm animals. Without water there can be no agriculture because both animals and crops depend on water.

2. Hydro-Electric Power (HEP)

Most of the rivers in the world are used to generate hydro-electric power for use in homes and industries.

3. Tourism

Rivers contribute to tourism as many people are interested in many activities done in the water of many rivers.

4. Water Supply

Rivers supply water for both domestic and industrial use

5. Fishing

Many types of fish are caught from rivers which are a source of protein to people.

6. Transport

Transportation of both goods and people can be done by water routes especially between places that are islands.

7. Settlement

Sometimes human settlements are concentrated along rivers for easy access to water.

8. Boundary

Some rivers act as boundaries between countries such as Zambezi River between Zambia and Zimbabwe and Luapula River between Zambia and DRC Congo.

9. Minerals

Some precious minerals are found on river beds and beaches such as gold and diamond

10. Building Materials

Rivers provide much needed building materials such as river sand and gravel.

E. Name the swamps of Zambia

i. What is a Swamp?

It is a wetland area usually found near lakes or rivers. The swamps are not totally under water like lakes or rivers but they remain wet and soggy all year round.

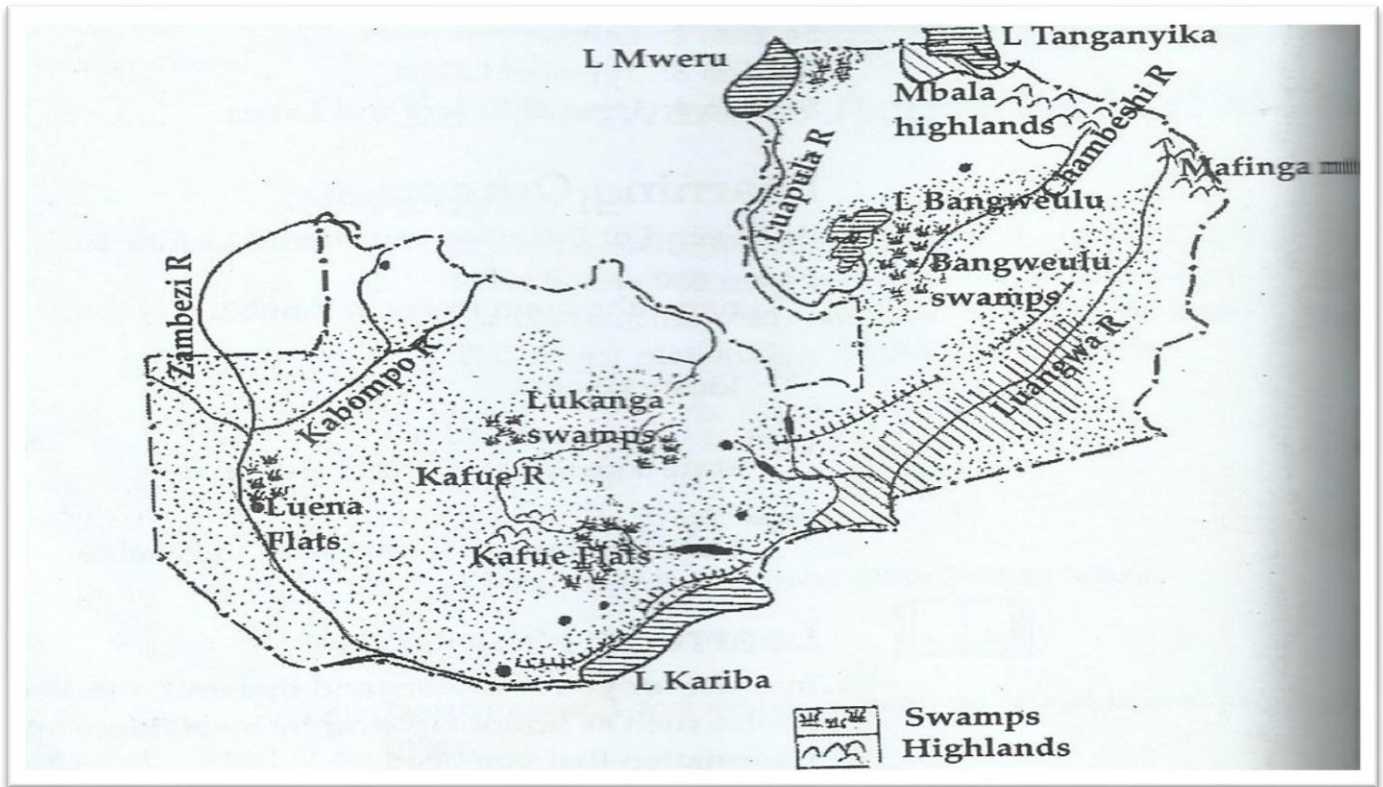
ii. Name the swamps found in Zambia

1. Bangweulu swamps
2. Busanga swamps
3. Lukanga swamps
4. Mweru-wa-Ntipa swamps
5. Kafue flats
6. Luena flats

iii. Name the importance of swamps in Zambia

1. Supports the well growth of plants
2. Home to many wild animals and birds
3. Traps water from reaching human settlement which can cause floods
4. Purify the water by filtering the dirty floating on water
5. Source of water for humans and animals
6. Source of fish

The Map of Zambia Showing, Swamps, Rivers and Lakes



TOPIC 5: CULTURAL FEATURES OF ZAMBIA

A. What are cultural features of Zambia?

These are man-made cultural features that are made by the Zambians such as road and railway network, bridges, plantations and settlement patterns.

B. Name the cultural features of Zambia

1. Road and Railway network

a. Roads network

Zambia has the following major roads.

i. The Lusaka – Copperbelt Road – most used inter- provincial highway

ii. The Ndola – Kitwe dual carriage way- most used inter-city highway

iii. The Great North Road – Runs from Chirundu and passes through Kafue, Lusaka, Kapiri Mposhi, Mpika, Isoka up to Tanzania.

iv. The Great East Road – Runs from Lusaka to Chipata

v. The Lusaka – Mongu Road – passes through Mumbwa to Mongu then Kalabo

vi. Chingola – Solwezi Road – Runs from Chingola to Solwezi then Mwinilunga.

vii. Lusaka – Livingstone Road – passes through Mazabuka, Monze, Choma, Kalomo to Livingstone.

viii. **Livingstone – Shesheke Road** – links Zambia and Botswana.

b. Railway network

Zambia has two principal lines of rail, the **Zambia Railways (ZR)** and **the Tanzania-Zambia Railways (TAZARA)**.

i. Zambia Railways Routes

The Zambia Railways runs from Kitwe and passes through Ndola, Kapiri Mposhi, Kabwe, Lusaka, Livingstone and Zimbabwe. Other lines of rail includes

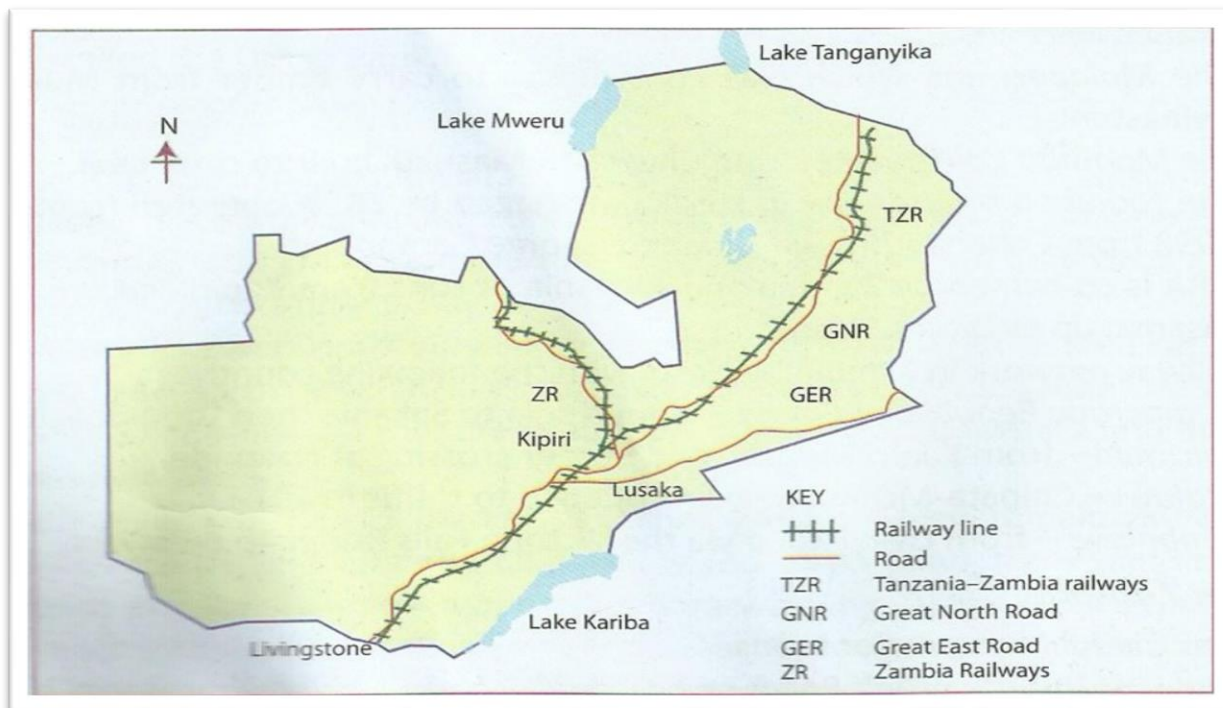
- **Mulobezi to Livingstone** - constructed to transport timber from Mulobezi.
- **Maamba to Masuku** – constructed to transport coal from Maamba.
- **Njanji Commuter Line (Chilenje to Town)** - constructed to transport people to town.

ii. Tanzania-Zambia Railways (TAZARA) Routes

TAZARA is co-owned by Zambia and Tanzania. It runs from Kapiri Mposhi through Mpika, Kasama up to Dar es Salaam.

iii. The countries linked by railway network in Zambia

- **Democratic Republic of Congo** – from Ndola to Sakania then Lubumbashi
- **Tanzania** – from Kapiri Mposhi and border crossing at Nakonde
- **Malawi** – Chipata – Mchinji opened in 2010 to link Zambia and Malawi.
- **Zimbabwe** – from Livingstone via the Victoria Falls Bridge to Bulawayo.



2. Bridges

The following are some of the bridges in Zambia

- i. The Victoria Falls Bridge** – built across the Zambezi river to link Zambia and Zimbabwe
- ii. The Chirundu Bridge** – Formerly known as **Otto Beit Bridge** built to link Zambia and Zimbabwe.
- iii. The Katima Mulilo Bridge** – built Zambezi river to link Zambia and Namibia via Trans – Caprivi Highway.
- iv. The Luangwa Bridge** – built across Luangwa river to Lusaka to Chipata
- v. The Kafue Hook Bridge** – built across the Kafue river to link Lusaka to Mongu
- vi. The Kafue Bridge** – built across the river to link Lusaka to Livingstone
- vii. The Luapula (Tuta) Bridge** – built across the Luapula river to link Zambia to Congo DRC. It is one of the longest bridge in Zambia
- viii. The Kalabo Bridge** – built across Zambezi river to link Kalabo to Mongu

3. Plantations

Zambia has several plantations that are divided into five categories as follows.

- i. Forest and Forest reserves** – where different trees are reserved for future use
- ii. Plantations** – such as Sugar, Coffee, Tobacco, Cotton and Tea
- iii. National parks** – certain species of plants are found in parks
- iv. Game management area** – also certain plants are found in such as areas
- v. Woodlands** – special trees are planted such as palm trees for power lines

4. Settlement Patterns of Zambia

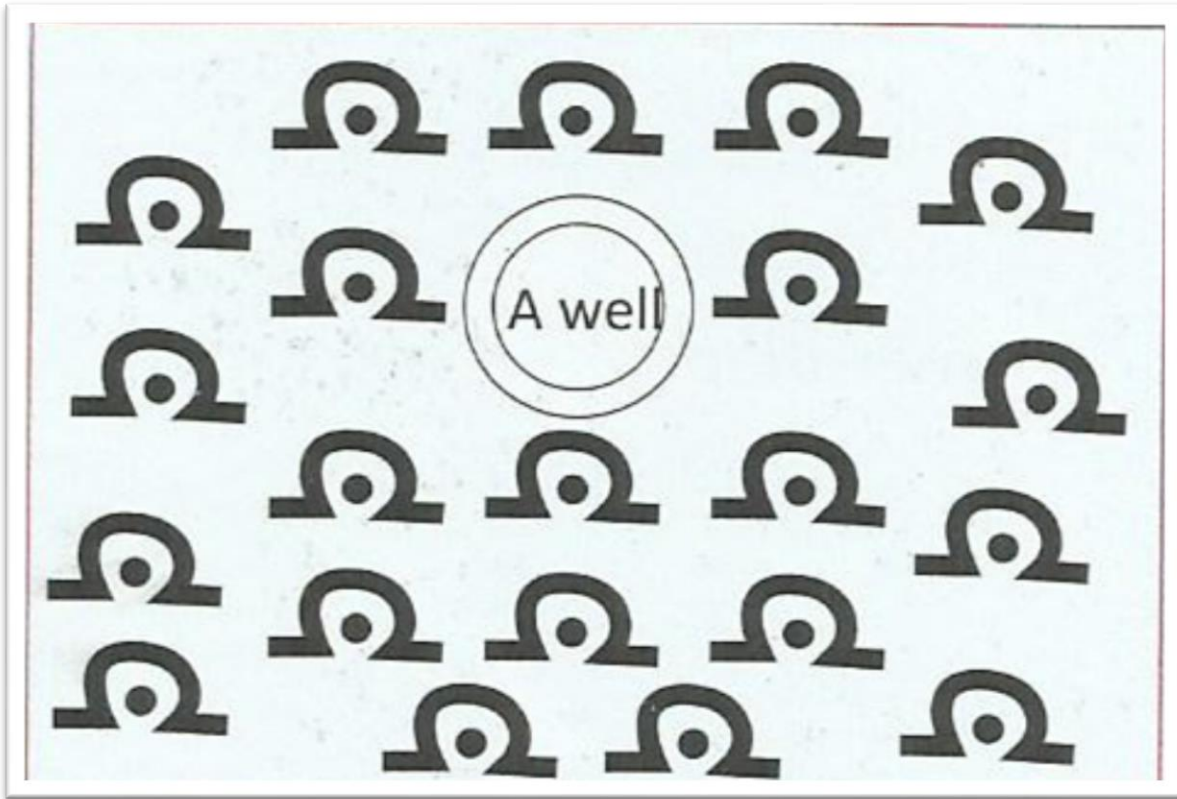
i. What is a Settlement?

It is place where people live. The settlements in Zambia vary in size from cities, big towns, small towns, villages and isolated homesteads in rural areas.

ii. Name the types of settlement

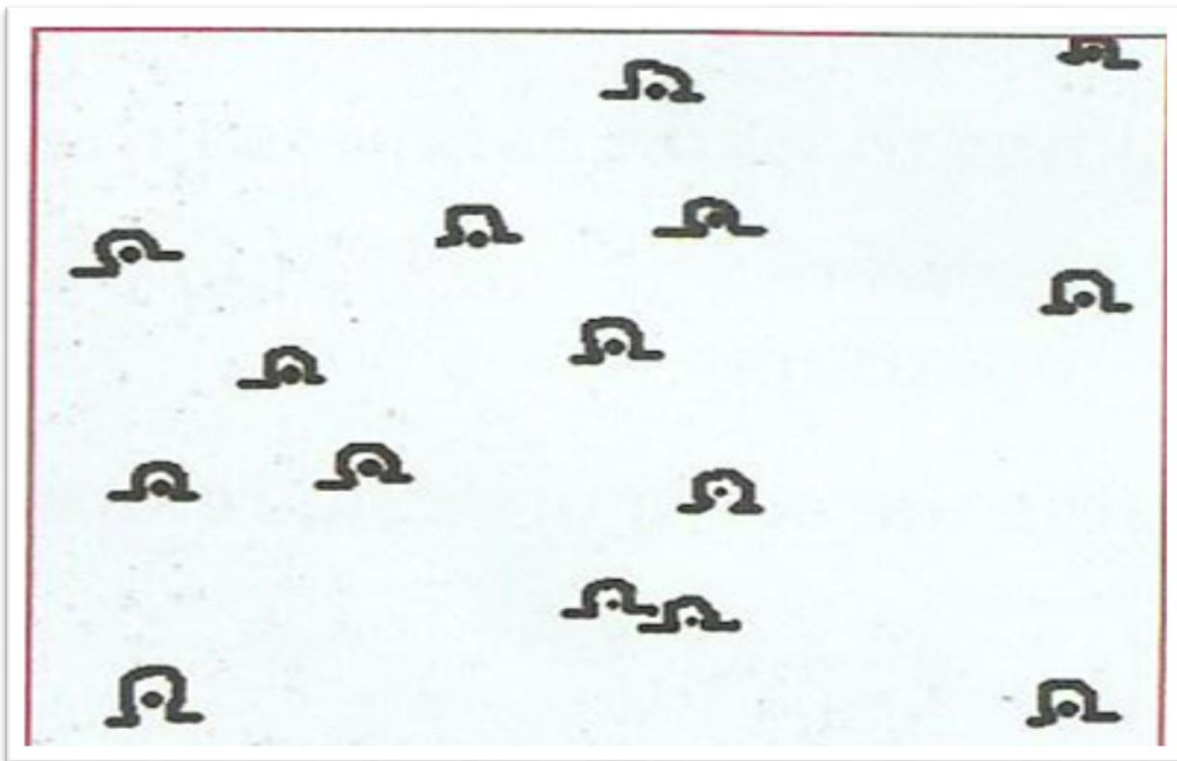
a. Nucleated Settlement pattern

This is a settlement where houses or huts are clustered together over an area. Houses or Huts may be built around a place of common interest (**also known as nucleus of the houses**) such as a well, school or mine.



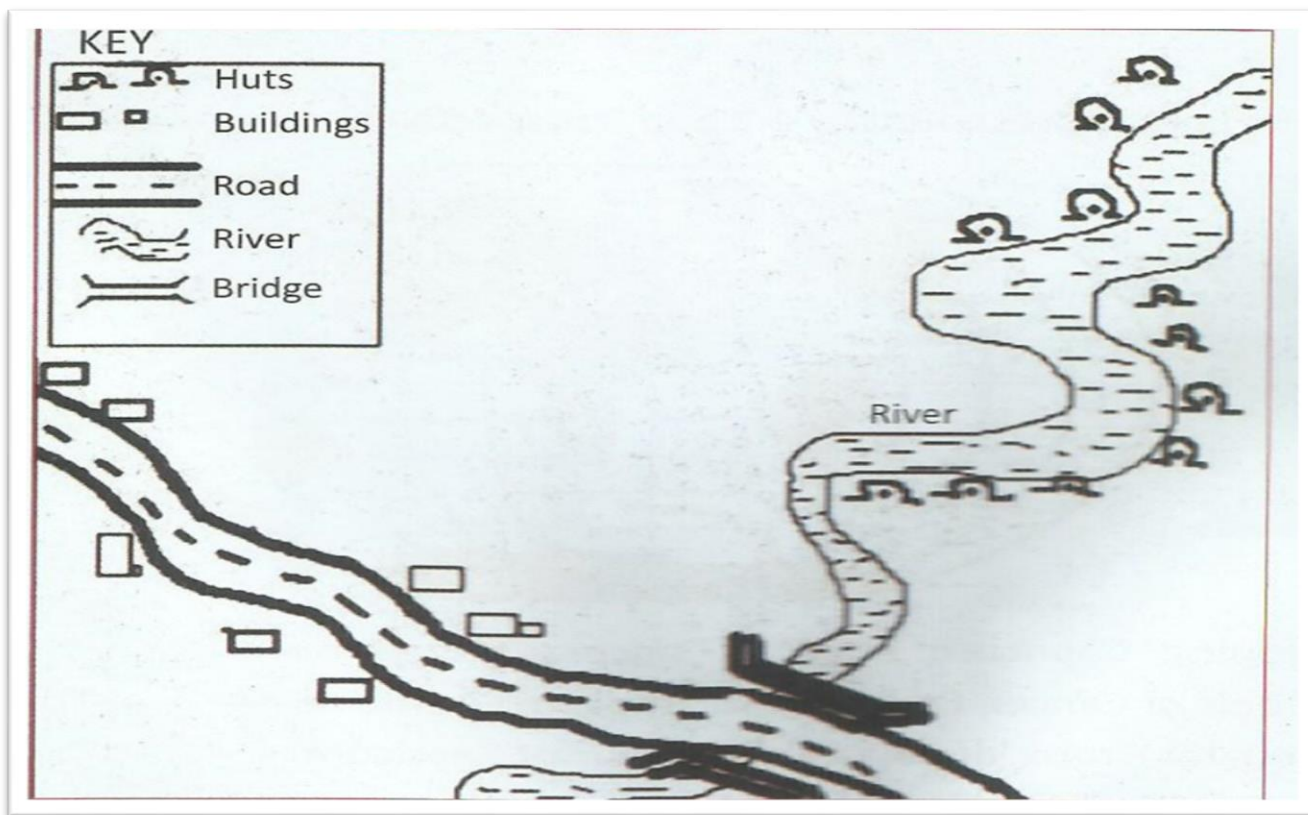
b. Dispersed Settlement pattern

This is a settlement where houses or huts scattered over an area. The distance between each houses or huts varies but within the same area.



c.Linear Settlement pattern

This is a settlement where houses or huts are built in a line over an area. This can be along a major road, rail line or river banks.



TOPIC 6: WEATHER AND CLIMATE

A. WEATHER

1. What is Weather?

It is the atmospheric conditions of a particular place over a short period of time.

2. What is Meteorology?

Is the study of weather and making of weather forecasts?

3. Who is a Meteorologist?

Is a person who studies weather and make weather forecasts.

4. What is Weather Forecast?

Is the prediction of what kind of weather might be expected over the few days or months?

5. What is Weather or Meteorological Station?

It is a place where the elements of weather are measured and recorded.

6. What are Elements of Weather?

These are atmospheric conditions that make up weather of a particular place at a given time.

7. What are Instruments of Weather?

These are instruments used to measure elements of weather.

8. Name the elements and instruments of weather.

ELEMENTS	INSTRUMENTS	UNITS	LINES DRAWN ON MAP
Rainfall	Rain gauge	Millimeters(mm)	Isohyets
Temperature	Thermometer	Degrees Celsius or Centigrade (°C) or Degrees Fahrenheit (°F).	Isotherms
Humidity	Hygrometer	Relative humidity (%)	None
Air pressure	Barometer	Millibars(mb)	Isobars
Sunshine	Sunshine Recorder/Sun dial	None	Isohels
Cloud Cover	Human eye by Observation	Oktas or eighths	Isoneph
Wind Speed	Anemometer	Knots	None
Wind Direction	Wind Vane/ weather clock	Compass directions	None

9. Rainfall

- ✓ It is formed when small droplets of water join together to form clouds.
- ✓ It is always measured by an instrument called a **Rain gauge**.
- ✓ **Drizzle** is a very fine rain (raindrops).
- ✓ **Haze, Mist or fog** these are formed when condensation occurs at a ground level without necessarily resulting in rain.

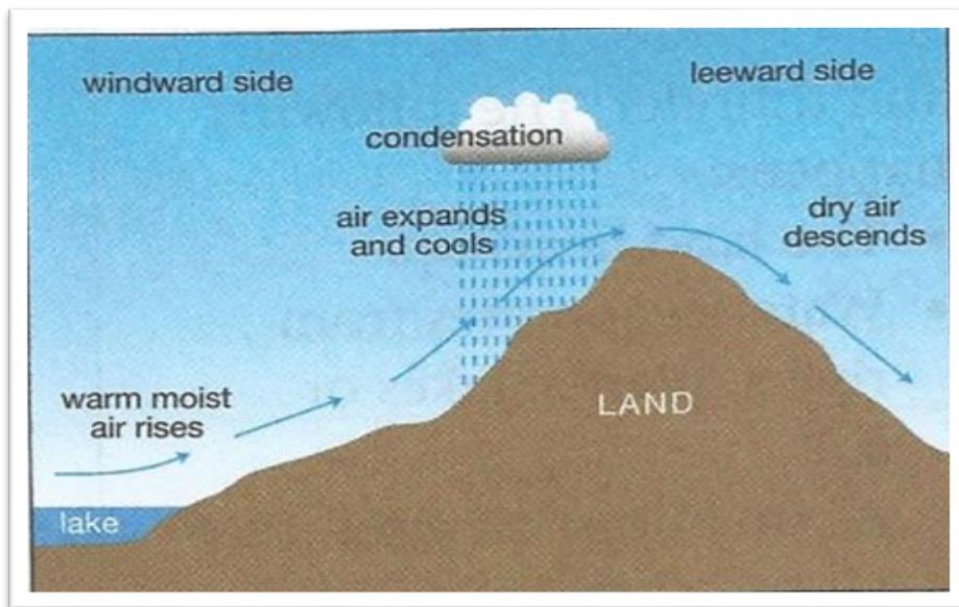
- ✓ **Dew** is water in form of droplets that appears on exposed objects such as car roofs, leaves and grass in the morning or evening due to condensation.
- ✓ **Snow** is formed when condensation takes place at temperatures below freezing point and the whole land is covered ice pellets.
- ✓ **Hail or sleet** is formed when moist air ascends quickly to cooler layers of the atmosphere, when this happens, water droplets freeze into ice pellets and fall as hail or hailstones.

TYPES OF RAINFALL

There are **(3) three** common types of rainfall namely **Relief, Convection and Convergence**.

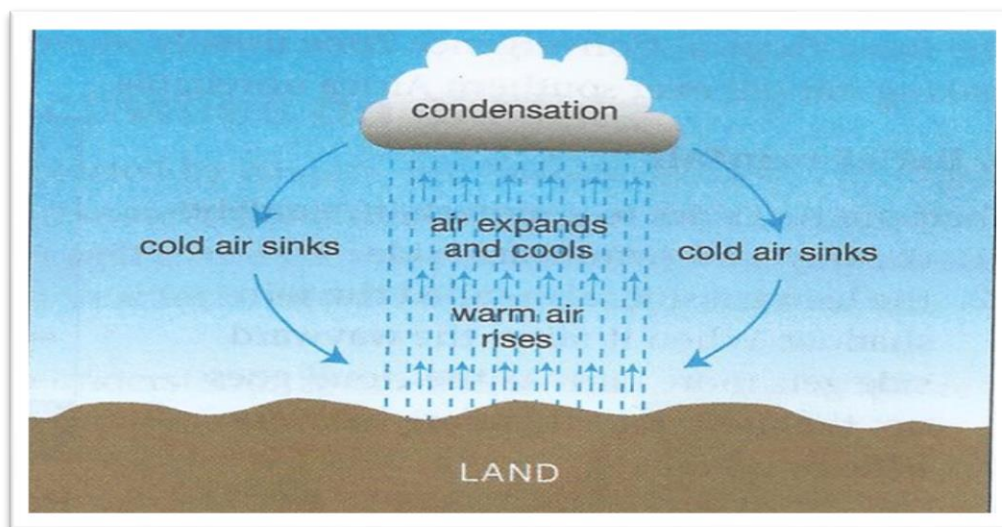
a. Relief rainfall

- i. It is also known as **orographic rainfall**
- ii. It is formed whenever moist air is forced to ascend a mountain barrier
- iii. It is common in all regions
- iv. The side that receives rainfall is called **Windward side or wayward side**.
- v. The side that does not receive rainfall is called **Leeward side or rain shadow**.



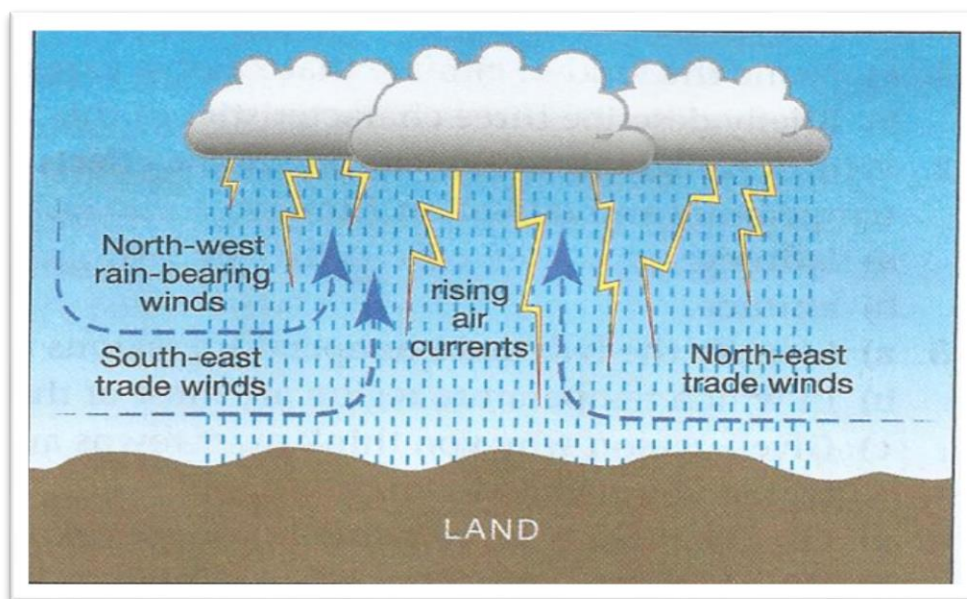
b. Convective rainfall

- i. This type is formed when the land is heated forcing evaporation of water from rivers, plants, lakes, seas or soil.
- ii. It usually occurs in the afternoon and is common in Equatorial and Savannah regions
- iii. It is usually accompanied by **lightning and thunder**
- iv. **Thunderstorms** (heavy rain sometimes mixed with hail accompanied by lightning and thunder) can occur when land surfaces are greatly heated.

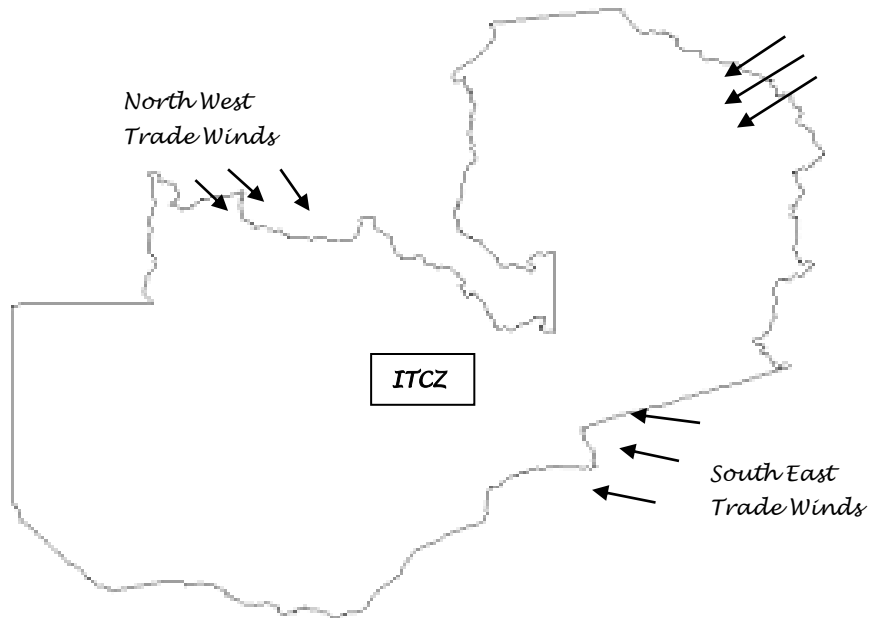


c. Convergence rainfall

- i. It is also known **Cyclonic, frontal or depression rainfall**
- ii. This type of rainfall occurs when large masses of air of different temperature meet forcing the **warm moist air** to rise over the **cooler moist air** to form clouds.
- iii. It is usually a very heavy rain that lasts for few hours
- iv. It is common in low **pressure belts (doldrums)** areas
- v. As the warm air rises, pressure decreases, the air expands and cools, condensation takes place and light showers called **frontal or cyclonic rain occurs**.
- vi. The point where the air masses meet is called **Frontal**.
- vii. For example in Zambia the three air masses namely **North West Trade Winds** (warm moist air mass), **North East Trade Winds** and **South East Trade Winds** (cooler moist air masses) brings about **convergence rainfall** in Zambia.
- viii. The point where these three trade winds meet is called **Inter-Tropical Convergence Zone (ITCZ)**.

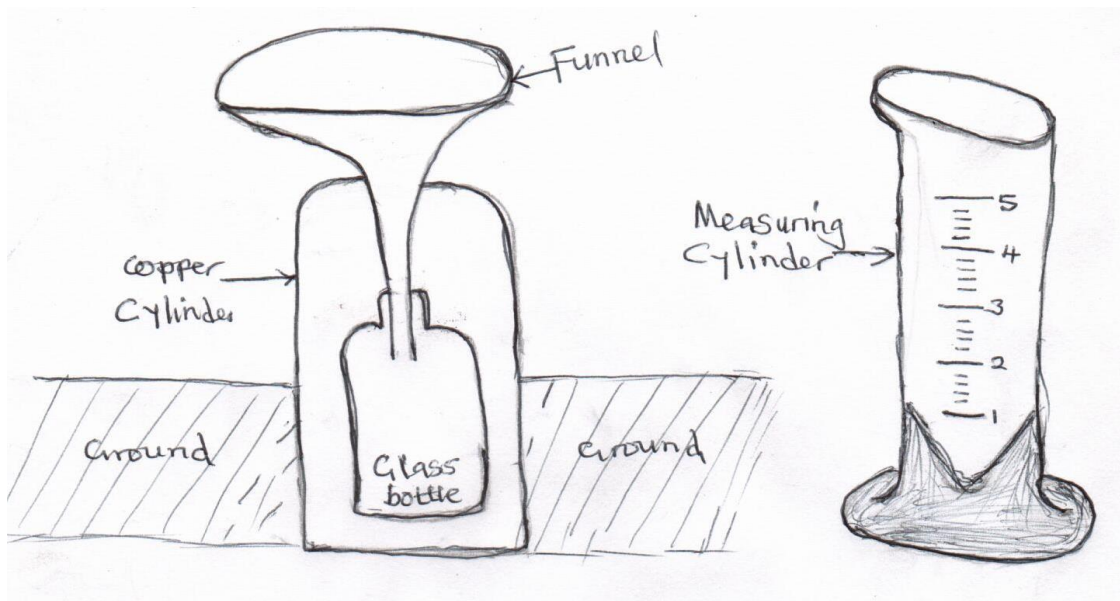


Below is the map of Zambia showing how the three trade winds namely **North West Trade Winds, North East Trade Winds and South East Trade Winds** enter the country.



A. Measurement of rainfall

- i. Rainfall is measured by an instrument called Rain gauge
- ii. Rainfall is usually measured in millimetres(mm)
- iii. A rain gauge consists of a cylinder copper container, glass bottle or small copper container and metal funnel.
- iv. A rain gauge is placed in an open space so that no runoff water from trees, tall buildings or other objects can get into the funnel.
- v. A rain gauge should be at least 30cm above the ground to avoid the splashing water from the ground getting into the funnel.



B. How to record rainfall measurements

- i. **Daily rainfall**- it is recorded in millimetres by reading it off the rain gauge.

- ii. **Monthly rainfall**- the daily records of rainfall are added at the end of the month to find total rainfall for the month.
- iii. **Mean monthly rainfall** is obtained by dividing the monthly total by the number of days in the month.
- iv. **Annual rainfall** is obtained by adding monthly totals of each month.
- v. **Mean Annual** rainfall is calculated by adding monthly rainfall totals divided by 12 months.
- vi. **Isohyets**- these are lines drawn on a map joining places of equal amount rainfall

TOPIC 7: TEMPERATURE

It is the degree of hotness or coldness of a body or place.

It is measured in Degrees Celsius or Centigrade ($^{\circ}\text{C}$) or Degrees Fahrenheit ($^{\circ}\text{F}$).

a). How to read temperature

It is observed by measuring the highest (maximum) and the lowest (minimum) temperatures of the day.

Degrees Celsius or Centigrade ($^{\circ}\text{C}$)

- i. 0°C represents freezing point of water
- ii. 100°C represents boiling point of water

Degrees Fahrenheit ($^{\circ}\text{F}$)

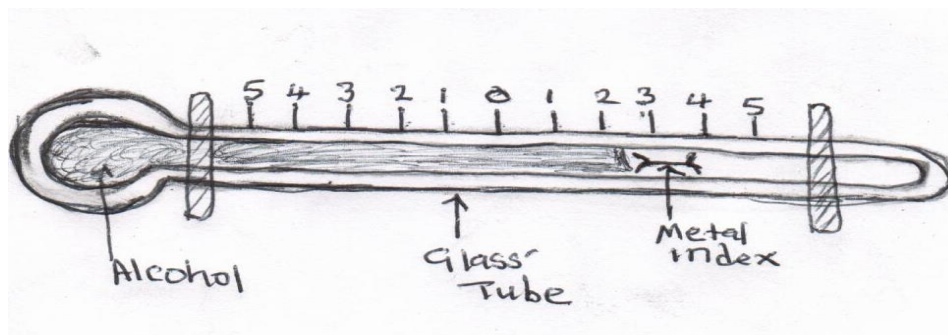
- i. 32°F represents freezing point of water
- ii. 212°F represents boiling point of water

b). How to measure temperature

Temperature is measured using a **thermometer**. The following are ways in which temperature can be measured using the minimum and maximum thermometers.

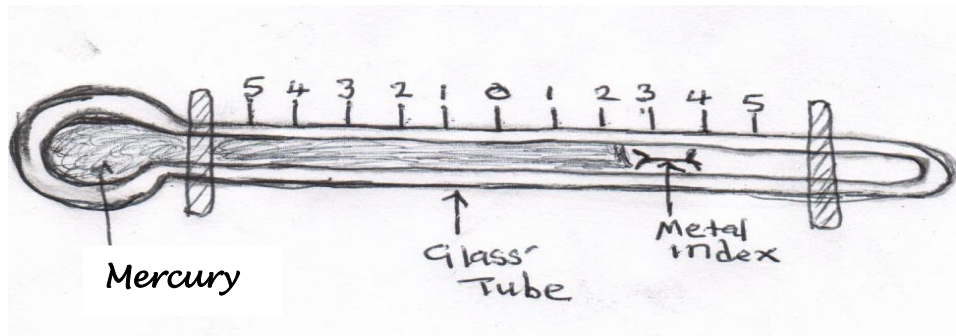
a. Minimum thermometer

- i. It is used to measure minimum temperature which is the lowest temperature of the day of a given place.
- ii. This thermometer uses alcohol.



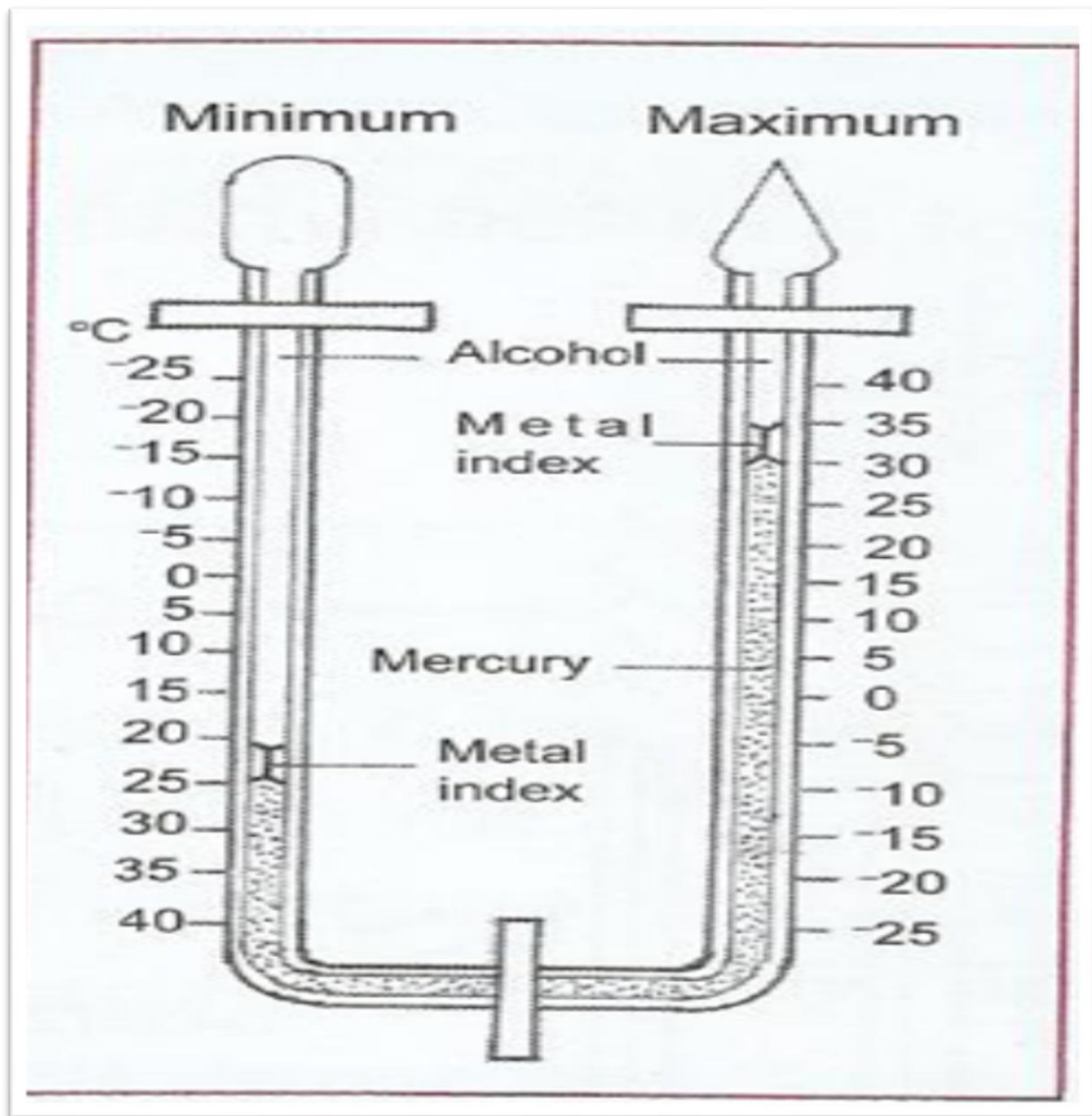
b. Maximum thermometer

- i. It is used to measure maximum temperature which is the highest temperature of the day of a given place.
- ii. This thermometer uses mercury.



c. Six's thermometer

- i. It is also called the minimum and maximum thermometer.
- ii. It is used to show both maximum and minimum temperatures
- iii. The two thermometers are joined in a U- shaped glass tube.



c). How record temperature

a) **Mean daily temperature** is the average of maximum and minimum temperatures. The maximum and temperatures for one day are added together and then halved.

For example Maximum temperature 30°C

Minimum temperature 10°C

$$\text{Mean daily temperatures} = \frac{30^\circ\text{C} + 10^\circ\text{C}}{2} = \frac{40^\circ\text{C}}{2} = 20^\circ\text{C}$$

2 2

b) **Diurnal/Daily range of temperature** is the difference between maximum and minimum temperatures of the day.

For example Maximum temperature 30°C

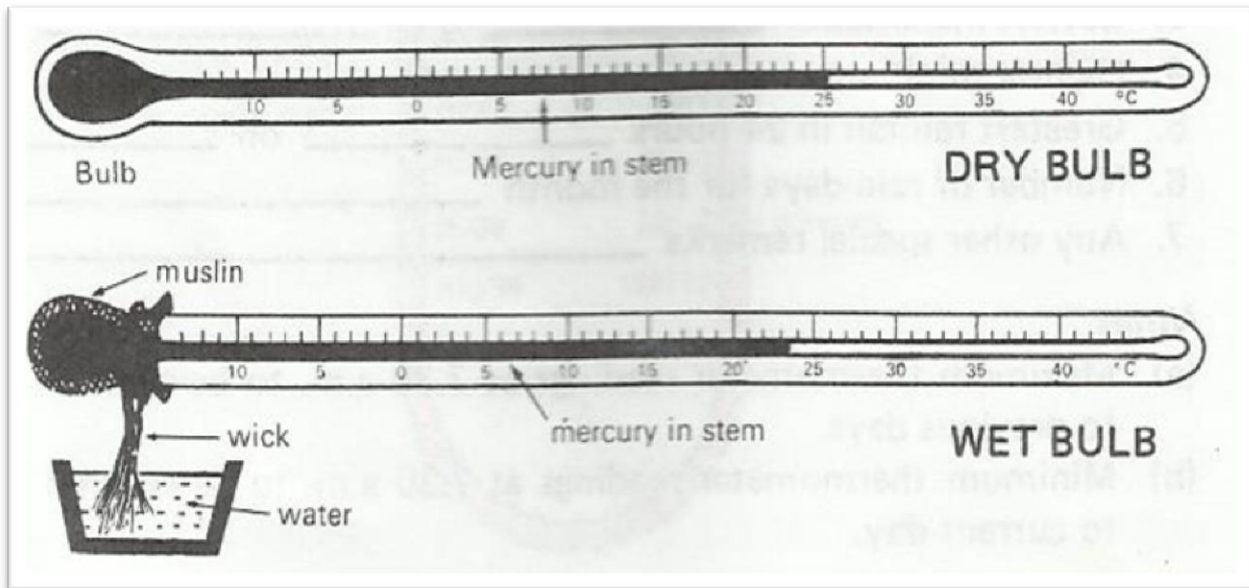
Minimum temperature -10°C

Daily range of temperature = 20°C

- c) **Mean monthly temperature** is obtained by adding all the daily readings for the month divided by the number of days in that month.
- d) **Mean annual temperature** is the total mean month temperature divided by 12 months.
- e) **Mean annual range of temperature** is the difference between the highest mean monthly temperature and the lowest mean monthly temperature.
- f) **Isotherms** are lines drawn on the map joining places with same mean temperature.

TOPIC 8: HUMIDITY

- ✓ It is the amount of water vapour in the air.
- i. **Relative humidity**- is the ratio between the amounts of water air can hold at given temperature and the actual amount of water in the air.
- ii. **Saturation point**- is when there is a limit in the quantity of water in the air. It is when the rate of humidity is 100% or when the relative humidity is 100%.
- iii. **Absolute humidity**- is the actual amount of water present in the air.
- iv. **Dew point**- is the critical temperature at which the air is fully saturated.
- v. **Relationship between humidity and temperature.**
 - As temperature rises, air holds more water vapour.
 - The higher the temperature the more water vapour in the air.
 - The more the temperature falls the less the water vapour in the air.
 - When relative humidity reaches 100% the air is completely saturated and cannot hold any more water. And at this point condensation will occur in form of **minute droplets of clouds, rain, mist, dew and fog.**
- vi. **How to measure humidity**
 - ✓ Humidity is measured by an instrument called Hygrometer
 - ✓ Hygrometer is made up of **wet bulb and dry bulb thermometers.**
 - ✓ When air is not saturated, water evaporates from the container and the **muslin** becomes wet.
 - ✓ The wet muslin cools the wet bulb and causes the mercury to contract.
 - ✓ However, the dry bulb is not affected and the two thermometers will indicate the amount of water vapour in the air.



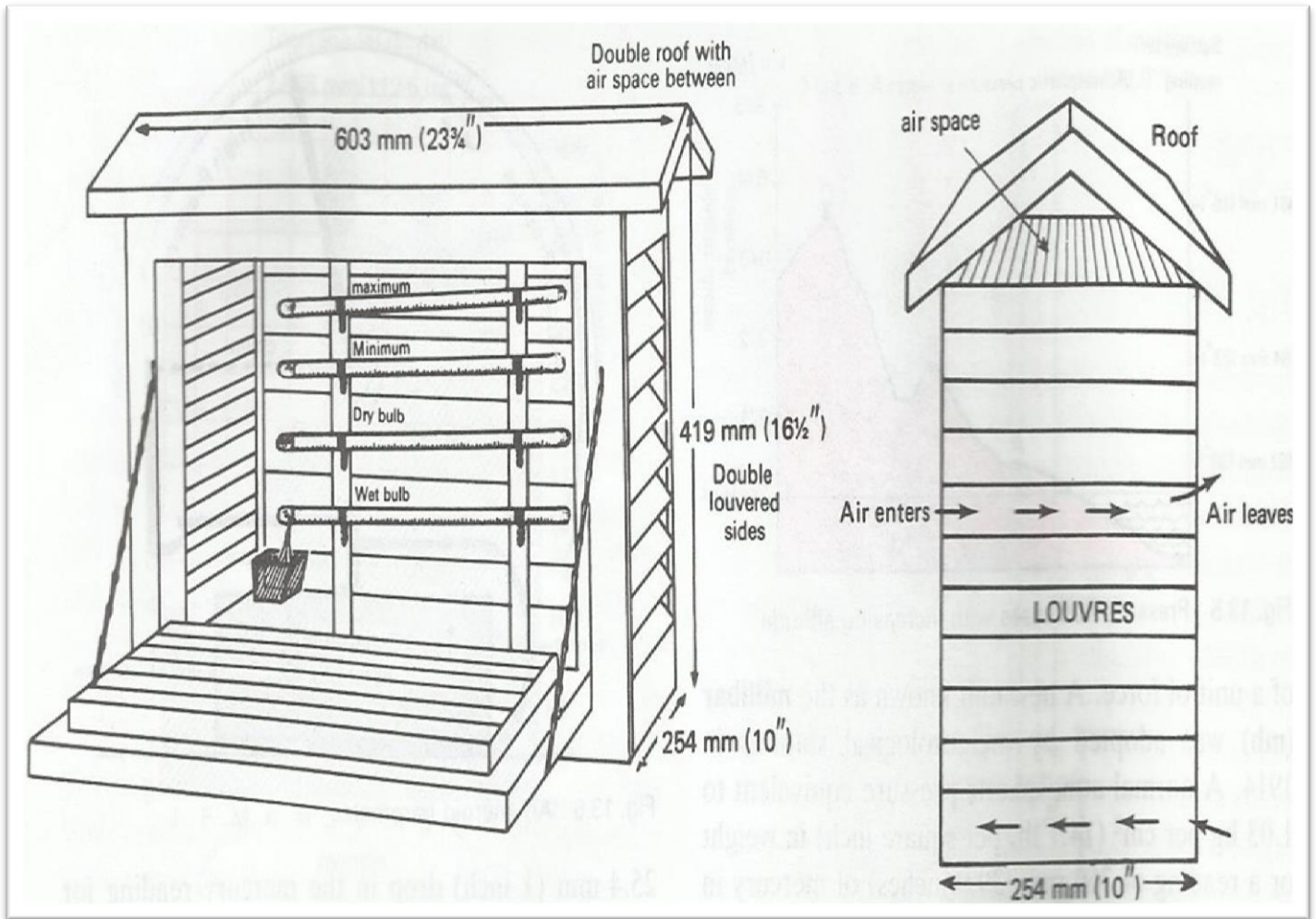
vii. How to read humidity

Thermometer reading	Amount of humidity
Large difference	Low humidity
Small difference	High humidity
No difference	Air is saturated

viii. Storage of thermometers

Stevenson screen

- ✓ It is a wooden box that is suspended or supported by four legs found at the weather station.
- ✓ Stevenson screen is used to keep **(4) four thermometers namely maximum, minimum, dry bulb and wet bulb thermometers.**
- ✓ It is suspended from the ground so that the heat from the ground does not affect the temperature readings.
- ✓ It is painted white to reflect the rays of the sun so that heat from the sun does not raise the temperature inside the box.
- ✓ It has louvered windows to allow free air circulation.
- ✓ It has a doubled layered roof with space in between to prevent direct rays of the sun reaching the instruments inside.



TOPIC: 9 AIR PRESSURE

- ✓ It is also known as the **atmospheric pressure**.
- ✓ It is the weight of the air which is exerted on the earth's surface.

i. Relationship between altitude and air pressure

- Pressure decreases with increase in altitude
- So the higher the altitude the lower the air pressure.
- So the higher the pressure the lower the altitude

ii. Relationship between temperature and air pressure

- The higher the temperature the lower the pressure.
- The higher the pressure the lower the temperature
- High temperature areas are associated with low pressure (**doldrums**)

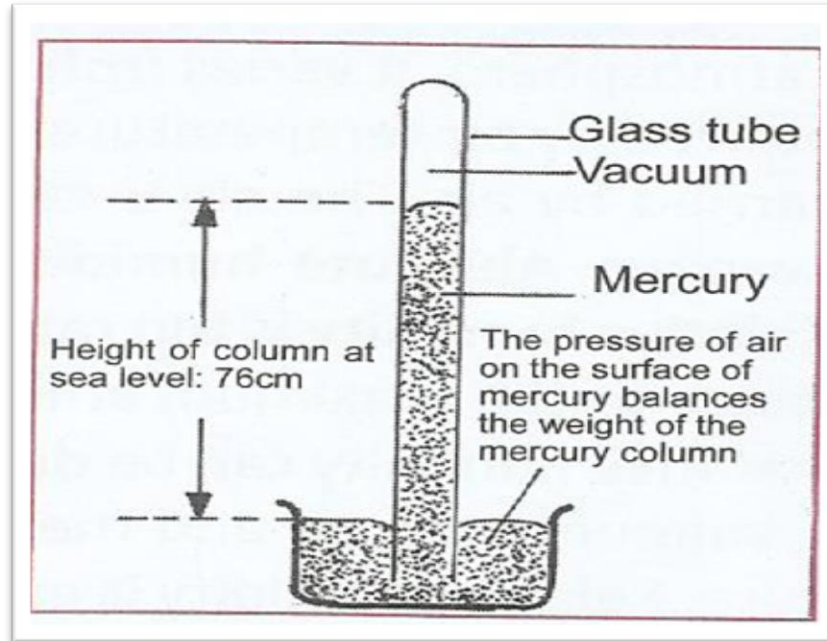
iii. How to measure air pressure

- ✓ Air pressure is measured by an instrument called **barometer**
- ✓ Air pressure is measured in units called **millibars**

- ✓ Air pressure is measured using two types of barometers namely.

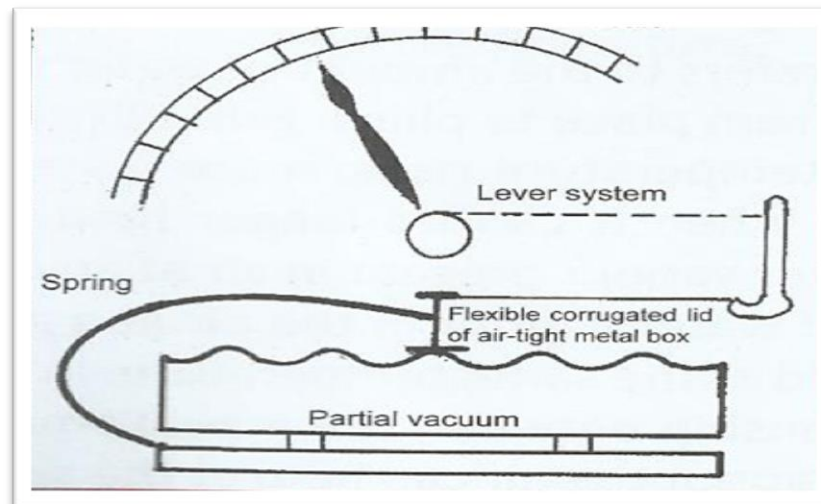
a. Mercury Barometer

- ✓ It is a very accurate instrument
- ✓ At sea level this 76cm is in metric units



b. Aneroid Barometer

- ✓ It consists of a hollow metal box which contains very little air.
- ✓ The top of the box is flexible so that it expands and contracts according to changes in atmospheric pressure outside the box.



- iv. Isobars** -are lines drawn on the map joining places with equal amount of pressure.

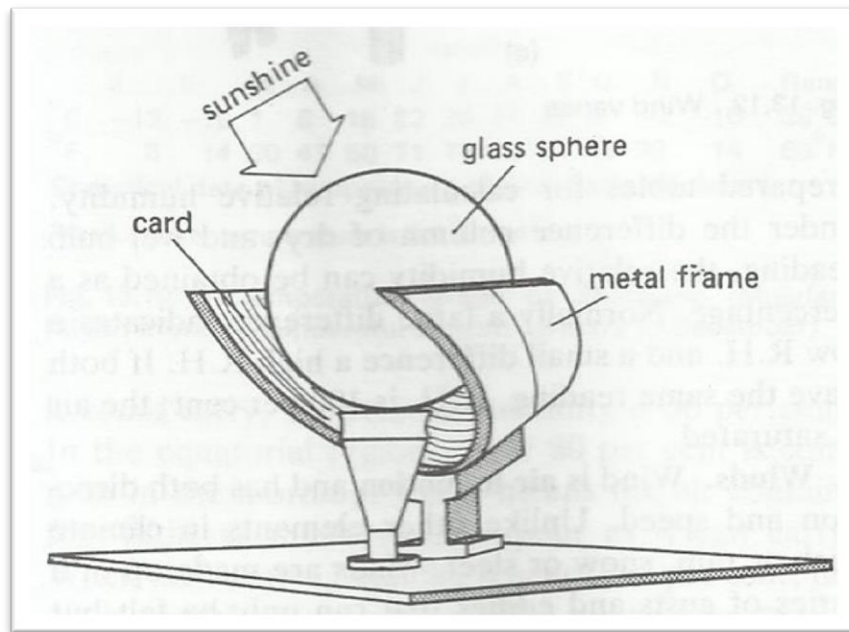
TOPIC 10: SUNSHINE, CLOUD COVER, WIND SPEED AND WIND DIRECTION

10. Sunshine

- ✓ Hours of sunshine are measured by a **sunshine recorder or sun dial**

i. Sunshine Recorder or Sun Dial

- ✓ It consists of a glass sphere of 102mm in diameter through which the rays of the sun are forecast upon a **sensitised card** graduated in hours.
- ✓ At the end of the day the card is taken out and the length of trace is turned into hours and minutes which represents the total amount of sunshine for the day.
- ✓ A line is made on the card when it is sufficiently heated but not when the rays are faint.



- ii. **Isohels** – these are lines drawn on the map joining places of equal amount of sunshine.

11. Clouds

- ✓ Are made of water droplets or ice particles that float in the sky.
- ✓ The shape, height and movements of clouds indicate the type of weather conditions for that particular place.

i. Measurement of cloud cover

- ✓ Cloud cover is measured by the **human eye** through **observation**

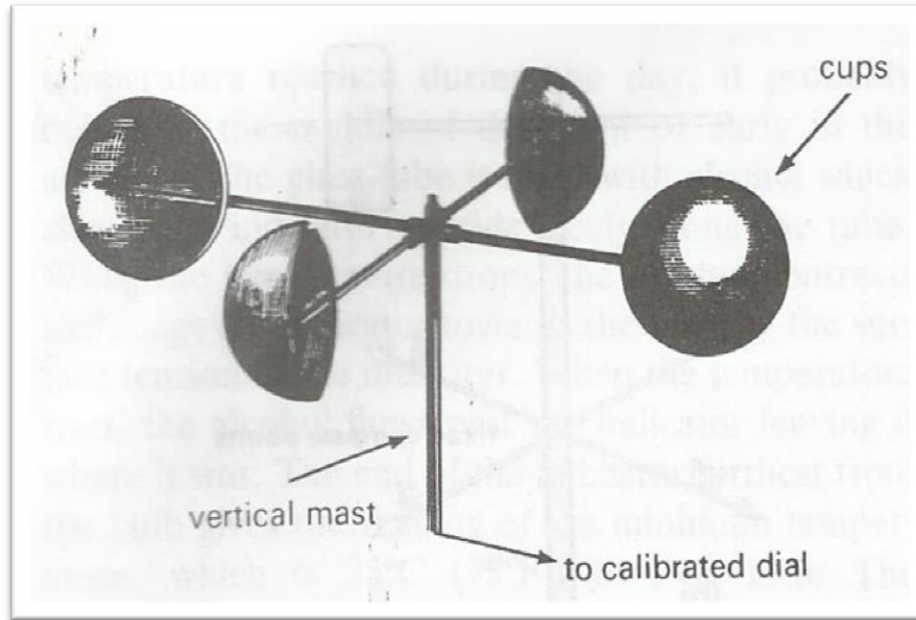
- ii. **Isoneph**s – these are lines drawn on the map joining places of equal amount of clouds.

12. Wind speed

- ✓ It is measured by an instrument called **anemometer**.

i. Anemometer

- ✓ It has three or four arms mounted on a vertical shaft (mast) with metal cups fixed at the ends of the arms.
- ✓ These arms rotate when there is wind and this movement operates a meter which records the wind speed in **km per hour**.

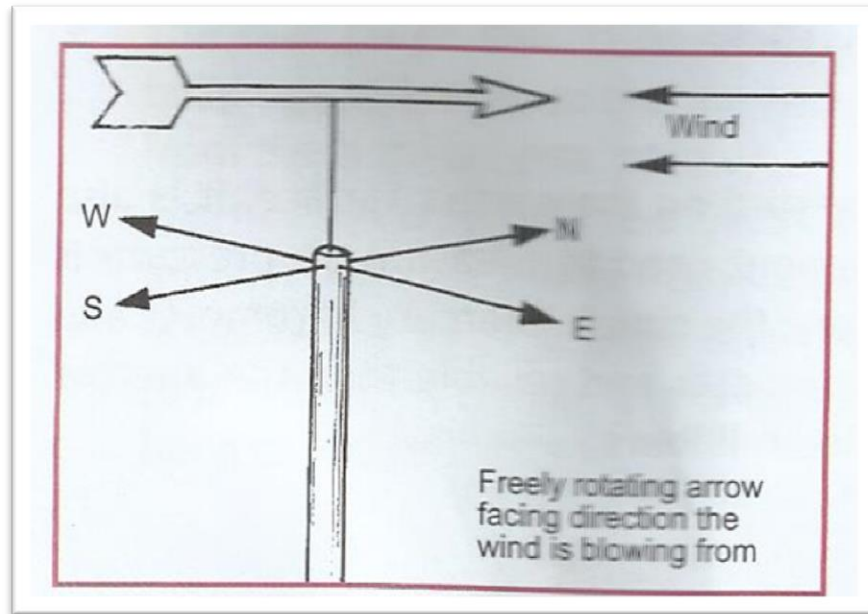


13. Wind direction

- ✓ It is measured by an instrument called **wind vane**
- ✓ Sometimes it can also be measured by an instrument called **windsock**.

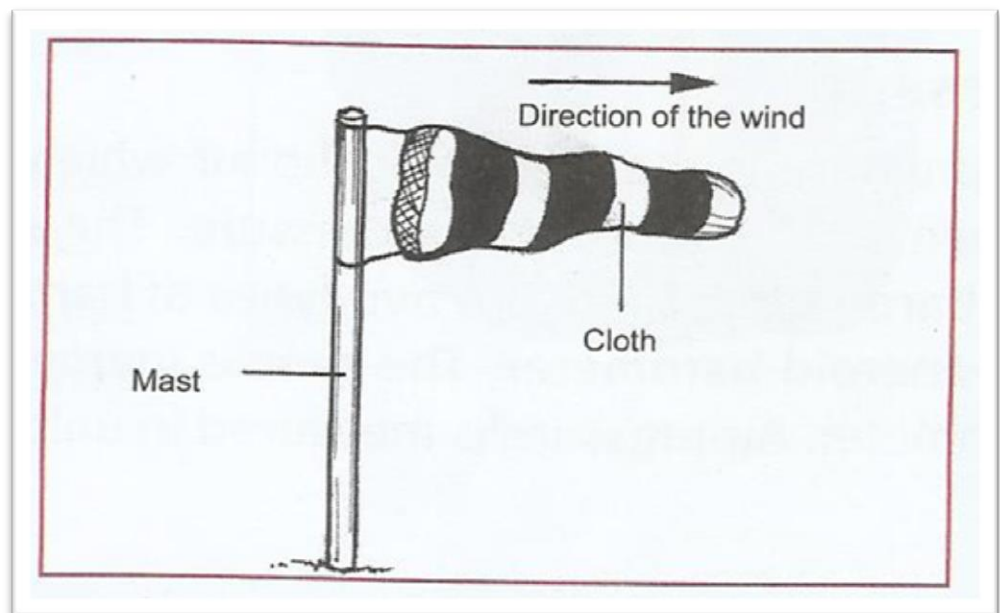
i. **Wind vane**

- ✓ It is used to indicate wind direction
- ✓ It has a rotating arm with a tail at one end and a pointer
- ✓ When the wind blows, the arm swings till the pointer faces the direction of the winds.
- ✓ Usually winds are always named from the direction they blow. For example the **east winds** blows from **east to west** named **east west winds** and **south winds** blows from **south to west** named **south west winds**.



ii. Windsock

- ✓ It is commonly found in airports and airstrips.
- ✓ It helps pilots to determine which direction to take when taking off or landing.
- ✓ It is made up of a piece of cloth mounted on a frame made out of metal or wood.
- ✓ The piece of cloth will show the direction in which the wind is blowing to and when there is no wind it rests horizontally to the frame.

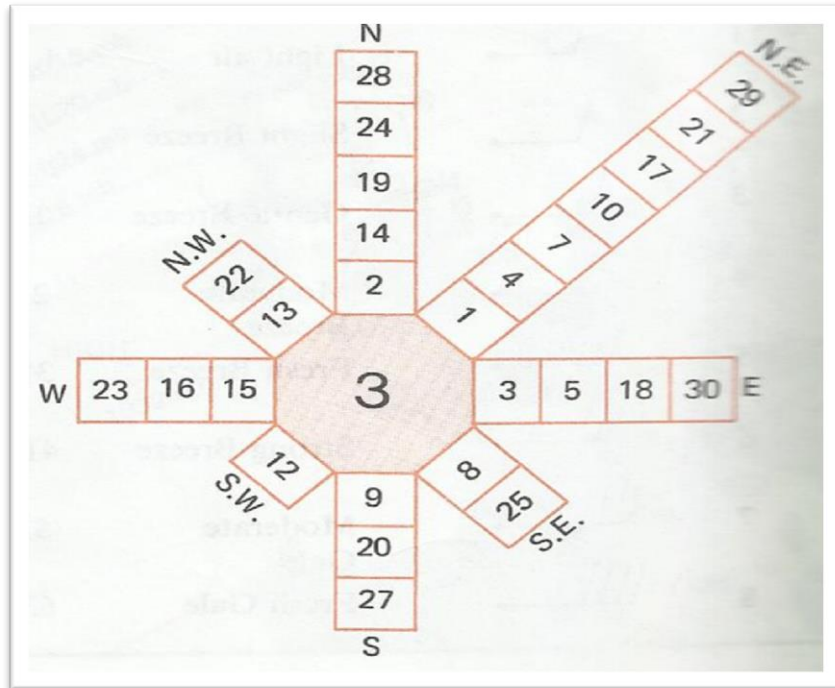


iii. How to record the direction of wind

- ✓ Wind rose is used to record the direction of wind on each day of the month.

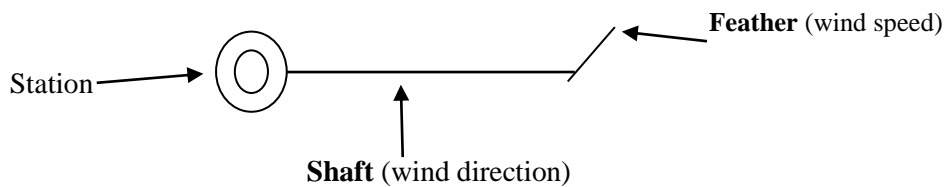
Wind rose

- ✓ It consist of an octagon with eight compass points
- ✓ Each of the small rectangles represents the date in which the wind blew from that direction.
- ✓ For example on 13th of the month the wind is north west
- ✓ The days without the wind are called **calm days**.
- ✓ Calm days are recorded in the box in the centre of the octagon
- ✓ For example, the diagram below shows 3 calm days.



14. How to record wind on the map

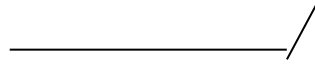
- ✓ Winds are shown by arrows on a weather map.
- ✓ A shaft of an arrow shows wind direction
- ✓ A feather of a shaft shows the wind speed



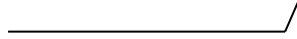
- i. This flag stands for the speed of 50 knots



ii. This full feather stands for the speed of 10 knots



iii. This half feather stands for the speed of 5 knots.

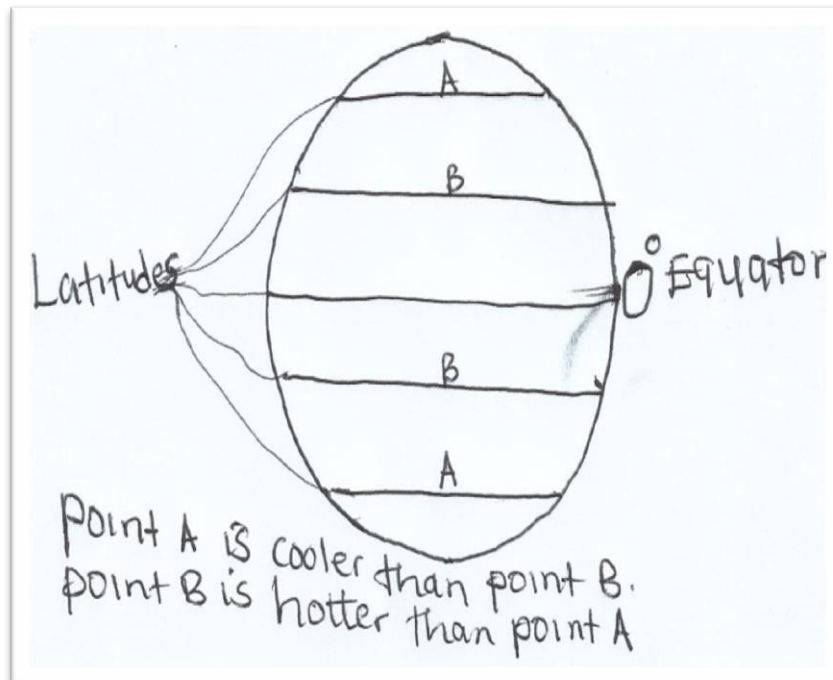


TOPIC 11: FACTORS INFLUENCING WEATHER PATTERN

The following are the factors that make weather to differ from one place to another.

i. Latitude

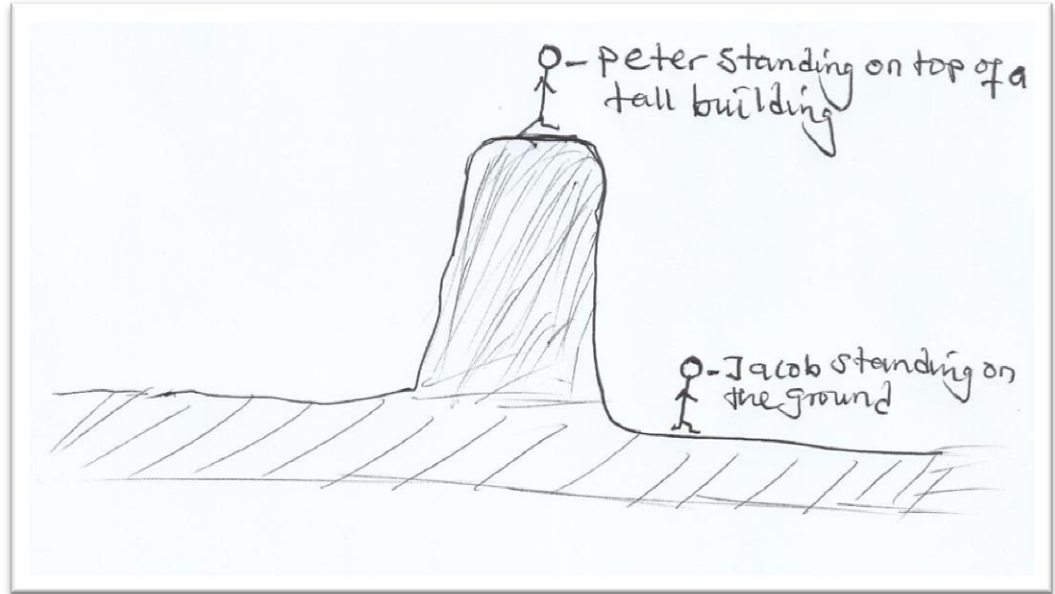
This is the distance away from the equator. The nearer to the equator the hotter it becomes, this is because the midday sun is directly overhead at the equator throughout the year and therefore, there is constant heating around the equator hence making it a hotter place and cooler at both south and north poles due to less sun lights being received.



ii. Altitude

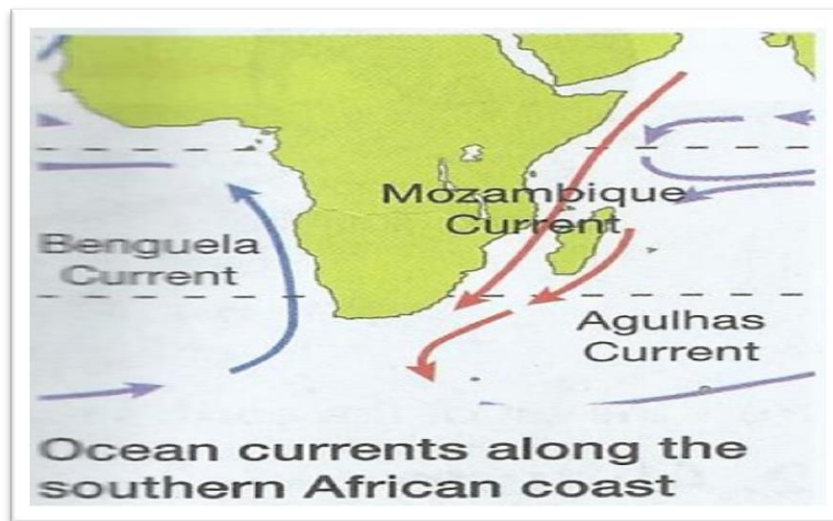
This is how high or low a place is above sea level. Therefore, the higher you go the cooler it becomes. To mean a place on higher altitude will be cooler than that place on lower altitude. For example, a person standing on the ground in October will feel more heat than that one standing on top of the roof of a tall building. This is because when the ground is heated by the sun it

produces long heat waves, thereby making the area few metres about the ground too hot as compared to a place raised high in the atmosphere.



iii. The location of the country or distance from the sea

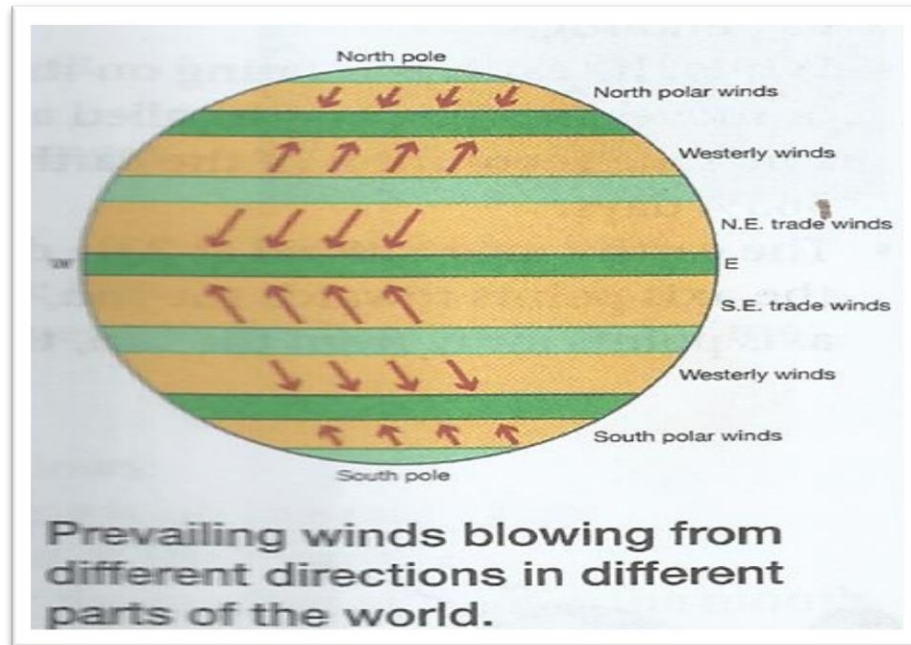
The position and distance from the sea of a certain place has an effect on weather. This is because the ocean currents that blow in from the sea, they contain more moisture than winds that blow from inland areas hence bring about warmth and coldness to the countries that receives these ocean currents.



iv. The prevailing winds

These are winds that consistently blow from the same direction at a particular time of the year. Therefore, the differences in temperatures between parts of the world at different latitudes create a movement of air and water in great swirling currents. These movements distribute heat energy from the sun across the planet such that since the cooler air is dense than warmer air it forces the

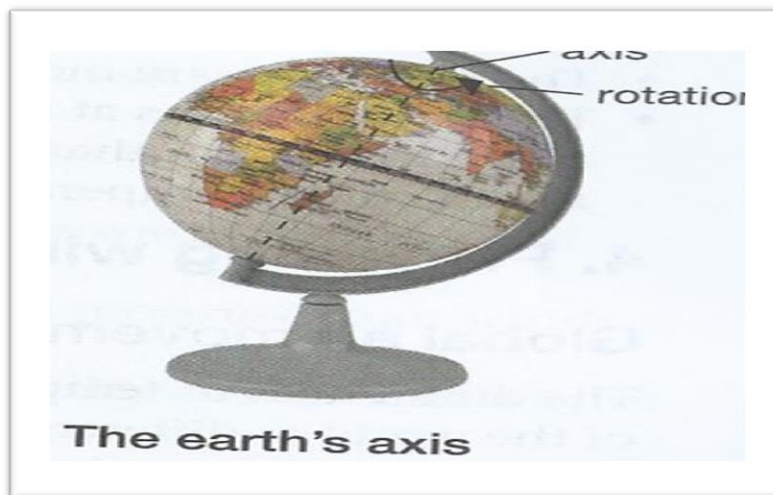
warmer air to rise and circulate on the planet thereby bringing about warm or cold temperatures in different countries of the world.



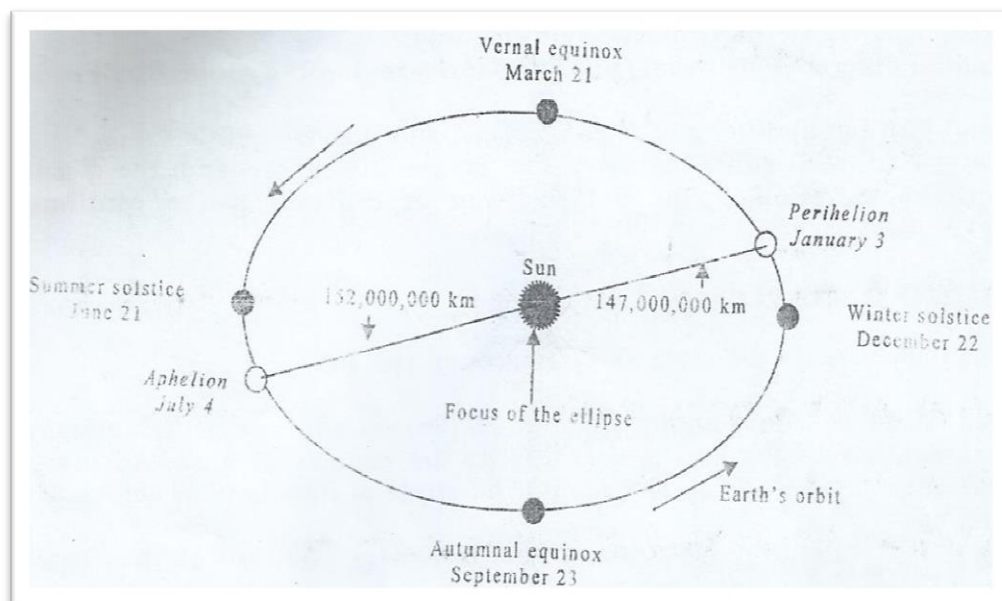
v. Seasons

The change of seasons that influence weather is brought about by the two movements of the earth namely **rotation** and **revolution**.

- a. **Rotation** –this is spinning or rotating of the earth on its axis once in 24 hours. For example, the earth spins like a soccer player spinning a ball on his or her fingertip. This rotation of the earth brings about day and night, difference in time and prevailing winds.



- b. **Revolution** –this is the movement of the earth around the sun. It takes $365\frac{1}{2}$ or 366 in a leap year to make one complete revolution around the sun. This revolution of the earth brings about change of seasons, varying length of day and night, change in position of the midday sun



TOPIC 12: CLIMATE

1. What Is Climate?

- ✓ It is the atmospheric conditions of a particular place over a long period of time.
- ✓ The elements of climate are the same as the elements of weather such as rainfall, temperature, humidity, air pressure, cloud cover, sunshine, wind direction and wind speed.
- ✓ However for the elements to be considered as climate of a given area they must occur repeatedly in that given area over a period of 35 years.

2. What is Zambia is climate?

Zambia has tropical continental climate also known as Savannah climate.

3. Describe Zambia's temperature and rainfall characteristics

a. Temperature

Temperatures in different parts of Zambia are influenced by two factors

- i. **Latitude** - this means the distance away from the equator. It is hotter near the equator because the sun's rays are more direct throughout the year. Example, Mwinilunga is hotter than Lusaka because it is closer to the equator.
- ii. **Altitude** – this means how high or low a place is above sea level. It is generally cooler at higher altitudes, such as on highlands or mountains, than at lower altitudes, such as valleys. Example, Mbala lies at a high altitude and is therefore cooler than Chirundu in the low-lying Zambezi valley.

b. Rainfall

Rainfall distribution in Zambia is affected by latitude and altitude

- i. **Latitude** – the northern part of Zambia gets the most rainfall. This is because it is closer to the equator.
- ii. **Altitude** – the higher altitudes such as highlands or mountains, receive more than at lower altitudes, such as valleys.

4. Name the seasons of Zambia

There are three seasons in Zambia namely

- i. Hot dry season (Autumn)-**(August to November)**
- ii. Rainy season (Summer)- **(mid-November to April)**
- iii. Cool season (Winter)-**(May to August)**

5. Name the effect of climate on human activities.

The climate of each given country affects people in the following ways.

- i. It influences people's health, behaviour, eating habits, choice of clothes and recreation activities.
- ii. It dictates the farming seasons
- iii. It influences human settlement(where people live)
- iv. It influences the type of houses that people build
- v. It influences the type of business favourable for each given area such as tourism, fishing, farming and mining.
- vi. Its brings about bad weather which can cause a lot of problems to people such as flooding, drought, skin diseases and loss of animals.

6. Name the impact of human activities on climate

i. What is climate change?

This is the change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere.

ii. What is greenhouse effect?

This is the ability of the air to absorb long heat waves from the earth after allowing the sun heat waves to pass through. The greenhouse effect contains gases such as water vapour, carbon dioxide, nitrous oxide and methane gas which normally absorbs the long heat waves from the earth to balance up the atmospheric temperatures neither too hot nor too cold

iii. What is global warming?

This is an average increase in the earth's temperature which brings about extreme hotness or coldness.

a). Causes of Climate Change and Global Warming

The following are the human activities that affect the climate.

- i. **Fuel combustion** – the smoke from all automobiles such as smoking vehicles contains different gases such as carbon monoxide which bring about climate change and Global warming.
- ii. **Industrial activities** – the smoke emissions from industrial plants which contain different toxic gases which affect the environment and bring about climate change and global warming.
- iii. **Agricultural activities** – the continuous use of chemicals in agricultural activities increases the emission of greenhouse gases that such as carbon dioxide, methane and nitrous oxide that leads to climate change and global warming.
- iv. **Deforestation** – the continuous cutting down of trees to make charcoal and clearing of land for farming is affecting the rain cycle hence bring about drought. Also trees help in absorbing excess carbon dioxide in the atmosphere, so their absence brings about climate change and global warming.
- v. **Waste management** – the undesignated dumping of waste produced by human activities pollutes the environment thereby producing different gas emissions as they decompose hence causing climate change and global warming.
- vi. **Fugitive emissions** – the continuous emissions of gases from all types aerosol sprays such as perfumes, air fresheners, air conditioning and refrigeration equipment has contributed to climate change and global warming.
- vii. **Mining**
The process of extracting minerals leads to gases emission and dust pollution of the environment thereby causing climate change and global warming.
- viii. **Over consumption**
The continued production and transportation of goods from one place to another due to overconsumption leads to overexploitation of natural resources and emissions of gases from international freight transport, which contributes to climate change and global warming.

b). Effects of Climate Change and Global Warming

- i. **Biodiversity**
The extreme change in elements of weather conditions leads to loss of animal and plant life.
- ii. **Oceans**
The extreme change in elements of weather conditions leads to melting of ice at Polar Regions thereby increasing water levels in oceans and bring about floods in nearby countries.
- iii. **Human Conflict**
Climate change and global warming brings about shortage of foods and reduced production of goods thereby causing people to fight for few food and goods.
- iv. **Natural Disasters**

Climate change and global warming brings about natural disasters like floods, hurricanes, Cyclone storms and wildfires, frost-free season.

v. **Human diseases**

Allergies, asthma, and infectious disease outbreaks will become more common due to increase in climate change and global warming.

c). Solutions to Climate change and Global warming

i. **Renewable energies**

The first way to prevent climate change is to move away from fossil fuels and begin to use Renewable energies like solar, wind, biomass and geothermal.

ii. **Energy use**

The other way is to reduce our consumption of energy by using more efficient devices such as energy serving bulbs.

iii. **Sustainable transportation**

By promoting public transport of electric vehicles to cut down on gases emission

iv. **Sustainable infrastructure**

By promoting the building of low energy buildings that will require less use of air conditioning and lighting.

v. **Sustainable agriculture**

By encouraging organic farming methods which use organic matter unlike use of chemical fertilizer

vi. **Forest management**

By encouraging better use of natural resources through stopping charcoal burning and deforestation

vii. **Responsible consumption**

To cut down on Fugitive emissions like aerosol sprays such as perfumes, air freshener, air conditioning and refrigeration equipment

viii. **Recycling**

By encouraging recycling and use of recyclable products such as use of recyclable plastic bags

ix. **Controlling fire burning**

By stopping bush fires and waste disposal burnings

x. **Waste management**

By collecting and dumping waste disposals in designated places.

TOPIC 13: FOREST AND THEIR PRODUCTS

A. What is a Forest?

It is the caring and planting of trees over a piece of land.

A. What is Vegetation?

It is any grasses or trees that grows in a given place or area.

B. What is Natural Vegetation?

It is any grasses or trees not planted by man that grows in a given place or area.

C. What is Artificial Vegetation?

It is any grasses or trees planted by man that grows in a given place or area.

D. Name the types of vegetation found in Zambia

Zambia's vegetation is classified as **Savannah vegetation** and is mainly characterised by trees and tall grass. Therefore, Zambia's vegetation can be divided into the following 3 types.

a) Closed forests

- i. This is a type of forest that mainly consists of trees close to each other.
- ii. It is found in places of high rainfall such as North Western, parts of Southern and Western provinces.
- iii. The closed forests are sometimes referred to as **Deciduous Savannah Woodlands**. A **deciduous tree** is a tree which is green and luxuriant during rainy season and shed off leaves during dry season to minimize loss water through evaporation.
- iv. Furthermore, the closed forest forms a **closed canopies** to mean a structure formed when tree tops or crowns touch each other creating a shade forest.
- v. A canopy allows very little sunshine to pass through and reach the ground as a result little or no under growth plants or grasses grow in such conditions.
- vi. Examples of trees that form canopies include Kayimbi, Mukwa (Zambia teak), Mupundu, Mukusi and Mutemwa.

b) Open forests

- i. This is a type of forest that consists of scattered trees with grass in between the trees.
- ii. This type of forest is found in all provinces of Zambia and covers about 70% of Zambia.
- iii. Examples of trees found in open forests include Mutondo, Musaka, Kayimbi, Mopane and Muunga (Thorn Acacia) trees.

c) Grasslands (Swamps)

- i. This is a type of forest that is mainly covered with grass and number of countable trees or very few scattered trees can survive the waterlogged soil conditions. Zambia's Savannah Vegetation name was derived in reference with this type of grasslands.

E. Name the types of trees found in Zambia

i. Local (Indigenous) trees

- ii. These are trees that are not planted by man but grow naturally in the environment.
- iii. These trees produce **hardwood timber**.
- iv. They grow slowly
- v. They are short with thick bark
- vi. They have umbrella shaped crowns
- vii. They have big leaves
- viii. Examples of local (indigenous) trees that produce hardwood timber include Mukusi (Zambian teak), Mupapa, Muwaka, Musompa, Kayimbi, Mululu, Mukula and Mukwa.

ii. Exotic (imported) trees

- i. These are trees that brought into Zambia from other countries in the world.
- ii. These trees produce **softwood timber**.
- iii. They grow fast
- iv. They are tall with smooth trunks
- v. They have cone shaped crowns
- vi. They have small leaves
- vii. Examples of Exotic (imported) trees that produce softwood timber include Eucalyptus, Gmelina, Tropical Pine and Rose wood
- viii. These exotic trees are planted in plantations located in Copperbelt at Chati, Chichele, Itimpi (Kitwe), Mwekere and Mufulira. Also in Choma, Samfya, Kabwe and Chisamba.

Reasons why Exotic trees are planted in these areas

- i. High annual rainfall of over 1200mm
- ii. Moderate temperature (18⁰C-24⁰ C)
- iii. Good government policy
- iv. Ready market for timber
- v. Good soil fertility

F. Name the forest products and their uses

Forest product	Use
1. Timber	Used in construction of houses and furniture.
2. Honey	A source of food

3. Mushrooms	A source of food
4. Herbs	A source of medicines
5. Fruits	A source of food
6. Tubers	A source of food
7. Vegetables	A source of food
8. Fuel wood	A source of energy
9. Caterpillars	A source of energy
10. Leaves, roots and bark	Traditional medicines, vegetables, basket and net making
11. Resins	Used in making soap, varnishes and paints and sizing paper

H. List the importance of Zambia's forest

1. Used in construction of buildings
2. Making Furniture
3. Making Electrical poles
4. Making railways sleepers
5. Making herbal medicine
6. Source of oxygen
7. Source of bees wax (honey)
8. Source of wild fruits
9. Source of charcoal, firewood
10. Protect the ground from soil erosion
11. Shelter for wild animals
12. Helps in rainfall formation

I. State why it is important to conserve and preserve forests.

Forest Conservation is the wise use of natural resources so that is available for use in future.

Forest Preservation is the keeping of natural resources same or preventing it from any damage or extinction.

How to conserve forests:

- i. Putting Commercial forestry programs for timber to protect our natural forests.
- ii. Forests can be conserved and preserved through dedicated efforts by all citizens and government
- iii. Control and regulation of bush fire.
- iv. Control and regulation of charcoal burning.

- v. Control of commercial logging (selling of timber)
- vi. Educating communities on the importance and values of forest resources.
- vii. Tree planting programs
- viii. Using renewable sources (wind, solar and water energy) instead of burning wood.

Importance of conserving forest

- i. Provision of food
- ii. Home of wild animals
- iii. Source of medicines
- iv. Source of clean air(oxygen)
- v. Prevention of soil erosion
- vi. Helps in rainfall formation
- vii. Provide shelter to wild animals
- viii. Source of recreation and scenery
- ix. Source of herbal medicine
- x. Source of timber for furniture and construction

H. Name the factors that are contributing to the depletion (finishing) of the Zambian forests.

1. Forest fires
2. Charcoal burning
3. Overgrazing of animals
4. Droughts
5. Clearing of land for farming
6. Clearing of land for settlement
7. Clearing of land for mining
8. Clearing of land for road construction and developmental projects.
9. Cutting down trees for furniture making
10. Cutting down trees for construction of buildings

I. Name the department responsible for running the affairs of forestry in Zambia.

1. Zambia Forests and Forestry Industrial Corporation (ZAFFICO)

J. Name the duties of the Zambia Forests and Forestry Industrial Corporation (ZAFFICO)

- i. By allowing the non-governmental organizations support the forestry industry
- ii. Delinking of ZAFFICO from the forest department in order to improve efficiency

- iii. Educating the communities on the importance of caring for forest resources
- iv. Embarking on rural electrification which may reduce on use of wood fuel
- v. Encouraging people to plant trees during the tree planting day
- vi. Establishment of forest reserves and plantations throughout the country by the forestry department.
- vii. Establishment of the forestry department to control forestry
- viii. Fire controls which may destroy trees is being done by the GOVT.
- ix. Giving of licences to all those willing to do forestry and lumbering
- x. Introduction punishments to all those found disturbing the forests
- xi. It has embarked on afforestation and re-afforestation programmes
- xii. The forestry department is promoting agro-forestry.

K. Define the following forestry related terms

1. **Deforestation-** is the illegal cutting down of trees

Causes of deforestation

- a) Clearing forests for commercial farming practices that require and burning of trees for farmland.
- b) Commercial logging for timber.
- c) Cutting of trees for charcoal and firewood.

Negative effects deforestation

- a) Destruction of biodiversity and changes in climate patterns all over the world.
- b) It can lead to desertification, with useful forests turning into useless deserts.
- c) Migration of animals and birds to other areas for shelter
- d) Shortages of wood fuel.

2. **Afforestation-** is the planting of new trees in areas where there were no trees before.

3. **Re-afforestation-**is the planting of new trees in areas where the trees were cut down.

TOPIC 14: AGRICULTURE/FARMING IN ZAMBIA

A. What is Agriculture/Farming?

Is the growing of crops (arable farming), the keeping of domesticated animals (pastoral farming) and birds (poultry farming) either for sell (commercial farming) or home consumption (subsistence farming).

B. Name the factors affecting Agriculture in Zambia

- 1) Climate
- 2) Distance from the market
- 3) Soils

- 4) The role of the government
- 5) Transport facilities
- 6) Diseases
- 7) Vegetation

C. Name the Importance of Agriculture in Zambia

- 1) Source of foreign exchange
- 2) Source of employment
- 3) Source of food
- 4) Source of raw materials
- 5) Source of income
- 6) Source of economic growth

D. Name the types of Agriculture in Zambia

There are three types of agricultural systems practiced in Zambia and these are:

i) Subsistence/Traditional Agriculture

Is the growing of crops (arable farming), the keeping of domesticated animals (pastoral farming) and birds (poultry farming) for home consumption with little or no surplus for sale? This is also called **Small Scale Farming**

ii) Emergent Agriculture

Is the growing of crops (arable farming), the keeping of domesticated animals (pastoral farming) and birds (poultry farming) for home consumption with surplus for sale? This is also called **Semi Commercial Farming.**

iii) Commercial Agriculture

Is the growing of crops (arable farming), the keeping of domesticated animals (pastoral farming) and birds (poultry farming) for sale?

i). Subsistence/Traditional Agricultural system

a) Characteristics of Subsistence/Traditional Agricultural system

- 1) Small farms
- 2) Grow crops such as maize, millet, cassava, beans, groundnuts, sweet potatoes
- 3) Use Simple tools such as axes, hoes, pangas and sticks
- 4) Low productions
- 5) No use of chemicals and fertilizers

b) Types of Subsistence farming

There are three kinds of subsistence farming systems in Zambia and these are;

- 1) The Chitemene system
- 2) The Mambwe system
- 3) The Lozi System

1). Chitemene system

i. What is Chitemene?

It is a Bemba word which means **Cut Over Area**. It is called **Ntena** in North Western. Chitemene system is also known as **slash and burn or shifting cultivation**. Under this system tree branches are slashed and heaped in one area. After they have dried, they are burnt so that the ash acts as **fertiliser**. It is mainly practised in Northern, Luapula North Western, Western, Copperbelt and Central province.

ii. Name the crops grown under Chitemene system

The crops grown include millet, maize, cassava, pumpkins, myungu, cowpeas, sweet potatoes, sorghum, groundnuts and beans.

iii. List the advantages of Chitemene system

- 1) Burning kills harmful insects and pests
- 2) Ash act as cheap fertilizer
- 3) Use simple tools like hoes and axes
- 4) Requires only small capital
- 5) Use of cheap labour

iv. List the disadvantages of Chitemene system

- 1) Useful organisms are killed in the soil
- 2) It promote deforestation
- 3) It encourages soil erosion
- 4) Burning releases carbon dioxide into the atmosphere.
- 5) Nitrogen is lost in the atmosphere by burning
- 6) The Eco-system is disturbed.
- 7) The habitat (homes for living things) is destroyed.

v. Name the farming tools and inputs used by Chitemene farmers.

a. Farming tools

- 1) Hoes
- 2) Axes
- 3) Watering cans

- 4) Oxen
- 5) Ox-drawn ploughs

b. Farming inputs

- 1) Chicken droppings
- 2) Cow dungs
- 3) Ashes

vi. Name the effects of Chitemene system (Shifting Cultivation) on the environment

- 1) it causes deforestation
- 2) it causes soil erosion
- 3) it causes low productivity
- 4) it causes air pollution
- 5) it causes global warming
- 6) it causes rainfall variability (changes in rainfall patterns)

vii. Name factors favouring (encouraging) Chitemene system

- 1) Burning neutralizes the acidic soil to make it fertile
- 2) Poor, infertile soils
- 3) Presence of heavy rainfall which encourage the growth of trees.
- 4) Bembas are not traditional cattle-keepers
- 5) Low population densities in places where Chitemene is practiced
- 6) The farmers are poor and cannot afford to buy farming inputs e.g. pesticides, inorganic fertilizers e.t.c

viii. Name the reason for the decline of Chitemene system

- 1) Community education on deforestation
- 2) Depletion of forests
- 3) High demand for land for settlement
- 4) Introduction of improved farming practices
- 5) Diversification of farming

2). Mambwe System

i. It is also known as **Fundika**. The Mambwe systems involve the cutting of grass and bury them in the mould. After sometime, the moulds are opened and the manure soils are spread where cultivation is to be done at the beginning of the rainy season. It is practised in Northern and North Eastern parts of Zambia.

ii. Name the crops grown under Mambwe system

Maize, Millet, Cassava, Beans and Groundnut.

iii. Name the advantages of Mambwe system

- i. No cutting down of trees
- ii. No use of chemical fertilizers

iv. Name the disadvantages of Mambwe system

- i. Needs a lot of labour to make moulds
- ii. It discourages mixed farming

3). Lozi system

i. The Lozi system is made up of five different agricultural techniques namely Matema, Matongo, Mazulu, Lishanjo and Litapa.

a) Matema (Liteima)

It means Cut-over area. It is similar to Chitemene farming system

b) Matongo (Litongo)

This farming is done on areas where people once lived.

c) Mazulu (Lizulu)

It means an anthill. This farming is done on anthill made by termites due flooding in western province

d) Lishanjo (Sishango)

This farming is done at the edge of the water bodies such as rivers and swamps.

e) Litapa (Silapa)

This farming is done in different areas where there is water lodged (stuck) in the flood plains.

ii. Name the crops grown under Lozi farming system

Cassava, Maize, Sorghum, pumpkins, Groundnuts and Sweet potatoes

iii. What is Transhumance?

It is the seasonal movement of the Lozi people of Western province with their animals from the flood plain to the upland.

iv. List the advantages of the Lozi system

- 1) No use of chemical fertilizer
- 2) Application of manure improves soil fertility
- 3) Practice mixed farming of animals and crops

v. List the disadvantages of the Lozi system

- 1) Cutting of trees lead to deforestation
- 2) Needs a lot of labour

- 3) Farmers lose crops to floods

E. Name the problems associated with/faced by subsistence (Traditional) farming

1. **Soil erosion** – This is the removal of topsoil by agents such as rain, wind or running water.
2. **Diminishing yields** – This is the decrease in production mainly due to unsustainable methods of
3. **Deforestation** – Due to cutting of trees which help hold soil together. This can lead to soil erosion and desertification.
4. **Bush fires** – This is due to early burning of fields and hunting.
5. **Lack of capital** – No money to purchase inputs or machinery.
6. **Lack of inputs** - fertilizers and seed
7. **Lack of education** –Little knowledge on farming
8. **Unreliable climatic conditions** – little rainfall and high temperature
9. **Mono cropping** – growing of type of crop leads to soil impoverishment.
10. **Pests and diseases** –Trypanosomiasis (nagana) and corridor disease.
11. **Market** – lack of good market to sale farm products
12. **Poor transport** – especially the impassable roads.
13. **Long distance** -to markets especially to urban areas.

F. Name the effects of subsistence (Traditional) farming practices on the environment

- 1) Soil erosion
- 2) Deforestation
- 3) Destruction of natural homes of plants and animals
- 4) Displacement of wildlife due to cleared land
- 5) Desertification caused by cutting down of trees
- 6) Pollution caused by burning

iii. Commercial agriculture

a) Name the characteristics of Commercial Farming

- 1) Involves inputs such as fertilizers, certified seeds and pesticides
- 2) Involves large capital investment
- 3) Large farms
- 4) Mainly monoculture type of farming is done annually.
- 5) Uses large labour force both skilled and unskilled
- 6) Uses machinery such as tractors, combine harvesters

b) Name the types of Commercial Farming

- 1) Plantation farming (Estate)
- 2) Mixed farming
- 3) Market gardening farming
- 4) Horticulture farming
- 5) Irrigation farming
- 6) Livestock farming

1) Plantation farming (Estate)

Plantation or Estate farming is the growing of tree crops such as banana, pineapples cotton, tobacco, sugarcane, coffee, cocoa, tea, rubber and citrus fruits like oranges and lemons.

a. Describe the Location of plantation agriculture in Zambia

- 1) Nakambala sugar Estate in Mazabuka
- 2) Kaleya Small holding in Mazabuka
- 3) Ngoli coffee Estate in Kasama
- 4) Kateshi Coffee Estate in Kasama
- 5) Kawambwa tea Estate in Kawambwa
- 6) Mununshi Banana Scheme in Luapula
- 7) Dunlop rubber plantation at Nchelenge.
- 8) Chiawa Banana Scheme in Chiawa

b. State the characteristics of estate/plantation farming

- 1) Plantations are usually foreign owned by large companies.
- 2) Processing of produce is done on site
- 3) They are labor intensive, meaning they employ a lot of people
- 4) They are usually export-oriented, meaning they mainly export their produce
- 5) They require large capital
- 6) They require large scale irrigation
- 7) They require long term investment
- 8) They concentrate on monoculture meaning growing one type of crop

b) Mixed Farming

This is the cultivation of different crops and the rearing of livestock at the same time on the same farm. The Crops grown includes maize, wheat, Soya beans and Livestock reared include cattle, goats, sheep.

c) Market garden Farming

- 1) This is the intensive growing of vegetables and mainly for sale near urban areas.
- 2) It is also called **Truck Farming** (transportation)
- 3) This is carried out near urban areas where transport is available and ready market for the products.
- 4) The chief vegetables grown are potatoes, tomatoes, onions, cabbage, beans, egg plants, carrots, beet roots, lettuce and chili pepper.
- 5) Fruits such as bananas, mangoes, avocado, guava and pineapples are produced seasonally.

d) Horticulture

This involves the production of ornamental plants such as flowers for sale locally and for export.

e) Irrigation Agriculture

This is the growing of crops in the dry part of the year by supplying water from rivers, boreholes and reservoirs (dams).

i. What are the Importance of Irrigation?

- 1) Irrigation transforms bare land into areas of green vegetation.
- 2) It enables the farmers to use a piece of land to produce crops two three times in a year.
- 3) It is one way of increasing food production to achieve household and National food security (self-sufficiency)

ii. Name the Methods of Irrigation

- 1) Sprinklers
- 2) Canals
- 3) Flooding
- 4) Over-head irrigation

iii. Name the areas of Irrigation

- 1) Areas around Lusaka for green maize, vegetables, flowers and wheat.
- 2) Chisamba area for green maize, vegetables, wheat and flowers.
- 3) Mpongwe area mainly for wheat but also coffee.
- 4) Mazabuka area for wheat and sugarcane.

iv. List the factors which makes necessary to undertake Large scale Irrigation

- 1) Its flat land which gently slopes towards the river is ideal for irrigation.
- 2) The presence of a river and its tributaries as fallows are made from there.

v. Name the crops grown by Irrigation

- 1) Maize (sweet corn), cabbage, tomatoes, onions, Irish potatoes, rape, carrots and green pepper for local market.

- 2) Also roses, gladioli, fillers and vegetables such as baby corn, paprika, green beans, peas and asparagus for the export market are grown.

vi. **What are the Positive effects of Irrigation**

- 1) It transforms bare land into an area of green vegetation
- 2) If the land is planted with tree crops like coffee, bananas and tea, this increases the land's retention of rainwater as ground water.
- 3) Large scale growing of tree crops aided by irrigation makes the climate wetter in the long run.
- 4) Growing crops twice or three times in a year increases food and raw material production in the country.

vii. **What are the Negative effects of Irrigation**

- 1) **Salination:** when the land is continuously used for irrigation, the fertilizer used makes it saline and this reduces productivity.
- 2) **Water diseases:** Irrigated areas have an increase in snails and mosquito populations which transmit bilharzias and malaria respectively.
- 3) **Fertilizers** used on agricultural lands next to the river under irrigation will be washed into the river. This will lead to the growth of aquatic plants which may sometimes be obstacles to navigation on rivers.

1. What is a cash crop?

It is a crop grown for sale

i. Name the types of cash crops grown in Zambia

Maize, tobacco, groundnuts, cotton, coffee, tea, sugarcane, sunflower, soya beans, rice, rubber, wheat and pineapples.

ii. Give three reasons why maize is an important cash crop in Zambia

1. it is a staple food
2. It is used as fodder crop for feeding cattle
3. it is used as raw material in opaque brewing and production of Millie meal

iii. Give examples of cash crops used as raw materials in Zambia

Cotton, tobacco, sugarcane, sunflower, wheat and groundnuts.

iv. Mention any towns that have cotton ginnery in Zambia

Lusaka, Mumbwa and Chipata

2. What is crop diversification?

It is the growing of different types of crops at the same time such as maize, cotton and sorghum.

i. Why is crop diversification important?

1. It increases the production of cash crops

2. it gives a variety of crops grown
3. it improves the methods of collecting crops
4. it improves the marketing of crops
5. it improves the income generation of farmers

3. What is crop rotation?

It is the growing of different crops on the same field year after year to maintain nutrients and soil fertility.

i. Why is crop rotation important?

1. it improves soil fertility
2. it adds nutrients to the soil
3. it promotes nitrogen in the soil
4. it discourages life cycle of harmful pests
5. it reduces soil leaching(downward loss of nutrients)
6. it improves soil structure

f).Livestock (Pastoral) Farming

Livestock (pastoral) farming in Zambia is practised under both subsistence (Traditional) and commercial farming.

1). What is Livestock (Pastoral) farming?

It is the rearing or keeping of domesticated animals and birds either for sell or home consumption.

2). Name the types of Livestock (Pastoral) farming in Zambia

a. Cattle Ranching

It is the commercial keeping of cattle for beef.

1. Why are major Ranching areas in Zambia located along the line of rail?

- i. Availability of cheap and reliable transport.
- ii. Ready market for beef and other animal products.
- iii. There are no tsetse flies.

2. Name the Cattle ranching breeds

The most popular commercial breeds reared in ranches are cross breeds between local (Angoni) breed and Exotic (Afrikander or Boran) breeds.

3. Why do farmers cross breed the animals?

In order to come up with animals that can with stand high summer temperatures and poor winter feeding.

4. What efforts have been put in place to increase beef production.

- i. Setting up of state ranches in many parts of the country e.g. Mbesuma ranch in Chisali, Chisamba ranch in Chisamba and Irumi ranch in Mkushi.

- ii. By opening new undeveloped areas.
- iii. By teaching local people how to care for their livestock.
- iv. By producing breeding stock for sale to commercial farmers.
- v. By producing beef for sale to local areas.

b. Dairying Farming

It is the rearing of cattle for milk production.

1. Name the chief dairy breeds reared for milk production in Zambia.

- i. Friesians (most common breed)
- ii. Jerseys
- iii. Ayrshires.

2. Name the milk processing companies (plants) and creameries in Zambia

- i. Zambeef in Lusaka, Chisamba and Mongu.
- ii. Parmalat in Lusaka.
- iii. Luscold in Lusaka.
- iv. Finta Danish Dairies in Livingstone (these produce long life milk)

4. Name the Products obtained from milk.

- i. Cheese
- ii. Butter
- iii. Ice cream
- iv. Yoghurt

c. Poultry

It is the rearing of chickens, ducks, geese and ostriches for meat and eggs.

i. What is hatchery?

It is a process of producing chicks from eggs under artificial condition.

ii. Name the hatchery companies in Zambia

Hybrid Company-It is leading producer of day old chicks in Zambia. It supplies its chicks to poultry farmers within the country and to other countries like Tanzania, Democratic Republic of Congo and Uganda. Hybrid is located in Lusaka and Kitwe.

d. Other Livestock

1. Pigs

Pigs are reared by both Traditional (subsistence) and commercial farmers in Southern, Eastern and Lusaka provinces.

2. Sheep

Sheep are mostly kept by traditional farmers in Southern Northern and Eastern province

a. The factors discouraging the Rearing of Sheep in other Parts of Zambia

- i. High temperature cause rot and parasites
- ii. Tall grass is not suitable for sheep grazing.
- iii. Limited market for mutton (meat).

b. The black head Persian Sheep

This is a non-wool bearing sheep kept by most farmers in Zambia because it is hardy and can withstand climatic conditional.

c. Why is Sheep rearing less important in Zambia?

It is because the climate is not very suitable for sheep rearing.

3. Goats

The goats are the only domestic animals reared in all provinces of Zambia because they are able to survive even in the absence of good pastures. They can live by eating branches, bark and leaves.

3). Why is (Livestock) Pastoral farming important in Zambia?

- i. The domestic animals kept are a source of food like meat and milk.
- ii. The domestic animals also provide leather, hair and wool used for making blankets, clothing etc.
- iii. The domestic animals like cattle are used for manure (cow dung), transport and bridal payment (lobola).

4). Name the areas where (livestock) pastoral farming is practised in Zambia.

- i. Western province in Mongu.
- ii. Southern Province especially along the line of rail from Livingstone – Mazabuka and also in Namwala.
- iii. Northern Province especially in Kasama and Mbala.
- iv. Eastern Province especially in Chipata and Petauke.
- v. other areas include Kitwe, Lusaka, Chisamba and Serenje.

5). Name the factors that influence Livestock (Pastoral) farming in Zambia

i. Rainfall.

Places that receive high rain are more suitable for livestock than places with little no rainfall.

ii. Temperature

Places that are very hot are not good for domestic animals or rearing eg Luangwa and Zambezi valley are too hot for cattle rearing.

iii. Diseases

Places with cases of diseases such as trypanosomiasis (nagana) east coast fever, foot and mouth disease, anthrax, contagious bovine pleuro –pneumonia, heart water and lamp skin disease are not suitable domestic animals rearing.

iv. Vegetation

Places with plenty of natural pastures and shade are suitable for domestic animal rearing e.g. open woodlands forest.

v. Nearness to market

If animals have to work or travel long distances to the market they will lose weight and even the price will reduce.

vi. Symbol of wealth

Traditional cattle keepers such as Tonga, Ila, Lozi, Ngoni and Mambwe are interested in numbers rather than quality of the cattle they have.

vii. Cattle rustling

It is the stealing of cattle from the farmers. Cattle rustling is common in southern and western province.

6). Discuss the role of the government in promoting (Livestock) pastoral farming in Zambia

- i. The government has set up many ranches in many parts of Zambia to breed domestic animals and supply to farmers.
- ii. The government train agriculture officers to take care of pastoral farmers domestic animals and offer advice to them.
- iii. The government encourages the setting up of support institutions such as ZAMBEEF who purchase animals and animal products from farmers.
- iv. The government controls the diseases through the department of veterinary and livestock.

7). What is Overgrazing?

It is the keeping too many domestic animals on a place of land such that the grass cannot grow properly.

8). What is a Overstocking?

This is the keeping of too many cattle on a small place of land.

g). Describe the Location of Commercial farms in Zambia

Most commercial farms are located in the following areas:

- 1) **Along the line of rail:** Areas near Livingstone, Choma, Monze, Mazabuka, Lusaka, Kabwe, Mkushi and also Copperbelt.
- 2) **Eastern Province** from Petauke through Chipata to Lundazi.

i). Why commercial farms are located along the line of rail and Eastern Province?

- 1) Ready market
- 2) Favorable climate
- 3) Fertile soils
- 4) Less diseases
- 5) Availability of power

6) Availability of cheap transport

7) Availability of water sources

j).Name the advantage of commercial farming

1) it provides employment to the people

2) it brings foreign exchange in the country

3) it grows crops throughout the year as it does rely on rainfall

4) it provides raw materials for manufacturing industries

5) it produces a lot crops for the people in the country

k).Name disadvantages of commercial farming

1) it requires the use of farm machinery

2) it uses so much fertilizers

3) it requires a large piece of land

4) it needs a lot of capital eg. A lot of money to start it.

5) it is expensive to maintain the farm machinery and workers.

l). Name the impact of commercial farming on the environmental

1) it promotes deforestation

2) it promotes displacement of wildlife

3) it promotes pollution

4) it promotes soil erosion

m). Name the Soil conservation measures and sustainable agricultural practices

1) **Crop rotation:** this is a kind of farming where crops are grown differently year after year.

2) **Controlled grazing:** this is where people put animals in feed places according to their numbers. Animals are able to feed without any problems pertaining to pasture.

3) **Contour Ploughing:** this is where people plough pieces of land across the contours.

4) **Re-afforestation:** the immediate replanting of trees where there were once some trees which were cut.

5) **Afforestation:** the immediate planting of trees where there were no trees before

6) **Cover cropping:** these are the crops that are grown to retain moisture and protect soil from erosion. e.g. groundnuts.

7) **Terracing:** this involves the cutting of flat terraces on steep hill slopes to create low land conditions.

8) **Strip cropping:** this is the planting of crops and trees in strategic place to act as wind barriers.

9) **Land Fallowing:** this is the situation where by farmers allow their land to remain without cultivating on for some time.

10) **Soil additives:** this is the addition of manure or fertilizers to the crops.

11) **Irrigation:** this is the supply of water to the crop by farmers.

12) **Mulching** – covering the soil to retain moisture by grass

n). Government measures to improve agriculture in Zambia

- 1) Provision or creation of co-operatives.
- 2) Creation of resettlement schemes.
- 3) Provision of extension services to educate the farmers.
- 4) Construction of feeder roads.
- 5) Use of drought animals e.g. donkeys in the southern province.
- 6) Provision of rural information services.
- 7) Distribution of inputs like fertilizers by government agents e.g. NGOs.
- 8) Purchasing and collection of harvested crops by Zambia Army and ZNS.
- 9) Fixing of purchase price of maize to avoid briefcase traders.
- 10) Provision of tax exemption on agricultural products

p). Name the ways of improving food security in the country

- 1) Improve marketing and storage facilities by Food Reserve Agency.
- 2) Production and distribution of seed by such as Zamseed, Pana Seeds.
- 3) Increase food production.
- 4) Improve crop research to have improved varieties of seeds e.g. drought resistant.
- 5) Improve transport especially feeder roads.
- 6) Providing credit facilities to small scale and emergent farmers.
- 7) Educating the farmers on sustainable methods of agriculture.
- 8) Encouraging crop diversification by farmer

TOPIC 15: FISHING IN ZAMBIA

A. What is fishing?

It is the activity that involves the catching of fish either on small scale or large scale from the water bodies such as rivers, lakes, dams and ponds.

B. Why is fishing important?

- i) It is a source of income (money)
- ii) It is a source of employment e.g. fishermen, marketeers and drivers.

- iii) It is a source of food proteins.
- iv) It promotes development of towns e.g. Mpulungu town.
- v) It encourages the setting up of fishery industries to make fishing boat, nets.
- vi) It is a good source of recreation e.g. fishing competition.

C. What is a Fishery?

It is an area where fish is caught for sale or eating.

D. Name the main fisheries of Zambia.

i) Lake Tanganyika Fishery

There are two types of fish caught namely Lake Sardines commonly known as Kapenta and the Nile perch commonly known as Buka buka.

ii) Lake Kariba Fishery

The following types of fish caught at Lake Kariba fishery namely lake sardines (Kapenta) bream fish, Tiger fish, bottle fish and cat fish.

iii) Kafue River Fishery

The following types of fish caught at Kafue river fishery namely barbell, pike, bulldog, bottle nose and bream (the main fish caught)

iv) Lake Bangweulu Fishery

The following types of fish are caught at Lake Bangweulu fishery namely bulldog, barbell, tiger, green headed and red-breasted bream fish.

- v) Other Fisheries found in Zambia include the lake Mweru- Luapula river fishery, Lukanga swamps fishery, Zambezi river, Luangwa river, Chambeshi river and Luena fishery.



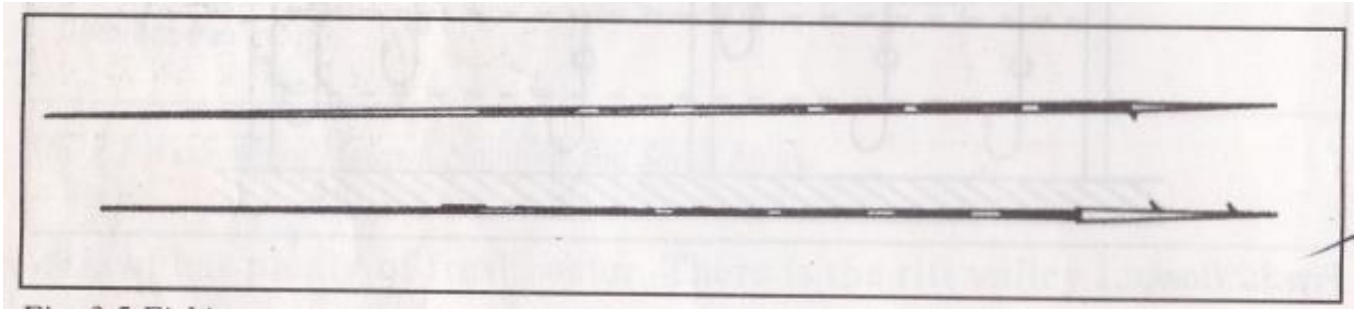
E. Name the types of fishing methods

1. Subsistence (small scale) Fishing

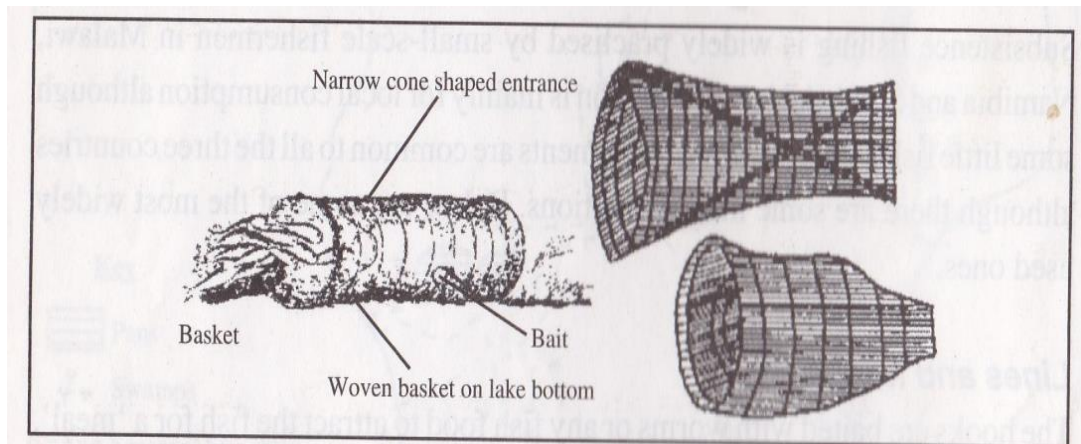
It is the catching of fish for one's own consumption.

Methods of fishing of fishing under subsistence (small scale) fishing

- i. **Spear:** - spears are used in shallow waters and require skills and patience as people may injure themselves if they are not careful.

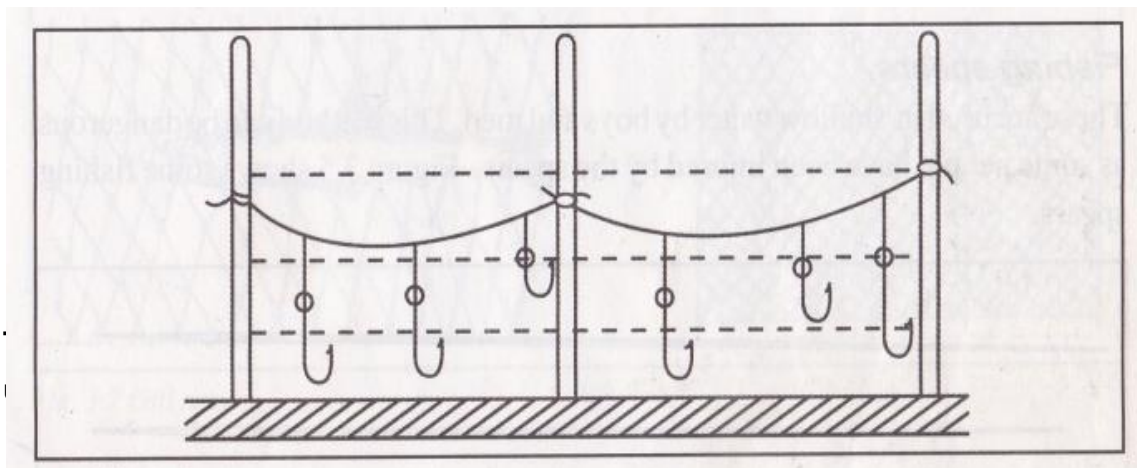


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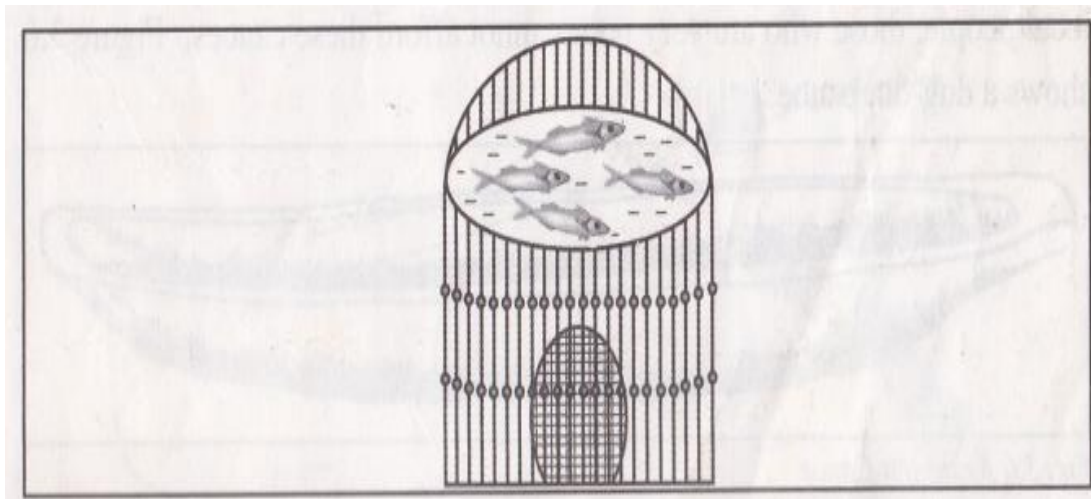
iii.

a meal.

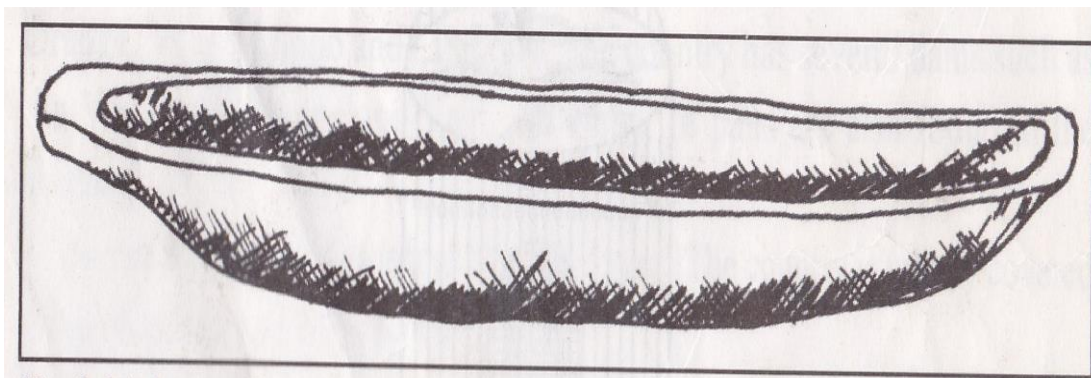


iv.

The traps are



- v. **Dug-out canoes:** - these are used to fish and transport fish to the harbour or camping area.

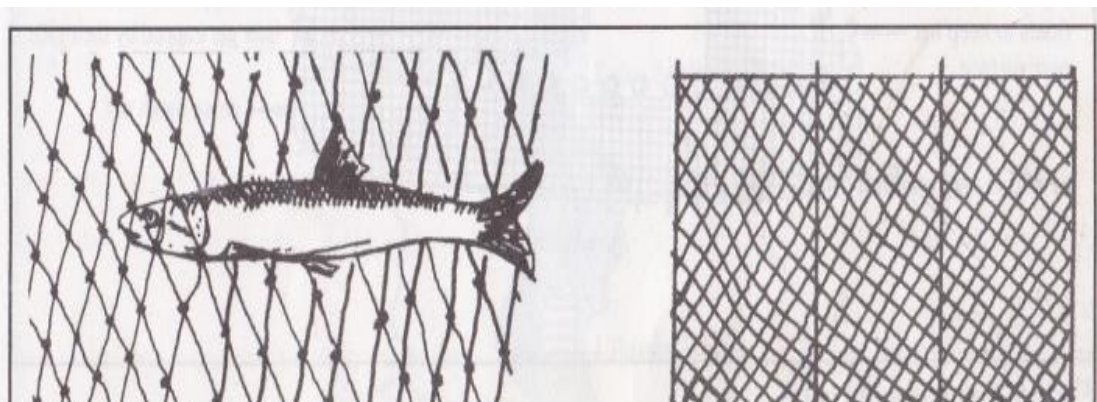


2. Commercial (large scale) Fishing

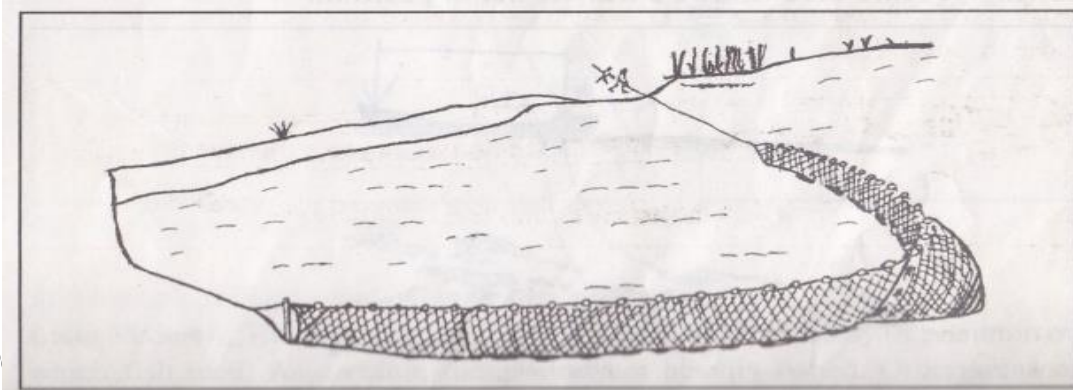
It is the catching of fish mainly for sale.

Methods of catching fish under commercial fishing

- i. **Hand Nets:-** these are used to scoop fish out of n the water, and nets are called by different local names depending on where they are used. This Insenga on Lake Tanganyika is used to catch Kapenta and Mutopo on Mweru-Wa-Ntipa.
- ii. **Fish Craft:** - These range from dug-out canoes to large motor powered boats. Fibre glass boats are increasing replacing wooden boats and dug-out canoes.
- iii. **Gill nets:-** these are used to trap fish by their gills. The nets are made of strong nylon. The net is mounted on a rope at the top (head rope) and bottom (foot) rope) floats are attached to the head rope while heavy sinks are attached at the bottom or they may be allowed to drift. They are used to set over night and the fish caught are removed next morning.



- iv. **Seine nets or drown nets:** - they are also made of strong nylon the seine net is also mounted on a head rope with floats and a foot rope with sinkers. The two people on the sides will begin to pull the net and fish caught is put in the boat.



- v. **P** place where the poison and explosives to kill the fish in the water and later collect when the fish float dead.

F. Name the Fish Processing and Preservation Methods

The following are the methods in which fish is processed and preserved.

- i. **Salting:** - this the method where fish is cleaned, washed and cut open then dry salted with salt.
- ii. **Sun drying:** - this is the method where fish is cleaned, washed and cut open and left to dry on the sun.
- iii. **Freezing:** - this is the method where fish is cleaned, washed and put in the fridges to get frozen.
- iv. **Smoking:** - this is the method where fish is cleaned, washed and smoked to dry under hot smoke from fire wood.
- v. **Canning:** - this is the method where fish is cleaned, washed and packed into small containers as canned fish also known as tinned fish.

G. Discuss the Fish Farms in Zambia

1. What is fish farming?

This is where fish farmers build up fish pounds and dams and restock them with the fish they wish to farm. The fish in fish ponds and dams is provided food for by the owners.

2. Name some places where Fish Farming is practiced in Zambia

- i. Fiyongoli fish farm
- ii. Mwekera fish farm.
- iii. Kariba fish farm.
- iv. Mwenda fish farm.

v. Chilanga fish farm.

Major Fish Farms in Zambia



H. Name the F

1. Enforcing fishing regulations such as banning the use of destructive fishing methods such as poison and explosives.
2. Observing fish ban as breeding season in order to allow fish to reproduce.
3. Regulating the amount of fish to be caught in each fishery.
4. Conducting fish research in order to improve fish production.
5. Encourage people to engage in fish farming.
6. Teaching people not to over fish.
7. Protecting fishing areas through the provision of fish guard.
8. Providing storage facilities especially for fresh fish.
9. Providing training facilities for fishermen.

I. Name the Challenges or Problems faced by the Fishing Industry

1. Over fishing.
2. Water pollution.
3. Aquatic plants (plants that grow in water)
4. Bad fishing methods
5. Illegal fishing.
6. Shared rivers and lakes with other countries.

7. Fish diseases.
8. Poor marketing of fish.
9. Shortage of storage facilities.
10. Long distances and poor road network to and from fisheries and market.

J. Name the Possible Solutions to the Challenges or Problems facing The Fishing Industry

1. Fisheries department should regulate the amount of fish to be caught in each fishery.
2. Fisheries department should ensure that annual fish ban is strictly followed.
3. The government should seriously punish anyone found to have polluted the water.
4. Aquatic plants should be cleaned regularly from the fishing areas.
5. Fisheries department should sensitise the people on the badness of using dangerous fishing methods.
6. The government should agree with countries that it shares rivers and lakes on fishing areas.
7. The government should strengthen the research department on fishing so that any diseases detected and controlled quickly.
8. The government should promote fish farming in the country.
9. The government should offer fish training to fishermen.
10. The government should improve the road network system and improve marketing of fish.

TOPIC 16: TOURISM AND WILDLIFE IN ZAMBIA

A. TOURISM

1. What is tourism?

It is the movement of people from one place to another for leisure (vacation), adventure (exploration), pleasure (fun), education and religion.

2. Who is a tourist?

Is a person who moves from one place to another for leisure (vacation), adventure (exploration), pleasure (fun), education and religion?

3. Name two types of tourist

(A) Local or Domestic Tourist

These are tourists that come from within the country e.g Mr Tembo from Lusaka goes to view Victoria Falls in Livingstone with his family.

(B) International or Foreign tourism

These are tourists who come from other countries e.g. Mr Brown from England comes to view Victoria Falls in Livingstone with his family.

4. Name the different types of tourism

a. **Eco –tourism**

This is the tourism concerned with environmental protection.

b. **Nature tourism**

This is the tourism that deals with natural wonders of the world

c. **Adventure tourism**

This is the tourism that deals with adventure activities such as bungee jumping from bridges and white water river rafting.

d. **Cultural and historical tourism**

This is the tourism that deals with traditional ceremonies and historical sites.

5. Why is tourism important (advantages)/reasons for conserving it

- i) It brings foreign exchange.
- ii) It is a source of income e.g. hotels owners.
- iii) It promotes development e.g. construction of roads to tourist centres.
- iv) It provides employment (jobs).
- v) It promotes local hand craft industry (home based industry).eg Kabwata/ Maramba Art Centres
- vi) It promotes the preservation of our cultural heritage sites
- vii) It encourages conservation of wild life
- viii) It improves other areas of the economy like airports, hotels and transport
- ix) It Provides market for farm products
- x) It promotes cultural exchange between countries

6. Name the disadvantages of tourism

- i) Some tourists can come as thieves or spies.
- ii) It promotes the spread of communicable diseases such as HIV/AIDS, STIS and Bird flu.
- iii) It promotes moral decay destruction of local culture e.g. poor dressing by girls and women.
- iv) It can lead to extinction (finishing) of endangered species such as elephants, Rhinos and Buffalos through hunting or trafficking.
- v) It pollutes the environment e.g. littering of plastics or empty bottles.
- vi) Too much money is spent on building tourism infrastructures such as hotels at the expense of other projects such as schools.

vii) A lot of money is used to import goods from other countries such as safari vehicles.

viii) Prostitution: tourist may encourage more women to engage in prostitution.

7. Name the major tourist attractions in zambia

i) Water falls:

These include the Victoria falls on the Zambezi river in Livingstone, Kalambo falls on the Kalambo river in Mbala and musonda falls on the kalungweshi river in Luapula.

ii) Traditional (culture) ceremonies

These include the Kuomboka ceremony of the Lozi people of Western province, Mutomboko ceremony of the Lunda people of Kazembe kingdom of Luapula and LikumbiLyaminze of the Luvale people of North-Western province.

iii) Wildlife in national parks and game reserves

These include the south Luangwa National park for elephants and buffalos and the Lochriver and blue lagoon National park of birds.

iv) National heritage site

These include the Shiwang'andu hot springs in Chinsali and Ing'ombe Iledde in Siavonga.

v) Museums and national monuments

These include the Moto-Moto museum in Mbala, Lusaka museum in Lusaka, Livingstone museum in Livingstone, Dag Hammarskjold in Ndola and freedom statue in Lusaka.

vi) Sports

These include fishing and golf competition, bungee jumping off Victoria falls bridge, white water rafting and sailing on the rapids of the Zambezi.

8. The Zambia National Tourism Board (ZNTB)

This is a body that promotes the development of tourism industry in Zambia.

9. The Functions Of The Zambia National Tourism Board (ZNTB)

i) Advertising Zambia's tourism attractions both locally and internationally.

ii) Attract both local and foreign invest to invest in the tourism industry.

iii) Represent country at various international conferences concerning tourism.

10. Problems faced by the tourism industry in Zambia

i) Absence of National airline. Tourists have depended on foreign airline that comes to Zambia.

ii) Under developed and undeveloped transport and communication infrastructures.

iii) Inadequate advertising and marketing of tourist attractions.

iv) Inadequate accommodation and company facilities in tourist centres.

11. Comparison of Tourism In Zambia And Kenya

The following are the reason why Kenya's tourism industry is more developed than Zambia's tourism industry.

- i) Kenya is near to Europe and Asia than Zambia.
- ii) Kenya has its own national airline to fly tourists to and from tourist attractions while Zambia has none.
- iii) Kenya has marine parks along the coast (coral reefs) while Zambia does not have.
- iv) Kenya has a well-developed transport and communication infrastructures in tourist attraction than Zambia.
- v) Kenya has a more aggressive marketing strategy to attract foreign tourists than Zambia.
- vi) Kenya has a more relaxed entry VISA arrangement with European, North American and Asia countries than Zambia.
- vii) Kenya has more modern hotels, motels and camping sites than Zambia.
- viii) Kenya has more world repositioned tourist attractions such as Tsavo National park, Masimara and Lake Naivasha than Zambia.

12. Name The Measures Taken By Zambia Government Improve And Develop Tourism Industry.

- i) By encouraging private investment both local and international to invest in tourism industry.
- ii) By encouraging and promoting package tours with neighbouring countries such as South Africa and Zimbabwe.
- iii) By embarking on consistent and aggressive market and advertising both local and broad.
- iv) By transport and communication infrastructures in tourist attraction centres.
- v) By conserving and protecting endangered animals, birds and plant species that may attract researches and adventures in future.
- vi) By advertising other unknown tourist attractions to the world rather than the Victoria Falls only.
- vii) By constructing better accommodation facilities in tourist centres.

B. WILDLIFE

1. What is wildlife?

These are animals and birds that are not domesticated (kept) by man plants non planted by man.

2. Name the classifications of wild animals.

i) Carnivorous animals:

These are animals that feed on other animals flesh (meat) examples include lions, leopards, cheetah, wild dogs and hyenas.

ii) Herbivorous animals:

These are animals that feed on vegetation materials or grass. Examples include Zebra, Giraffe, Elephants, Buffaloes, Impala and Hippos.

3. Name the importance of wild animals

- i) Promote tourism.
- ii) Bring foreign exchange.
- iii) Source of employment e.g game guards.
- iv) Source of income e.g by selling meat, skin, horns and tusk.
- v) For education.
- vi) Provides meat for people.
- vii) Provides revenue to services industries such as hotels, motels.

4. Name the disadvantages of wild animals

- i. Villages lose their sheep, goats and cattle to lions, hyenas and leopards.
- ii. Parks take up much needed land for agriculture e.g Kafue National Park.

5. What is conservation of wildlife?

This is the wise use of wildlife so that its available for use in future.

6. The importance of conserving wildlife.

- i. To avoid extinction of wildlife.
- ii. To allow animals to increase.
- iii. To maintain ecological balance.
- iv. It is a source of revenue for the country.
- v. It is the heritage of the country.

7. What is poaching?

It is the illegal killing of wild animals.

8. The reason why poachers kill or capture wild animals

- i. To sell horns, tusks, meat and skins.
- ii. For eating.
- iii. To smuggle the rare species such as birds and leopards.

9. Measures taken by Government to Promote wildlife.

- i. Give military training to game rangers.
- ii. Involving local people in game management and protection.
- iii. Providing of improved communication equipment and vehicles to ZAWA officers.
- iv. Give stiffer penalties to poachers.
- v. Banning of the trade in endangered animals species such as Rhinos, elephants and lions.

10. Organization involved in the Protection of Wildlife

- i. Zambia wildlife Authority (ZAWA)
- ii. World Wild fund for nature(WWF)
- iii. Wildlife Conservation Society of Zambia (WCSZ)

11. What is game cropping?

It is the selective killing of wild animals when they become too many in the park.

12. What is a zoo?

It is place where animals are kept and fed a zoo is smaller than a game park.

13. What is Game Management Area?

It is park which has wild animals and people living in as well.

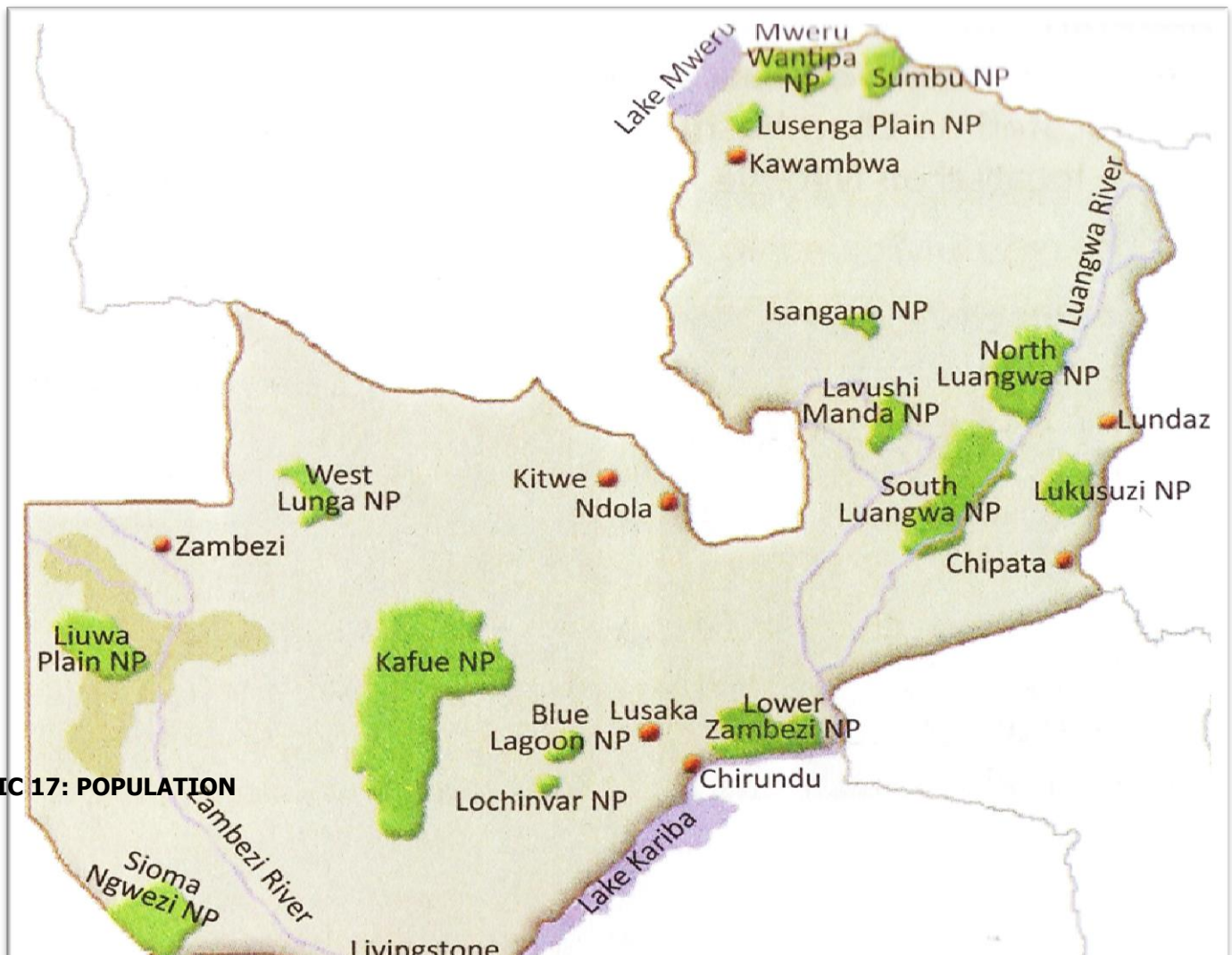
14. What is Game Park?

It is a park for wild animals only

15. What is a Game Reserve?

It is a private owned park where specific wild life animals are kept.

16. Names and location of game parks and National parks found in Zambia



A. EXPLAIN THE FOLLOWING POPULATION CONCEPTS

1. **Population** – is the number of people living in an area or country at a particular time
2. **Census** – is the official counting of people living in an area or country at a particular time.
3. **Mortality rate** – is the number of deaths in a given population in a year.
4. **Infant mortality rate** – is the number of babies who die before the age of 5 years in a year
5. **Maternal mortality rate**– is the number of women who die during or after giving birth in a year.
6. **Fertility rate**– is the actual reproductive performance of an individual in his/her lifetime.
7. **Population growth rate** – is the rate at which the population is increasing or decreasing in a given year due to birth rate, death rate and migration.
8. **Birth rate** – is the number of births per 1000 population in a year.

$$\text{Birth rate} = \frac{\text{number of births}}{1000} \times 100\%$$

9. **Death rate** – is the number of deaths per 1000 population in a year

$$\text{Death rate} = \frac{\text{number of deaths}}{1000} \times 100\%$$

10. **Migration** – is the movement of people from one area to another.
11. **Immigration** – is the movement of people into an area
12. **Immigrant** – is a person who comes to settle in a country from another country.
13. **Emigration** – is the movement of people out an area
14. **Emigrant** – is a person who leaves his/her own country and goes to settle in another country.
15. **Life expectancy** – is the number of years a person is expected to live after birth.
16. **Zero population** – is when the population remains constant (not changing)
17. **Over population** – is when the population is more than the resources available
18. **Optimum population** – is when the population is balanced or equal to the resources available.
19. **Population Explosion (Boom)** - is when the population is increasing rapidly or at a faster rate.
20. **Dependence ratio** – is the number of people aged below 15 and above 64 years who depend on other people for a living.
21. **Population density** - is the number of people living in an area or country per square kilometer.

$$\text{Population density} = \frac{\text{number of people}}{\text{area in square kilometer}}$$

22. **Population distribution** – is the way people are spread over an area or country.

B. Describe the population distribution in Zambia

The population of Zambia is distributed in three ways as follows.

1. High density populated areas

These are areas with a lot of people in Zambia such as Lusaka, Copperbelt and along the line of rail from Livingstone to Copperbelt.

Reasons for being high density populated areas

- i. Many industries
- ii. Good relief for human settlement
- iii. Cheap transport
- iv. Good medical facilities
- v. Good climate
- vi. Good infrastructure
- vii. High education opportunities
- viii. High employment opportunities
- ix. Availability of readily market
- x. Good communication network such as roads and mobile providers.

2. Medium density populated areas

These are areas with an average number of people in Zambia such as Eastern, Northern, Western, North Western, Luapula provinces and border areas. Therefore, much of the people found in the medium density areas are in provincial capitals and along the roads leading to the provincial capitals of the named provinces.

Reasons for living along the roads and in provincial capitals

- i. Easy access to provincial administration services
- ii. Easy access to provincial general hospitals
- iii. Availability of shops along the roads in provincial capitals
- iv. Availability of readily available market
- v. Easy access to transport network to transport farm products
- vi. Good communication network reception
- vii. High employment opportunities
- viii. High education opportunities
- ix. Easy access to sub industries outlet
- x. Availability of good infrastructure

3. Low density populated areas

These are areas with very few people living in them in Zambia such as valley areas like Luangwa and Zambezi valleys, fishing areas like Kafue flats, Lake Tanganyika basin and along Zambezi river in Buluzi flood plains. Also in the remote rural areas and around game management of Zambia

Reasons for being low densely populated areas

- i. Lack of industries
- ii. Lack of easy access to transport network
- iii. Lack of easy access to communication network
- iv. High number of diseases such as Trypanosomiasis (nagana) which is caused by tse-tse fly bite.
- v. Poor soils
- vi. Very little rainfall
- vii. Extreme high temperature in hot and cold seasons
- viii. Lack of good health facilities
- ix. Most land in such areas is reserved for animal settlement such as in Luangwa and Kafue areas.
- x. Lack of education opportunities for further education

C. THE FACTORS LEADING TO RAPID POPULATION GROWTH IN ZAMBIA

The following are the reasons that have led to Zambia's population to be increasing at a faster rate.

- i. High birth rates due to high fertility rate.
- ii. Improved medical facilities.
- iii. Improved food nutrition.
- iv. Decline in death rates.
- v. Lack of family planning.
- vi. Early marriages.
- vii. Low education levels among girls and women.
- viii. Religious and traditional beliefs.
- ix. High levels of poverty.
- x. Lack of recreation facilities (social amenities) such as play parks, swimming pools, sports playing fields, movies and game centres to keep young people busy.
- xi. Desire for big family

D. THE SOLUTIONS TO RAPID POPULATION GROWTH IN ZAMBIA

The following are the ways in which rapid population growth can be reduced in Zambia.

- i. Use of family planning methods such as pills, condoms and abstaining.

- ii. Provision of more school places for girls,
- iii. Provision of recreation facilities (social amenities) such as play parks, swimming pools, sports playing fields, movies and game centres to keep the young people busy.
- iv. Provision of employment opportunities to reduce high poverty levels.
- v. Discourage early marriages.
- vi. Discourage religious and traditional beliefs.
- vii. Limiting the number of children per married couple.
- viii. Teaching of sex education in schools.
- ix. Making polygamy marriage illegal.
- x. Raising the status of women in society e.g. giving more jobs to women.

E. THE EFFECTS OF RAPID POPULATION GROWTH IN ZAMBIA

The following are the problems of rapid population growth in Zambia.

- i. Overcrowding in public places e.g. towns, markets, schools, hospitals.
- ii. Shortage of housing leading to high rentals.
- iii. Inadequate medical facilities.
- iv. Pressure on education such as high enrolment in schools, colleges and universities.
- v. Increase in street kids and street vending.
- vi. Increased crime.
- vii. High unemployment levels.
- viii. Development of unplanned settlement (shanty compounds).
- ix. Environmental degradation e.g. air, water, noise and land pollution.
- x. Poor sanitation.
- xi. Shortage of land for human settlement and agriculture.

F. POPULATION MIGRATION IN ZAMBIA

Population migration in Zambia is either voluntary or compulsory depending on the factors behind the migration of people.

1. RURAL-URBAN MIGRATION

This is the movement of people from rural areas to urban areas.

REASONS FOR LEAVING RURAL AREAS TO URBAN AREA

a) PUSH FACTORS

The following are some of the reasons why people run away from rural areas in Zambia.

- i. Fear of witchcraft

- ii. Lack of employment for the educated people.
- iii. High number of diseases.
- iv. Lack of good shelter (poor houses)
- v. High levels of poverty.
- vi. Poor transport network.
- vii. Lack of recreation activities
- viii. Lack of education facilities.
- ix. Lack of proper health facilities.
- x. Poor communication reception.

b) PULL FACTORS

The following are some of the reasons why people want to live in urban areas.

- i. High employment opportunities.
- ii. Good infrastructure e.g. roads, houses.
- iii. High growth chances of getting married.
- iv. Good health facilities.
- v. High education opportunities.
- vi. New technology.
- vii. Good transport network.
- viii. Good communication network.
- ix. Provision of recreation facilities.
- x. Desire for a town life.

2. URBAN-RURAL MIGRATION

This is the movement of people from urban areas to rural areas.

Reasons for leaving urban areas to rural areas:

- i. Availability of enough land for human settlement and agriculture.
- ii. Presence of natural forests for a healthy living and fresh air
- iii. Desire for a village life.
- iv. Absence of rentals, rates and other bills.
- v. Reduction in food buying as much food is grown.

3. URBAN-URBAN MIIGRATION

This is the movement of people from one place to another in urban areas.

Reasons for moving from one urban area to another:

- i. Hike of rentals in the previous or current house.
- ii. Change in working place and schools for children.
- iii. High crime levels.
- iv. Poor water and electricity supply in the area.
- v. Family population growth due to birth rate, death rate and migration.

4. RURAL-RURAL MIGRATION

This is the movement of people from one place to another in rural areas.

Reasons for moving from one rural area to another

- i. Family population growth rate due to birth rate, death rate and migration.
- ii. Looking for enough land for agriculture.
- iii. Presence of drought in the area.
- iv. Presence of animal and human diseases.
- v. Introduction of developmental projects by the government of the community in the area.

5. COUNTRY-COUNTRY MIGRATION.

This is the movement of people from one country to another.

REASONS FOR COUNTRY-COUNTRY MIGRATION

- i. Presence of war in the country.
- ii. Looking for employment opportunities.
- iii. To reunite with family members.
- iv. Availability of business opportunities.
- v. Political reasons.

G. THE IMPACT/EFFECTS OF HIV/AIDS ON ZAMBIA'S POPULATION.

The following are the effects of HIV/AIDS on Zambia's population.

- i. Loss of skilled and unskilled man power.
- ii. Loss of many hours due to time spent looking after the sick.
- iii. More money is spent on drugs than economic activities.
- iv. Reduction in the production of goods and services.

- v. Decline in agricultural activities.
- vi. Reduction in population.
- vii. Increase in widows and widowers.
- viii. Increase in orphans and street kids.
- ix. Sick workers missing work most of the time.
- x. Loss of money by government in paying workers who are not working due to sickness.

I. SOLUTION TO THE IMPACT/EFFECTS OF HIV/AIDS ON ZAMBIA'S POPULATION.

- i. Provision of medicine Anti-Retro Viral (AIDS)
- ii. Provision of home based care
- iii. Provision of medicine to infected mothers to prevent Mother To Child Transmission (MTCT)
- iv. Sensitizing and educating the public about HIV and AIDS transmission and treatment
- v. Provision of Voluntary Counseling and Testing (VCT) and treatment
- vi. Voluntary male circumcision to reduce infection and re-infection rate
- vii. Provision of protection by use of condoms to both infected and uninfected
- viii. Promoting by abstinence
- ix. By taking Pre-Exposure Prophylaxis (PrEP) medicine
- x. By avoiding sharing sharp objects like needles, razor blades etc.

BASIC MAP READING TECHNIQUES

A. MAPS AND DIAGRAMS

1. What is a map?

It is the representation of the features of part of the earth on a flat piece of paper. The map contains a lot of information such as rivers, mountains, settlements, buildings and forest information. **Below is an example of a map in social studies**

Triangle Trade

- Refers to the triangle route that ships followed in trade between Europe, Africa, and the Americas.



2. Name the characteristics of a map

A good should have the following features or characteristics namely.

i. **Title** – To mean the name of the map eg. Map of Zambia

ii. **Direction** – To mean the compass direction. Eg.



iii. **Key(Legend)** – To provide the meaning of information found on the map

iv. **Author** – To mean the name of the company or person who made the map.

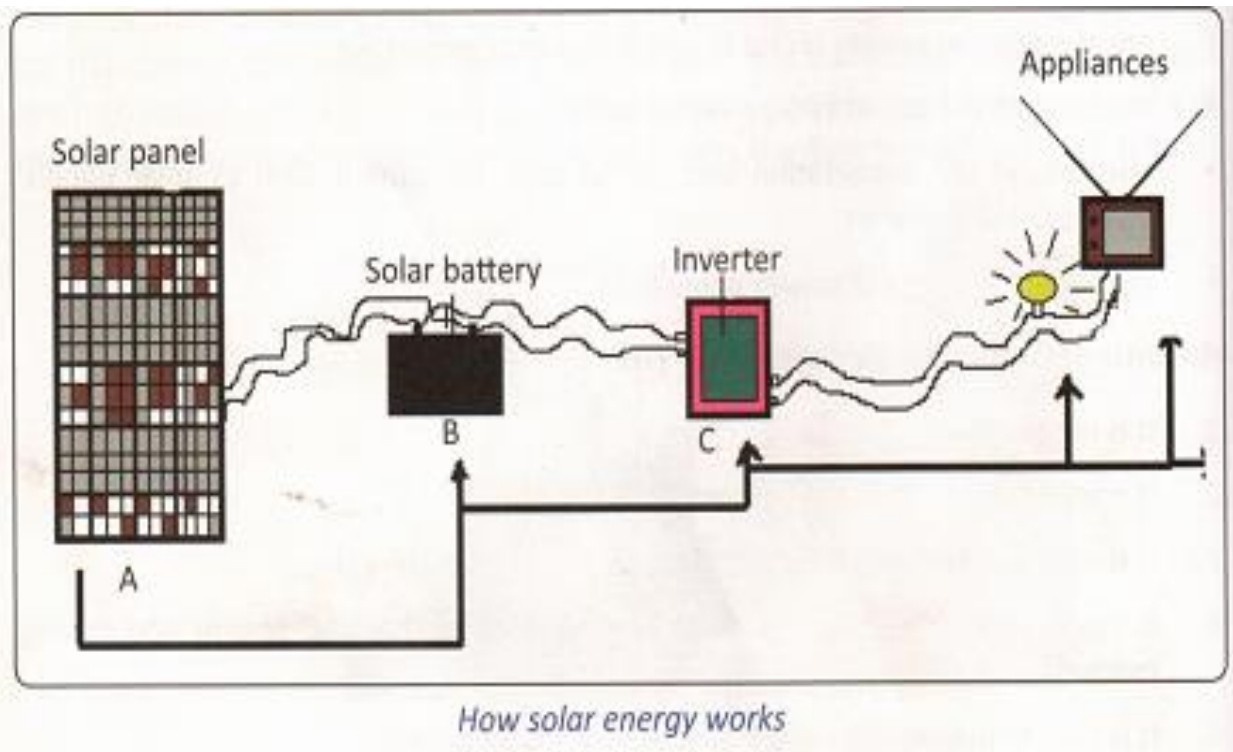
v. **Symbols** – These are small pictures or signs drawn on the map representing real objects on the ground. Eg. Any blue line on map represent water body.

vi. **Grid system** - These are lines of longitude and latitude used to locate places on the map.

v. **Scale** – This is the ratio distance on the map corresponding to the distance on the ground. Eg 1 unit on the map represent 100000 kilometers on the ground expressed as ratio (1:100000).

3. What is a diagram?

It is a plan, graph, chart or drawing that explains something by showing how it works. Below is an example of a diagram in social studies.



4. What is the difference between a map and a diagram?

Map	Diagram
It is the representation of the features of part of the earth on a flat piece of paper	It is a plan, graph, chart or drawing that explains something by showing how it works.
It uses universal accepted symbols to indicate natural and cultural features	It uses symbols that are not universally used and are based on individual drawing
It is usually accompanied by the key	It does not have a key
It uses grid system to locate positions	It does not use grid system to locate position.

5. What is Map reading?

It is a skill given to the learner in order to able to read any maps. However, map reading involves the following skills.

- i. Grid reference
- ii. Measurement of bearing
- iii. Measurement of distance
- iv. Measurement of slope

i. **GRID REFERENCE**

This is used to refer to or locate any point on the map with speed and measurable accuracy. It involves four and six figures grid reference.

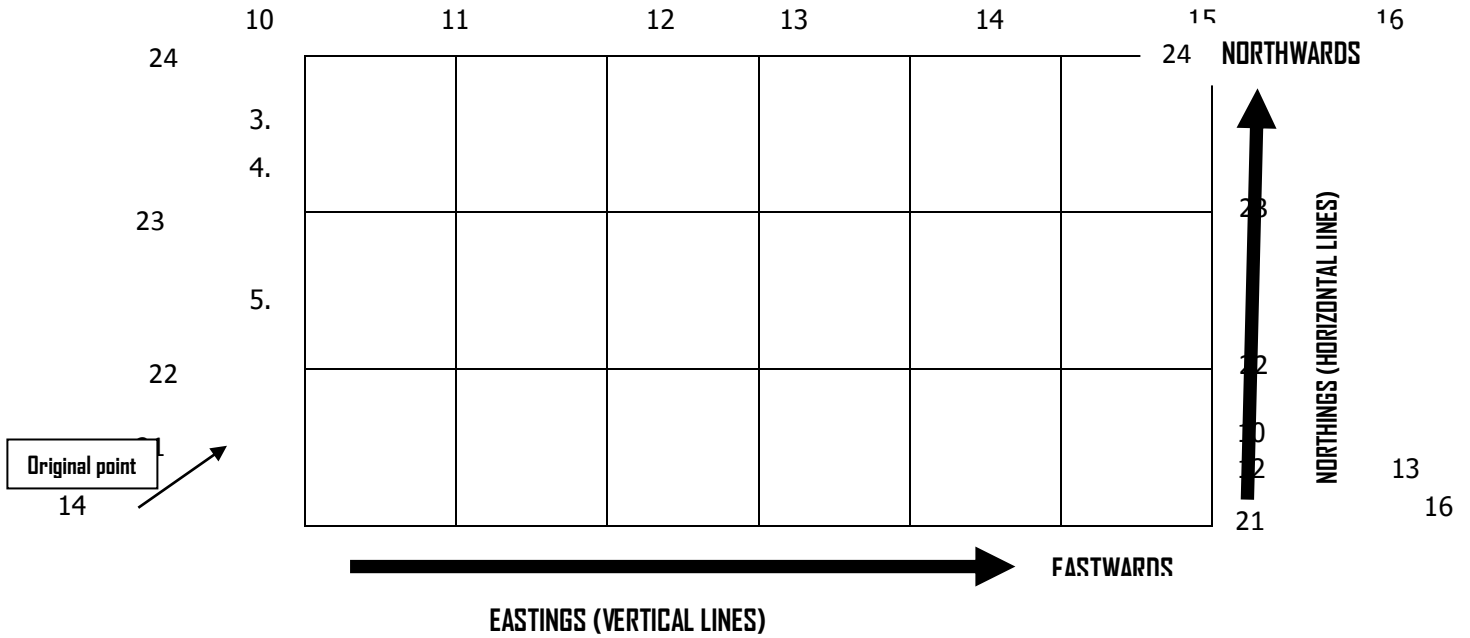
a. **Four figure grid reference**

This requires learners to find numbers (figures) on which the given point or location lies on the map.

Rules when determining four figures grid reference

1. Read starting with the EASTINGS and NORTHINGS.

2. The Vertical lines are called EASTINGS because they increase in value EASTWARDS whereas the HORIZONTAL lines are called NORTHINGS because they increase in values NORTHWARDS



EXAMPLE

1. Given the map of Zambia. Find the four figure reference where the following points or locations lie on the map.

i. Lochanika

- ✓ Firstly follow the easting (vertical) grid line **84** where Lochanika lies
- ✓ Secondly follow the northing (horizontal) gridline **62** where Lochanika lies.
- ✓ Therefore, the four figure grid reference for Lochanika is **8462**

- ii. Mushi is _____
- iii. Kanema is _____
- iv. Nsomwa is _____
- v. Munika is _____

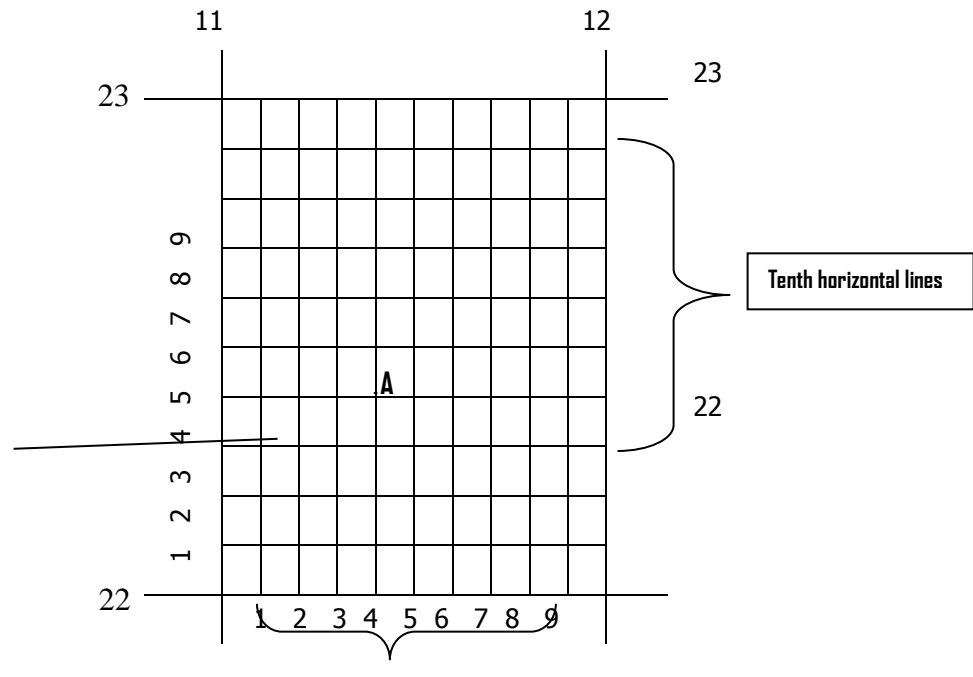
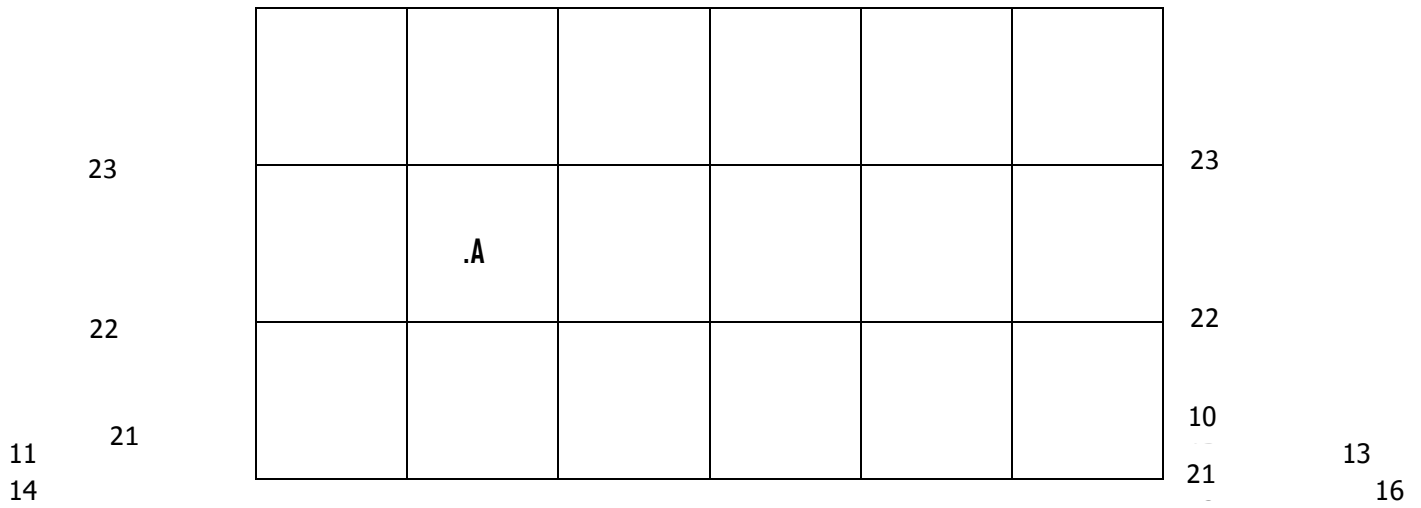
b.Six figure grid reference

This requires the learner to find six numbers on which the given point or location lies on the map.

Rules when determining the six figure grid reference

- i. Firstly find the four grid reference on which the point or location lies on the map.
- ii. Secondly find the 3rd number and the 6th number on which the point or location lies on the map
- iii. Thirdly to find the 3rd number and 6th number divide the square box into equal tenths on vertical and horizontal lines
- iv. Fourthly pick the 3rd number and 6th number where the point or location lies on the map.





To find six figure grid reference for point A will follow the following steps.

- i. Find the Four figure reference for point A is 1122
- ii. Open up the four figure grid reference for point A by inserting a dash every after two numbers or figures. A is 11__22__
- iii. Insert the 3rd number and 6th number calculated on the two dashes created 114224
- iv. Therefore, the six figure reference for point A is **114224**

EXAMPLE

Given the map of Zambia. Find the six figure grid reference for the following points on the map.

- i. Makamba = 8557
 = 85__57__
 = **857574**

- ii. Mulenga =
=
=
- iii. Luchu =
=
=
- iv. Munika =
=
=

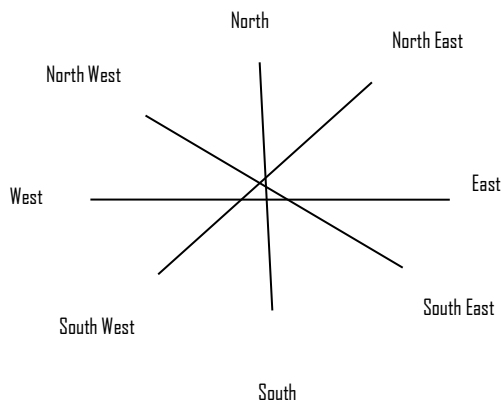
B. MEASUREMENT OF DIRECTION AND BEARING

1. MEASUREMENT OF DIRECTION

To find the direction of a given point on the map we use **the cardinal point method.**

a) CARDINAL POINT METHOD

This is a method that uses cardinal points of a campus namely **the North, South, East and West (NEWS)** to find directions of a given point on the map.

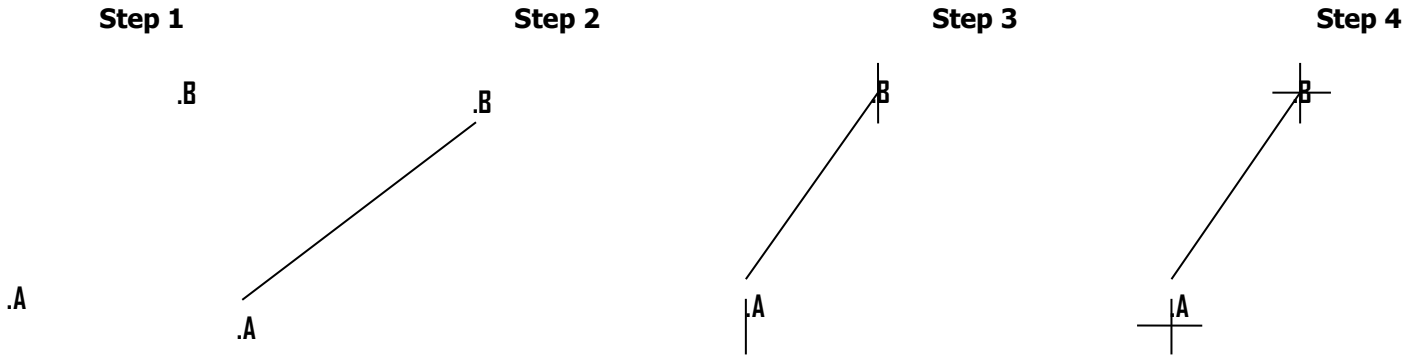


RULES WHEN DETERMINING THE DIRECTION OF A GIVEN POINT ON THE MAP

- i) Identify the two points under consideration on the map.
- ii) Connect the two points with a straight line using a sharp pencil or a ruler.
- iii) Draw vertical lines through the two points to represent the campus directions namely North and South.
- iv) Draw horizontal lines through the two points to represent the campus directions namely West and East.
- v) Pick the direction under which the point lies on the map from the given point in the question.

For example

i) Find the direction of point A from B



Point A from B is South West to North East

2. Given the map of Zambia find the directions of the following given points on the map.

a. What is the direction of Chansa in grid square 7755 from Nsofwa in grid square 7754

Ans:

b. What is the direction of Nsofwa in grid square 7754 from Kaumba in grid square 7855.

Ans: .

2. MEASUREMENT OF BEARING

b) WHOLE CIRCLE BEARING

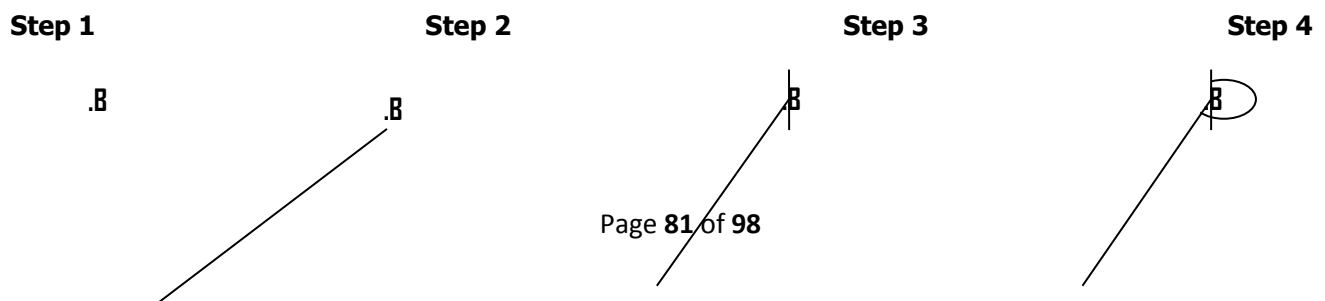
Bearing refers to the directional movement of an object from one point to the other.

RULES WHEN DETERMINING THE BEARING OF A GIVEN POINT ON THE MAP

- i) Identify the two points under consideration on the map.
- ii) Connect the two points with a straight line using a ruler and sharp pencil
- iii) Draw vertical lines through the two points to represent the campus directions namely North and South.
- iv) Draw the directions of the bearing using a campus square set.
- v) Determine the angle size for the bearing using a protractor.

For example

i) Find the bearing of point A from B



.A

.A

.A

.A

Point A from B is 220°

vi) Always measure the bearing angle starting from the North.

vii) The bearing angle is always read using the clockwise direction.

2. Given the map of Zambia find the bearing of the following given points on the map.

i) What is the bearing of Chanda from Nsofwa?

Ans:

ii) Find the bearing of Nsofwa from Chanda.

Ans:

C.MEASUREMENT OF DISTANCE

i. What is a map scale?

A map scale is a ratio of a distance on the map to the corresponding distance on the ground. Without the scale we would have no idea of distances over a map or the area covered by a map.

ii. Types of a map scales

1. A ratio or representative fraction (RF)

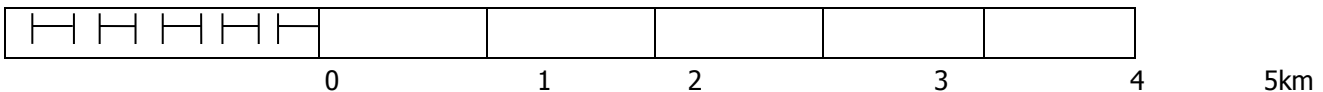
This indicates how many units on the earth's surface are equal to one unit on the map. It is expressed as 1/100 000 or 1:100 000. To mean 1 centimeters on the map is equal to 100 000 centimeters (1 kilometers) on the earth's surface.

2. A statement scale

This gives a written description of map distance such as "one centimeter equals to ten kilometer".

3. Graphic or linear scale

This is a line marked on the ground which the map user can use along with a ruler, string or edge of a piece of paper to determine any given distance of an area on the map.



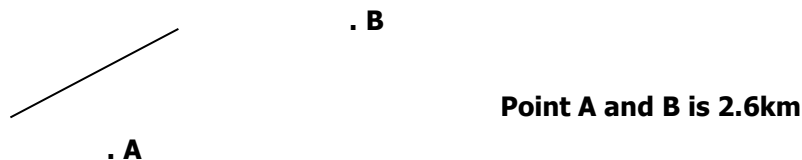
iii. Types of distance measured on a map.

There are two types of distance that are measured on a map namely;

1. Straight line distance

This is the measuring of distance between two points on the map that are on a straight line. A map user can use a divider, a ruler or straight edge of a piece of paper to measure the straight line distance. Thereafter take the readings on the linear scale given on the map to determine the straight line distance of the given two points on the map.

1. For example what is the distance between point A and B?



2. Given the map of Zambia find the distance of the 330KV power line from grid square 7654 to grid square 7759

Answer is 6.0 km

2. Curved line distance

This is the measuring of distance between two points on a map that are on a curved line. A map user can use cotton thread or string and straight edge of a piece of paper to measure the curved line distance. Thereafter, take the readings on the linear scale given on the map to determine the curved line distance of the two given points on the map.

For example what is the distance between point A and B?



Point A and B 5.6 km

2. Given the map of Zambia find the distance of the un tarred from TT2 in grid square 8460 to end of the road in grid square 8564.

Answer is 4.1 km

D. MEASUREMENT OF SLOPE

This is the measuring of physical features such as hills, mountain, plateau, escarpment and buildings on the map. This involves finding out the measurement through control lines, height (spot heights and trigonometry station) and gradient.

1. CONTOURS

i. What are Contour lines?

These are imaginary lines connecting places with same height on the map

ii. Types of contours on shape

a). Even slope contours

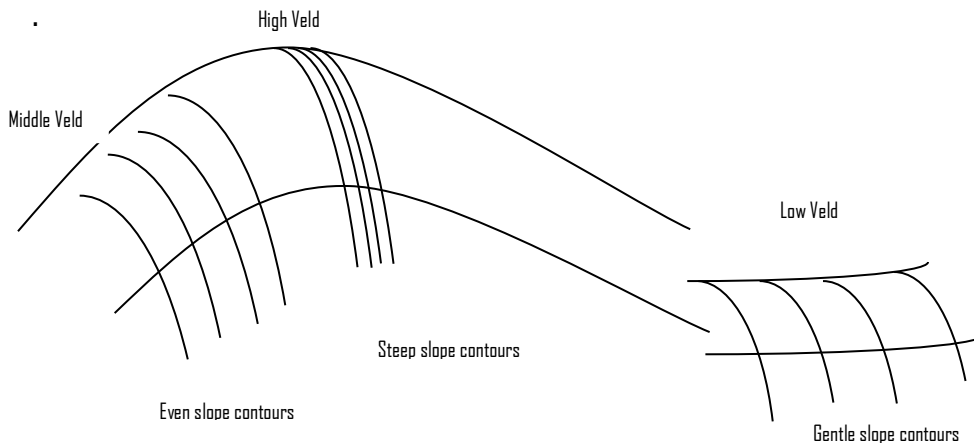
These are contour lines that are evenly spaced

b). Steep slope contours

These are contour lines that are close together.

c). Gentle slope contours

These are contour lines that have a wide distance between each other

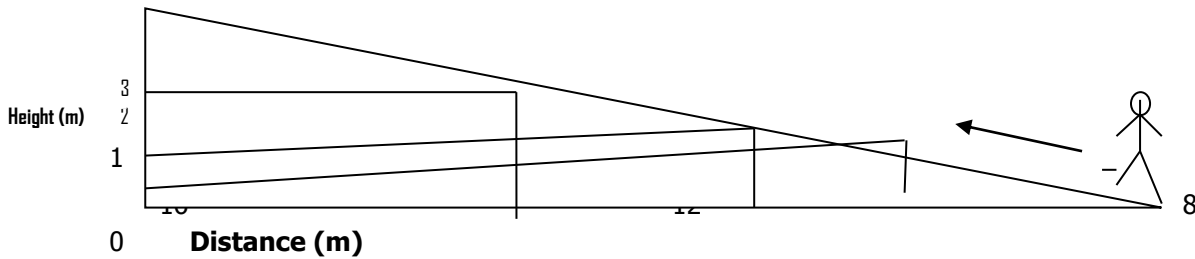


2. HEIGHTS

To find the height of a given place on the map follow closest successive contour passing nearer that place under consideration until you find a four figure number on it. eg 100, 1100, 1200.

$$= \frac{150}{600} = \frac{1}{4} \text{ or } 1:4$$

The gradient value simply means that for every horizontal distance of 4 meters one travels, he or she also moves vertically or upwards by 1 meter.



4

MINING IN ZAMBIA

A. What is mining?

It is the extraction (removal) of minerals from underground. e.g copper

B. METHODS OF MINING

The following are the methods of mining

Open pit mining

- This is a method of mining minerals which are nearer to the ground surface. Example of open pit mine in Zambia is the **Nchanga open pit** mine in Chingola and it is the biggest open pit in Zambia. This method is also used by mining companies in North Western province

Advantages of open pit mining

- It is cheaper because it does not require heavy and sophisticated machinery

Disadvantages

- It poses a danger to the environment. The mining may get flooded
- Humans or people are also displaced when such mines are opened
- Pollutes surface water and underground
- Causes landslides

Underground (shaft) mining

This is the method of mining minerals which are very deep in the ground. The shaft or machines are sunk and fitted with sharp objects to create a route to reach out the minerals in the ground and bring them out to the surface.

Disadvantages of underground mining

- It is too expensive because it uses expensive and heavy machines

Examples of underground mines

- Most of the mining towns have shaft mine like Nkana mine in Kitwe, Konkola mine in Chililabombwe and Mufulira mine in Mufulira.

Note: Mufulira Mine in Zambia is the largest underground mine in Zambia.

C.NAME THE MINING TOWNS (AREAS) IN ZAMBIA

Copperbelt province

The mining towns (areas) include:

- 1) Ndola – Bwana mukubwa mine
- 2) Mufulira – Mufulira plant
- 3) Kitwe – Nkana mine
- 4) Luanshya – Baluba mine
- 5) Chambeshi – Chambeshi mine
- 6) Chililabombwe – Konkola mine

North Western province

The North Western towns include Kasenshi, Lumwana, Kalengwa and Kalumbila.

Southern Province

The mining towns (areas) include Maamba and Munali

Central Province

The mining towns (areas) include Mkushi, Nampundwe and Kabwe (mines closed)

Lusaka Province

The mining towns (areas) include Chilanga and Rufunsa

Luapula Province

The mining towns (areas) include Mansa – Manganese and is not in operation

D.DESCRIBE THE COPPER PROCESSING IN ZAMBIA

This is a process in which copper goes through before being sold

- (i) **Mining:** This is the first process which is the removal from the ground.
- (ii) **Milling (crushing):** This is the second process which is the crushing and turning copper into copper powder
- (iii) **Smelting:** This is the third process which is the removal of impurities (unwanted products) through filtration process
- (iv) **Refining:** This is the final process which is the purification making the copper cathodes.

E.NAME THE ROUTES FOR TRANSPORTING COPPER TO OTHER COUNTRIES

- (i) **Zambia to Tanzania**- then to port of Dar es Salaam by rail line.
- (ii) **Zambia to South Africa** then to port of Dubai East London by railway line.
- (iii) **Zambia to Mozambique** to port of Maputo and Beira by road

F. IMPORTANCE OF MINING IN ZAMBIA

- (i) It bring foreign exchange
- (ii) It brings development e.g. roads, schools
- (iii) It provides or creates employment to people
- (iv) It brings wealth to the country

(v) It provides material (raw) for many manufacturing industries e.g copper to make electric cables.

G. TYPES OF MINERALS MINED IN ZAMBIA

(i) Copper

It is mined in the Copperbelt, North Western and Central provinces of Zambia.

USES OF COPPER

1. For making electrical cables
2. For making bullets for guns
3. For making coins ,radios and roofing materials
4. For making water pipes and taps
5. For making bronze and brass medals
6. For making telephone ,radio and Television wires
7. For making ornaments

DISADVANTAGES

1. It is difficult to extract copper from the ground.
2. High cost of production e.g buying of machinery
3. Long distance to many sea ports
4. Fluctuating prices of copper on the world market
5. Poor road network

2. COBALT

Cobalt is mined as a by product of copper. This means it is mined at the same time when mining copper. Cobalt is mined at Nkana ,Chibuluma and Chambeshi mines in the Copperbelt. The cobalt concentrate are treated at Nkana mine.

Uses of Cobalt

Because of its magnetic properties and ability to withstand high temperature, it is used for:

- i. Manufacturing cutting tools eg. Knives
- ii. Manufacturing of magnets
- iii. Making diesels jets and steam turbines engines.

3. Lead

It is a soft and dense metal that can be rolled or hammered into thin sheets.

Uses of Lead

- i. It is used as protective shield against radiation
- ii. For making bullets for guns
- iii. For making electric storage batteries
- iv. For making roofing materials
- v. For making pipes

4. Zinc

It is a soft metal malleable and resists rust

Uses of Zinc

- i. Making roofing materials
- ii. For making toothpaste tubes
- iii. For making battery tubes

- iv. For making paint tins

Lead and Zinc Mines

These mines were initially in Kabwe; however in 1994 they were closed due to the following reasons.

- i. Decrease in production
- ii. Decrease in world market prices

5. Coal

It is mined in Maamba Southern Province

Uses of Coal

- i. It is used in thermal power stations
- ii. It is used by processing plants such as Chilanga Cement, Nakambala Sugar Refinery

6. Manganese

It is mined near Mansa in Luapula Province

Uses of Manganese

- i. It is used in dry cells factory
- ii. It is used in alloy reserves in Central, Copperbelt Province and also near Chilanga

7. Limestone

It is mined at Shimabala near Lusaka and Itawa in Ndola

Uses of Limestone

- i. Making paints
- ii. Treating water plants
- iii. Putting it on the field to neutralize the acidic soils

8. Amethyst

It is mined in Southern Province open pits method and sorted by hands

9. Gypsum

It is mined in Lochnivar in Kafue flat and Western Province near Ngoye falls in open pits.

Uses of Gypsum

- i. Making cements
- ii. Making proof tiles
- iii. Making fertilizer
- iv. Making paint
- v. Making plasters of Paris wall paper

10. Mica

It is mined in Lundazi, Choma and Mazabuka

Uses of Mica

It is used as insulator in stove oven glass windows

11. Other minerals

- i. Iron
- ii. Diamond
- iii. Gold
- iv. Emeralds

H. Name the problems/challenges facing the mining industry in Zambia

- i. Long distance to sea ports
- ii. Inadequate infrastructure eg. Houses for miners

- iii. Fluctuation market prices of minerals on the world market
- iv. Shortage of mining spare parts
- v. High cost of production
- vi. Poor road network
- vii. Lack of capital to buy modernized equipments

I. Name the solutions to the problems/challenges facing the mining industry in Zambia

- i. By forming mining support institutions eg. Metal Marketing Corporation(MEMACO)
- ii. By encouraging private investment into mining industries
- iii. Value addition to minerals by way of setting up mineral processing industries to make finished goods like electrical cables
- iv. By improving road network
- v. By building enough infrastructure
- vi. By forming companies that make mining spare parts

J. Describe the role of government in the mining industry

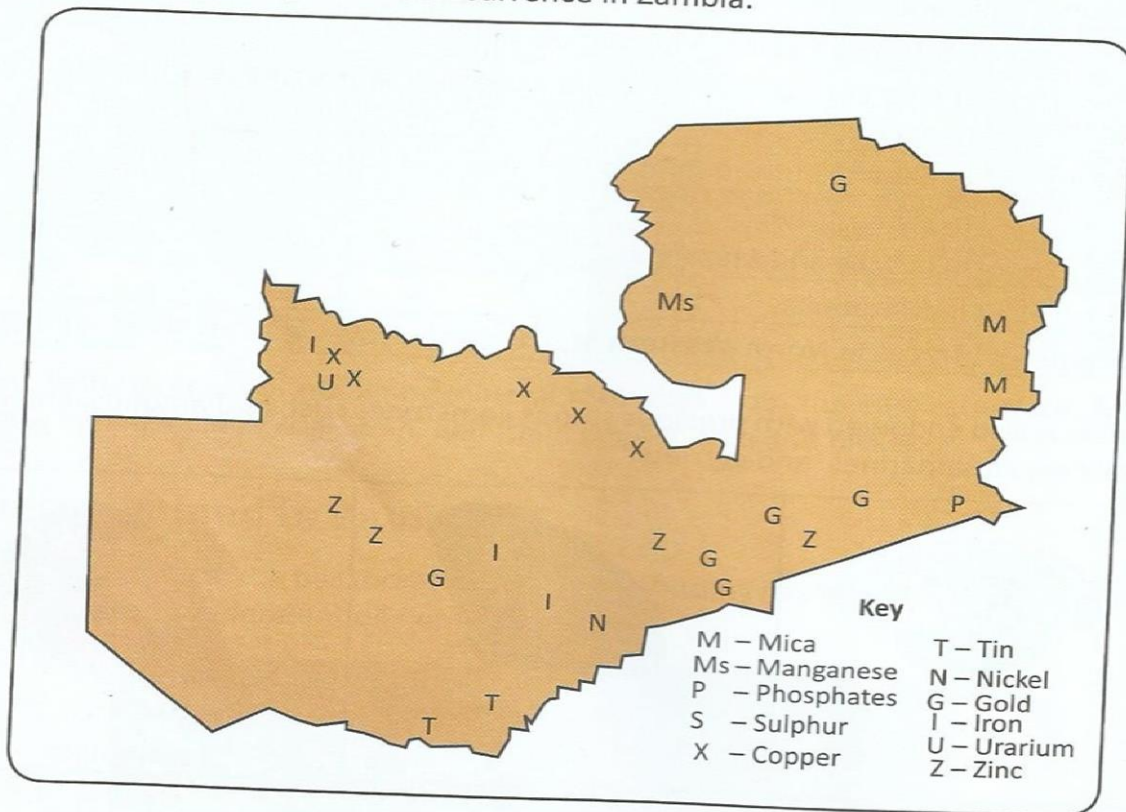
- i. To encourage private investment into the mining industry
- ii. Making of mining policies
- iii. Making affordable mining taxes
- iv. Improve road network
- v. Advertise potential mining prospects
- vi. Support mining institutions
- vii. Support value addition to minerals

H. Name the impact of mining on the environment

- í. Land degradation
 - íí. Displacement of humans and animals
 - ííí. Pollution of air, water, land and noise
 - íííí. Destroys the natural vegetation
- Mine waste disposal poses a health risk to humans and animals

Mineral occurrence in Zambia

Below is a map showing mineral occurrence in Zambia.



A table showing minerals mined in Zambia

Mineral	Places where they are mined
Copper	Mainly the Copperbelt but also in the North-Western province parts of Lumwana and Kansanshi; Mkushi in Central Province and Luapula.
Cobalt	It is mined as a by-product of copper in most copper producing places.
Coal	Maamba in Southern Province.
Uranium	Solwezi in Southern Province.
Manganese	Luapula and Kabwe.
Mica	Central and Eastern Provinces.
Gold	Traces of gold in Mumbwa in Eastern Province and as a by-product of copper.
Lead/zinc	In Kabwe, but the mine is closed and in Kafue and Kasempa.
Tin	In Livingstone.
Iron	In Lusaka and Mazabuka.
Nickel	In Mazabuka.
Petroleum	Traces in North-Western and Eastern Provinces.

MANUFACTURING AND FOOD PROCESSING INDUSTRIES IN ZAMBIA

A. What is an Industry?

It is an economic activity that process raw materials, manufacture goods and offer services to people.

B. Name the types of industries

There are three types of industries namely

1. Primary (Basic or Extractive) Industry

This is an industry that collects raw materials from the environment such as maize, sugarcane, sunflower, minerals and trees.

2. Secondary (Manufacturing or Processing) Industry

This is an industry that turns raw materials into finished goods. For example, Maize turned into Millie meal, sunflower turned into cooking oil and copper turned into electrical cables.

3. Service (Tertiary) Industry

This is an industry that offers services to people. For example, teaching industry offering a service of teaching to people, banking industry offering a service of banking money for people and transport industry offering a service of transporting people to and from work, school etc.

C. Name the types of manufacturing (Secondary or Processing) Industries

The secondary industry can be divided into two groups namely.

1. Manufacturing (Good Processing) industry

This is an industry that makes goods such as phones, desks, vehicles and steel bars.

Types of manufacturing (Good Processing) industry

i. Steel making industry

This is an industry that makes metal bars, iron sheets etc.

ii. Textiles industry

This is an industry that makes clothing materials such as those we use to make shirts, chitenges, trousers and neckties.

iii. Leather industry

This is an industry that makes leather materials products from animal skins such as those we use to make leather jackets, belts, shoes and gloves.

iv. Furniture making industry

This is an industry that makes goods such as chairs, beds, desks and cupboard.

v. Brick (Block) making industry

This is an industry that makes bricks or blocks used in building of houses, shops and schools.

vi. Pottery making industry

This is an industry that makes pottery goods from clay soil such as clay pots, mug cups, breakable plates, and ceramic or porcelain tiles.

2. Processing (Food processing) industry

This is an industry that makes food from raw materials such as Millie meal from maize.

Types of Processing (Food processing) industry

i. Milling industry

This is an industry that makes powdered milies such as Millie meal, baking flour, powdered groundnuts, table salt etc.

ii. Caning industry

This is an industry that makes canned food such as canned fish, jam, beef and baked beans.

iii. Confectionery industry

This is an industry that makes sweet (candy) foods such as sweets, biscuits, chocolate, and ice creams.

iv. Beverage industry

This is an industry that makes drinks such as beer and soft drinks. For example, Chibuku and coca cola.

D. Name the factors influencing the location of industries

i. Raw materials

For any industry to manufacture goods they need raw materials such as maize to manufacture milie meal. Therefore, the building of an industry depends upon the availability of raw materials.

ii. Power

For any industry to manufacture goods using machinery needs power such as hydro electrical power (HEP) or thermal power.

iii. Labour

For any industry to effectively begin to operate needs skilled labour (experts) and unskilled labour (manual workers) to work for the industry. Hence, industries are built in areas where there is large population to supply labour.

iv. Transport

For any industry to be built in an area it must have access either to road, railway, water or air transport materials, labour and goods to and from the industry.

v. Market

For any industry to be built in an area needs the access readily market where the goods produced can be sold and buying of materials needed in the industry?

vi. Water supply

For any industry to be built in an area it needs the supply of fresh clean water to use in the industry. So industries are built in areas where there is water nearby.

vii. Government policy

Government policies attract many industries to be built in the country whereas bad government policies chase away or discourages building of industries in the country.

viii. Industries depend on one another

Industries should be built in area where there are other industries in order to get the materials they may need from other industries. For example, milling companies are built near Food and Reserve Agency (FRA) or maize built area so that it is easier for the milling companies to transport maize from FRA to their companies to produce milie meal.

E. Describes the challenges facing the manufacturing and food processing industries.

1. High cost of raw materials

The raw materials needed to produce goods in the industries are sold at very high price and sometimes they are in short supply.

2. Lack of capital

Most industries lack capital such as human, machinery and money to use in their industries.

3. Competition

There is a high demand for goods produced by industries from the people such that if the goods are not of high quality people avoid buying them making the company that produced suffer losses.

4. Lack of good transport network

Most industries have challenges in transportation of their goods to and from their industries. Mostly many roads are full of pot holes.

5. Lack of good storage

Most industries have little or no storage where they can put their goods before transporting to market.

6. Lack of readily available market

Most industries lose their goods due to lack of people to buy their goods on time by either going bad or reaching the expiry date.

7. Lack of technology

Most industries rely on simple tools to produce goods hence affecting the production of goods.

8. Poor (bad) government policy

Poor or bad policies disadvantage the industries to point where they may fail to operate and subsequently lead to their closure or lay down some of its workers.

POWER AND ENERGY

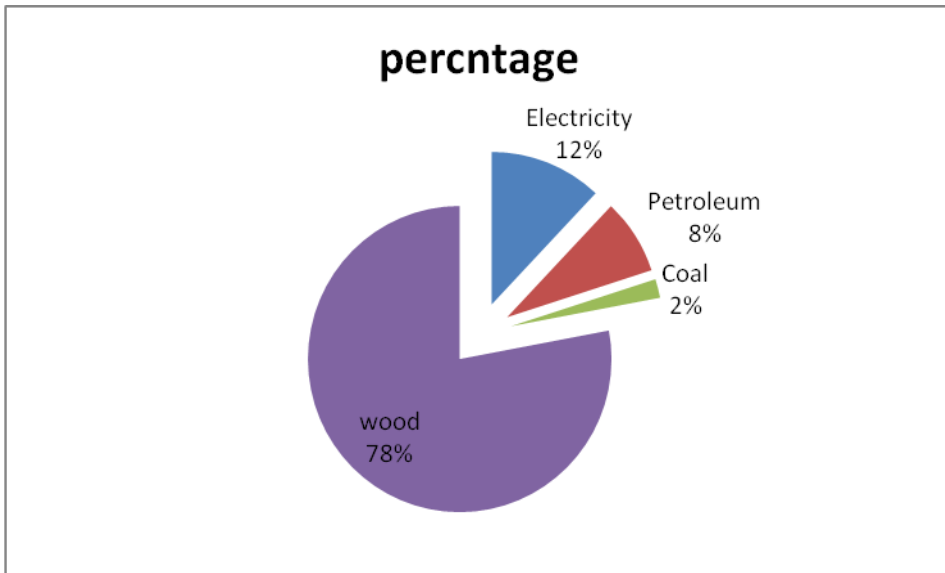
- Energy makes things work.
- We need energy for almost everything we do each day. We need energy for lighting, for moving our vehicles, for cooking and heating, and for running machinery and equipment in the kitchen, office, industries and mines.

Importance of Power and Energy

- It has stimulated both small and heavy industries
- It has stimulated commercial agricultural activities
- It has created employment
- It has stimulated demand for electrical appliances
- ZESCO exports power to neighbouring countries and earns foreign exchange

Sources of Power and Energy

There are a number of different sources of energy as shown below in the pie chart:



Pie Chart showing sources of energy

The majority of people (61%) live in rural areas in Zambia, and their main source of energy is wood. Charcoal and electricity are the main sources in urban areas, while 75% use wood fuel.

All energy sources can be divided into one of two groups.

- i. **Non-renewable energy source.**
- ii. **Renewable source.**

Non- renewable source of power and energy

- Non-renewable energy comes from source that will run out or cannot be replaced for thousands or even millions of years. This includes FOSSIL FUELS (which are coal, crude oil and natural gas) and uranium.
- Most fossil fuels are burned to create energy and electricity. More electricity is generated from coal than from any other fossil fuel.
- **CRUDE OIL** is a liquid fossil fuel. It is re fined and used in car, aeroplanes and motorbikes.
- **NATURAL GAS** can be piped into homes and for gas ovens and stoves.
- **URANIUM** is a non-renewable resource. It is a heavy metal that occurs in rocks. Nuclear energy is created by splitting uranium atoms. The energy is then used to generate electricity.

Coal

- The mined coal is used to generate thermal electricity power at a number of thermal power plants in the country.

Crude oil and natural gas

- Zambia has none of its own natural gas or oil reserve.
- Crude oil or petroleum is imported from the Middle Eastern countries and mainly used in the transport industry in Zambia, the agricultural industry, as well as for the generation of electricity.
- Besides takers, an oil pipeline from Dar es Salaam is used to transport petroleum to Ndola.
- There it is refined by the Zambia National Oil company (ZNOC) into petrol, liquefied petroleum gas (LPG), diesel, aviation fuel (for aeroplanes) and kerosene for the Zambian market . There are plans to import oil from Angola.

- In, Zambia the main companies that market petroleum products are: **Puma, Total, Petroda, Mobile Engen, Mount Meru and Oddys.**

Uranium

- Uranium is used in nuclear power plants to generate electricity.
- Uranium is at this stage it is not being mined in Zambia. It also does not have any nuclear power plants. However, some of our neighbouring countries do use this type of non-renewable energy e.g. South Africa.

Disadvantages of using fossil fuels as energy sources

- Mining crude oil, uranium core damages the environment and also may be dangerous to the health of workers.
- Fossil fuels are non-renewable energy sources. Their supply is limited and they will eventually run out.
- Mining and processing fossil fuels produces harmful waste products, and releases large amounts of pollutants into the air and water system.
- When fossil fuels are burnt, they give off carbon dioxide, a greenhouse gas which is the main cause of global warming.
- They also emit sulphur dioxide, which combines with moisture in the air to form acid rain. Acid rain destroys mountains and buildings. It also affects the soil and the crops that grow in it.
- The mines may scar the landscape, particularly if they are open pit mines. Mine dumps destroy the landscape and may give off poisonous gases.
- Burning coal at thermal power stations produces large amounts of pollution, as well as large amounts of solid waste.
- Nuclear power stations could lead to major nuclear disasters if damaged.

Renewable sources of energy and power.

- Renewable energy comes from natural resources that can be replenished, unlike fossil fuels which take millions of years to form.
- This includes **sunlight, winds, tide, geothermal heat, water** and various forms **biomass**. Biomass can include biological materials that come from living, or recently living organisms, such as wood, paste and alcohol fuels.

Wood fuel

- Most rural communities in Zambia depend on wood fuel for cooking and heating. Household energy supply in urban areas is mainly based on charcoal.
- Most of the charcoal produced in Zambia is for domestic energy use, especially for cooking. The high demand for wood fuel has resulted in deforestation of many Zambia's forest ecosystems.
- Charcoal is commonly used in urban areas than wood, as it is easier to transport and produces less smoke and sulphur. Most charcoal produced in rural regions and used in urban areas.

Hydroelectricity

- Hydroelectricity is generated by water. Zambia is blessed with plenty of water resources, which make up 40% of all the fresh water in the southern Africa region.
- Hydroelectric power (HEP) is the second most important energy source in Zambia (after wood fuel). About 10% of the natural energy supply comes from hydroelectricity.
- More than 99% of Zambia's electricity comes from hydroelectricity.

- Zambia exports power to Zimbabwe, DRC, South Africa Botswana and Namibia and there are plans to export to Tanzania, Mozambique, and Malawi.

Production of hydro electricity

- Dam or reservoir stores water
- Water flows in steep slope pen stock
- Fast running water turns turbines
- The turbine turns the generation
- The generator produces electricity which goes in a transformer
- Electricity produced reaches homes

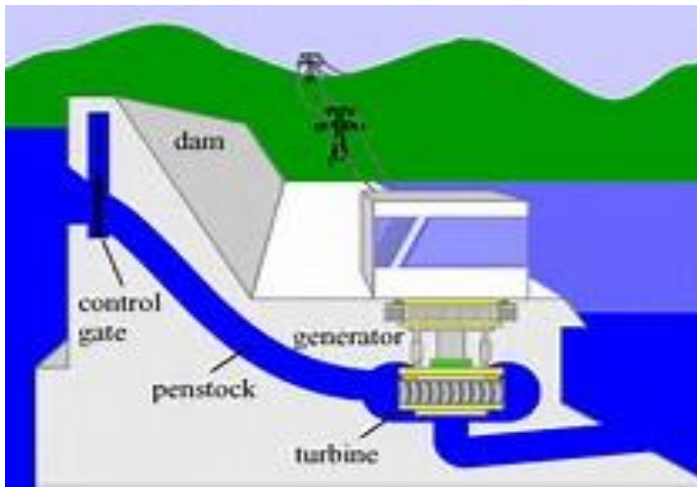


Diagram: H.E.P Production

Advantages of hydro electricity

- It is a renewable resource
- It is clean and does not cause pollution
- It is easily transported through cables
- It has a broad range of uses in modern households and agriculture
- It is cheaper as compared to thermal
- Ease to use, it is a matter of a flick

Disadvantages of hydro electricity

- High cost of building a power station
- It is affected by drought
- It cannot be stirred like petroleum
- Leads to re allocation of people when constructing

There are number of hydroelectric power stations in the country were hydroelectricity is generated. This includes: Kariba north bank power station, Kafue gorge power station, Victoria Falls power station, Lonzua in Mbala, Lusiwasi in Serenje, Chishimba in Kasams, Musonda in Mansa power station. And Shuangandu in Chinsali power station

Government's effort to increase HEP production

- The itezhi-tezhi hydro power plant project is expected to be completed in February 2015 and the Kafue gorge lower hydro project will be completed in 2017.
- Another new project is the construction of Kabompo gouge project. These new developments will ensure a more constant power supply and make Zambia as regional supply of electricity.

Solar power

- Solar power is a cheap and clean source of renewable energy.
- Solar energy comes from sunlight. Humans have used the sun for thousands of years for heating, removing salt from sea water, and cooking food.
- Nowadays the sun can be used to create electricity. This can be done in two ways:
 - I.** Directly by using photovoltaic (PV). PV converts light renege into electricity by photoelectric effect. PV cells can be used to power portable devices such as calculators. Large number of PV cells are put together to create solar panels.
 - II.** Indirectly, by using concentrated solar power (CSO). Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into small beams.
- Zambia is a very sunny country so solar power has a great potential. Currently, however, solar power is rarely used in Zambia.
- A number of companies have entered the Zambian market to supply and install solar operated equipment's. These include **Muhanya** solar limited, **Suntech**, **Davis** and **Shirliff** and **sun beam**. Most of them are based in Lusaka.

Wind

- Farmers use wind power to pump water from underground into farm bams.
- Wind mills are the simplest form of wind energy: the wind turns the blade of the wind mill which then drives a mechanical pump. This pump pumps water from underground boreholes
- Wind can be used to generate electricity. Wind turbines are like giant windmills. They convert wind energy to electricity for distribution. The wind makes the rotors rotate, which drives generators produce electrical energy.
- This electricity can be transmitted via a power grid. Using wind to generate Power is not widely used in Zambia. Some farms use wind power to pump water, but there are no wind turbines is Zambia.

Geothermal power.

- Geothermal power uses energy stored within the earth.
- Deep within the earth temperatures may reach over 5000 degrees salacious. This heat is called geothermal energy.
- Geothermal power plants use heat from deep inside the earth to generate steam to make electricity.
- They are normally built in areas that have a lot of hot springs, geysers, or volcanic activities, because these are places were the earth is practically hot just below the surface.
- The steam spins the turbine, which is connected to a generator to produce electricity. Then the steam cools off in a cooling tower, condenses back to water and pumped back into the earth for the process to start again.

Biogas.

- Biogas is a fuel produced by fermentation of organic matters.
- Biogas is any fuel that comes from decay of organic matters, such as food peelings or manure. Basically, it means rotting plants produce gas, which is then collected.

- Biogas is composed mainly of methane, with some carbon dioxide and other trace gases
- Biogas can be produced by processing waste from livestock (such as dung and uneaten food), food production (such as fruits and vegetable wastes) and effluents from industries as well as municipal waste water treatment plants.
- In Zambia, this source of power production has not yet seen much production.

Companies involved the development of biofuel

1. The biofuels association of Zambia,
2. Copper belt energy cooperation (CEC)
3. Thomro investments limited
4. Black power investments set up a bio fuel refinery plant in Zambia in 2011.

A. NAME THE INSTITUTIONS THAT DEAL WITH POWER AND ENERGY IN ZAMBIA

i. Zambia Electricity supply Corporation(ZESCO)

It was formed in 1970 to generate (produce), transmit (transporting) and distributing (supplying) of hydro electric power (electricity) in Zambia. It is a major source of power in Zambia and runs several hydro power stations across Zambia. It is a parastatal company to mean it is owned by the Zambian government.

ii. Copperbelt Energy Corporation (CEC)

It was formed in 1997 to transmit and distribute to mining companies on the copperbelt. It has its own power stations that it controls. Although in most cases it buys electricity from ZESCO and resells it to the mining companies. It is a private company based on the copperbelt province- means it is owned by individuals.

iii. Energy Regulation Board (ERB)

It was formed in 1995 to regulate the provision of all forms renewable and non-renewable energy in Zambia. Its headquarters are based in Lusaka near mass media (ZNBC).

FUNCTION S OF ERB

1. Issue licenses to all companies of power and energy.
2. To monitor the performances of companies involved in the supply of power and energy in Zambia.
3. To receive and investigate any power and energy related complaints from consumers.
4. To set and control the price of energy of energy and power in Zambia.
5. To set out rules and regulation on energy and power in Zambia.