

GEOGRAPHY FORM FOUR WORK.

TOPIC ONE:

STATISTICAL METHODS IV

By Prof. Ogoti Robert Maxwell

Methods of Statistical Presentation.

- ✓ Age-sex pyramids.
- ✓ Dot maps.
- ✓ Choropleth maps.

1. Age-sex pyramids.

- **Age-sex pyramid** is a graph used to present population data showing the different age groups for males and females.
- Age-sex pyramid consists of bars which are drawn horizontally. The length of each bar indicates the number of persons in each age-group in a population.

Example.

The Population of Kenya (1999 census)

Age-group	Males 000,000	Females 000,000	% Males	% Females
0-4	2291936	2242966	16.13	15.49
5-9	2000580	1962556	14.08	13.55
10-14	2034980	2003655	14.32	13.83
15-19	1681984	1721194	11.84	11.83
20-24	1328529	1504389	9.35	10.38
25-29	1094909	1164594	7.70	8.04
30-34	840692	845230	5.91	5.83
35-39	695263	723749	4.89	4.99
40-44	516502	516989	3.63	3.57
45-49	419844	418987	2.95	2.89
50-54	344639	340167	2.42	2.34
55-59	223691	236325	1.57	1.63
60-64	194513	214715	1.36	1.48
65-69	140969	160364	0.99	1.10
70-74	118601	135524	0.83	0.93
75-79	79166	81620	0.55	0.56
80+	103487	86956	0.72	0.60
Total	14205589	14481081		

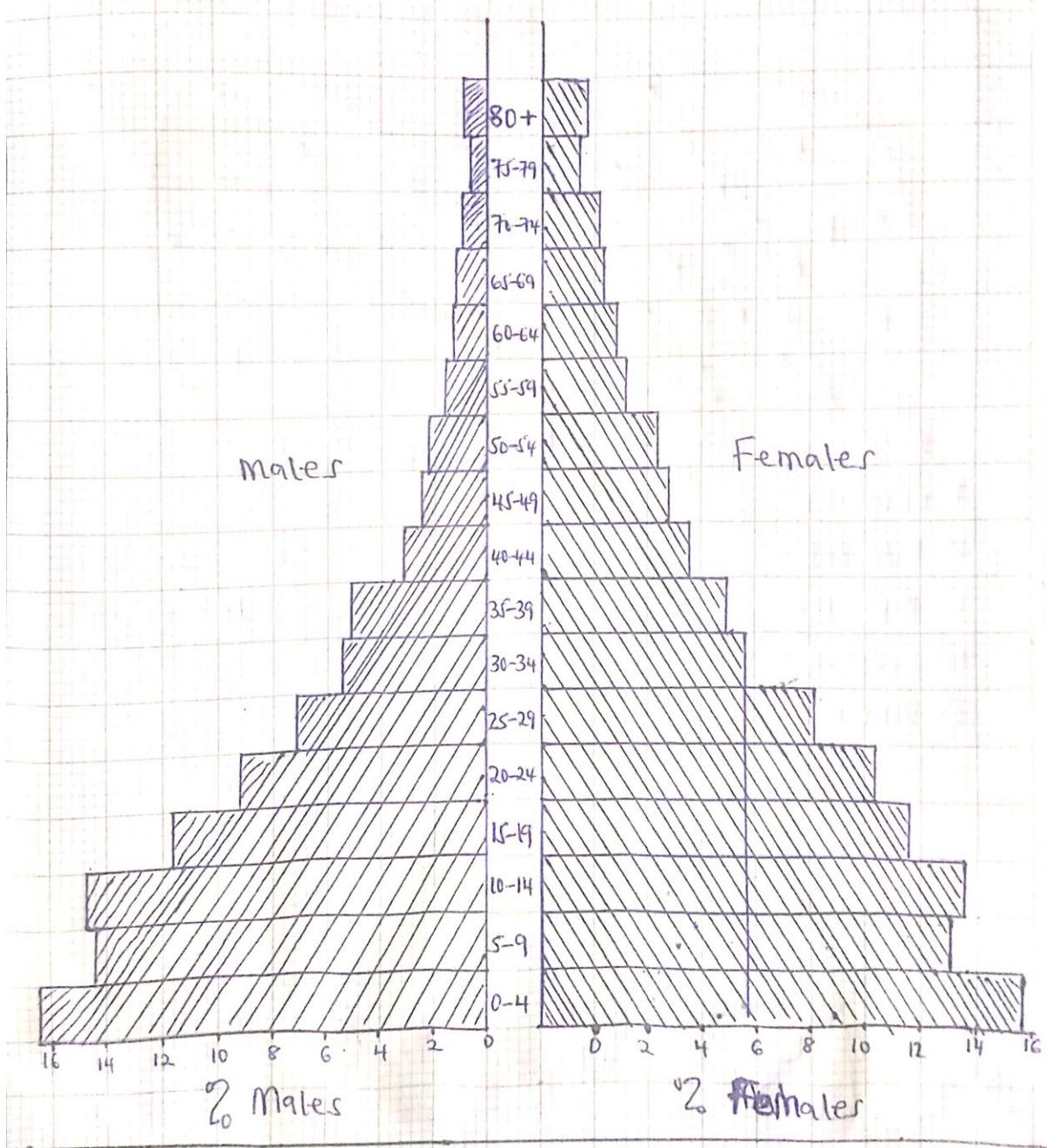
Hint:

- Calculate the number in each age group as a percentage of the total population i.e.

$$0-4 \text{ males: } \frac{2291936}{14205589} \times 100 = 16.13$$

$$0-4 \text{ females: } \frac{2242966}{14481081} \times 100 = 15.49$$

AGE-SEX PYRAMID SHOWING POPULATION OF KENYA (1999 CENSUS).



Advantages of Age-sex pyramid.

- i. It gives a clear visual impression of population data.
- ii. It is easy to construct/ draw.
- iii. It is easy to read/ interpret.
- iv. It has a variety of useful information for planning purposes by the government.
- v. It can easily enable comparisons of population for various countries.

Disadvantages of Age-sex pyramid.

- i. It is tedious to construct/ time consuming.
- ii. It represents a few variables/ items.
- iii. It is difficult to choose a suitable horizontal scale.
- iv. It is difficult to tell the exact values at a glance.
- v. The reasons for differences in population figures cannot be gotten directly from the pyramid.
- vi. If age-groups are many, the graph can take much space.

2. Dot maps/ Distribution maps.

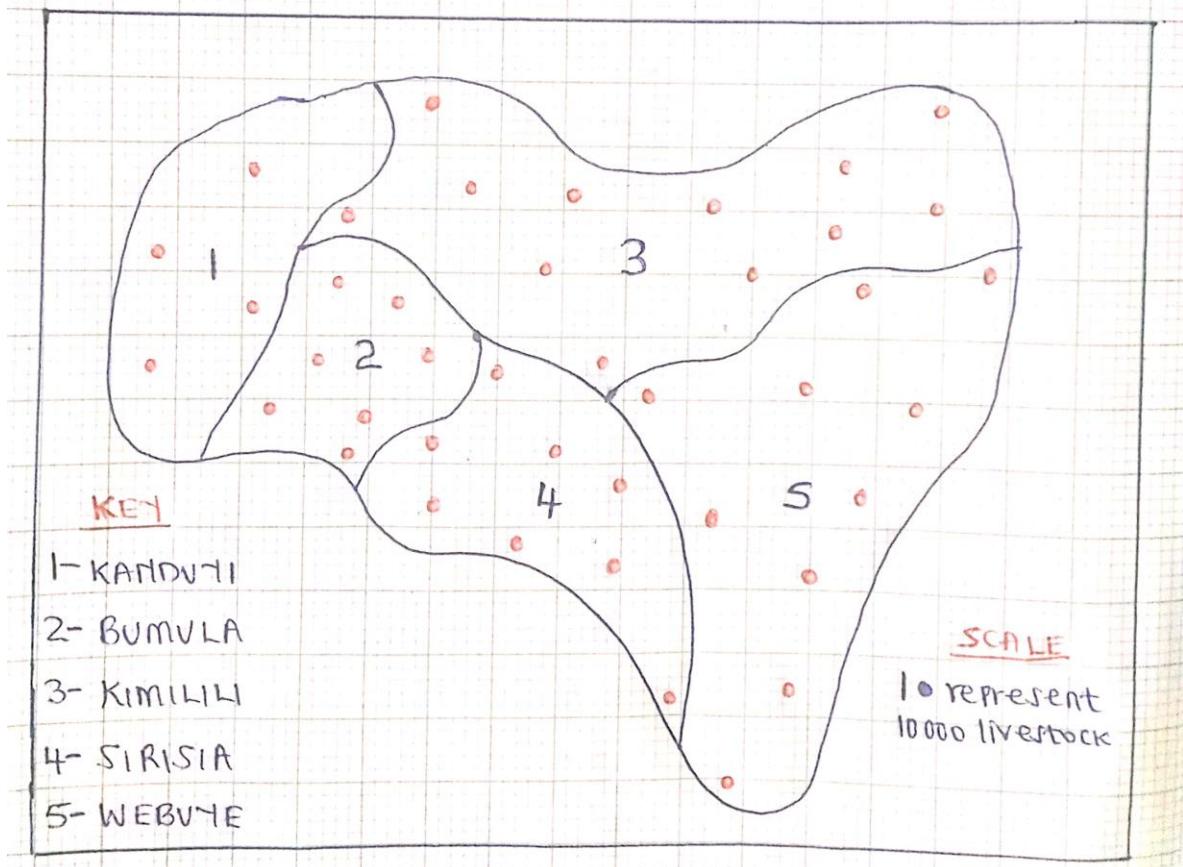
- **A dot map** is a map that uses dots to describe distribution of phenomena.
- Each dot represents the number of items in an area.
- The dots used on a dot map are quantitative symbols each having a specific or fixed value.
- When drawing or constructing a dot map, the following factors are taken into consideration:
 - **The value of each dot** – Dot value represents the actual number of items or phenomena in a given area. It determines the number of dots to be placed on a map.
 - **The size of each dot** – Dot size must be considered alongside the dot value and dot location. Extremes of dot sizes too large or too small should be avoided.
 - **The location of each dot** – Calculate the number of dots to be used to show distribution and locate them.

Example.

The table below shows the number of livestock per sub-county in Bungoma County.

Sub- County	Number of livestock
Kanduyi	40,000
Bumula	70,000
Webuye	100,000
Sirisia	80,000
Kimilili	120,000
Total	410,000

DOT MAP SHOWING LIVESTOCK DISTRIBUTION IN BURIGOMA COUNTY.



Advantages of a Dot map.

- i. It gives a clear visual impression of comparative densities and distribution of phenomena.
- ii. If the key is given, it is easy to calculate the total population.
- iii. It has a wide use i.e. showing rainfall patterns and population distribution.
- iv. It can be used to show the distribution of different phenomena in the same geographical unit.
- v. If the dot value is known, it is easy to calculate the total population.
- vi. It is easy to interpret/ read.
- vii. It is easy to draw/ construct.

Disadvantages of a Dot map.

- i. It is tedious to draw uniform dot sizes and shape.
- ii. Location of dots reflect to a certain extent a personal, subjective decision.
- iii. When dots overcrowd they give the impression that the distribution of phenomena is dense.
- iv. Placing of the dots does not take into account the reality on the ground.
- v. Calculating and placement of dots is time-consuming.
- vi. Miscounting of dots can lead to wrong data of the total population of the phenomena.

- vii. Rounding off of fractions, say 3.8 to 4 dots leads to wrong number of dots plotted on the map.

3. Choropleth maps/ density or shaded maps.

- **Choropleth maps** show the relationship between quantities and area.
- **In a choropleth map**, densities, say of population, crop yields, animal numbers or settlements per hectare in different areas are shaded differently in colours or patterns.

$$\text{Density} = \frac{\text{Total quality}}{\text{Area of unit}}$$



Advantages of choropleth maps.

- i. They give a clear visual impression.
- ii. They are easy to compare densities at a glance.
- iii. They are easy to construct.
- iv. They are easy to read/ interpret.

Disadvantages of choropleth maps.

- i. They give wrong impression that density changes abruptly at the boundaries in a given map.
- ii. They give the impression that densities are uniform within each region.
- iii. Calculations and shading are laborious and time consuming.
- iv. Represents a few variables/ items.
- v. They can be confusing if the boundaries are not clearly marked.
- vi. It is not possible to show the distribution of more than one phenomenon on the same map.

“END OF TOPIC ONE”

TOPIC TWO: LAND RECLAMATION AND REHABILITATION

Land reclamation -kcse 2021

- **Land reclamation** is the process in which unproductive land is converted into useful land for crop/ livestock farming/ settlement.

Methods used in land reclamation in Kenya -kcse 2017/ 2022

- i.) **Draining of swamps in flood prone areas.** This is done through the following methods; -kcse 2022

- Constructing drainage pipes.
 - Digging open ditches/ canals.
 - Pumping out the water.
 - Planting trees/ eucalyptus/ vegetation/ bananas.

- ii.) **Irrigation** in order to provide water required for crop growth. **Types of irrigation practised in Kenya are;** -kcse 2018

- Use of lifting devices.
 - Drip irrigation.
 - Overhead/ sprinkler irrigation.
 - Furrow/ canal irrigation.
 - Flood/ basin irrigation.
 - Trickle irrigation.

- iii.) **Control of pests** like tse tse flies, mosquitoes and rodents. This is done through;

- Bush clearing.
 - Trapping.
 - Spraying using insecticide.
 - Sterilisation of the males.
 - Draining of stagnant water.
 - Construction of buffer zones.

- iv.) **Filling open pits/ landscaping** in order to be used for farming and settlement.

- v.) **Planting trees/ afforestation.**

- vi.) **Filling open quarries with water** to practice aquaculture.

- vii.) **Flood control.**

- viii.) **Controlling soil erosion.**

- ix.) **Introducing drought resistant crops.**

- x.) **Use of manure/ fertilizers.**

- xi.) **Draining a portion of the lake** to provide land for farming.

Characteristics of land reclamation in Kenya –kcse 2018

- ✓ Simple methods of reclaiming land are used like digging canals/ ditches to drain water.
- ✓ Land is reclaimed mainly from swamps/ marginal lands.
- ✓ Irrigation is used where there is low rainfall/ in arid areas.
- ✓ Drought resistant crops are planted.
- ✓ Trees are planted.
- ✓ There is high evaporation of irrigation water due to high temperature.

Land rehabilitation –kcse 2008

- **Land rehabilitation** is the process of restoring land to its former productive state.

Methods of land rehabilitation in Kenya. –kcse 2014

- i) **Planting trees/ afforestation** on degraded land protect it against the agents of erosion.
- ii) **Constructing terraces** thereby reducing the speed of surface run-off hence reducing erosion.
- iii) **Construction of bunds and gabions** in order to hold/ trap the soil carried by water –kcse 2018
- iv) **Applying manure/ fertilizer on land** in order to restore its fertility.
- v) **Filling up of quarries with soil/ landscaping** in order to be used for farming and settlement.
- vi) **Controlled grazing** to allow regeneration of pasture/ control erosion.
- vii) **Constructing dykes** along river banks/ dams across river in order to control floods.
- viii) **Mulching.** The use of crop residues such as vegetable remains/ plant/ litters/ grass/ polythene sheets to cover the soil/ crop. It helps to retain soil moisture/ reduce soil erosion/ increase water infiltration –kcse 2018

MWEA-TEBERE IRRIGATION SCHEME.

Objectives of Mwea Tebere irrigation scheme.

- ✓ To reclaim the unproductive land from semi-arid conditions.
- ✓ To occupy detainee labour.
- ✓ To settle former detainees and the landless.
- ✓ To create employment for former detainees.
- ✓ To increase agricultural production.

Sources of water –kcse 2019

- i. River Thiba
 - ii. River Nyamindi
 - iii. River Murubara
- } Are tributaries of River Tana

Methods of irrigation used.

- i. Basin/ flood irrigation.
- ii. Furrow/ canal irrigation.

Crops grown –kcse 2014

- i. Main crop- rice
- ii. Subsistence crops- maize, beans, peas, watermelons, onions, tomatoes, chillies, vegetables, bananas and green grams.

Physical factors that influenced the location of Mwea Irrigation Scheme –kcse 2017

- i.) **Presence of rivers Nyamindi and Thiba** which provide water for irrigation throughout the year.
- ii.) **Presence of black cotton/ clay soils** which is suitable for rice cultivation –kcse 2010
- iii.) **The area is gently sloping** which allows mechanization and flow of water by gravity.
- iv.) **Availability of extensive land** which enables expansion of growth of rice.
- v.) **Hot climate conditions** suitable for growth of rice.
- vi.) **Presence of loamy soils** ensured cultivation of other crops to support the families settled.

Human factors that influenced the location of Mwea Irrigation Scheme.

- i.) **Government policy e.g. –kcse 2019**
 - There was need to keep detainees busy.
 - For people to provide free labour.
 - There was need to settle landless people.
 - The need to control flood of rivers that pass through the area.
 - To increase food production.
 - For maximum utilization of land.
 - To fully utilize the black cotton soils.
- ii.) **Mwea plains were sparsely populated** enabling large area to be put under cultivation. The cost of resettling the few people was low –kcse 2010
- iii.) **Strategic location near major urban centres** like Nyeri, Nairobi and Embu that provide immediate **market** for rice.
- iv.) **Labour was readily available** due to presence of former detainees/ high population in the surrounding regions.

Rice cultivation/ processing/ marketing.

- **Land is ploughed** using tractors.
- The land is **divided into plots**.
- The plots have **bunks/ ridges** built around them to hold water.
- **Canals** are dug from the river to lead water into the plots.
- **Basin/ flood irrigation** is done.
- The seedlings are planted in a **nursery**.
- **Seedlings are transplanted** into the already flooded plots.
- **Gaping** is done after two weeks.
- **Fertiliser** is applied.
- **Weeding** is done.
- **Water level** in the plots is regulated as paddy rice grows.
- After about five months, the fields are **drained** to allow ripening of the paddy.
- **Harvesting** is done manually using sickles.
- Dried paddy stalks are **threshed** by hitting them manually against the ground.
- **Winnowing** is done.

- Grains are taken to the **milling** centres.
- **Yellowish husks are removed** from the paddy to obtain white/ polished rice.
- The rice is then **graded** and **packed** into bags for sale.
- **Marketing** of rice is done by the National cereals and produce Board (NCPB)/ National Irrigation Board (NIB).

Benefit of Mwea Tebere irrigation scheme.

- i.) Increased food production e.g. rice.
- ii.) It provided land for **settling the landless** people.
- iii.) Reservoirs created have helped in **controlling floods**.
- iv.) It has promoted **land reclamation**.
- v.) **Diversification of production** e.g. subsistence crops and horticultural crops.
- vi.) Provision of **employment** to many people in farms, local mills and trading.
- vii.) Provision of **social amenities** like schools and hospitals which has improved people's standard of living.
- viii.) It has led to development of **roads** linking the farms to the markets.
- ix.) Earning a country **foreign exchange** through the exportation of rice.
- x.) **Saving the country foreign exchange** by not importing rice.
- xi.) **Provision of income** to farmers/ traders through the selling of rice.

Problems facing Mwea-Tebere irrigation scheme –kcse 2001

- i.) **Stagnant water forms breeding grounds for vectors** which spread diseases hence infecting the farmers.
Solution- Insecticides should be sprayed on stagnant water to reduce the breeding rate of vectors.
- ii.) **Shortage of labour** during the planting and harvesting season which forces the farmers to hire labour at high cost.
Solution- Improved marketing by NCPB to resume so that farmers can earn more money to meet their expenses.
- iii.) **Fluctuating water levels** due to excessive drought and diversification of water into 'Jua Kali' rice farms.
Solution (kcse 2008) - Construction of dams to store water for use during dry season.
 - Continuous dredging of canals/ deepening of canals.
 - Government to enforce laws on proper land use in the catchment areas of the rivers that supply water to the scheme.
- iv.) **Pests like quelea birds** attacks the crops lowering the yields.
Solution- Use explosives to scare birds.
- v.) **Diseases like leaf minor** reduces the crop yields lowering the profit margins.
Solution- Using clean planting seeds.
- vi.) **Delayed payments** kill the morale of the farmers.
Solution- NCPB/ NIB should ensure farmers are paid on time.
- vii.) **Decline in rice quality** due to recycling of seeds lowering production and profits.

Solution- Using clean planting seeds.

viii.) **Due to siltation**, farmers incur a lot of costs hence reducing their profit margins.

Solution- Farmers to avoid cultivating on the river banks.

ix.) **Growth of weeds** which compete with rice for nutrients resulting to low crop yields.

Solution- Control weeds using herbicides.

x.) **Poorly constructed roads** which make transport expensive reducing profit margin.

Solution- Government to improve the existing roads/ construct new ones.

xi.) **Inadequate health centres** which necessitates travelling for long distances losing many working hours.

Solution- Construction of more health centres.

xii.) **Inadequate capital** on the part of farmers since the cooperatives collapse making them unable to acquire farm inputs.

Solution- Take policies out of co-operatives so that they can be empowered to supply inputs and credit to farmers.

xiii.) **Low prices of rice**

Solution (kcse 2008)- Diversifying the crops produced in the scheme.

- Improving the quality of the rice produced through research.
- The government should restrict the importation of rice to reduce competition.
- Improve the marketing strategies to enable farmers to source for market outside Kenya.

PERKERA IRRIGATION SCHEME.

Aims of setting up the scheme.

- i. To utilize detainee labour.
- ii. To develop land for agricultural production.
- iii. To settle the pastoralists as farmers.
- iv. To control the seasonal floods of R. Perkerra.
- v. To utilize the excess water of R. Perkerra.

Source of water.

- R. Perkerra

Method of irrigation used.

- Furrow/ canal irrigation

Crops grown.

- Watermelons, onions, chillies, seed maize, pawpaws, kales, tomatoes, beans, cotton.

Physical factors that influenced the location of Perkerra Irrigation Scheme –kcse 2016/2021

- i. Availability of water from R. Perkerra.
- ii. Presence of gently sloping land/ undulating land that allows water to flow by gravity/ easy mechanization.
- iii. Presence of soils rich in minerals nutrients/ clay/ loamy soils for the growth of a variety of crops.
- iv. Availability of large tracts of land for irrigation.
- v. Inadequate rainfall/ semi-arid/ dry condition making it necessary to irrigate the area.

Human factors that influenced the location of Perkerra Irrigation Scheme –kcse 2016

- i. Area was sparsely populated due to the pastoral lifestyle of the inhabitants.
- ii. The large population of ex-detainees needed to be occupied in a productive way.
- iii. Desire of colonial government to start a project to occupy political detainees.

Benefits of Perkera Irrigation Scheme.

- i. It has made use of unproductive semi-arid land into productive land.
- ii. It has settled previously landless people.
- iii. Source of livelihood for farmers and their dependants.
- iv. Taxation of seed maize raises revenue for the government.
- v. Has created employment opportunities for local people.
- vi. Source of foreign exchange when crops are exported.
- vii. Has led to development of roads.
- viii. Has led to provision of social amenities like schools/ hospitals/ electricity.

Problems facing Perkerra irrigation scheme.

- i. **Fluctuation of water in R. Perkerra** due to droughts reduces the yields.

Solution- Dam construction on the upstream side.

- ii. **Livestock- human conflict** when farmers go to graze in the region due to attractive vegetation.

Solution- Solving the conflicts through elders.

- iii. **Intense ethnic conflict between Tugen and Njemps tribes** because the scheme lies on the Njemps' land while Tugens are the majority.

Solution- Government to issue farmers with title deeds.

- iv. **Financial problems** causing the farmers to be unable to prepare the land.

Solution- Start co-operatives to offer affordable credit facilities.

- v. **Impassable roads** which hinders production of perishable crops.

Solution- Government to improve the existing roads and construct new ones.

- vi. **Limited market for products** because the surrounding areas are sparsely populated.

Solution- Transporting produce to distant markets with dense population.

Conditions that favour irrigation farming in Kenya –kcse 2018

- a) Gently sloping land which permits flow of water by gravity hence reducing pumping of water to the fields.
- b) Presence of rivers/ reservoirs/ lakes which provide regular water supply making it possible to irrigate land throughout the year.
- c) Presence of clay soils/ black cotton soils which retain water for longer use by crops.
- d) High temperatures throughout the year which allows multiple cropping/ continuous farming activities throughout the year.
- e) Availability of uninhabited extensive areas to provide adequate land for irrigation.

Significance of irrigation farming in Kenya.

- a.) It is **source of income** to farmers when they sell their produce.
- b.) It has led to **resettlement of landless people**.
- c.) It **saves on foreign exchange** that would be used to import food needed in the country.
- d.) It has **made barren/ unproductive land productive**.
- e.) It has led to **growth of urban centres** e.g. Marigat (Perkerra) and Mwea (Mwea Tebere).
- f.) It has assisted in the **control of floods** in the affected areas.
- g.) It has created **employment opportunities** to people improving their standards of living.
- h.) It has **enhanced food security** in the country by encouraging growing of food crops.
- i.) It has **promoted industrial development** through providing raw materials like rice, pineapples.
- j.) It has led to the **development of roads** in an area.
- k.) It has led to **provision of social amenities** like schools/ hospitals improving people's living standards.
- l.) It **earns Kenya foreign exchange** through exportation of fruits, chillies, flowers.

Problems facing irrigation farming in Kenya –kcse 2000

- a.) **Destruction of crops** when excess water goes to the fields causing flooding.
- b.) **Pests like quelea birds/ aphids/ termites** destroy the crops leading to low yields.
- c.) **Diseases like leaf minor** affects the crops leading to low yields.
- d.) **Inadequate water/ unreliable rainfall** makes the land not to be fully utilized.
- e.) **Growth of weeds** on furrows and canals causing reduced water flow to the farms.
- f.) **Silting of the canal** which prevents water from flowing smoothly to the farms.
- g.) **Leaching** taking nutrients to the lower horizons where they can't be accessed by some plants leading to lower yields.
- h.) **Diseases like Bilharzia and malaria** transmitted by vectors living in stagnant water weaken and even kill farmers.
- i.) **Payment of low prices to the farmers** which kills the morale of farmers.
- j.) **High cost of production** reduces profit margins to the farmers.
- k.) **Mismanagement of irrigation bodies** leads to losses, lack of credit and low prices.
- l.) **Farmers lack the necessary technical advice** to enhance their agricultural production as there are very few extension officers.
- m.) **Shortage of labour** giving the farmers the burden of hiring labour at high cost.
- n.) **Limited markets** as a result of some schemes being located in sparsely populated areas.
- o.) **Inadequate capital** to meet the operational costs.

Irrigation schemes in Kenya.

	Name of the scheme	Source of water	County	Main crop
1.	Mwea-Tebere	R. Thiba/ Nyamindi/ Murubara	Kirinyaga	Rice
2.	Perkerra	R. Perkerra	Baringo	watermelons, onions, chillies, seed maize
3.	Bura	R. Tana	Tana River	cotton
4.	Ahero	R. Nyando	Kisumu	Rice
5.	West kano	R. Nyando	Kisumu	Rice
6.	Bunyala	R. Nzoia	Busia	Rice
7.	Mitunguu	R. Kathita	Tharaka Nithi	French beans
8.	Kibirigwi	R. Sagana	Kirinyaga	Vegetables
9.	Ishiara	R. Thuci	Embu	Cotton
10.	Daua	R. Daua	Mandera	maize
11.	Kibwezi	R. Kiboko	Makueni	Fruits/ vegetables
12.	Kitobo	R. Njoro springs	Taita-Taveta	onions, fruits
13.	Katilu	R. Turkwel	Turkana	maize
14.	Galana-kulalo	R. Galana	Tana River/ Kilifi	maize

Related studies on land reclamation in Kenya and the Netherlands.

1. Kenya.

a) Tse-tse fly control in Lambwe Valley.

Objectives.

- ✓ To eliminate the tsetse fly.
- ✓ To rehabilitate the area.
- ✓ To use methods of reclamation that would be environmental friendly.

Tse tse fly control measures -kcse 2012

- ✓ Sterilising the male tse tse fly.
- ✓ Bush spraying/ use of chemicals.
- ✓ Bush clearing.
- ✓ Creation of buffer zones.
- ✓ Trapping.

Problems faced in the control of tsetse fly in Kenya.

- Clearing bushes leads to total destruction of bushes therefore exposing the soil to agents of erosion.
- The tsetse fly became resistant to insecticides.
- Some insecticides sprayed are harmful to man, animals and the environment, cause pollution.
- The method of sterilizing the male tsetse fly is quite sophisticated.

- The areas infested are extensive therefore costly to spray.

b) Drainage of swamps e.g. Yala swamp.

Objectives.

- ✓ Free the area from pests.
- ✓ Prepare the area for settlement and profitable agriculture.
- ✓ Reduce flooding and associated hazards of mosquitoes.
- ✓ To achieve an overall development of an otherwise remote area.

Benefits of reclamation of Yala swamp –kcse 2003

- ✓ Floods were controlled.
- ✓ There was creation of employment opportunities to people.
- ✓ There was an increase in the land for agriculture.
- ✓ Pests/ water borne diseases were controlled.
- ✓ Better farming methods were introduced.

2. Land reclamation in the Netherlands.

- A low lying land reclaimed from the sea and enclosed by dykes is called a **polder**.

Stages of reclamation of land from the sea in the Netherlands –kcse 2017

- **Protective dykes/ sea walls** are constructed to enclose the part of the sea which is to be reclaimed.
- **Ring canals** are constructed on the interior sides of the dykes to carry away excess water.
- **Pumping stations** are installed to pump water from enclosed area.
- **Water is pumped out** of the area enclosed by the dyke.
- **Reeds are planted** to drain excess water and use up the excess salt.
- **Drainage ditches** and more pumping stations are put on the land being reclaimed.
- **Drainage pipes** are laid below the soil.
- **Inner dykes and ring canals** are used to divide area into regular portions.
- **Soils are treated with chemicals** to lower salinity.
- The drained land is **flushed with fresh water** to remove salt from the soil.
- Water is pumped from the polders regularly to avoid its accumulation in the reclaimed land.

Ways in which salinity of polders is reduced in the Netherlands –kcse 2014

- ✓ Chemicals are applied to lower salts in the soils.
- ✓ Fresh water is flashed to the soils to remove/ dilute the excess salts.
- ✓ Reeds are planted to use up the excess salts.
- ✓ Continuous pumping of water from the polders.

Crops grown in the polders in the Netherlands –kcse 2017

- Rye
- Wheat
- Vegetables
- Fruits
- Barley
- Potatoes
- Oats
- Beetroots

➤ Flowers

Factors that favour farming in the polder.

- ✓ Well drained marine soils.
- ✓ Cool temperatures/ moderate temperatures.
- ✓ High rainfall amount.
- ✓ Low rate of evaporation.
- ✓ Availability of water for irrigation.
- ✓ Market for agricultural produce.
- ✓ Flat land for mechanization.
- ✓ Good control of water level in the soil.
- ✓ Modern methods of farming.

Characteristics of the polders in the Netherlands.

- ✓ The soils are highly mechanized.
- ✓ They are protected by dykes against sea encroachments.
- ✓ They are surrounded by ring canals to facilitate drainage.
- ✓ They are divided into specific land use activities.
- ✓ The land is intensively utilised.
- ✓ Horticulture is the predominant agricultural activity.
- ✓ They are large in acreage/ area/ size.
- ✓ They are relatively/ largely flat.
- ✓ They are largely below the sea level.

Main projects of land reclamation in the Netherlands.

- Zuider zee project.
- Delta plan project.

1. Zuider zee project.

- It involved land reclamation from the southern sea to utilize the well-drained soils.
- **Areas which make up the Zuider Zee reclamation project in the Netherlands are;**
-kcse 2010

- ✓ Markerwaad
- ✓ Wieringer meer
- ✓ South Flevoland
- ✓ East Flevoland
- ✓ North- Eastern Flevoland

Benefits of the Zuider Zee project/ land reclamation in the Netherlands *-kcse 2017*

- a.) Reclamation has created more **land for agriculture/ settlement.**
- b.) Reclaimed land has **improved agricultural output.**
- c.) Land reclamation has resulted in **improved fresh water supply** for domestic/ industrial use.
- d.) Construction of dykes around the polder has helped to **control floods/ sea invasion.**
- e.) Construction of dykes/ canals has **improved transport network.**
- f.) Reclamation has created sceneries for **tourists' attractions.**
- g.) Reclamation and associated activities have **created job opportunities.**

2. Delta plan project.

- It involved land reclamation in the South West of Holland.
- It involved the closure by means of dams with sea inlets to prevent flooding.

Areas that make up Delta plan project are;

- ✓ Haring Vliet
- ✓ Gawtern sheldt
- ✓ Bronwershavensche Gent
- ✓ Veersche Gat

Benefits of Delta plan project.

- a.) Pollution and salination of inland waters was controlled leading to the improvement of soil **increasing cultivated land**.
- b.) More recreational opportunities were created by the newly created lakes/ sandy beaches/ broad dune belts/ five old towns/ aquatic sporting activities **attract tourists**.
- c.) The **floods** from the sea were effectively **controlled** eliminating flooding in the South Western region.
- d.) **The fresh water reservoir created provides enough water** for domestic/ industrial/ agricultural use.
- e.) **Development of roads** attracted dense population offering opportunities for industrialization.

Similarities between land reclamation in Kenya and the Netherlands.

- i) In both countries, **dykes** are used to control flooding.
- ii) In both countries, **ditches and canals** are used to drain water from the reclaimed areas.
- iii) In both countries, reclaimed land is used for **settlement/ agriculture**.
- iv) The **government** of both countries assist in reclaiming land and then lease it to the people.
- v) In both countries, **fertilizers/ manure** are used to improve soil fertility in the reclaimed land.
- vi) In both countries, **mechanisation** is carried out where land is gently sloping.

Differences between land reclamation in Kenya and the Netherlands –kcse 2010

- i) In Kenya, **the area that is reclaimed** is relatively small while the areas reclaimed in the Netherlands are large.
- ii) In Kenya, **land** is mainly reclaimed from swamps/ marginal areas while in the Netherlands, reclamation is from sea.
- iii) In Kenya, the **methods used** for draining water from marshy areas is digging of canals/ ditches while in Netherlands, methods are advanced/ use of wind pumps to drain sea water from the polders.
- iv) In Kenya, **irrigation** is used in reclaiming dry areas while in the Netherlands, irrigation is used to lower salinity of the soil in reclaimed lands.
- v) In Kenya, the **methods of land reclamation** are simple like digging canals/ ditches to drain water from land while in the Netherlands, method used are highly advanced like creation of polders.
- vi) **Furrow/ ridges** in Kenya are used to control river floods while in the Netherlands, dykes protect the reclaimed land from invasion by the sea.
- vii) In the Netherlands, the methods employed are more **capital intensive** while in Kenya, the methods are less capital intensive.

- viii) In the Netherlands, the **main method of land reclamation** is the draining of the seas while in Kenya a variety of methods are used e.g. irrigation/ tse tse fly control.
- ix) In the Netherlands, advanced **technology** are employed in reclaiming land e.g. use of underground pipes/ pumping stations while in Kenya, low technology that uses only canals and dykes.

TOPICAL QUESTIONS.

1. a) What is irrigation?
- b) Explain the factors that determine amount of water needed for irrigation.
- c) State factors determining the amount of water required for irrigation.
- d) Explain methods of irrigation used in Kenya.
- e) Give advantages of irrigation over natural water supplies.
 - Ensures steady and reliable water supply.
 - Cultivation can be done all year.
 - River water brings in silt (well drained soils)
 - Enables cultivation of marginal areas.
 - Controls floods.
 - The dam can be used to generate H.E.P., improve navigation on rivers, lead to development of fishing industry and modify local weather.
- f) Cite the problems that may result from irrigated lands.
- g) State three ways of rehabilitating overgrazed land **–kcse 2018**

“END OF TOPIC TWO”

TOPIC THREE:

FISHING.

By Prof. Ogoti Robert Maxwell

- **Fishing** is the exploitation of water resources/ aquatic animals like fish **-kcse 2020**
- **Fisheries** are the water bodies that contain fish and other related resources that merit fishing **-kcse 2020**
- **Fish farming** is the artificial rearing of fish in ponds.
- **Areas practising fish farming are** Kibos, Sagana, Bamburi, Homa bay, Lake Jipe and Kabaru.
- **Types of fish reared in fish ponds are** Tilapia, Mudfish, Trout, Dagaa, Carps, Prawn and Oyster.

Measures taken by Kenyan government to promote fish farming.

- i. Government has set up fish pond/ hatcheries in different counties.
- ii. Fisheries ministry send extension officers to advice farmers of fish farming skills.
- iii. The government has budgetary allocation for financing fish farming activities in Kenya.
- iv. Campaign to encourage people to eat fish.
- v. Encouraging establishment of cooperatives that offer credit facilities to fish farmers.
- vi. Allocating finance to construct factories producing fish feeds.
- vii. Establishment of research institutions to investigate aspects of fish farming.

Reasons why fish farming is being encouraged in Kenya -kcse 2020

- ✓ Fish farming is free from inter territorial conflicts/ disputes.
- ✓ Some fish from fish farms are exported earning foreign exchange.
- ✓ Fish farming occupies small space.
- ✓ Fish farming creates job opportunities.
- ✓ Fish contributes to supply of animal protein.
- ✓ The fish farming activity has stimulated development of related industries.
- ✓ Source of income to the farmers.
- ✓ Helps to conserve the countries natural fisheries.
- ✓ To make use of unproductive land.
- ✓ To reduce fish importation/ save foreign exchange.
- ✓ Generate revenue to the government in form of taxes.

Factors influencing fishing.

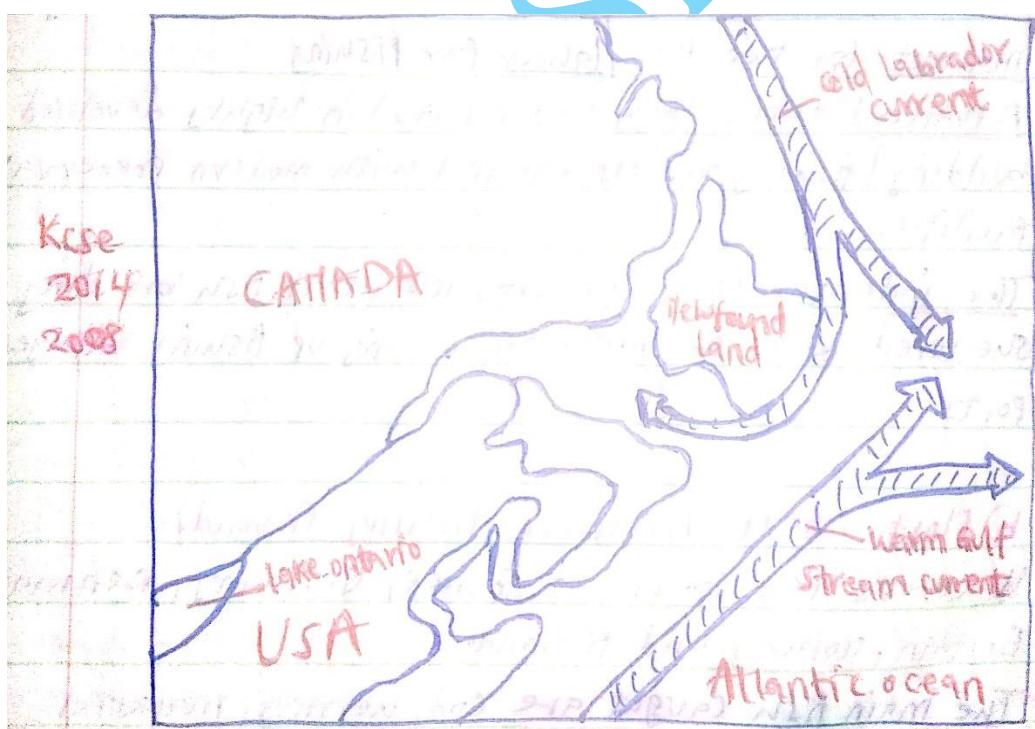
- i. **Presence of fishing grounds** like lakes, oceans with fish food/ planktons.
- ii. **Cool climate/ waters** are ideal for fish breeding because of abundant supply of plankton/ fish food.
- iii. **Convergence of ocean currents** which helps in moderating water temperatures, bringing to the surface fish nutrients and supply more oxygen for plankton growth.
- iv. **Nature of the coastline i.e.**
 - **Indented coastlines** provide sheltered breeding grounds for fish and for development of ports/ fishing villages **-kcse 2003**
 - **Wide, shallow and long continental shelf** provides ideal conditions for fish breeding.

- **Constriction of the coastline** allows the convergence of ocean currents increasing mineral nutrients for planktons.
 - **Coastlines sheltered from strong winds** and ocean currents are popular breeding grounds for fish.
- v. **Availability of capital** to purchase fishing equipment / vessels.
- vi. **Advanced level of technology** to allow deep marine fishing.
- vii. **Readily available market** to buy/ consume the fish.
- viii. **Availability of labour** e.g. fishermen.
- ix. **Well-developed roads** to link fishing grounds to the market/ factories.

MAJOR WORLD FISHING GROUNDS.

1. Atlantic fishing grounds.

- These are found in the Atlantic Ocean.
- They are divided into;
 - a) **North-west Atlantic fishing ground.**
- **Countries located-** Canada and USA.
- **Main fishing areas-** Grand Bank, the Sable Bank and Georges Bank.
- **Types of fish species caught –kcse 2014**
 - Herring, Cod, Haddock, Mackerel, Menhaden, Hake, Flounder, Tuna, Shell fish and sardines.
- **Fishing methods used –kcse 2003**
 - Seining, trawling and drifting.



Factors favouring fishing in North-West Atlantic fishing grounds –kcse 2008

- i. **Convergence of cold Labrador current and warm Gulf stream current –kcse 2014**
 - It causes upwelling of water which increases supply of oxygen/ planktons/ minerals required for growth of fish hence presence of a lot of fish/ many species of fish.
 - The warm current raises the temperature of the ocean water making it ice-free thereby encouraging fishing throughout the year.
 - The cold current carries minerals which encourage growth of planktons/ food for fish thus a lot of fish.
 - It causes cool conditions/ moderate temperatures thereby favouring the growth of planktons/ food for fish thus a lot of fish.
- ii. The area has **a broad shallow continental shelf** which provides suitable conditions for the growth of plankton used by fish as food.
- iii. The region experiences **low temperatures** that are favourable for the survival of fish/ for preservation/ storage of fish.
- iv. **The ruggedness of the land** bordering the area hinders agriculture hence fishing becomes an alternative.
- v. The hinterland is densely populated thus providing **ready market** for the fish/ **labour** for fishing.
- vi. **Advanced technology** has resulted in highly developed ship building/ fishing vessels are equipped with modern preservation facilities thus making it possible for fishermen to carryout large scale fishing.
- vii. **The indented coastline** provides ideal fish breeding sites/ sheltered bays are ideal for setting up fishing villages and ports –**kcse 2003**

b) North-East Atlantic fishing grounds.

- It covers the coasts of France, Germany, Denmark, Britain, Norway and Finland.
- **The main fish caught are** cod, herring, mackerel
- **Methods of fishing used are** trawling, drifting, line fishing

Factors favouring fishing in North-East Atlantic fishing grounds.

- i. **High latitudes/ cool waters** encourage the flourishing of fish.
- ii. **Broad shallow continental shelf** that favours the growth of planktons.
- iii. **Ruggedness of the land** of the immediate surrounding hinders agriculture favouring fishing as an alternative economic activity.
- iv. **Presence of warm Atlantic drift ocean current** makes the waters free from ice supporting fishing.
- v. **Numerous fiords along the coast** provide shelters for the spawning of fish and fishing boats.
- vi. **Dense population** in the Western Europe provides a ready **market** for fish and the required **labour**.
- vii. **Advanced technology** has enabled development of modern fishing equipment and preservation/ processing facilities.

c) **Fishing grounds in the southern Atlantic Ocean.**

- They include;
 - The West Coast of South America.
 - The Namibian Coast/ South West Africa.
 - The Mauritian coast.
- } Refer to Klb bk 4 pg 41

2. The pacific fishing grounds.

- These are found in the Pacific Ocean.
- They are divided into;
 - a. **North-East Pacific fishing ground.**
- Located at the West Coast of North America.
- It covers Alaska (USA), British Columbia (Canada) and the California Coast (USA).
- **Fish species caught** are salmon, tuna, sardines, herring, Pollack and Alaska.

Factors favouring fishing in North-East Pacific fishing grounds.

- i. **Cool waters** ideal for fish breeding.
- ii. **Convergence of cold Alaska and warm North Pacific current** moderates the temperatures of waters making it ideal for fishing.
- iii. **Indented coastlines with several fiords** form good site for fish landing ports and fish breeding respectively.
- iv. **Extensive shallow continental shelf** favours fish breeding due to availability of plankton.
- v. **Presence of rivers and lakes** have expanded the fishing ground for species like salmon.
- vi. **Ruggedness of the land** in the immediate surrounding discourage agriculture only favouring fishing.
- vii. **Advanced technology** in modern fishing equipment, refrigeration and processing.
- viii. **Modern port facilities** make it easier to access foreign markets for fish and fish products.

b. **North-West Pacific fishing ground.**

- It covers North East Asia.
- It comprises the fishing grounds of **Japan**, China, Malaysia and Indonesia.
- **The major fish species** caught are salmon, tuna, cod, sardine, mackerel, Pollack and bonito.

Factors favouring fishing in North-West Pacific fishing grounds –kcse 2022

- i. **Highly indented coastline/ numerous islands** provides suitable breeding grounds for fish/ suitable sites for the fish ports/ villages.
- ii. **Convergence of cold Oyashio and warm Kuroshio currents** provide cool waters/ ice free suitable for fish/ upwelling of water which brings minerals/ fish food close to the surface/ well oxygenated waters.
- iii. **Shallow broad/ wide continental shelf** which provide favourable conditions for growth of planktons/ contain large quantities of fish (for commercial investment/ exploitation).

- iv. **The ruggedness/ mountainous landscape** limits agricultural development therefore people practice fishing as an alternative source of food/ earning.
- v. **Cool waters** favours the survival of numerous fish species.
- vi. **Dense population** in the Asian countries provide **labour** and **ready market** for fishing and fish.
- vii. **Advanced technology** in modern fishing equipment, refrigeration and processing.
- viii. **Presence of modern ports** like Osaka, Hakodate and Nagasaki with modernised storage and processing facilities.

3. Fishing grounds in Africa.

a) Marine fisheries.

- They are **waterbodies like seas and oceans** along the coasts where exploitation of aquatic life are carried out.
- **Major marine fishing grounds** in Africa are; -kcse 2019
 - ✓ South Africa
 - ✓ Sierra Leone
 - ✓ Morocco
 - ✓ Guinea Republic
 - ✓ Namibia
 - ✓ Angola
 - ✓ Mauritania
 - ✓ D.R. Congo
 - ✓ Cot d' Ivoire
 - ✓ Ghana
 - ✓ Nigeria
 - ✓ Kenya

b) Inland fisheries.

- They are waterbodies like rivers, lakes and ponds where exploitation of aquatic life is carried out.
- **Categories of inland fresh water fisheries in East Africa** -kcse 2022
 - ✓ Fresh water lakes
 - ✓ Reservoirs
 - ✓ Rivers
 - ✓ Fish ponds
 - ✓ Swamps
- **Main fish reared in the ponds** are Tilapia, Trout, Black Bass, Eels

Types of fishing.

- i. Pelagic fishing
- ii. Demersal fishing
- iii. Inshore fishing
- iv. Freshwater fishing

i. Pelagic fishing

- This involves the exploitation of fish that live close to the water surface.
- **Pelagic fish** are fish that mainly live near the surface/ in shallow waters/ lakes/ seas/ oceans –kcse 2023
- **Examples of pelagic fish** are mackerel, menhaden, herring, sardines, tuna
- **Characteristics of pelagic fish;**
 - They live in large groups.
 - They move in shoals.
 - They mainly live near the surface/ shallow depth of lakes/ seas.
 - They have migratory habits.

ii. Demersal fishing

- This involves the exploitation of fish that lives close to the bottom of deep waterbodies where the water is cool.
- **Demersal fish** are fish that live close to the bottom of waterbodies/ deep waters –kcse 2023
- **Example of demersal fish** are cod, haddock, Pollack, hake, flounder halibut.
- **Characteristics of demersal fish are;**
 - They are large in size.
 - They are found in small shoals.
 - They do not have migratory habits.
 - They live close to the bottom of deep waterbodies.

iii. Inshore fishing

- This involves the exploitation of fish that live close to the shores in shallow sheltered coastal waters and the lower stretches of rivers.
- Examples of fish caught are;
 - Shell fish
 - Crustaceans like lobsters, prawns, shrimps and crabs.

iv. Freshwater fishing

- This involves the exploitation of fish in freshwater streams, rivers, lakes, ponds and paddy fields.
- Examples of freshwater fish are sturgeon, carp, tilapia and trout.

Categories of fish communities/ Types of fish –kcse 2018

- i) **Pelagic fish** are fish that mainly live near the surface/ in shallow waters/ lakes/ seas/ oceans –kcse 2023
- ii) **Demersal fish** are fish that live close to the bottom of waterbodies/ deep waters –kcse 2023
- iii) **Salt water fish/ marine fish** are fish that live in saline waters like oceans and seas e.g. herring, mackerel, sardines

- iv) **Fresh water fish** are fish that live in fresh inland waterbodies e.g. perch, trout, tilapia, Nile perch, sardines
- v) **Anadromous fish** are fish species that are migratory in nature. The fish move up and down a river course to breed or allow the young to mature. They include the salmon, pilchard, sturgeon, shad and sardines.

Methods of fishing

- The methods of fishing are largely determined by;
 - The type of fish to be caught.
 - The fishing environment.
 - The depth of water.
 - The level of technology
- There are two **methods of fishing** namely;

1. Traditional fishing methods/ small scale fishing methods –kcse 2022

- ✓ Harpooning/ use of spears.
- ✓ Use of gill nets.
- ✓ Use of herbs.
- ✓ Use of barrier traps.
- ✓ Use of baskets.
- ✓ Use of hand lines/ hook and line.
- ✓ Use of lamp and net/ lampara.

2. Modern methods –kcse 2018

- ✓ Seining
- ✓ Trawling
- ✓ Drifting
- ✓ Long lining
- ✓ Whaling/ Haprooning

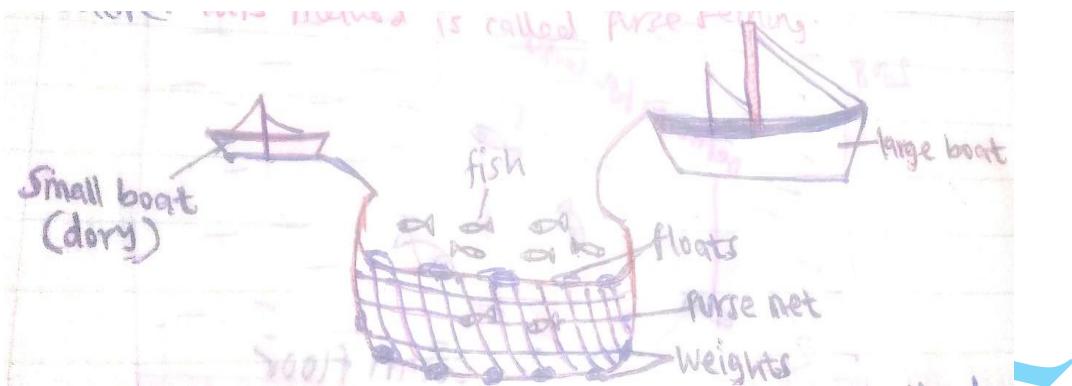
a) Seining.

- **Seine** is a fish net which when laid in water (fisheries) hangs vertically because of weights at its bottom and floats at the top.
- **They are of two types;**
 - Purse seining
 - Haul/ beach seining

I. Purse seining –kcse 2006

- It uses two boats, one large and one small (dory) as well as a large net.
- The net has floats on top and weights at the bottom to keep it in a vertical position while in water.
- The net has a string along its bottom edge.
- The fishermen begin by locating a shoal/ area rich in fish.
- The small boat drags the net to enclose the area that has fish.
- The string at the bottom of the net is pulled to close the net at the bottom and trap the fish.

- The net is pulled out of the water and fish hauled into the large boat for preservation and transportation to the shore. This method is **purse seining**.



II. Haul/ beach seining.

- The haul net is kept floating vertically in water by floats and weights.
- On both ends of the net is tied ropes which are extended to the beach.
- A team of fishermen pull the ropes simultaneously in both sides.
- As the beach seine moves towards the shore, it collects fish especially anadromous on its way.
- On reaching the beach, the collected fish is gathered and hauled onto the beach. This method is **Haul/ Beach seining**.

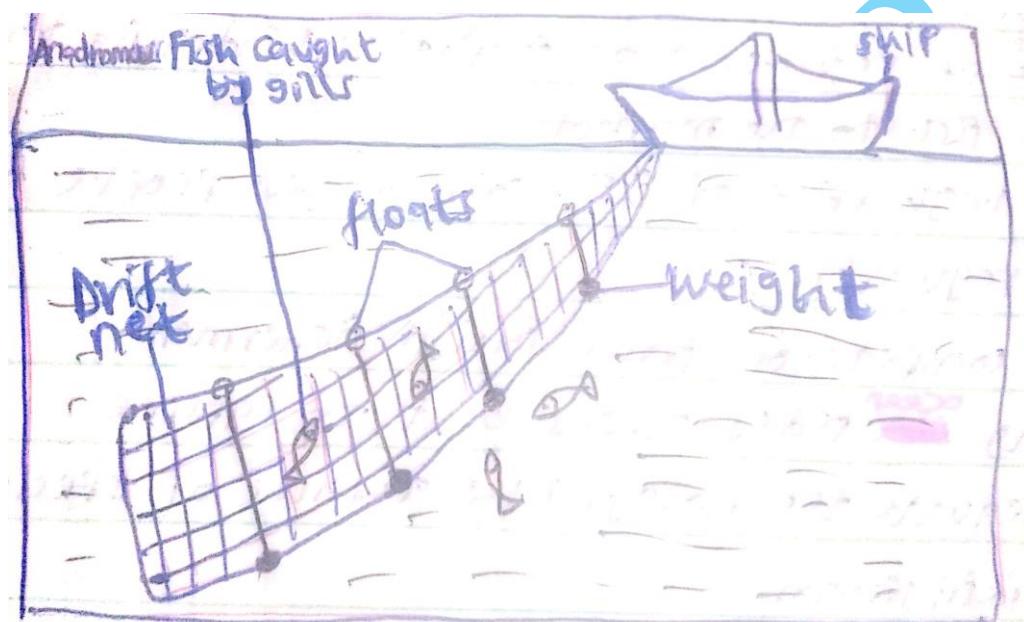
b) Trawling.

- A bag shaped net is attached to a trawler/ ship.
- The net is cast into water by the trawler.
- The net's mouth is kept open by otter boards/ head beams.
- The upper part of the net is kept afloat by corks/ floats.
- Weights are used to keep the lower parts of the net at the sea bed.
- Trawler drags the net along the sea bed.
- After sufficient fish has been caught, the net is hauled into the trawler to empty the fish. This method is **Trawling**.



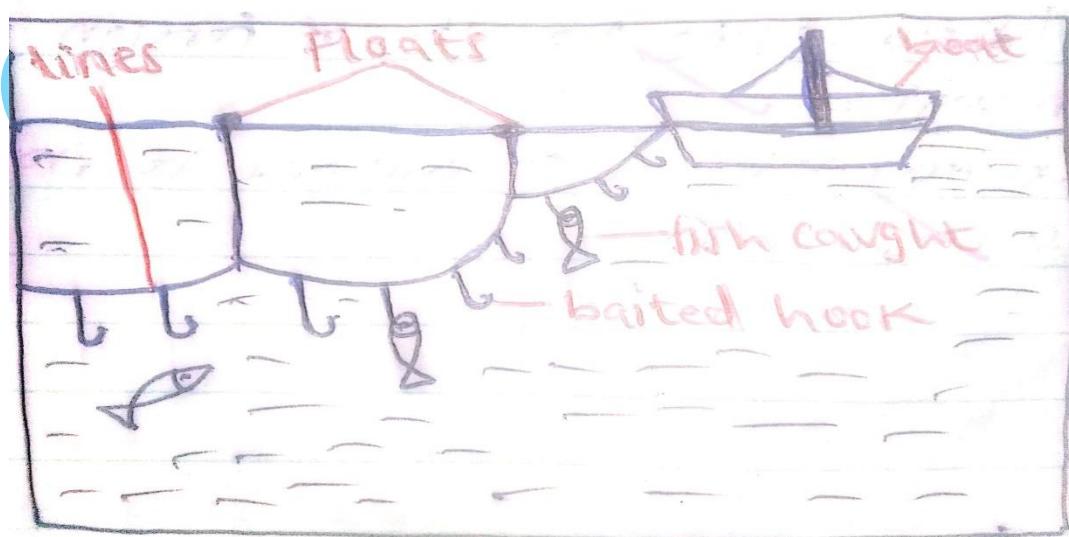
c) **Drifting**

- Nets are hang vertically in water.
- They are attached to a drifter/ boat.
- They are kept afloat by floats on the upper side.
- The lower side is held by weights.
- Several nets can be joined together to form a fleet of nets.
- Fish swim through the nets and get trapped by the gills due to small mesh.
- The nets are dragged to the shore.
- The fish are removed from the nets.
- The nets are then returned back to the sea for more catch. This method is **Drifting**.



d) **Line fishing**

- In calm waters, fishing boats spread out long lines with several hooks on them.
- The floats keep the lines suspended to show the fishermen where the lines are.
- The baited hooks then catch the fish as they compete to feed.
- It is used to catch demersal fish like cod. This method is **longline fishing**.



Fisheries in Kenya.

- Fisheries in Kenya are divided into Marine (Ocean) and inland (freshwater fisheries).
 - a) **Marine fisheries.**
- They are concentrated off the coast of Kenya in the Indian Ocean.

Problems facing marine fishing in Kenya.

- ✓ Small market for fish.
- ✓ Inadequate refrigeration facilities hindering transportation of fresh fish to the market.
- ✓ The high price of fish discourages people from eating fish regularly.
- ✓ Stiff competition from foreign fishermen.
- ✓ Strong Ocean tides causes boat to capsize.
- ✓ Inadequate technology like absence of specialised ships with refrigerators.

Ways of conserving marine fisheries in Kenya –kcse 2011

- ✓ Restocking the overfished areas.
- ✓ Standardizing the mesh size of nets to be used in fishing.
- ✓ Licensing commercial fishermen to control their numbers.
- ✓ Restricting fishing to specific seasons.
- ✓ Restricting the disposal of untreated waste into the Ocean/ control of water pollution.
- ✓ Monitoring/ discouraging the entry of foreign fishermen off the Indian Ocean waters.
- ✓ Enforcing the international conventions to protect endangered fish species.

b) Inland/ freshwater fisheries

- **The main inland fishing grounds in Kenya are;**
 - Lakes Victoria, Turkana, Naivasha, Chala, Baringo
 - Rivers Tana, Athi, Nzoia, Yala, Kuja, Sondu, Nyando
- **Fishing methods used are** use of handlines, use of traps, use of baskets, use of herbs
- **The main fish caught are** salmon, catfish, tilapia, Nile perch

Factors influencing the development of fishing in Lake Victoria.

1. The lake has many landing beaches which have formed fishing ports such as Mbita point, Usenge, Luanda K'Otieno, Misori, Port Victoria, Remba and Dunga Beach. This has promoted fishing along the lake.
2. The dense population around the lake has offered cheap labour to the fishing industry and provided a ready market for the fish.
3. The lake has many fish species of commercial and domestic value such as dagaa, Nile perch, and tilapia.
4. High demand for fish around the lake region. This is because fish is a major traditional diet for most of the people who live around the lake.

Problems facing fishing in Lake Victoria –kcse 2003

1. There are impassable feeder roads linking the beaches. This has slowed down the transportation of fish to the market.
2. There are inadequate refrigeration facilities. This has led reliance on indigenous methods of fish preservation like salting, sun drying, and smoking.
3. The local people engaged in fishing are exploited by large scale traders. They are thus forced to sell their catch at a throw away price due to lack of preservation methods.
4. Inadequate labour force which has been aggravated by the spread of HIV/AIDS along the fishing beaches. This has interfered with fishing activities.
5. There has been conflict over fisheries between Kenya and Uganda. This has led to loss of fishing gear and the capture of those involved.
6. Over fishing due to the use of trawlers has led to drastic reduction of fish species of commercial value.
7. Water weeds such as water hyacinth that block the landing beeches. Water weeds also harbour dangerous animals.
8. Frequent accidents in the lakes due to strong winds/ strong water currents leads to death of fishermen/ destruction of boats/ nets.

Reasons why there is widespread fresh water fishing than marine fishing in East Africa –kcse 2023

- ✓ There are several waterbodies/ rivers/ ponds/ lakes that host a variety of fish which are exploited.
- ✓ High demand for fresh water fish which are easily available/ low demand for Ocean fish.
- ✓ Inland fishing grounds allow use of low technology/ traditional methods as most fishing grounds are shallow/ most fishermen have less sophisticated instruments.
- ✓ High population around the fishing grounds offer market for the fish.
- ✓ Fresh water fish provide an alternative source of cheap protein.
- ✓ Fresh water fishing requires low capital investment.

Significance of fishing to the economy of Kenya –kcse 2023

- ✓ Fishing provides fish which is a source of income to the fishermen.
- ✓ Fishing creates job opportunities to people raising their living standards.
- ✓ Fishing stimulates growth of other related industries/ fish provides raw materials for industries.
- ✓ Taxation of fishing activities bring revenue to the government.
- ✓ Fish products are exported earning Kenya foreign exchange.
- ✓ Has led to development of transport/ communication networks/ landing ports.
- ✓ Fish is a source of food/ protein.
- ✓ Sport fishing promotes tourism.
- ✓ Has led to development of fishing ports and towns like Usenge, Asembo

Problems facing fishing in Kenya.

1. **Over-fishing/ over exploitation** – Indiscriminate harvesting of immature fish through the use of undersize nets and uncontrolled trawling have led to depletion of various fisheries leading to the exhaustion of fish resources.
2. **Pollution** – Both marine and fresh water fisheries in Kenya have been polluted through discharge of toxic effluent from factories, raw sewage and oil spillage from marine vessels. This has led to death of aquatic life hence decline in fish resource –**kcse 2014**
3. **Inadequate capital** – Kenya has inadequate capital required to purchase modern fishing gears and refrigeration equipment.
4. **Inadequate transport network** – most of the roads leading to the fishing grounds are poorly maintained and are mostly impassable during the rainy seasons.
5. **Presence of aquatic weeds** – fishing, especially in Lake Victoria, has been greatly hampered by the growth of weeds such as water hyacinth –**kcse 2014**
6. **Limited market** – the demand for fish in the country is small because fish eating is not popular among the majority of the communities in Kenya. This has limited the internal market for fish thus hindering the development of the fishing industry.
7. **Presence of dangerous animals** – on many occasions fishermen are attacked by crocodiles and hippos found in the fresh water lakes and rivers limiting fishing.
8. **Accidents** – during certain periods of the year, the fishermen's canoes and boats capsize in the lakes and oceans due to the strong wind and storms prevailing in the area. The fishermen lose their fishing gear and equipment as some of them drown.
9. **Few fish co-operatives** – most of the fishermen do not belong to a co-operative through which they can sell their fish. They usually sell their fish to middle men at low prices which does alleviate poverty among them.
10. **Inadequate research** – there is inadequate research in the fishing industry on important issues such as breeding, seasonal migration and feeding habits. Such information is valuable to the development of the industry.
11. **Poaching and competition from developed fishing nations** uses advanced equipment reducing amount of fish.
12. **Inter boundary conflicts** leads to arrest of Kenya fishermen leading to loss of fish and fishing equipment.

Problems experienced in the marketing of fish in Kenya –kcse 2006

- ✓ Some fishing grounds are far from the markets/ inaccessible due to impassable roads.
- ✓ Fishermen have inadequate storage and preservation facilities.
- ✓ There are limited local markets due to cultural beliefs.
- ✓ The external markets are limited due to tight restrictions/ competition from other producers.
- ✓ The limited number of fish species limits the market.

Factors influencing fishing in Japan –kcse 2006/ 2022

- i. **Highly indented coastline/ numerous islands** provides suitable breeding grounds for fish/ suitable sites for the fish ports/ villages.
- ii. **Convergence of cold Oyashio and warm Kuroshio currents** provide cool waters/ ice free suitable for fish/ upwelling of water which brings minerals/ fish food close to the surface/ well oxygenated waters.
- iii. **Shallow broad/ wide continental shelf** which provide favourable conditions for growth of planktons/ contain large quantities of fish (for commercial investment/ exploitation).
- iv. **The ruggedness/ mountainous landscape** limits agricultural development therefore people practice fishing as an alternative source of food/ earning.
- v. **Cool waters** favours the survival of numerous fish species.
- vi. **Dense population** in Japan provide **labour** and **ready market** for fishing and fish.
- vii. **Advanced technology** in modern fishing equipment, refrigeration and processing.
- viii. **Presence of modern ports** like Osaka, Hakodate, Yokohama, Nagoya, Kushiro and Nagasaki with modernised storage and processing facilities.
- ix. **Well established fish cooperatives** that provides loans to the fishermen to improve and expand their fishing.
- x. **Extensive research on** fish breeding has promoted fishing in Japan.
- xi. **Financial support from the government** enable fishermen to purchase advanced fishing equipment.

Popular fish species in Japan.

- ✓ Tuna
- ✓ Herring
- ✓ Sardine
- ✓ Cod
- ✓ Mackerel
- ✓ Bonito
- ✓ Salmon
- ✓ Crabs
- ✓ Lobsters
- ✓ Halibut
- ✓ Pollack
- ✓ Allaskan

Fishing methods used in Japan.

- ✓ Trawling
- ✓ Seining
- ✓ Long lines

Problems facing fishing in Japan.

- ✓ Industrial pollution of the ocean has rendered the water unsuitable for fish breeding.
- ✓ Overfishing leads to depletion of certain fish species.
- ✓ Control of territorial waters has hindered expansion of fishing in Japan waters.

Similarities between fishing in Kenya and Japan -kcse 2017

- ✓ In both countries fresh water and marine fishing are practiced.
- ✓ Inshore marine fishing is practiced in both countries.
- ✓ Both countries practice fish farming.
- ✓ Overfishing is a problem in both countries.
- ✓ In both countries, modern methods of preserving and processing fish are used.
- ✓ In both countries, fish caught is consumed both locally and exported.
- ✓ In both countries fish is used as a raw material in the manufacture of fertilizers, cosmetics and medicine.

Differences between fishing in Kenya and Japan -kcse 2014

- ✓ In Kenya there is low level of **technology**/ less mechanization while in Japan there is advanced/ efficient technology/ high mechanization-kcse 2023
- ✓ In Kenya fishing is done on small **scale** while in Japan fishing is done on large scale.
- ✓ In Kenya there is a small domestic/ external **market** while in Japan there is large domestic/ eternal market-kcse 2023
- ✓ In Kenya few people market their fish through **cooperatives** while in Japan marketing is mainly done through co-operatives.
- ✓ In Kenya fishing is mainly done near the continental shelf/ shallow **ocean waters**/ lakes while in Japan fishing is mainly deep sea fishing.
- ✓ In Kenya fishermen face stiff **competition** from foreigners while in Japan there is little competition from foreigners.
- ✓ In Kenya there are few **varieties of marine fish** species while in Japan there are many varieties of marine fish species.
- ✓ In Kenya fish **eating culture** is limited while in Japan it is widespread.
- ✓ In Kenya fish farming is **less developed** while in Japan it is more developed.
- ✓ In Japan, extensive **research** on fishing has been done while in Kenya little research has been done on fishing.

Management of fisheries.

- This refers to effective planning and control of fish resources and waterbodies.

Conservation of fisheries.

- This refers to the careful use and protection of fish resources to ensure little or no wastage.

Methods of managing and conserving fisheries –kcse 2022

- i. Restricting the disposal of untreated wastes into the fisheries/ enforcing anti-pollution laws to ensure that water remain clean for survival of fish.
- ii. Restricting fishing to specific seasons to allow for breeding/ maturing of fish.
- iii. Breeding fingerlings to restock overfished areas.
- iv. Standardizing the mesh/ net hole size of nets used in fishing to ensure that only the mature fish are caught.
- v. Limiting the number of fishermen through issuance of licences.
- vi. Fish farming is being encouraged to ensure that there is sufficient supply of fish from other sources other than the natural fisheries.
- vii. Carrying out research to improve the quantity of fish.
- viii. Setting up institutions to train personnel to manage fisheries.
- ix. Enforcing the international conventions to protect the endangered species.
- x. Setting up special hatcheries for artificial fertilization of eggs to be used in restoring overfished areas.
- xi. Monitoring/ discouraging the entry of foreign fishermen off the Indian Ocean waters.

Topical Questions.

1. State three ways in which the government of Kenya is promoting the fishing industry –kcse 2016

- ✓ Encouraging fish farming.
- ✓ Restocking overfished areas.
- ✓ Establishing research stations.
- ✓ Dredging of silted lakes.
- ✓ Establishing feeder roads to fisheries.
- ✓ Banning indiscriminate fishing/ enforcing the use of standardized nets/ seasonal ban on fishing.
- ✓ Controlling water hyacinth.
- ✓ Looking for external markets for fish/ encourage fish eating culture.
- ✓ Controlling water pollution.
- ✓ Establishment of ministry of fisheries.
- ✓ Encouraging formation of fishing cooperatives.

2. List three methods used to preserve fish –kcse 2008

- ✓ Canning
- ✓ Freezing
- ✓ Smoking
- ✓ Salting
- ✓ Sun-drying

3. Name two major fishing ports in the world.

- ✓ Gremsby
- ✓ St. Johns (Newfoundland)
- ✓ Bargent
- ✓ Boston
- ✓ Stavanger

4. Give three reasons why fish migrates.

- ✓ Different ocean currents in different parts of the ocean.
- ✓ Predators
- ✓ Breeding
- ✓ Food

5. Identify two pelagic fish caught off the coast of Kenya.

- ✓ King fish
- ✓ Bonito
- ✓ Mullet
- ✓ Tuna
- ✓ Sardines

6. Why Norway is a great fishing nation.

OGOTTI SENIOR

“END OF TOPIC THREE”

Definition of wildlife –kcse 2020

- **Wildlife** is plants and animals existing in their natural habitat.

Factors influencing distribution of wildlife in East Africa –kcse 2019**i. Climate**

- **Different climates will influence varied wildlife.**
- Areas receiving high rainfall have a variety of plant and animal species like elephants and birds.
- Arid areas have limited plant cover hence have fewer wild animals.

ii. Vegetation cover

- **Different types of vegetation offer habitat/ food for different wild animals.**
- Birds live where there are trees so as to have shelter.
- Natural forests are habitat for a wide variety of animals like monkeys and elephants.
- Savannah woodlands with more acacia trees favour giraffes which feed on foliage from the trees.
- Desert and semi-desert vegetation support hardy animals like gazelle.
- Most herbivores and carnivores are found in open/ savanna grasslands.

iii. Drainage

- **Drainage supports a wide variety of plants and animals.**
- Rivers, lakes and oceans hosts a variety of organisms like birds e.g. flamingos and animals e.g. crocodiles/ hippos.
- Waterbodies also contain a variety of fish e.g. sharks/ whales.
- Waterbodies also influence growth of plants like mangrove trees that contain crabs/ snakes.

iv. Soil type

- **Different types of soils influence varied vegetation/ wild animals.**
- Deep, well drained soils support luxuriant forests which support wild animals.
- Thin soils favour grasslands which support carnivores/ herbivores.
- Waterlogged soils support papyrus plants.

v. Relief

- **Varied relief will influence varied wildlife.**
- Hunting animals like cheetah are found in plains/ plateaus which are relatively flat.
- Windward sides of mountain receive high relief rainfall supporting large forests with a variety of wild animals.
- Leeward sides of mountain receive low rainfall favouring grassland supporting carnivores/ herbivores.
- Low altitude areas are warmer than high altitude areas favouring variety of animals.

vi. Government policy

- **Policies of the government** like conserving and managing wildlife influences a variety of plants and animals.

vii. Human factors

- **Human activities are largely responsible for survival and distribution of wildlife.**
- Man can promote existence of wildlife in an area through various management and conservation measures of wildlife.

Quiz: Explain four ways in which human activities interfere with wildlife (8mks) –kcse 2020

- ✓ Vegetation cover is destroyed through cutting trees for **timber/ wood fuel**.
- ✓ Animal habitat is destroyed through **clearing/ burning** of vegetation.
- ✓ In some game reserves people **graze** their livestock which leads to shortage of pasture/ habitat for some wild animals.
- ✓ In some areas vegetation cover is cleared for **cultivation/ settlement**.
- ✓ Setting up **industries** has led to pollution of some waterbodies causing death of aquatic animals/ migration of some animals.
- ✓ **Noise pollution** from the tourist vehicles in the parks scare away the animals.
- ✓ **Fire outbreaks** destroy vegetation cover/ cause migration of animals.
- ✓ **Overfishing** may deplete certain marine species.
- ✓ Overuse of **water for irrigation** reduces habitat for aquatic organisms.
- ✓ **Mining activities** destroys plants and animal habitats.
- ✓ **Illegal hunting/ poaching** lead to extinction of some animal species.

Definition of terms.

Game parks.

- **Game parks** are areas that have been set aside for wildlife to live in.
- They include;
 - National parks
 - Game reserves
 - Wildlife sanctuaries

a) National parks –kcse 2021

- **National parks** are areas set aside for wildlife/ scenic/ historical sites where human activities are prohibited and are managed by central government.
- **Characteristics;**
 - Established by an act of parliament.
 - Managed by the national government e.g. Kenya wildlife service (KWS), Uganda wildlife Authority and Mali Hai in Tanzania.
 - No other form of land use is permitted.
 - May be fenced to keep off people and prevent animals from going out.

b) Game Reserves –kcse 2021

- **Game reserves** are areas set aside for wildlife with limited human activities.
- **Characteristics;**
 - Managed by local authorities/ county governments.
 - Accommodates both wildlife and livestock.
 - May be or not fenced off.

c) Wildlife/Game Sanctuaries –kcse 2010

- **Game sanctuary** is an area set aside for protection of specific animals/ plants/ birds threatened with extinction.

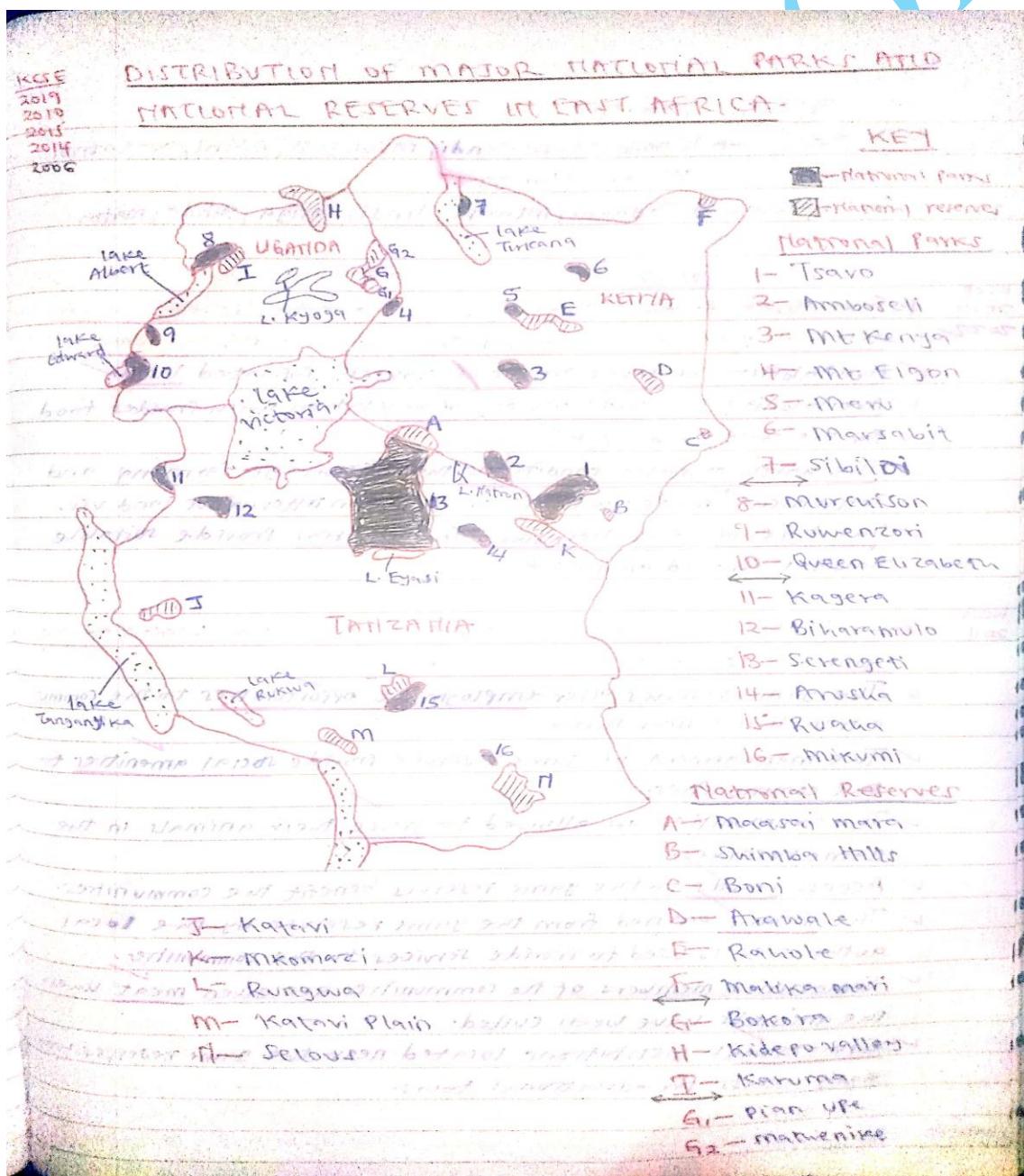
- Characteristics;

- Hunting is not permitted.
- Predators are controlled.
- Breeding and keeping young ones until they are fit for release.

Note: A game range is a protected large tract of land for rearing specific kinds of animals for meat/ game products.

Examples of Big five/ endangered species -kcse 2020

- ✓ Elephant
- ✓ Rhino
- ✓ Lion
- ✓ Buffalo
- ✓ Leopards



Major marine parks.

1. **In Kenya-** Mombasa, Malindi, Mpunguti, Diani, Watamu, Kisite, Kiunga
2. **In Tanzania-** Sadaani, Mtwara, Lindi, Tanga, Pande, Mafia

Quick Quizzes.

1. **Give three factors that favour the establishment of national parks in semi-arid areas of East Africa (3mks) –kcse 2022**
 - ✓ Availability of large tracts/ sparsely populated land.
 - ✓ Availability of a wide variety of vegetation/ savanna grassland/ scrub land/ shrub which provide food for the wild animals.
 - ✓ The harsh climatic condition/ dryness that discourage farming/ settlement/ makes wildlife conservation the best alternative use.
 - ✓ The type of vegetation/ savanna found in such areas provide suitable habitat for wild animals.
 - ✓
2. **State four ways in which game reserves are of benefit to the communities living near them (4mks) –kcse 2011**
 - ✓ The game reserves offer **employment opportunities** to the communities living near them.
 - ✓ The management of game reserves provide **social amenities** to the communities.
 - ✓ The communities are allowed to **graze** their animals in the game reserves.
 - ✓ Access **roads** to the game reserves benefit the communities.
 - ✓ The **income** earned from the game reserves by the local authorities is used to provide services to the communities.
 - ✓ Sometimes members of the communities are given **meat** when the animals have been culled.
 - ✓ **Educational** institutions located near the game reserves have easy access for educational tours.
3. **Give reasons why wildlife conservation is encouraged in Kenya –kcse 1999**
 - ✓ To protect the endangered species.
 - ✓ To promote tourism.
 - ✓ To generate foreign exchange.
 - ✓ To keep them for posterity/ future generations.
 - ✓ To sustain the raw materials for supply of drugs.
 - ✓ For education/ research purposes.
 - ✓ For aesthetic value/ beauty.

Significance of wildlife.

- a. Wildlife **attract tourists** earning a country foreign exchange used to develop other sectors of economy.
- b. Wildlife creates **employment opportunities** to people e.g. tour guides/ drivers/ game wardens improving their living standards.
- c. Wildlife encourage tourism **diversifying the economy** instead of relying on agriculture as a major source of revenue for the country.
- d. Wildlife leads to **protection of endangered species** ensuring their survival for future tourism/ future generations.
- e. Wildlife leads to **development of roads** leading to game parks opening up remote areas.

- f. Wildlife ensures **proper utilisation of marginal areas** through creation of game parks on ASALs.
- g. It promotes **education and research** on wildlife.
- h. It is **source of food** e.g. game meat.
- i. It leads to **growth of hotel industry** e.g. game lodges to cater for the tourists.
- j. It is **source of medicine** e.g. neem tree.
- k. It leads to **modification of climate** e.g. forests increase rainfall and moderate temperature.
- l. It **provides water catchment areas** e.g. forests are source of rivers.

Quiz: Explain four ways in which wild animals are of significance to the Kenya economy (8mks) –kcse 2020

- ✓ Wild animals are a major **tourist attraction** earning the country foreign exchange used to develop Kenya's economy.
- ✓ Conservation of wild animals creates **job opportunities** to people improving their living standards.
- ✓ Wild animals in the privately owned game ranches are slaughtered/ culled for **game meat** and sold in some hotels/ exported earning foreign exchange.
- ✓ Wild animals promote **research/ knowledge** which helps in management and conservation of some species.
- ✓ Wild animals promote **agricultural development** since tourists create a high demand for food.
- ✓ Some wild animals promote industrial growth by providing raw materials.
- ✓ Conservation of wild animals leads to **utilization of marginal areas** which receive little rainfall unsuitable for crop growing.
- ✓ Park entry fees are source of government **revenue**.
- ✓ **Roads** built to parks/ reserves ease transport/ open up the remote areas.
- ✓ Wild animals provide a balanced ecosystem in Kenya/ **ecological balance**.

Problems facing wildlife in East Africa.

a.) **Poaching/ illegal hunting** for wild animals leads to extinction of rare species of animals.

Control of poaching of wildlife.

- Establishing of more game reserves/ national parks/ sanctuaries to protect wildlife against poachers.
- Creating more anti-poaching units to track down and arrest poachers.
- Equipping anti-poaching units with modern equipments to make them more efficient.

b.) **Human encroachment into wildlife habitats** in search of land for settlement and farming leads to;

- Killing/ dying of some animals.
- Extinction of some animals/ plants.
- Wildlife predation/ competition may set in.
- Land fragmentation/ reduction of the habitat.
- Increased human-wildlife conflicts.
- Migration of some animals.

c.) **Civil wars causes insecurity** leading to migration of wild animals due to gunfire, killing of animals and also discouraging tourists from visiting such areas.

d.) Adverse climatic conditions –kcse 2020

- **Prolonged drought leads to migration of animals** to areas that have supply of water/ pasture.
- **Prolonged drought leads to drying up of some plant species/ starvation/ death of some wild animals.**
- **Excess rain leads to flooding** of some areas where wild animals are drowned/ **destruction of plants.**
- **After the floods there is shortage of pasture** causing starvation of animals.
- When there is **prolonged drought, fire outbreaks** are common leading to destruction of habitats of wild animals.
- **Prolonged drought cause wild animals to invade farms** destroying the crops.
- **Very low/ very high temperatures limit plant/ animal variety.**

e.) Pests like tse tse flies attack wild animals transmitting diseases to animals leading to their death.

f.) Diseases like nagana affect the wild animals leading to death hence reduced population.

g.) Bush fires –kcse 2022

- The fires destroy the habitats of animals.
- Animals/ plants are destroyed/ killed/ damaged/ injured by the bush fires.
- Fires leads to reduction of food/ water for animals.
- The fires pollute the environments/ water resources.
- Fires lead to migration of wild animals to other places/ farm lands.
- Fires interrupt the ecosystems.

h.) Overpopulation of animals leads to overgrazing reducing habitats for animals hence migration.

i.) Pollution from careless disposal of litters by tourists may kill the animals when they feed on the litters/ waste.

j.) Human-animal conflict whereby pastoralists kills wild animals which kill their livestock/ destroy their crops.

k.) Inadequate capital to improve game parks and deploy adequate personnel to take care of wildlife.

QUIZ: Explain three ways in which human activities interfere with wildlife –kcse 2020

- ✓ Vegetation cover is destroyed through cutting trees for timber/ wood fuel.
- ✓ Animal habitat is destroyed through clearing/ burning of vegetation.
- ✓ In some game reserves people graze their livestock which leads to shortage of pasture/ habitat for some of the wild animals.
- ✓ In some areas vegetation cover is cleared for cultivation/ settlement.
- ✓ Setting up industries has led to pollution of some water bodies causing death to aquatic animals/ migration of some animals.
- ✓ Noise pollution from the tourist vehicles in the parks scare away the animals.
- ✓ Fire outbreaks destroy vegetation cover/ animals/ causes migration of animals.
- ✓ Overfishing may deplete certain marine species.
- ✓ Overuse of water for irrigation reduces habitats for aquatic organisms.
- ✓ Mining activities destroys plants/ animal habitats.
- ✓ Illegal hunting/ poaching lead to extinction of some animal species.

Problems associated with wildlife in Kenya.

- a. Wild animals stray from parks killing livestock of the locals causing losses.
- b. Wild animals occupy large tracts of land causing shortage of land for agriculture and settlement.
- c. Some disease from wild animals are spread to livestock and humans threatening their lives.
- d. Wild animals destroy crops reducing harvests causing food security.

Management and conservation of wildlife in East Africa.

Management of wildlife.

- This is the effective **planning and control of wildlife**.
- **Wildlife management measures** are;
 - a. Setting up **wildlife protection agencies** e.g. KWS.
 - b. **Educating the public** on the need to preserve wildlife.
 - c. **Establishing wildlife clubs in schools** to create awareness on the importance of wildlife.
 - d. **Translocation of animals** whose population increases beyond the capacity of parks to other parks.
 - e. **Training and research** on wildlife management principles.
 - f. **Encouraging domestic tourism** by lowering entry fee to enable the locals appreciate and conserve wildlife.
 - g. **Culling** i.e. killing older animals to reduce the number of wildlife giving room for younger animals to flourish.

Conservation of wildlife.

- This is the **protection of wildlife** against interference and destruction by people.
- **Wildlife conservation measures** are;
 - a. **Establishing national parks and reserves** to protect the wildlife from destruction by people.
 - b. Setting up the **Kenya wildlife service/ anti-poaching units** which conserve wildlife.
 - c. **Creating the ministry of Tourism** to coordinate management of wildlife.
 - d. **Legislation/ banning/ controlling game hunting/ trade** in wildlife products.
 - e. **Creating public awareness** of wildlife conservation through media/ wildlife clubs/ education centres.
 - f. Establishing Kenya rangeland ecological monitoring unit (**KREMU**).
 - g. **Encouraging individuals/ communities** to set up game ranches/ conservancies/ sanctuaries.
 - h. **Recognizing/ supporting NGOs** which support protection/ conservation of wildlife.
 - i. **Intensifying research** on wildlife conservation.
 - j. **Gazetting forest reserves/ establishing forest reserves/ orphanages.**
 - k. **Offering veterinary services** to wild animals.
 - l. **Joining and enforcement of charters on animal protection internationally** e.g. Convention on International Trade on Endangered species of flora and fauna (CITES).

Reasons for wildlife conservation.

- ✓ To protect the endangered animal/ plant species.
- ✓ To promote tourism.
- ✓ To generate foreign exchange.
- ✓ To sustain the raw materials for supply of drugs.
- ✓ For education/ Research purposes.
- ✓ For aesthetic value/ natural beauty.
- ✓ To keep them for posterity/ future generations

NOTE: Failure to conserve wildlife in a country may lead to the following consequences;

- ✓ Increased soil erosion due to exposed surface.
- ✓ Landslides and floods.
- ✓ Loss of biodiversity.
- ✓ Extinction of some species of plants and animals.
- ✓ Lead to increased aridity and desertification.
- ✓ Shortage/ Lack of forest products e.g. Timber.
- ✓ Decreased vegetation cover reduces transpiration and leads to reduced rainfall

TOURISM.

- **Tourism** is an activity where people travel to visit places of interest either for leisure, business or education.

Eco-Tourism

- It is derived from ecology and tourism.
- **Ecology** is the study of relationships between the living things and their environment.
- **Eco-tourism** is the development and management of tourism while conserving the environment. It is enjoying what nature provides while protecting it -Kcse 2011

Aspects/ Characteristics of Eco-Tourism.

- a. **The tourists follow marked trails** instead of driving to the areas where animals are.
- b. **Telescopic viewing** of the animals is encouraged.
- c. There is **creation of awareness** among the local communities to appreciate and understand nature.
- d. **Benefits accrued are shared** with the community.
- e. **Mass tourism is being discouraged.** Mass tourism is where large group of people in several vehicles visit game parks and occasionally surround animals of interest interfering with their routines.
- f. **Soft or green tourism is being encouraged.** This is where people travel seeking to protect and restore the damaged environment e.g. by planting trees.
- g. At the entry points to the parks, **tourists are warned** against dangers of throwing cigarettes remains onto dry vegetation.
- h. **Only particular types of vehicles** are allowed in parks.

QUIZ: State ways in which ecotourism has led to sustainable tourism industry in Kenya
–kcse 2022

- ✓ Conservation of the environment/ preservation of scenic beauty.
- ✓ Respect of rights/ active partnership with stakeholders.
- ✓ Equitable distribution of benefits accrued from tourism.
- ✓ Respect/ safeguarding of local customs/ culture.

- ✓ Harmonious development of tourism sector alongside other economic sectors.

Types of tourism.

- i) Domestic tourism.
- ii) International tourism.

1. Domestic Tourism.

- This is the visit by people within their country for pleasure –kcse 2015

Reasons why Domestic tourism is being encouraged in Kenya –kcse 2018

- i) For people to appreciate the need to preserve wildlife/ culture.
- ii) To utilize tourist facilities during low tourist season.
- iii) For the people to appreciate the tourist attraction features.
- iv) To earn revenue especially during the low tourist season.
- v) To create more employment in the country.
- vi) For education/ research.
- vii) To enhance national unity.
- viii) To provide market for local products.
- ix) To earn income.
- x) To enhance circulation of money in the country.

Measures being taken in Kenya to promote domestic tourism.

- i) Advertising Kenya's tourist sites through media.
- ii) Offering favourable rates on accommodation in hotels/ lodges.
- iii) Lowering entry fees into the parks/ reserves for Kenyans.
- iv) Providing cheaper air tickets for the locals.
- v) Special concession is given to school parties when they visit game parks.
- vi) Marketing and improving tourist sites by county governments.

Problems facing domestic tourism in Kenya.

- i) Low public awareness due to inadequate advertisement locally.
- ii) Local people are familiar with the tourist attractions and hence they don't appreciate their beauty and value.
- iii) Majority are low income earners thus cannot afford the cost of traveling and accommodation.
- iv) Negative attitude towards local tourists.
- v) Poachers and gangsters pose security problem

2. International tourism.

- This is the visit by people away from their mother country to a given country for pleasure –kcse 2015
- **The origin of tourists to Kenya are Dubai, India, USA, Uganda, UK, China, Tanzania, South Africa**

Measures being taken by the Kenyan government to attract more tourists –kcse 2006

- i) **Improving roads** to tourist sites to make them accessible even during the rainy seasons.
- ii) **Building of more hotels** to increase bed capacity.

- iii) **Improving air links** with other countries so as to facilitate direct movement of tourists to Kenya.
- iv) **Preservation of wildlife/ eradication poaching/** maintaining tourist sites to attract more tourists.
- v) **Improving security** by establishing the tourist police unit to deal with tourist related crimes.
- vi) **Traditional culture is being promoted** so as to attract more tourists.
- vii) **Advertising abroad** by opening tourist offices to give information about tourist attractions in Kenya.
- viii) **Providing package tours** for the tourists to make it cheaper for them to visit the country.
- ix) **Lowering the rates charged** during low tourist seasons to attract domestic tourists.

Factors influencing tourism in Kenya.

- i) Kenya has a variety of **beautiful scenery** like lakes/ mountains/ the great rift valley/ sandy beaches that attract tourists –kcse 2015
- ii) Kenya has a pleasant **warm tropical climate/** sunny conditions throughout the year that attract tourists from temperate regions –kcse 2015
- iii) **Richness in wildlife** attract tourists.
- iv) **The tour companies** charter flights/ organize package tours which lower the cost of travel for tourists/ facilitate movement of tourists–kcse 2015
- v) Kenya's **rich culture** whereby different ethnic groups have unique way of dancing/ handicrafts/ dressing attract tourists.
- vi) Presence of **historical sites** and monuments with preserved artefacts of Iron Age attract tourists.
- vii) **Political stability/ Relative peace** which assures tourists of their safety.
- viii) **Availability of many tourist sites by road, air** and water facilitate tourism throughout the country.
- ix) There are **comfortable tourist accommodation facilities** e.g. high class hotels and lodges which attract tourists.
- x) **Improved facilities** creates awareness on Kenya's tourist sites both locally and internationally.
- xi) Presence of **packaged tours** also has promoted tourism.
- xii) **Trained personnel in tourism** provides excellent services in the tourism industry.
- xiii) **Involvement of the government** has contributed to the flourishing of the tourism industry.
- xiv) **Kenyans are friendly** to visitors and this attract tourists.
- xv) **Kenya's efforts in wildlife conservation** has promoted tourism industry.

Tourist attractions in Kenya.

1. Tourist attractions at the coast –kcse 2011

- ✓ Marine parks.
- ✓ Historical sites e.g. Fort Jesus/ Gedi ruins/ Vasco da gama pillar.
- ✓ Sandy beaches/ coral reefs/ coastal scenery.
- ✓ Sunny/ warm climate.
- ✓ Traditional culture e.g. the Mijikenda.
- ✓ Beach sports/ water sports like Yatching, surfing
- ✓ Wildlife

- ✓ Mangrove swamps with unique plants and animals.
- ✓ The Halter Park.

2. Inland tourist attractions.

- ✓ Wildlife conserved in national parks, game reserves and sanctuaries.
- ✓ Warm and sunny climate.
- ✓ Rich culture and traditions e.g. Maasai, Pokot, Kambas
- ✓ Pre-historical sites e.g. Kariandusi, Olorgesailie
- ✓ Museums and cultural centres.
- ✓ The famous wildebeest migration in the mara.
- ✓ Attractive scenery like snow-capped Mt. Kenya/ Rift valley.
- ✓ Turkwel Gorge project.
- ✓ Seven forks dams project along R. Tana.

3. Tourist attractions in the Rift Valley region.

- ✓ Wildlife.
- ✓ Lakes.
- ✓ Varied relief features.
- ✓ Birds like flamingos.
- ✓ Hot springs and geysers.
- ✓ Vegetation.
- ✓ People's culture.
- ✓ Pre/ historical sites e.g. Olorgesailie and Kapenguria Prison.

4. Tourist attractions in the lake regions –kcse 2018

- ✓ Wildlife in Impala sanctuary/ Kakamega forest.
- ✓ Lake Victoria/ Lake Simbi Nyaima/ Ox-bow lakes.
- ✓ Granitic tors.
- ✓ Kisumu museum.
- ✓ Hot sunny weather.
- ✓ Sport fishing/ water sports.
- ✓ Relief features/ escarpments/ Rift valleys.
- ✓ Historical/ Archaeological sites.
- ✓ Waterfalls.
- ✓ Beaches.
- ✓ Island.
- ✓ Hot springs.
- ✓ Culture of the people.
- ✓ Rivers.

Significance of Tourism –kcse 2006

- i) It creates **employment opportunities** e.g. tour guides/ chefs improving their living standards.
- ii) Tourists earn a country **foreign exchange** used to develop other sectors of the economy.
- iii) It promotes **agricultural development** since tourists create a high demand for food.
- iv) Parks entry fees are source of **government revenue**.
- v) It promotes **development of local craft industries** e.g. sisal bags (ciondos), wood and stone carvings.

- vi) It promotes **development of roads** leading to game reserves/ parks hence opening up remote areas.
- vii) Tourists provide **a ready market** for trade items such as handcrafts hence source of income to the locals.
- viii) It encourages **cultural exchange** which promotes international understanding.
- ix) It enables people to **appreciate wildlife** as they visit game parks reducing human-wildlife conflict.
- x) It promotes **conservation of wildlife and historical sites** since they attract tourists.

Problems facing tourism in Kenya.

- i) **Insecurity in the parks** whereby tourists are attacked and their property stolen from them.
- ii) **Ethnic clashes** in tourist attraction areas make tourists to stay away than put their lives at risk e.g. in Molo.
- iii) **Poaching/ illegal hunting of wild animals** reduces rare wildlife species reducing number of tourists.
- iv) **Terrorist attacks** e.g. bombing of tourist resort causes foreign countries to issue travel advisories to their citizens reducing the number of tourists.
- v) **Pollution** of aquatic systems kills aquatic organisms reducing the number of tourists.
- vi) **International media giving negative publicity** of Kenya by portraying it as an insecure country.
- vii) **Air fares** from and to many parts of the world **is high** due to high fuel prices which discourages tourists to Kenya.
- viii) **Adverse climatic conditions** affects wildlife which in turn reduce number of tourists.
- ix) **High tariffs/ taxes charged on tourists** e.g. visa charges/ airport taxes/ parks entry fee/ food and accommodation discourages many tourists.
- x) **Negative attitude by Kenyans** that tourism belongs to the international travellers.

QUIZ: State five effects of floods on tourism –kcse 2015

- ✓ Inaccessibility to tourist sites.
- ✓ Migration of wild animals.
- ✓ Death of wild animals.
- ✓ Destruction of tourist sites/ hotels/ lodges.
- ✓ Disruption of communication systems.
- ✓ Loss of income by proprietors.
- ✓ Water related diseases in tourist areas.
- ✓ Drowning of people.

Problems associated with tourism –kcse 2011

- i) Tourism has led to increase in **drug abuse**.
- ii) A number of youths especially at the coast have **dropped out of school** to become tour guides/ beach boys.
- iii) Tourism has led to the **spread of diseases** like S.T.I.s
- iv) Tourism has led to **pollution of environment**/ national parks.
- v) Overemphasis on tourism has led to the **neglect of other sectors of economy**.
- vi) Tourism has led to increase in **crime/ insecurity**.
- vii) Tourism has encouraged **poaching**/ illegal collection of marine resources.

- viii) Tourism has led to **international terrorism/ piracy**.
- ix) **Erosion of some social values/ culture.**

QUIZ: Explain four ways in which the county governments in Kenya would promote sustainable tourism –kcse 2015

- ✓ **Involving local communities** in decision making to enhance positive perception on wildlife conservation.
- ✓ **Compensating persons aggrieved by wild animals**, fencing parks to minimise human-wildlife conflicts.
- ✓ **Encouraging the use of alternative sources of energy/ management of energy** to reduce the destruction of natural ecosystem/ animal habitat.
- ✓ **Improving waste management** to reduce contamination of the environment.
- ✓ **Encouraging local tourism/ lowering rates** during the low season in order to have continuous use of tourist facilities.
- ✓ **Conserving water** to meet the needs of local communities/ wildlife/ tourists.
- ✓ **Improve transport systems** within their counties to facilitate movement of tourists.
- ✓ **Advertise tourism** activities within their county to increase awareness/ strengthening marketing.
- ✓ **Enforcing by-laws** to strengthen security in game reserves/ tourists sites.
- ✓ **Planting trees** to help in the conservation of the environment.
- ✓ **Encouraging community tourism/ home stays** in order to benefit from the tourism industry/ enhance hospitality.
- ✓ **Encouraging collaboration with the private sector** to finance tourist activities.
- ✓ **Establishing new tourist attractions** to create diversity.
- ✓ **Modernizing existing tourist facilities** to attract more visitors/ tourists.

Tourism in Switzerland.

- Tourists who visit Switzerland come from Netherlands, Canada, Japan, USA, Belgium, UK and France.

Factors influencing tourism in Switzerland.

a) Physical factors.

- i) **Beautiful scenery** produced Alps Mt e.g. snow-capped Mt peaks, clear blue lakes and waterfalls.
- ii) **Climate** i.e. it has a double season of winters and summers that attract tourists all year round. The sunny summer conditions favour mountaineering/ winters are suitable for winter sports –kcse 2019
- iii) **Central location** i.e. it is centrally located within Europe which makes her accessible to other European countries who form a bulk of her international tourists –kcse 2019

b) Human factors.

- i) **Political neutrality** i.e. Switzerland is non-aligned to any political blocks in the world. This removes any restrictions to the country as a tourist destination hence it attracts tourists from any country in the world –kcse 2019
- ii) **Well-developed transport network** system e.g. electric trains, good roads which enable tourists to travel easily to centres of attraction.
- iii) **Language diversity where several major languages** of Europe are spoken making it possible for tourists to get excellent services in the country.

- iv) **Headquarters of various international organisations** like ILO, Red Cross and UN hence people who go for meetings take time to tour various parts of the country.
- v) **Excellent accommodation facilities** which are fairly priced and offer discounts to mass tourists.
- vi) **Hospitality i.e.** the Swiss people are highly trained and efficient thus offering high quality service.
- vii) **It is highly industrialised** hence many people are employed earning good income enabling them to save for holidays.
- viii) It has one of the **lowest crime rates** in the world which attract many tourists since security is guaranteed.
- ix) **Package tours** is availed to people hence attracting many tourists.
- x) **Presence of many tourist resorts** e.g. Geneva, Bern which attract many tourists.

Significance of Tourism in Switzerland –kcse 2021

- i) It earns the country **foreign exchange** which is used to finance development.
- ii) It creates **employment opportunities** to people improving their living standards.
- iii) It has encouraged the **development of other related industries** like banking, insurance, hotels and transport.
- iv) Many **unproductive areas have been opened up** and brought to productive use e.g. glaciated landscapes.
- v) The country earns **revenue** through taxation and direct fee collection.
- vi) Through tourism, Switzerland has gained **good international reputation and fame**.

Similarities between tourism in Kenya and Switzerland.

- i) Both countries have **similar tourist attractions** like snow-capped mountains, waterfalls and a rich culture.
- ii) Both countries have a **well-established hotel industry** offering excellent accommodation for tourists.
- iii) Both countries have a well-established **tour package system**.
- iv) Both countries have **offices abroad** to promote their tourist attractions to the international market.
- v) Both countries **enjoy a peaceful political environment** suitable for tourism.
- vi) In both countries, all the **major tourist sites are accessible** by road, railway or air.
- vii) In both countries, tourism sector earns a significant fraction of the **foreign exchange**.
- viii) In both countries, **tourist visits are all the year round**.
- ix) Both countries have **health spas** with mineral water which people consider to cure certain ailments e.g. at Mt. Moritz (Switzerland) and at lake Bogoria (Kenya).
- x) Both countries have **national parks** e.g. Swiss National park and Amboseli National park attract tourists.

Differences between tourism in Kenya and Switzerland.

- i) Kenya has tropical climate which is warm and sunny most of the year encouraging sun-bathing while Switzerland has temperate climate with cold winters which encourage winter sports.
- ii) Kenya has varied and beautiful coastal **scenery**/ Rift valley/ volcanic mountains while Switzerland has varied scenery consisting of snow-capped mountains/ glaciated landscape.
- iii) Kenya being **far from Europe** gets fewer tourists while Switzerland which is centrally located in Europe gets more tourists.
- iv) Kenya's reports of **insecurity** scare away potential tourists while the reports of peaceful atmosphere in Switzerland encourage more tourists.
- v) Kenya has inefficient **transport network** making it difficult to access some tourist sites while in Switzerland transport network is efficient.
- vi) Kenyans are not able to speak a variety of **international languages** hence communication with tourists is sometime limited while the diversity of languages spoken in Switzerland make it possible for tourists to communicate with ease.
- vii) The **training of personnel** in tourism industry in Switzerland is more advanced hence higher quality services to the tourists while in Kenya it is less advanced.
- viii) The accessibility to **financial facilities** and services like use of credit cards by tourists is widespread in Switzerland promoting easy transactions by tourists while in Kenya access to financial facilities/ services is limited.
- ix) Kenya's low **purchasing power** limits their ability to travel as tourists while in Switzerland, the high purchasing power enables people to travel as tourists.
- x) Kenya has coastal **beaches** while Switzerland has lakeside beaches.
- xi) In Kenya, wild animals are found in their natural **habitat** while in Switzerland, they are kept in zoos.

The future of tourism in Kenya.

- Factors that indicate a bright future of the tourism industry in Kenya include;
- i) **Aggressive promotion** by ministry of tourism through the Kenya tourist board exhibitions abroad promoting Kenya as a tourist destination.
- ii) **Serious marketing** being done to promote domestic tourism.
- iii) **Improved security** in tourist attraction sites.
- iv) **Lowering tariffs** in hotels, game parks and airports taxes to encourage more tourists in Kenya.
- v) **Strength of the Kenya shilling-** depreciation of the Kenyan shilling will attract more tourist since most will find it cheap to visit Kenya.
- vi) **Opening up of new areas** with untapped attraction potential e.g. Northern part of Kenya, Lakes Turkana, Baringo and Victoria.
- vii) **Developing of sustainable tourism** e.g. ecotourism which involves conservation of the environment.
- viii) **Formation of Kenya national tourism master plan** to underscore the need to diversify tourist sources and opening new avenues.

Topical Questions.

1. Explain three ways in which the Kenyan government protects her wildlife (6mks).
2. Explain four features of tourism that Kenya can learn from Switzerland (8mks).
3. Explain four factors which hindered the development of domestic tourism in Kenya (8mks).
4. Explain three problems experienced by the Kenya government in its effort to conserve wildlife (6mks).
5. State three reasons why national parks have been established in Kenya (3mks) **-kcse 2003**
6. Give three reasons why it is necessary to preserve historical sites (3mks) **-kcse 2004**
7. Explain four reasons why Switzerland gets more tourists than Kenya (8mks) **-kcse 2001**
8. Explain the difference between tourist attractions in East Africa and Switzerland under;
 - Climate
 - Culture

“END OF TOPIC FOUR”

TOPIC FIVE:

ENERGY

By Prof. Ogoti Robert Maxwell

Definition of Energy –kcse 2021

- **Energy** is the power/ fuel needed to run a machine/ assist people in production.

Sources of Energy.

- ✓ Sun
- ✓ Wind
- ✓ Fossils
- ✓ Plants
- ✓ Animals
- ✓ Water

Types of energy.

- This refers to the different forms of energy that are derived from the various sources.
- Sources of energy are classified into two types namely;
 - a) Renewable sources of energy.
 - b) Non- renewable sources of energy.

1. Renewable Energy Sources.

- **A renewable energy source** is that source that can be regenerated/ replenished/ reappear/ inexhaustible/ used over a long period of time –kcse 2019
- **Renewable sources of energy include;** -kcse 2022
 - ✓ Water
 - ✓ Wind
 - ✓ Solar/ sun
 - ✓ Waves/ tides
 - ✓ Geothermal steam/ underground steam
 - ✓ Biomass
 - ✓ Wood / trees
 - ✓ Drought animals

i) Solar Energy.

- This is the power from the sun.

Advantages of solar energy –kcse 2012

- ✓ It is free.
- ✓ It is cheap source of energy.
- ✓ It is inexhaustible/ renewable source of energy.
- ✓ It is clean/ environmentally friendly.
- ✓ It can be stored for future use.
- ✓ It is safe to use.
- ✓ It can be found everywhere/ it has many uses.
- ✓ It is easy to use.

Disadvantages of solar energy –kcse 2017

- ✓ Solar panels are expensive to manufacture.
- ✓ Low energy production.
- ✓ Solar batteries are cumbersome to transport.

- ✓ Solar energy has limited use.
- ✓ Solar technology is new hence used by few people.

QUIZ: State three factors that have hindered the development of solar energy in Kenya
–kcse 2023

- ✓ Solar energy has low energy output.
- ✓ The short life span of storage batteries.
- ✓ Competition from alternative sources.
- ✓ High cost of purchasing/ installation of solar panels/ low purchasing power of people.
- ✓ Inadequate technology.

ii) Wind Energy.

- This is the power from air in motion (wind).

Advantages of wind energy.

- ✓ It is inexhaustible/ renewable.
- ✓ It is cheap source of energy.
- ✓ It is free.
- ✓ It is clean/ environmentally friendly.
- ✓ It can be produced on a small scale basis.
- ✓ It can be found everywhere/ it has many uses.

Disadvantages of wind energy.

- ✓ Not very reliable as the wind may change direction.
- ✓ Wind mills are expensive to establish and maintain.
- ✓ Low energy production.
- ✓ Wind energy has limited use/ cannot run heavy machines.
- ✓ Wind mills may take up land needed for agriculture.
- ✓ Only available in open areas.

iii) Tidal Energy.

- This is the power from the periodic rise and fall in the level of ocean water due to gravitational pull by the sun and moon (tides).

Advantages of tidal energy.

- ✓ It is inexhaustible/ renewable.
- ✓ It is cheap as it is freely available.
- ✓ It is clean/ environmentally friendly.

Disadvantages of tidal energy.

- ✓ It is expensive to harness tidal energy.
- ✓ It is limited to countries with a sea front.
- ✓ Low energy production.

iv) Wave Energy.

- This is the power from a moving ridge of ocean water caused by the frictional drag of wind over the water surfaces. (Waves are oscillation of water particles).

Advantages of wave energy.

- ✓ It is inexhaustible/ renewable.
- ✓ It is cheap as it is freely available.
- ✓ It is clean/ environmentally friendly.

Disadvantages of wave energy.

- ✓ Power stations are expensive to set up.
- ✓ It is not safe in areas with regular incidences of storms, cyclones, hurricanes and tsunamis.

v) Hydro-electric power.

- This is the energy derived from falling water.
- It is produced by rotating turbines connected to generators.

Advantages of H.E.P.

- ✓ It is inexhaustible/ renewable.
- ✓ It is clean/ environmentally friendly.
- ✓ It can be transmitted over long distances using cables.
- ✓ It can be put into many uses e.g. cooking, lighting
- ✓ It is relatively easy to use i.e. switching on/ off.
- ✓ Dams for HEP creates lakes used for fishing/ irrigation/ recreation.
- ✓ It is reliable since significant levels of energy are produced.

Disadvantages of H.E.P.

- ✓ Fluctuation of water levels in the reservoirs may lead to shortage of power.
- ✓ It requires high capital for investment.
- ✓ It cannot be stored once generated.
- ✓ Construction of dams may lead to resettlement of people.
- ✓ It causes inconvenience to migratory fish species downstream.

vi) Geothermal Energy.

- This is the power derived from steam flowing from earth's core to the surface.

Advantages of geothermal power as a source of energy –kcse 2015

- ✓ It is a clean source of energy/ non pollutant.
- ✓ The cost of production is low.
- ✓ It has minimal environmental degradation.
- ✓ It is a renewable source of energy.
- ✓ It is a reliable source of energy.

Disadvantages of geothermal energy.

- ✓ Low energy production.
- ✓ The sites for exploitation are limited.
- ✓ It is expensive to exploit.
- ✓ It causes noise pollution.

vii) Biomass.

- This is the energy produced from organic matter/ plant and animal waste (Biogas).

- **Sources of biomass;**
 - Wood
 - Animal waste
 - Agricultural waste
 - Molasses produce gasohol

Advantages of biogas.

- ✓ It is inexhaustible/ renewable.
- ✓ It is cheap as it uses waste products.
- ✓ It is readily available in many places.
- ✓ Simple technology is used in its production.

Disadvantages of biogas.

- ✓ It requires a lot of space.
- ✓ It cannot be transported to far places.
- ✓ It contributes to pollution which causes global warming.

viii) Wood fuel.

- It is derived from firewood, charcoal and saw dust.

Advantages of wood fuel.

- ✓ It is readily available.
- ✓ It has no maintenance costs.
- ✓ It is a renewable source.

Disadvantages of wood fuel.

- ✓ It leads to environmental degradation.
- ✓ It pollutes the environment.
- ✓ It is bulky/ requires a big storage area.
- ✓ It is dirty due to soot and smoke.
- ✓ A lot of wood is required because of less energy output.

ix) Draught animals.

- Animals generating power includes oxen/ bulls, horses, camel, donkeys

Advantages.

- ✓ They are readily available all over the world.
- ✓ It is cheap to maintain animals.
- ✓ Animals are flexible i.e. can pass over rugged terrain.
- ✓ Some animals can be used in ASALs.
- ✓ It is inexhaustible/ renewable.

Disadvantages.

- ✓ Animals are prone to diseases and fatigue.
- ✓ Their use is restricted only to rural areas.
- ✓ They need regular rest as they tire easily.
- ✓ They can die as a result of too much work.
- ✓ They can only do limited work.

2. Non-renewable sources of energy.

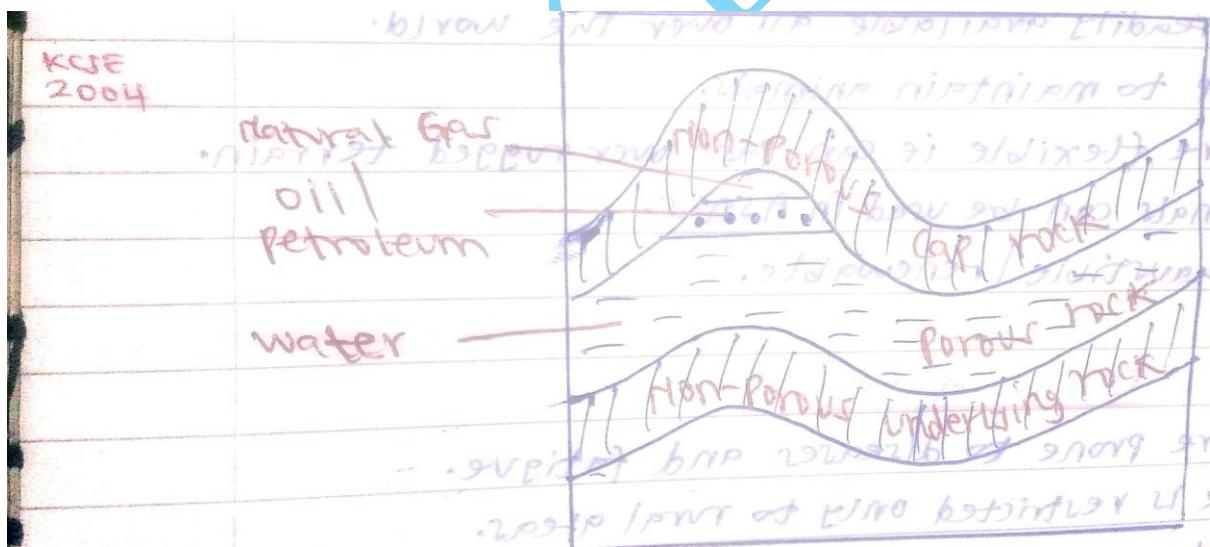
- They are sources which are exhaustible if they are not well managed.
- **Non-renewable sources of energy include;** -kcse 2020
 - ✓ Petroleum
 - ✓ Natural gas
 - ✓ Coal
 - ✓ Uranium
 - ✓ Peat

i) Petroleum.

- It consists of gaseous and liquid hydrocarbons from animals and vegetation matter laid in sedimentary rocks.

Conditions that are necessary for the formation of petroleum -kcse 2022

- ✓ Deposition of remains of flora and fauna/fossils/ organic remains over a long period of time.
- ✓ Presence of non-porous rocks underneath the deposits of flora and fauna.
- ✓ Deposition of other layers of rocks/ non-porous over the remains of flora and fauna.
- ✓ Compression of the remains of flora and fauna due to folding of the layers of the rocks.
- ✓ Presence of porous rocks in between two non-porous rocks.
- ✓ Presence of sedimentary rocks.



By-products of petroleum -kcse 2022

- ✓ Lubricants/ Grease
- ✓ Tar/ Bitumen/ Asphalt
- ✓ Wax/ Paraffin wax
- ✓ Sulphur
- ✓ Resin/ petro-chemicals

Products from refined petroleum.

- ✓ Motor oil
- ✓ Diesel
- ✓ Liquid and petroleum gas

- ✓ Kerosene
- ✓ Gasoline
- ✓ Jet fuel
- ✓ Lubricants

Advantages of petroleum.

- ✓ It is convenient for a variety uses.
- ✓ It can be easily transported to far areas.
- ✓ It can be stored in tanks.
- ✓ It can be used to generate thermal electricity.
- ✓ Free of the effects of weather changes.
- ✓ Transport and maintenance costs are low.

Disadvantages of petroleum.

- ✓ Crude oil is bulky to transport.
- ✓ It is non-renewable source of energy.
- ✓ It pollutes the environment causing global warming.
- ✓ It is expensive for low income groups.
- ✓ Exploration of petroleum is very expensive.
- ✓ It is highly inflammable and causes fire accidents.

ii) Coal.

- Coal is made up of vegetable matter laid down in a swampy area and buried under other materials.

Advantages of coal.

- ✓ It is most suitable in the smelting of iron and steel.
- ✓ It is more efficient in thermal generation of electricity.

Disadvantages of using coal as a form of energy –kcse 2022

- ✓ Coal is exhaustible/ non-renewable form of energy.
- ✓ Coal is bulky/ costly to transport.
- ✓ Soot/ smoke from coal pollutes environment.
- ✓ Coal has low calorific value/ low heat/ low energy value.
- ✓ Coal excavation lead to degradation of the environment/ pollute land.
- ✓ Coal is dirty/ dusty.
- ✓ It is expensive to mine/ difficult to mine.
- ✓ It is radioactive.

QUIZ: Give three reasons why use of coal as an industrial fuel has declined –kcse 2020

- ✓ It is bulky/ costly to transport.
- ✓ It is difficult/ expensive to mine.
- ✓ It is an exhaustible source of energy.
- ✓ It is dirty/ sooty/ dusty/ pollutes environment when used.
- ✓ It produces very little energy when burnt/ low calorific value.
- ✓ Adoption of new technology in steel production.
- ✓ Competition from other efficient sources of energy.
- ✓ The deepening of coal mines.

iii) Peat.

- It is young coal consisting of partially decomposed organic matter and inorganic minerals that have accumulated in water-saturated environment.
- It is produced in Russia, Ireland, Finland and USA.

iv) Uranium/Nuclear Energy/atomic energy

- It is derived from the alteration of atomic structures leading to release of heat that produces steam which is used to generate electricity.
- Nuclear energy is used in USA, Russia, Britain, Germany, France, Japan, South Africa and Canada.

Advantages.

- ✓ It occurs in huge reserves.
- ✓ It produces large amounts of energy.
- ✓ It has a longer lifetime.
- ✓ It is relatively cheap.
- ✓ It does not produce greenhouse gases.

Disadvantages.

- ✓ It is expensive to construct a nuclear reactor.
- ✓ Nuclear wastes are highly radioactive.
- ✓ It is exhaustible/ non-renewable.
- ✓ It requires heavy capital investment/ expertise.

v) Natural gas.

- It occurs in association with petroleum i.e. normally found on top of upper layers of crude oil.
- Composed of mixture of hydrocarbons with methane making the highest percentage.

Advantages.

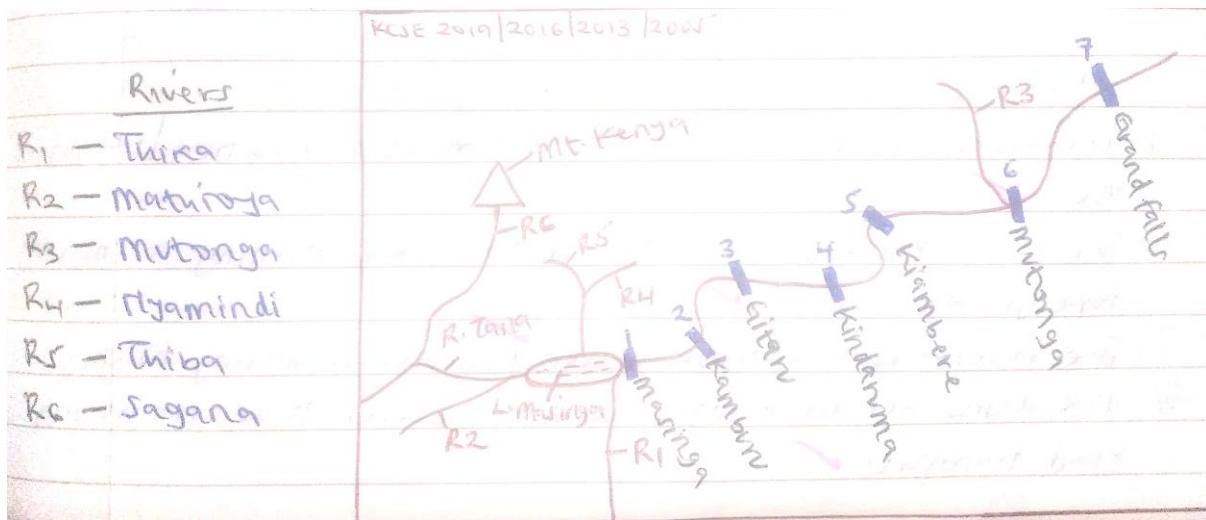
- ✓ Clean
- ✓ Cheap to transport in pipelines
- ✓ Free from weather changes

Disadvantages.

- ✓ Accidental fires may occur due to gas leakage/ damaged pipes.
- ✓ Pollution of environment through gas leakage.
- ✓ Expensive for low income earners.
- ✓ It is exhaustible/ non-renewable.

Hydro – electric power (HEP) stations in Kenya.

- River Tana and its seven forks dams produce the highest amount of HEP in Kenya.



Physical factors that favoured the development of the seven forks hydro-electric power projects –kcse 2021

- i) **Presence of large volume of water from River Tana** and its tributaries to provide water to drive the turbines.
- ii) **Regular/ constant flow of River Tana** which enabled continuous production of electricity.
- iii) **Presence of hard basement rock** along the site which provided a firm foundation for the dams.
- iv) **Availability of enough space** for construction of dams/ reservoirs due to low population in the area.
- v) **Presence of waterfalls/ rapids/ steep gradient** which provided sufficient hydraulic force to turn the turbines.
- vi) **Presence of impervious rock** which prevents seepage of water underground.
- vii) **Presence of a gorge/ deep valley** which reduced the cost in construction of dam.

Human factors that favoured the development of the seven forks hydro-electric power projects.

- i) **Adequate capital** for construction and maintenance of HEP projects.
- ii) **High demand for electricity** for industrial and domestic use.
- iii) **Sparse population in an area** to minimize the cost of relocating people.

Benefits of the dams along the river Tana –kcse 2016

- i) It provides **electric power** for both industrial/ domestic use.
- ii) The reservoirs **provide water** for domestic use/ industrial use/ irrigation.
- iii) The dams/ reservoirs are **tourist attractions** earning a country foreign exchange.
- iv) The reservoirs are **fresh water fisheries** promoting fishing.
- v) The reservoirs **modify local climate**.
- vi) The dams act as **bridges across the river** thus promoting road transport.
- vii) The dams and reservoirs **control floods** downstream.

NOTE: Other HEP projects in Kenya include;

- Turkwell Gorge on River Turkwel.
- Sondu – Miriu project on River Sondu.

Problems that affect the production of power along river Tana –kcse 2016

- ✓ Fluctuations of water levels in the reservoirs leads to the rationing of power.
- ✓ Inadequate capital for maintenance/ high cost of dredging/ expansion.
- ✓ Siltation of the reservoirs reduces its capacity and makes it expensive to desilt.
- ✓ Inadequate skills/ technology in power generation and maintenance of machinery.
- ✓ Relocation of people for the construction of dams is expensive.

Hydro – electric power (HEP) stations in Uganda.

- The major power source and HEP project in Uganda is the Owen Falls Dam.
- On the site where River Nile flows out of Lake Victoria provided a natural waterfall from where the power generation was possible.
- Produces 162MW that supplies most of Uganda's electricity and about 30MW exported to Kenya.

Physical factors that have favoured high hydro-electric power production in Uganda –kcse 2018

- ✓ Large volume of water from River Nile/ Lake Victoria to provide water to drive the turbines.
- ✓ The Owen falls/ natural waterfall for power generation.
- ✓ High rainfall throughout the year to enable high volume of water.
- ✓ Presence of deep valleys/ gorges which reduced the cost in dam construction.
- ✓ Presence of impervious/ non-porous rocks that prevent seepage of water underground.
- ✓ Regular supply of water from river Nile/ Lake Victoria which enable continuous production of electricity.
- ✓ Presence of hard basement rocks for firm foundation.

Geothermal Power projects in Kenya.

Places in Kenya where geothermal energy has potential of being harnessed –kcse 2018

- ✓ Mt. Longonot/ Suswa
- ✓ Lake Bogoria
- ✓ Eburru
- ✓ Menengai Crater
- ✓ Lake Turkana
- ✓ Lake Magadi
- ✓ Lake Baringo
- ✓ Olkaria
- ✓ Homa hills
- ✓ Mai Mahiu

Reasons why the geothermal power has not been fully exploited in Kenya –kcse 2014

- ✓ Inadequate capital required for exploitation.
- ✓ There is shortage of skilled personnel as the country relies on expatriates.
- ✓ The country faces low level of technology which hinders exploitation of the energy.
- ✓ Most of the potential sites are found in remote/ inaccessible areas which makes it difficult/ expensive.
- ✓ Danger of land subsidence as tectonic fluids is withdrawn.

Ways in which Kenya has benefited from the development of geothermal power. -kcse

2010

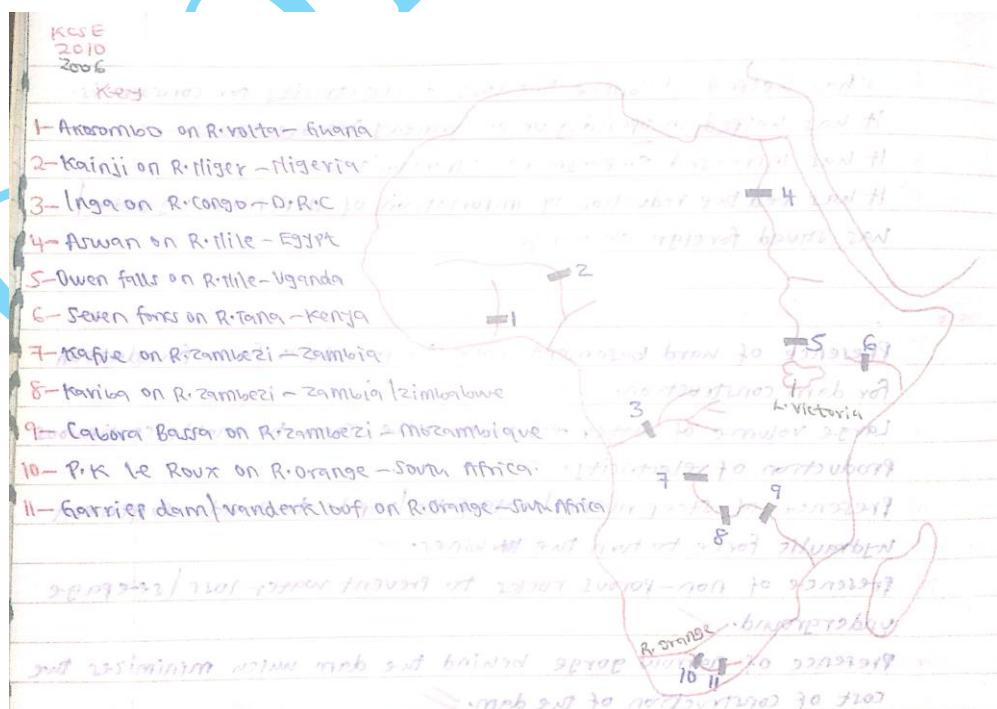
- ✓ It has provided alternative source of energy.
- ✓ It has increased Kenya's energy output.
- ✓ It has helped stabilize the cost of electricity for consumers.
- ✓ It has helped in opening up of formerly remote areas.
- ✓ It has increased employment opportunities.
- ✓ It has led to the reduction of importation of hydro-electric power from Uganda/ has saved foreign exchange.

Factors favouring development of HEP projects in Africa -kcse 2010

- i) **Presence of hard basement rocks** to provide a firm foundation for dam construction.
- ii) **Presence of steep rivers/ waterfalls/ rapids** to provide a massive hydraulic force head for power generation.
- iii) **Regular/ large volume of water from rivers Nile/ Tana** to ensure continuous power generation.
- iv) **Presence of non-porous rocks** to prevent water loss/seepage underground.
- v) **Presence of a deep narrow valley/gorge** to provide a large reservoir behind the dam/reduce cost of building embankments.

Reasons why HEP projects in Africa are not fully developed.

- i) **Inadequate capital** to develop and maintain HEP projects.
- ii) **Remoteness of some potential areas** limits their exploitation.
- iii) **Low industrial development** hence low demand for electricity limiting HEP production.
- iv) **Fluctuation of river regime** affecting power production.
- v) **Limited research** is carried out slowing the development of HEP projects.
- vi) Foreign aid sought by many countries to put up the projects **carries higher interest rates** thereby over-burdening countries with HEP potential.



Significance of Energy.

- i) Energy is used for domestic purposes e.g. cooking/ lighting/ heating
- ii) Energy is used in industrial sector e.g. to run the machines/ lighting/ heating.
- iii) Energy is used in transportation e.g. diesel and petrol used in Motor vehicles.
- iv) Energy is used in agriculture by powered tractors/ drying grains.
- v) Energy is used in water supply where wind mills/ solar power/ diesel engines are used to pump water.
- vi) Energy is used for medical purposes by diagnosing equipment like X-Ray uses electricity.

Energy Crisis –kcse 2022

- **Energy crisis** refers to a situation where the prices of fossil fuel rise sharply as a result of short supply relative to demand.

Causes of Energy Crisis –kcse 2014

- i) There is a **high demand for oil**/ over reliance on petroleum leading to increase in the oil prices.
- ii) There are embargoes/ **controls on oil production** by the producing countries.
- iii) There is **de-regulation of oil prices** by the suppliers.
- iv) There is **unequal natural pattern of crude oil occurrence**.
- v) There is **political instability/ wars** in some of the oil producing countries.
- vi) **Inadequate alternative sources of energy** leading to over-reliance on oil and oil products.
- vii) **Improvement in technology** resulting into many machines that consume a lot of energy leading to shortage causing a crisis.
- viii) **Prolonged drought** lowers production of HEP leading to more demand of oil.
- ix) Artificial shortages may be created by the **oil-producing countries with holding the oil**.
- x) **Rapid depletion of oil reserves** leading to oil shortage hence energy crisis.

Effects of Energy Crisis in Kenya –kcse 2021/ 2022

- i) Increase in oil prices triggers **increase in prices of commodities/ inflation** leading to low standards of living/ high cost of living.
- ii) Increase in oil prices leads to **rise in the cost of farm inputs** which in turn leads to low agricultural production/ food shortage.
- iii) Increase in prices of crude oil makes **Kenya spend a lot of foreign exchange** in importation lowering foreign currency reserves/ brings about imbalance of trade/ slows down the rate of economic growth.
- iv) Increase in oil prices leads to **high cost of production** leading to slow industrial growth.
- v) Oil scarcity leads to **scarcity of by-products of oil** leading the scarcity of raw materials in some industries.
- vi) Increase in fuel prices leads to an **increase in transport costs** which triggers price increase in price commodities/ **inflation/ reduced tourism activities**.
- vii) Increase in oil prices leads to high demand for wood fuel leading to **deforestation**.
- viii) Increase in oil prices has led to the **development of alternative sources of energy** to reduce overdependence of oil.
- ix) Increase in oil prices lead to **high cost of goods** thus lowering their consumption.

Measures Kenya may take to manage energy crisis.

- i) **Developing alternative sources of energy** like solar to reduce overdependence on oil.
- ii) **Encouraging Kenyans to use energy-saving devices** so as to reduce the amount of oil used.
- iii) **Control the importation of vehicles with high engine capacities** to reduce the consumption of oil.
- iv) **Improve the flow of traffic in urban centres** to avoid delays that lead to high fuel consumption.
- v) **Encouraging industries to use coal** which is slightly cheaper than petroleum.
- vi) **Developing nuclear energy** to enhance self-sufficiency in energy provision.

Management and Conservation of Energy

- **Management of energy** is the effective planning and control of energy resources.
- **Conservation of energy** is the careful use and protection of energy resources to ensure little or no wastage.

Measures the government of Kenya has taken to conserve energy –kcse 2016

- i) **Encouraging people to use renewable sources of energy** in order to reduce the overreliance of fossil fuels.
- ii) **Developing energy saving technologies** in order to reduce the high consumption of energy.
- iii) **Enforcing the legislation against indiscriminate cutting down of trees** for fuel thus conserving existing resources.
- iv) **Educating the public** on the careful use of energy in order to save it.
- v) **Progress taxation on energy consumption** in order to discourage the misuse of energy.
- vi) **Proper planning of road networks** in urban areas to reduce traffic jam hence saving on fuel consumption.
- vii) **Encouraging the use of public transport/ walking/ cycling/ railway** in order to reduce the number of vehicles on the roads/ reducing energy consumption.
- viii) **Discouraging importation of high fuel consumption vehicles** to reduce amount of fuel used.
- ix) **Encouraging afforestation/ reafforestation** for continuous supply of wood fuel.

Topical Questions.

1. Explain four effects that the increase in oil prices has had on the economies of the oil importing countries in Africa (8mks)-**kcse 2006**
2. State four ways in which Kenya can reduce the use of petroleum as a source of energy (4mks)-**kcse 2006**
3. Give three effects of liberalization of the oil industry in Kenya (3mks)-**kcse 2001**
4. Explain three benefits that would result from rural electrification in Kenya (6mks)-**kcse 2002**
5. State three benefits Kenya will achieve after drilling oil in Turkana County (3mks)

“END OF TOPIC FIVE”

TOPIC SIX:

INDUSTRY

By Prof. Ogoti Robert Maxwell

Definition of terms.

Industry is an enterprise that enables the production of goods/services for consumption / sale- kcse 2019

Industrialization is the process and pace at which a country establishes enterprises that produce goods and services for consumption /sale.

Industrialized countries produces manufactured goods as their main economic activity.

Less industrialized countries produce agricultural raw materials.

Factors influencing the location and development of industries.

a) Labour –kcse 2021

- ✓ Industries that require **intensive labour** are located in areas that are highly populated /adequate supply of needed labour.
- ✓ Industries require personnel with **managerial skills** to ensure maximum output at low production cost.
- ✓ Industries that require personnel who are **semi-skilled** are located in areas with high population.
- ✓ Industries requiring **highly skilled** labour force tend to be located in major towns where there are adequate skilled personnel/ training facilities.
- ✓ Areas with **inadequate / lack skilled labour** discourage location of industries/ necessitate hiring of expatriates who are costly.

b) Transport and communication –kcse 2021

- ✓ Well-developed transport network facilitates transporting of raw materials to the industries /finished products to the market.
- ✓ Well-developed transport and communication networks attract more industrial investors in an area.
- ✓ Areas with poorly developed transport and communication networks discourage setting up of industries.
- ✓ Industries depend on good communication network to keep in touch with customers/suppliers.
- ✓ Well-developed transport network facilitates quick /safe transportation of perishable /fragile goods.

c) Market –kcse 2020

-Some industries are located near a market because:-

- ✓ Some finished goods /products are fragile.
- ✓ Some products are highly perishable.
- ✓ Some goods /products are bulky.
- ✓ High demand of the products.
- ✓ Need to reduce transportation cost.

d) Regular water supply –kcse 2011

-Some industries are located near source of water e.g. river because:-

- ✓ Industries need large amount of water for cleaning.
- ✓ Industries use water for cooling machines.
- ✓ Industries dispose off their waste materials through water.
- ✓ Water provides cheap means of transport.
- ✓ Some industries are located near large rivers that may provide H.E.P.
- ✓ Water is used as a raw materials in the industry.
- ✓ Some industries use water debark the logs.

e) Capital

- ✓ Capital is used to purchase land were industries are established.
- ✓ Capital is used to put up buildings for establishment of industries.
- ✓ Capital is used in paying wages/salaries of workers in industries.
- ✓ Capital is used to purchase raw materials used in industries.

f) Raw materials –kcse 2006

-Some industries are located near sources of raw materials because:-

- ✓ Raw materials may be too bulky and thus expensive to transport.
- ✓ Some raw materials are perishable e.g. tea and milk.
- ✓ There is a steady supply of raw materials e.g. paper industry.

g) Availability of power

- ✓ Industries are located in areas where power is readily available.
- ✓ Industries are located in areas where power is cheap.
- ✓ Industries are located near main power supply points to reduce the cost of transmitting power.

h) Government policy -kcse 2022

-Policies of the government may either encourage or discourage location /development of industries in an area.

-**Ways in which the government policy influences location of industries in Kenya;**

- ✓ Legislating industrial laws that restrict industrial location to given areas.
- ✓ Offering special concessions/ financial support to industrialists towards industrial locations.
- ✓ Developing roads/ railway lines/ airports/ communication systems that attracts industries to a given area.
- ✓ Developing of sources of power/ hydroelectric power/ geothermal.
- ✓ Providing security in areas where industries are meant to be established/ located.
- ✓ Government may set aside land for the location of certain industries.
- ✓ Government may provide technical support/ advice on industrial locations.
- ✓ Signing industrial location agreement with other countries.
- ✓ Government may influence the decentralization of some industries.

i) Personal decisions.

-Industrialists may decide to locate industries at a place of their choice i.e.

- Where there is security.
- Where there is reality available market.
- Need to provide jobs to the local people.
- For the interest of the family.
- Where there is well developed roads.

j) Industrial inertia

-It is the tendency of an industry to remain in a particular place even when the original factors for its location no longer exist.

Factors that lead to industrial inertia: -

- Availability of experienced workers.
- Established markets.
- Fear of the cost of building other industries elsewhere.
- Well-developed roads.
- High cost of land in new areas.
- Extra cost of buying new equipment.

k) The cost of land

- ✓ A place where land is expensive discourages industrial development.
- ✓ Area where land is cheap encourages industrial development.

Types of industries

- a) Primary industry
- b) Secondary industry
- c) Tertiary industry

a) Primary/ Extractive industries.

- They involve the **extraction of raw materials from their sources**.
- They involve exploitation of natural resources.
- They include mining /fishing/ lumbering /Agriculture.

b) Secondary/ processing/ manufacturing industry –kcse 2013

- They change raw materials into semi-processed/finished products.
- They are categorized into:- **Light Industries.**

-Heavy industries.

i) **Light Industries**

- They process **light raw materials** to make goods with little volume /weight.
- Require **small capital investment /small production.**
- They include:-
 - ✓ Textile Making
 - ✓ Coffee Processing
 - ✓ Tea Processing
 - ✓ Sugarcane Processing
 - ✓ Milk Processing
 - ✓ Pharmaceutical
 - ✓ Shoe Making

ii) **Heavy industries.**

- They process **heavy /bulky raw materials** to make heavy bulky products. .
- Require large capital investment / large production.
- **They include:-**
 - ✓ Steel rolling mills.
 - ✓ Glass making.
 - ✓ Cement factories.
 - ✓ Assembly of motor vehicles.
 - ✓ Oil Refining.
 - ✓ Pulp and paper.
 - ✓ Car Manufacturing.

c) **Tertiary industries** –kcse 2013

- They provide services to consumers.
- They include insurance/trade/banking/tourism /security/communication /hospitality/repair and maintenance.

DISTRIBUTION OF INDUSTRIES IN KENYA

1. Agricultural food processing industries e.g– kcse 2007

- ✓ Tea processing.
- ✓ Sugar refining.
- ✓ Milk processing.
- ✓ Coffee processing.
- ✓ Brewing.
- ✓ Bakeries.
- ✓ Fruit canning/ processing.
- ✓ Grain milling.
- ✓ Meat canning/ processing.
- ✓ Vegetable canning /processing.
- ✓ Oil pressing/ canning.

2. Agricultural non –food processing industries –kcse 2022

- ✓ Tobacco processing/ cigarette making.
- ✓ Cotton /textile processing/cloth fabrication.
- ✓ Leather tanning /footwear making.
- ✓ Bees wax processing.
- ✓ Pyrethrum processing.
- ✓ Aloe Vera processing.
- ✓ Wood processing /lumbering/pulp and paper manufacturing.
- ✓ Sisal/ fibre making.
- ✓ Soap making.
- ✓ Glue making.

3. Non-agricultural manufacturing industries –kcse 2021

- ✓ Glass making.
- ✓ Oil refinery.

- ✓ Cement factories.
- ✓ Clay /ceramic industry.
- ✓ Pharmaceuticals industry.
- ✓ Iron /steel/ aluminum rolling mills.
- ✓ Plastic manufacturing.
- ✓ Pulp and paper.
- ✓ Motor vehicle assembly.

Decentralization

- It is the establishment of some industries in rural areas so as to decongest urban areas.

Reasons why the government of Kenya encourages establishment of industries in rural areas –kcse 2021

1. To improve transport /communication networks /opening up the rural areas.
2. To diversify the economy /reduce over reliance on agriculture.
3. To create employment opportunities in rural areas/reduce rural-urban migration.
4. To improve /set up social amenities in the rural areas.
5. To enables people in the rural areas sell their products /raw materials to the industries.
6. To make use of the locally available raw materials.
7. To decongest major towns.
8. For equitable regional development.

Cottage industries.

- They are involved in making products particularly in homes using hands and simple tools.

Examples of cottage industries

- ✓ Pottery /pot making.
- ✓ Wood carving.
- ✓ Stone carving.
- ✓ Weaving of baskets.
- ✓ Boat making.

- ✓ Those using scrap metals.

Characteristics of cottage industries

- i) They are labour intensive.
- ii) They are owned by families /individuals.
- iii) They use locally available raw materials.
- iv) They produce mainly for local markets.
- v) Little capital is involved.
- vi) They use simple tools.
- vii) They require simple skills.
- viii) Labour is provided by individual/family members.
- ix) They are wide spread in the country/ located in homes.

Factors that have promoted the growth of Jua kali industry in Kenya

- i) The industry requires little capital to start.
- ii) It uses locally available raw materials.
- iii) It requires simple tools.
- iv) Its products are cheap and target the local market.
- v) It requires simple skills which are readily available.

Characteristics of Jua kali industries in Kenya –kcse 2005

- i) They are operated by individuals /small groups.
- ii) They are pursued as part time /full time occupation.
- iii) They require low capital investment.
- iv) They use local/ recycled raw materials.
- v) They use basic/simple skills in craft.
- vi) They are mostly operated in open space/sheds.
- vii) They are widespread.

Ways in which the government is encouraging development of Jua kali industry.

- i) The ministry of trade and industry has set up a department to promote this industry.
- ii) It provides loans to Jua kali artisans to purchase raw materials and build sheds.
- iii) It has set aside land for use by Jua kali artisans.
- iv) It has encouraged Jua kali artisans to form cooperatives to assist in marketing of their products.
- v) It offers advisory service to the artisans in marketing and expansion.
- vi) It sources for funds and machinery from donors and NGOs to support Jua Kali artisans.
- vii) It offers training through seminars and workshops to improve their skills.
- viii) It has established permanent structures /sheds where the artisans can operate at low costs.

Importance of Jua kali sector.

- i) It has **created employment opportunities** to people improving their living standards.
- ii) It **earns a country foreign exchange** through the exportation of her products.
- iii) It **saves a country's foreign exchange** that would have been used to import goods.
- iv) It is **source of income to people** when selling produced goods.
- v) It is **source of government revenue** through taxation.
- vi) It **produces cheaper goods** than those produced in the formal industries.
- vii) It **utilizes the locally available raw materials** that would have been thrown away.

Problems facing Jua kali industries in Kenya –kcse 2022

- i. Goods face discrimination due to wrong attitude leading to low demand/competition from well-established manufacturers this reduces sales.
- ii. Inadequate capital for expansion leading to low production.
- iii. Exploitation by middlemen/ business people who offer low prices which discourages people in industries.

- iv. Poor working conditions as most work is done in the open sun/rains/ easily affected by weather changes.
- v. Frequent power blackouts which disrupt work leading to losses.
- vi. Difficulty in getting raw materials leading to low production.
- vii. Inadequate security/ theft leading to losses.

Significance of industrialization to Kenya –kcse 2022

- i) It creates **employment opportunities** hence raising the living standards of the people.
- ii) It **earns a country foreign exchange** through the exportation of industrialized goods.
- iii) It **saves a country's foreign exchange** through reduction of the importation of some industrial goods/ local consumption of industrialized goods.
- iv) It **leads to development of roads** thus opening up rural areas to development/ ease movement of goods.
- v) It **leads to development of social amenities** improving people's living standards.
- vi) It **leads to diversification of the economy** thus reducing over reliance on the agricultural sector.
- vii) It **leads to improvement in the balance of trade** since there is added value to the export exchange.
- viii) It **leads to development of urban centers** which are focal points for economic development.
- ix) It **leads to utilization of natural resources** which would otherwise be idle converting them to finished products.
- x) It **enhances good international relations created** by a trading co-operation.
- xi) It **leads to enhancement of agricultural production** since most industries rely on agriculture for raw materials.

Problems of industrialization in Kenya –kcse 2021

- i) Some industries **lead to displacement of people** disrupting their economic /social life.
- ii) Some industries **emit gases that are toxic** causing harm to human/animals.
- iii) Industrialization leads to **rural-urban migration** increasing urban population hence shortage of houses /congestion /increase in crime rates.

- iv) **Uncontrolled disposal /dumping of industrial wastes** leading to land degradation /pollution.
- v) **Industrial wastes /effluents pollute water sources** making it unfit for human /animal consumption.
- vi) **Fumes emitted** by chemical industries corrode metallic roofs hence destroying them.
- vii) There **is imbalance in economic development** due to concentration of infrastructure /social services in the industrial centers.
- viii) Industrialization may cause **neglect of agriculture sector** leading to shortage of food /importation of food.

Problems facing industrialization in Kenya.

i) Shortage of raw materials –kcse 2019

- **Agricultural raw materials fluctuate** with seasons/may be perishable hence the industries may have inadequate raw materials during low seasons/ due to spoilage.
- Some industries relying on **natural resources** suffer closure/low production when the natural resources get exhausted.
- Industries relying on **imported materials** face shortage when the allocation for importation is restricted.
- **Political differences** between /within countries may lead to limited supply of raw materials to the rival/ in the country leading to shortage.

ii) Inadequate skilled manpower –kcse 2019

- Kenya has limited **industrial culture /education** to impart relevant skills for industrialization.
- Kenya rely on **expatriates** who are expensive to hire/maintain/ unreliable.
- Kenya has inadequate **managerial skills** to run industries resulting to mismanagement /embezzlement of funds.
- Kenya suffers from **brain drain** that slows down industrial development.

iii) Inadequate capital

- Inadequate capital for industrial development forces a country to get loans from IMF/world bank whose interest rates are very high.

iv) Limited markets

- Local market for industrial goods is not sufficient to sustain production due to low purchasing power.

v) High cost of energy

- High cost of energy reduces profit margins thereby discouraging investors.

vi) Competition from cheap imports.

- Locally produced goods compete with imported goods which are cheaper leading to the decline/closure of local industries.

vii) Industrial unrest

- Workers may strike due to poor working conditions /low pay interfering with production.

viii) Underdeveloped transport/communication networks

- Impassable roads hinders the transportation of raw materials to the industry or finished products to the market.

ix) Mismanagement of industries

- Some industries are poorly managed leading to their closure.

x) Low level of technology

- Low level of technology in industrialization limits its development /expansion.

COTTAGE INDUSTRY IN INDIA.

A **cottage industry** is one whose labour force consists of people working at home with their own tools /simple machinery.

Major concentration areas are:- Mumbai/ Lucknow/ Gujarati/ Calcutta/ Bhopal/ Bangalore/ Jabalpur/ Magpur.

Examples of cottage industries in India –Making clothes/ pottery/ weaving / brassware/ silverware/ ornamental ivory / jewellery/ carpets making / handicrafts / trinkets.

Characteristics of cottage industry in India –kcse 2022

- The level of capital investment is relatively low/ requires little capital.
- They are labour intensive.
- Simple tools/ equipment are largely used in production.
- Raw materials are mainly locally sourced/ locally available/ recycled.

- v) Products are for domestic/ external market.
- vi) The crafts person are highly skilled.
- vii) The finished products are relatively cheap.
- viii) Workshops are widespread/ located in homes.
- ix) Industries are owned by individuals/ family/ groups.

Factors that favour development of cottage industry in India.

- i) The industry **requires little capital** outlay to establish.
- ii) India has a huge population which ensures a steady supply of **cheap labour**.
- iii) India **has abundant supply of locally available raw materials** which are used in the cottage industry.
- iv) **Availability of H.E.P** which is well distributed within the rural towns.
- v) The industry can **be established anywhere** e.g. people's homes or small rented rooms.
- vi) Majority of **Indians are skilled weavers** and ornamental ware workers.
- vii) Availability of **simple and affordable tools** and machines.
- viii) **The high demand for products** in the popular sub-continent has led to the development of the industry.
- ix) **The urge of the people to earn an income** in order to uplift their living standards.

Significances of cottage industry India.

- i) It creates **employment opportunities** to people raising their living standards.
- ii) It leads to **utilization of locally available raw materials** or recycle waste materials.
- iii) It earns **a country foreign exchange** through the exportation of her products.
- iv) It **reduces rural –urban migration** hence helps to check the influx of people to urban areas.
- v) It **produces cheap products** than those produced in the formal industries.
- vi) It produces **affordable products** to meet the demands of people.
- vii) It leads to **diversification of the economy** from agriculture.

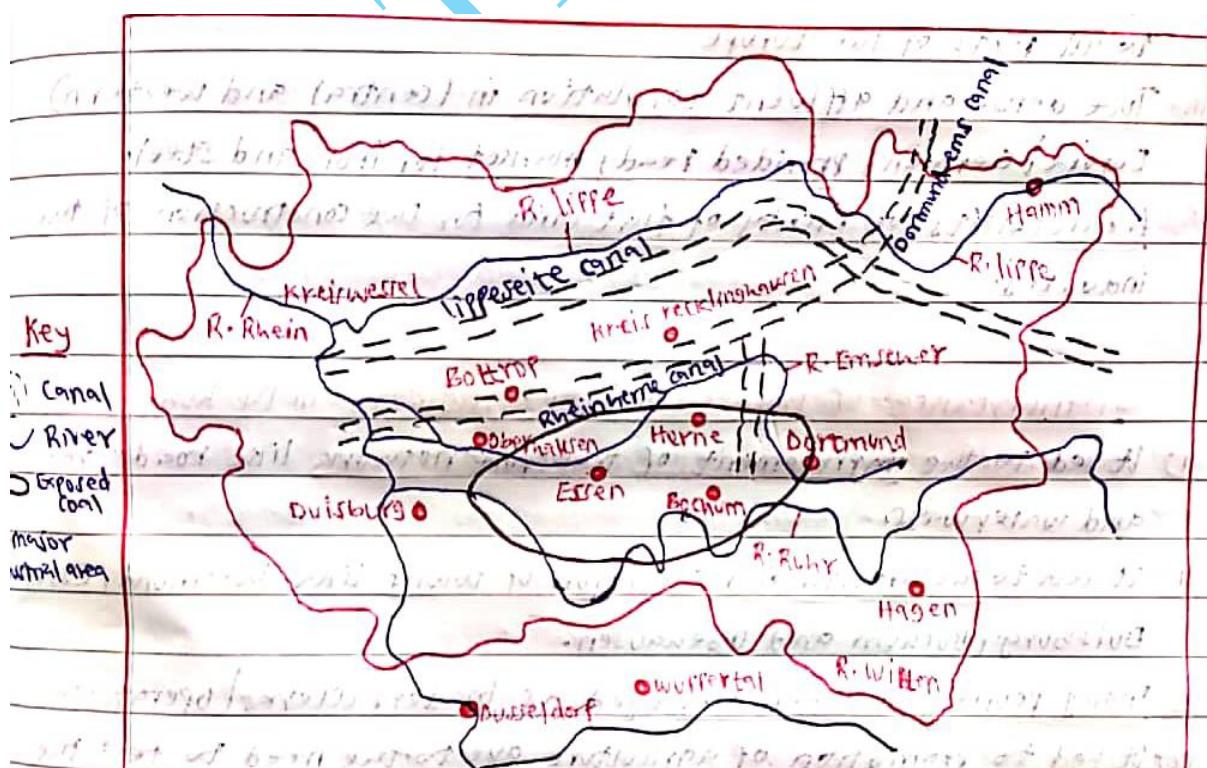
Problems facing cottage industries in India.

- i) **Inadequate capital** to purchase raw materials and run the industry has affected the industry.
- ii) **Stiff competition** for market from factory manufactured products.
- iii) **Exploitation of the artisans** since middlemen sell the raw materials at high prices to the artisans.
- iv) **Difficulty in obtaining raw materials** at an affordable prices.
- v) **Difficulty in making some products** due to simple tools used.

Major industrial regions of the world

- i) The Ruhr region of Germany.
- ii) The Pittsburgh –Eastern states of USA
- iii) The Moscow area of Russia.
- iv) Tokyo –Yokohama region of Japan.
- v) South-East England in Britain.
- vi) The Rotterdam area in the Netherlands.

Iron and steel industry in the Ruhr Region of Germany.



Raw materials for iron and steel industry.

- ✓ Coal
- ✓ Iron ore
- ✓ Limestone.

Examples of industries in the Ruhr region of Germany.

- ✓ Iron and steel industry.
- ✓ Textile manufacturing.
- ✓ Chemical manufacturing.
- ✓ Ship building industry.
- ✓ Cement factories.
- ✓ Paper manufacturing.
- ✓ Car manufacturing.

Factors which influenced the location of iron and steel industry in the Ruhr region of Germany –kcse 2009

- i) **Availability of coal /iron ore /limestone from the Rhine valley provided raw materials needed in the industry.**
- ii) **Presence of rivers Rhine /Ruhr/ Lippe provided water required for industrial use e.g. cooling of machines.**
- iii) **Presence of navigable Rhine /Ruhr Rivers and EMS canals provided cheap water transport for the bulky raw materials/finished products.**
- iv) **Coal from Ruhr region/imported petroleum provided power required in the industry.**
- v) **The local population had acquired skills on iron working and this formed the foundation of iron and steel industry.**
- vi) **Presence of rich companies /families like Ruhr khlet krupp which provided capital for the development of industries.**
- vii) **The region is centrally located in Europe which offers easy access to all parts of the Europe.**
- viii) **The dense and affluent population in (central and western) Europe/Germany provided ready market for iron and steel.**
- ix) **Availability of plenty of flat land for the construction of the industry.**

Significance of iron and steel industry in the Rhur region.

- i) It led to the **improvement of transport network** like roads, rail and waterways.
- ii) It led to the **growth and expansion of towns** like Dortmund, Essen, Duisburg, Bochum and Oberhausen.
- iii) **Many people have been employed** as loaders /clerks /operators.
- iv) It led to **promotion of agriculture** due to the need to feed the huge population in the industrial towns.
- v) It led to **provision of social amenities** like schools and hospitals to cater for workers.
- vi) **It is source of foreign exchange** through the exportation of industrial goods.

Problems facing the Ruhr industrial region.

- i) There is environmental pollution from smoke/fumes and solid wastes discharged into the rivers.
- ii) There is congestion and overcrowding in housing and social amenities due to large influx of people.
- iii) Depletion of coal mines due to coal being non-renewable.

CAR MANUFACTURING AND ELECTRONICS INDUSTRY IN JAPAN

Major manufacturing industries in Japan are ship building, chemicals, textile, automobiles (car manufacturing), electronics and iron and steel industry.

Examples of automobile companies in Japan –The Mitsubishi and Toyota motor corporations.

Examples of electronics companies in Japan –Sony & Toshiba.

Major car manufacturing cities –Tokyo, Kobe, Osaka, Chiru, Hitachi.

Car models from Japan in Kenya –Toyota, Honda, Mitsubishi, Daihatsu, Isuzu, Datsun, Suzuki.

Major car manufacturing zone in Japan- kcse 2019

i) Tokyo-Yokohama zone

Has towns like Tokyo, Kawasaki, Hitachi, Chiba & Yokohama.

ii) Osaka-Kobe zone

Has cities like Osaka, Kobe, Kyoto, Nagasaki, Otsu, Akashi and Wakayama.

iii) Nagoya zone

Has cities like Nagoya, Toyota, Honda, Okazaki and Yokaichi.

Factors which have favoured the development of car manufacturing and Electronic industries in Japan -kcse 2019

- i) The country has **adequate capital** from rich families / companies to invest in the car manufacturing and Electronic industries.
- ii) The **advanced technology** has increased efficiency leading to mass production of high quality products.
- iii) **Advanced scientific research** which has led to diverse / high products.
- iv) **Highly developed sources of energy** i.e. HEP / nuclear power provide the power required in the industries.
- v) **Large population with high purchasing power** provides a large local market for cars and electronics.
- vi) The **government policy / peace and stability** has encouraged industrialization.
- vii) **Japan has highly skilled and industrious work force** which has promoted massive production of quality cars/ electronics.
- viii) **The efficient transport system** which eases the transportation of raw materials for industries.
- ix) **The rise of Empire Meiji** who promoted industrial development in Japan.
- x) **The education system** which has given rise to skilled man power / advanced technology.
- xi) **Japan produces fuel saving vehicles / cheap and affordable leading** to high demand for them in the world market.
- xii) **The rugged terrain of Japan** hinders agricultural development making industrialization as an alternative source of income.

- xiii) **Strategic location of Japan** in relation to other countries makes it accessible to leading sea routes.
- xiv) **Japan has many sea ports** which make importation of raw materials and exportation of goods easy.

Significance of car and Electronic industries in Japan.

- i) It **earns Japan foreign exchange** through exploitation of cars and electronic appliance
- ii) It created **employment opportunities** to Japanese improving their living standards.
- iii) It **led to the growth of towns** like Yokohama / Osaka which are focal points for economic developments.
- iv) **It improved transport network** e.g roads/ waterways/ railways.
- v) It led to **establishment of training institutions** like universities, colleges to train personal.

Environmental problems which have resulted from development of car manufacturing industry in Japan.

- i) Environmental pollution i.e. air/ water / noise pollution and this has a negative effect.
- ii) Land pollution has occurred due to dumping of industrial waste on land.
- iii) Traffic congestion i.e. there is shortage of parking space due to increased number of cars produced.
- iv) Over exploitation of the limited raw materials e.g. coal due to increased number of cars produced.
- v) Inadequate housing facilities due to high demand of houses caused by large manpower attracted to the many industries.

FIELD WORK

Form 4 geography class of EGSS carried out a field study about Mumias Sugar Company.

- a) State four factors that led to its location (4 mks)
- b) State five activities carried out in Mumias sugar company (5 mks)
- c) Outline five ways in which you would prepare for a field study (5 mks)
- d) Give four reasons why you would need a route map
- e) Identify four characteristics of a good hypothesis for the study
- f) State three advantages of using the interview method to collect data.

TOPICAL QUESTIONS.

1. Explain three causes of the decline in the textile industry in Kenya (6 mks) –kcse 2003

- ✓ Large scale importation of second hand clothes has reduced demand for locally produced textile products.
- ✓ There is decline in the production of cotton which has led to limited supply of raw materials for the textile industry.
- ✓ Mismanagement of textile factories has led to closure of such operations.
- ✓ Belief that imported garments are superior to locally produced ones has reduced demand for local garments.
- ✓ Decline in economy has discouraged investors who would set up textile industries in Kenya.

2. State four ways in which Kenya has benefited from the motor vehicle assembly industry (4 mks) –kcse 2009

- ✓ Kenyan saves foreign exchange.
- ✓ Kenya earns foreign exchange through motor- vehicles export.
- ✓ The industry has created employment opportunities.
- ✓ The industry has promoted trade links with the neighboring countries.
- ✓ The industry has attracted foreign investors.
- ✓ It has led to the development of skills among Kenyans.
- ✓ It has promoted transport system by availing buses / Lorries / cars.
- ✓ It is source of government revenue through taxation.

3. Why is Kenya's oil refinery located in Mombasa (2 mks) –kcse 2016

- ✓ It is easier to transport refined petroleum products than crude hence the need to process crude oil at the point of entry.
- ✓ Crude oil – the raw material for the refinery comes by sea / cheaper to transport to the port of Mombasa.
- ✓ Nearness to the source of raw material.
- ✓ Mombasa is the only port of entry.

4. a) Define industrial conurbation (2 mks)

This is a big industrial landscape formed due to joining together of many industrial towns.

b) Give three examples of industrial conurbation in the world (3 mks)

- ✓ The Ruhr region of Germany.
- ✓ The Pittsburg of USA.
- ✓ Tokyo – Yokohama of Japan.

- ✓ The Moscow area of Russia.
- ✓ The Rotterdam area of the Netherlands.

5. What efforts have been made to decentralize industries in Kenya? (3 mks)

- ✓ By providing part of capital for industries located in rural areas.
- ✓ By providing cheap land for industrial sites.
- ✓ By offering lower interest rates on bank loans to industrialists.
- ✓ By constructing roads in rural areas making them accessible.
- ✓ By improving security in rural areas.

6. Explain three factors that hinder decentralization of industries -kcse 2000

- ✓ Collapse of previous industries in rural areas discourage fresh investments in similar industries.
- ✓ Insecurity in some areas discourage investment in such areas.
- ✓ Some industries depend on each other hence difficult to separate them.
- ✓ Low market in rural areas discourages investors from locating industries away from urban centers.
- ✓ Some private sectors are discouraged by impassable roads.

7. Explain three ways through which industries will contribute to achievement of vision 2030 in Kenya.

- ✓ More industries will create **employment opportunities** to Kenyans improving their living standards.
- ✓ The government will export manufactured goods **earning more foreign exchange** used for economic development.
- ✓ More industrial goods will help reduce importation of similar goods hence **save foreign exchange**.
- ✓ More industries will provide **more revenue** to the government through taxation providing much-needed services to Kenyans.
- ✓ More industries will provide **more market for agricultural raw materials** hence farmers are able to improve their standards of living.
- ✓ Development of industries will require **construction of more roads / railways / air connections** opening up the country.

“END OF TOPIC SIX”

- Transport is the physical movement of goods/ people from one place to another -kcse 2022
- Communication is the transmission of ideas/ information from one person to another – kcse 2019

Modes of Transport.

- They are medium on which movement of people/ goods take place.
- They include;
 - Land transport.
 - Water transport.
 - Air transport.

1. Land Transport.

- It involves movement of goods/ people using units of carriage that move on dry land.
- **Means of transport are;** -kcse 2021
 - Human/ animal transport.
 - Road transport.
 - Railway transport.
 - Pipeline transport.

Advantages of Human and animal transport.

- i) It is cheap.
- ii) Relatively safe.
- iii) Does not pollute the environment.
- iv) They are flexible.
- v) They are convenient/ readily available.

Disadvantages of human and animal transport.

- i) They are very slow.
- ii) They cannot transport large quantities of goods.
- iii) Goods can be stolen or destroyed by wild animals and extreme weather conditions.
- iv) They can cause congestion on busy urban roads.

Road Transport.

- It is the movement of goods/ people on roads using means like vehicles/ bicycles/ motor cycles.

Types of roads.

- i) **All weather roads-** Are used all year round i.e. tarmac and murram roads.
- ii) **Dry weather roads-** Are used/ reliable during dry seasons.
- iii) **Motorable trucks-** Are used by people on foot and by vehicles on dry season.

NOTE: - A **truck** is a path/ rough road made by people/ vehicles/ animals.

- A **by-pass** is a road/ highway that avoids passing through a town/ residential area in order to avoid traffic jams.
- A **two way road** is a road divided into two with a yellow line and traffic flows into two opposite ways.

- **A one way road** is a double carriage where roads are built parallel to each other and on each road traffic flows in one direction.

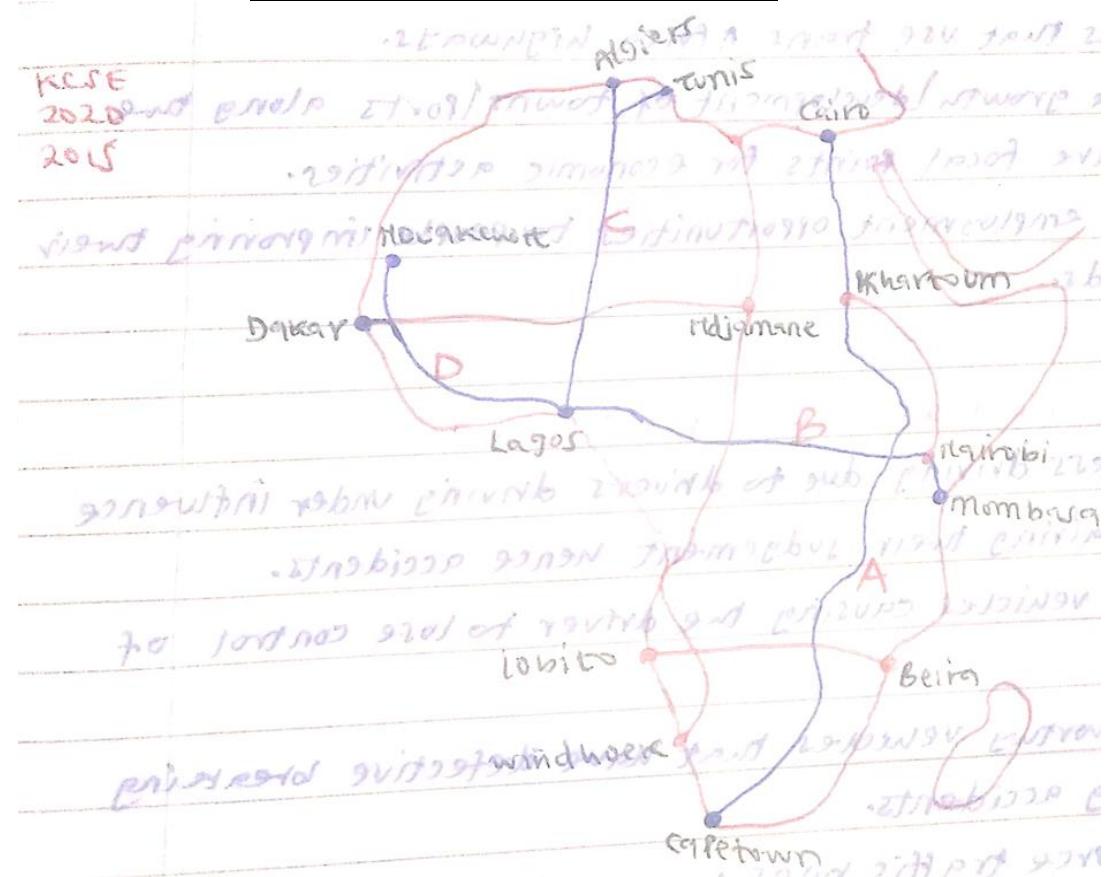
Advantages of road transport -kcse 2020

- i. It is cheaper to establish/ maintain compared to other means of land transport.
- ii. It is flexible/ offers door to door services.
- iii. It can be repaired/ built in stages while being used/ stepwise development.
- iv. It is relatively fast over short distances.
- v. It is widespread/ opens up remote areas.
- vi. It has an open schedule use/ can be used any time.
- vii. It is relatively cheap over short distances.
- viii. It accommodates a wide variety of vehicles.
- ix. It can be developed with low technology.
- x. It complements other means of transport.

Disadvantages of road transport.

- i. Roads are expensive to maintain.
- ii. It is expensive to transport bulky goods over long distances.
- iii. It suffers from traffic jams and congestion.
- iv. It is prone to theft/ robbery of goods on transit/ carjacking.
- v. It is prone to accidents.
- vi. It is affected by certain weather conditions like fog/ flooding.
- vii. Vehicles can lead to environmental pollution from their exhaust pipes.
- viii. Not convenient for transporting perishable goods over long distances.

Trans-continental Highways in Africa.



Key:

- A-** The Great North Road- connects Capetown and Cairo.
- B-** Trans- African highway- connects Port of Mombasa and Dakar.
- C-** Trans- Saharan highway- connects Lagos and Tripoli through Algeria.
- D-** West-highway- connects Lagos and Nouakchatt

Other proposed trans-continental highways –kcse 2010

- i) Proposed Windhoek- Tripoli highway.
- ii) Proposed Lobito- Beira highway.
- iii) Proposed Nairobi- Addis Ababa highway.
- iv) Proposed Dakar- Ndjamena.

Benefits of Trans Africa highway to the economies of Africa –kcse 2022

- i. It has encouraged **trade/agriculture** in countries along the highway by providing cheap means of transport.
- ii. It allows **quick movement of goods/ services/ people** from one place to another among the African countries.
- iii. It has encouraged cheap/ easy movement of raw materials/ finished products which have facilitated **growth of industries**.
- iv. It provides **quick/ fast links** between the African countries hence promoting trade/ dissemination of information.
- v. The countries along the highway earn **revenue** from toll charges levied on trucks that use Trans African highways.
- vi. It has led to the growth/ development of **towns/ ports** along the highway which are focal points for economic activities.
- vii. It has created **employment opportunities** to people improving the living standards.

Causes of road accidents in Kenya.

- i. **Careless/ reckless driving** due to drivers driving under influence of alcohol/ impairing their judgement hence accidents.
- ii. **Overloading of vehicles** causing the driver to lose control of their vehicles.
- iii. **Driving unroadworthy vehicles** that have defective breaking systems causing accidents.
- iv. **Failure to enforce traffic rules** hence allowing defective vehicles on the roads.
- v. **Narrow roads/ poorly maintained roads** with potholes leading to accidents due to congestion.
- vi. **Corruption in the traffic department** leading to unqualified people being issued with driving licences exposing other road users to accidents.

Conditions of roads in Kenya that may lead to accidents –kcse 2012

- i. **Some roads have potholes/** uneven road surface which may cause tyre burst/ vehicle breakdown hence accidents.
- ii. **Some roads are steep** which may cause vehicle to overturn hence accidents.
- iii. **Some roads have sharp bends** which may make drivers lose control of vehicles.
- iv. **Some roads are slippery** which may cause vehicles to slide/ overturn.
- v. **Some roads are not marked/** absence of road signs may make drivers to lose control and crash.
- vi. **Some roads have loose surface** may cause vehicles to slide/ overturn.
- vii. **Some roads are dusty** which may reduce visibility leading to accidents.

- viii. **Some roads are narrow** which may lead to heavy traffic limiting ease of movement/overtaking.

Reasons why road transport is more developed than railway in Africa/ Kenya/ East Africa –kcse 2004

- i. **Roads are cheaper to construct/** maintain than railways.
- ii. **Roads are more flexible/** provide door to door services unlike railways that use a rigid line.
- iii. **Roads** can be used by a wide range of transport agents/ they **are versatile**.
- iv. **Roads are a faster means** of transporting goods/ people than railways.
- v. **There is a high demand for road transport** than railway transport.
- vi. **The high cost of constructing railway** in comparison to roads discourage railway transport.
- vii. **Skills of road construction are less involving** as compared to railways where different gauges are constructed.
- viii. **Roads carry small quantities of goods, this promotes small scale business** to most areas as opposed to railway.
- ix. **Roads are more suitable for short distances** than railways.

Efforts made to improve road transport in Kenya –kcse 2007

- i. **Construction of highways** to accommodate more traffic and improve traffic flow e.g. Thika super highway/ Trans Africa highway.
- ii. **Construction of by-passes/** sub-ways/ fly overs/ tunnels underpasses to reduce congestion/ improve traffic flow.
- iii. **Rehabilitation/ repair and maintenance of major roads** to reduce road accidents and improve traffic flow.
- iv. **Educate road users on road safety/** precautions/ discipline on roads to ease traffic/ reduce road accidents.
- v. **Enforcing traffic rules** by creating highway patrol unit to reduce road accidents and ensure regular traffic flow.
- vi. **Provide paths for cyclists/ pedestrians** to reduce congestion on roads/ improve road safety.
- vii. **Control of loads carried by trailers and large trucks** by traffic police to reduce damage to roads.
- viii. **Diversification of the means of transport** like introduction of electric trains.
- ix. **Sourcing for funds from international money lenders** to improve road transport.
- x. **Establishment of regional economic blocs** like COMESA/ EAC which cooperate in improving road transport.

Benefits that would result from improving the conditions of roads in rural areas in Kenya – kcse 2022

- i) It would encourage setting up of industries/ growth of tourism.
- ii) It would encourage the setting up/ improvement of social amenities.
- iii) It would attract investors/ encourage diverse investments/ improve trade.
- iv) It would encourage effective exploitation of agricultural/ mineral forest resources.
- v) It would lead to growth/ development of urban centres.
- vi) It would enhance access to security services.
- vii) It would lead to creation of more employment opportunities.

Factors hindering development of road transport.

- i. **Limited advanced technology** causes substandard works on roads causing potholes on roads.
- ii. **Inadequate capital** for the construction of new roads/ maintain existing roads.
- iii. **Harsh weather conditions** during rainy season causes floods/ make dry weather roads muddy hence impassable.
- iv. **Presence of physical barriers** like mountains/ escarpments that make road construction difficult/ expensive.
- v. **The absence of resources** in some parts of Kenya/ sparse population with few economic activities making road construction non-viable.

Problems facing road transport in Africa.

- i. **Insecurity/ civil wars** in some countries makes road construction difficult hindering flow of goods/ people.
- ii. **Inadequate capital involved in road construction** as many countries are developing thus giving priority to other sectors of economy.
- iii. **Different political ideologies/** misunderstanding between some countries makes road construction difficult.
- iv. **Impassable roads** results into many road accidents hence heavy loses to the countries concerned.
- v. **Some countries have not constructed their sections of highways** making transport difficult.
- vi. **Some highways pass through areas with sparse population/** with no resources making road networks uneconomical.
- vii. **The weight allowed to be transported on different roads on the continent varies** making it difficult to adjust their trailers/ tankers loads hindering business.

Railway Transport.

- It is the movement of goods/ people on rails using trains.

Advantages of railway transport –kcse 2021

- i. It is convenient for transporting variety of goods.
- ii. It is used to carry bulky/ heavy goods.
- iii. It is more efficient/ reliable due to fixed time schedule/ no traffic jams.
- iv. The trains are less prone to accidents.
- v. It has low maintenance cost/ cheap mode of transport.
- vi. The railway lines uses little land space.
- vii. Electric trains are faster.
- viii. It is less affected by weather changes.

Disadvantages of railway transport.

- i. Some trains are slow taking several hours to reach destination.
- ii. It is very expensive to construct railway lines in areas of hilly terrain.
- iii. It is expensive to buy and maintain trains.
- iv. It is difficult for trains of one country to use the rails of a different country.
- v. It is inflexible/ cannot offer door to door services.
- vi. Trains cannot use rails while they are being constructed.

Examples of Railway lines in Africa.

- i. **Tazara Railway**- connects Zambia copper belt with the sea port of Dar-es-salaam.
- ii. **Benguela Railway**- run from Zambia copper belt to Angola.
- iii. **Kenya- Uganda Railway**- runs from Mombasa to Kisumu with an extension from Nakuru through Eldoret to Malaba then through Tororo to Kampala.
- iv. **Kenya's other railway branches** are Voi to Taveta, Konza to Magadi, Nairobi to Nanyuki, Gilgil to Nyahururu, Nakuru to Eldoret and Kisumu to Butere.

Factors that hinder development of railway links among African countries –kcse 2001

- i. African countries have railways of different gauges which makes it difficult to link them.
- ii. Administration by different colonial governments who constructed railway lines only within areas of their jurisdiction.
- iii. Different political ideologies/ political instability among African countries hinder efforts to construct railway lines to link them.
- iv. Inadequate capital limits the construction of new railway lines/ maintenance of railways.
- v. Most parts of Africa are economically unproductive thus it would be uneconomical to link railways.
- vi. Competition from/ presence of other means of transport has led to neglect of railway transport.
- vii. Limited trade links due to production of similar goods makes it unjustifiable to construct railway lines.
- viii. Variation in the terrain like mountain landscape has hindered the linkage of the railways due to high cost involved.

Problems facing railway transport in Africa –kcse 2016/ 2017

- i. It faces stiff competition from the faster/ flexible means of transport leading to underutilization of facilities.
- ii. African countries have inadequate capital making it difficult to extend/ maintain existing railways.
- iii. Vandalism/ uprooting of the railway lines cause great losses/ delays in transportation.
- iv. Tropical storm waters at time wash away vital sections of the railway lines thereby disrupting transport.
- v. Fuelling/ maintenance of railway stations and other related overhead costs are high thus reducing profit margins.
- vi. Mismanagement of rail services.
- vii. African countries use of different railway gauges which makes it difficult to have an integrated railway system.

Quick Quizzes.

1. State five benefits of standard railway gauge (SGR) construction in Kenya (5mks).
2. Explain four advantages of railway transport over road transport (8mks).

Pipeline Transport.

- It is the movement of fluids/ gas products like water/ gas/ oil/ petrol/ diesel through pipes from one place to another.

Advantages of pipeline transport.

- i) It is a cheap means of transport as it requires little maintenance.
- ii) It is a safe means of transporting liquids.
- iii) It does not suffer from traffic congestions/ delays.
- iv) It is a reliable and convenient means of transporting highly inflammable products like petroleum.
- v) It is not affected by any weather conditions.
- vi) The cost of maintaining/ operating pipelines is lower.
- vii) It can be used over varied surfaces/ beneath the ground.
- viii) It is a faster means of transporting liquids.

Disadvantages of pipeline transport.

- i. It is selective i.e. only one type of product is transported at a time.
- ii. It may cause pollution in case of leakages.
- iii. It is prone to sabotage in case of war.
- iv. It is not flexible and it cannot serve immediate locations.
- v. It can cause excessive loss in case of leakage/ fire.

Reasons why the government of Kenya is expanding pipeline transport –kcse 2012

- i. To reduce congestion on roads.
- ii. To reduce damage on roads by tankers.
- iii. To reduce congestion of oil terminus.
- iv. Pipeline transport is cheaper compared to road transport.
- v. Pipeline transport is more reliable/ convenient than road.
- vi. Faster means of transporting oil/ water/ gas.
- vii. To minimize environmental pollution by tankers using the roads to transport petroleum products.
- viii. To reduce contamination/ wastage/ loss of oil products while being transported.
- ix. It transports larger volumes of oil/ water/ gas.

2. Water Transport.

- It involves the movement of goods/ people over waterways/ waterbodies like rivers/ lakes/ oceans/ seas.

Types of water transport –kcse 2017

- i) Inland water ways e.g. rivers/ lakes/ canals –kcse 2012
- ii) Ocean/ Sea/ Marine waterways.

Examples of navigable rivers in Africa.

- ✓ River Nile.
- ✓ River Zambezi.
- ✓ River Congo.
- ✓ River Tana.
- ✓ River Niger.

Examples of lakes which are inland waterways.

- ✓ Lake Victoria
- ✓ Lake Tanganyika
- ✓ Lake Malawi
- ✓ Lake Albert

- ✓ Man-made lakes like Kariba, Nasser, Volta, Kainji.

Reasons why most rivers in Africa are not fully navigable.

- The presence of floating vegetation which blocks the river channels hindering navigation.
- The seasonal fluctuation of the water regime which hampers/ impedes the movement of the water vessels.
- The siltation of the river courses which reduces their ability to accommodate large water vessels/ ships.
- The presence of waterfalls along the rivers which hinders the movement of water vessels.
- The rivers are shallow and fail to accommodate large water vessels.
- The steep gradient of the slope through which certain rivers flow making them unsuitable for navigation.
- The outcrops/ obstacles along the rivers which hinders the movement of water vessels/ ships.

Factors that have hindered development of river transport in Africa –kcse 2007

- Low level of technology** hinders the process of developing river transport.
- The presence of waterfalls and rapids** which hinders the movement of vessels.
- Many rivers in Africa are short/ too shallow/ too swift/ narrow** making it difficult to navigate on those rivers.
- Presence of floating vegetation** makes it difficult for vessels to sail on the river.
- Silting at the river mouths** hinders the development of river ports.
- Inadequate capital** in the African countries to be used in the development of waterways/ ports/ purchasing of vessels.
- Different political ideologies/ misunderstanding** hinders development of river transport for those rivers that are boundaries.
- Most rivers in Africa pass through unproductive areas** hence it is uneconomical to develop the rivers.
- The seasonal fluctuation of water regime** makes it difficult for water vessels to sail.

Measures taken to improve inland water transport in Africa –kcse 2011

- Dredging waterways regularly** to control siltation/ maintain constant depth of the rivers/ lakes for easier navigation.
- Constructing dams** to control flooding hence allowing navigation.
- Constructing canals** where waterfalls/ rapids/ rock outcrops exist to by-pass obstacles that hinder navigation.
- Controlling the growth of floating vegetation** to allow the free movement of vessels.
- Using modern vessels/ equipment/ ports** to improve the efficiency of handling cargo/ passenger service.
- Removal of rock obstacles from rivers bed** to allow navigation.

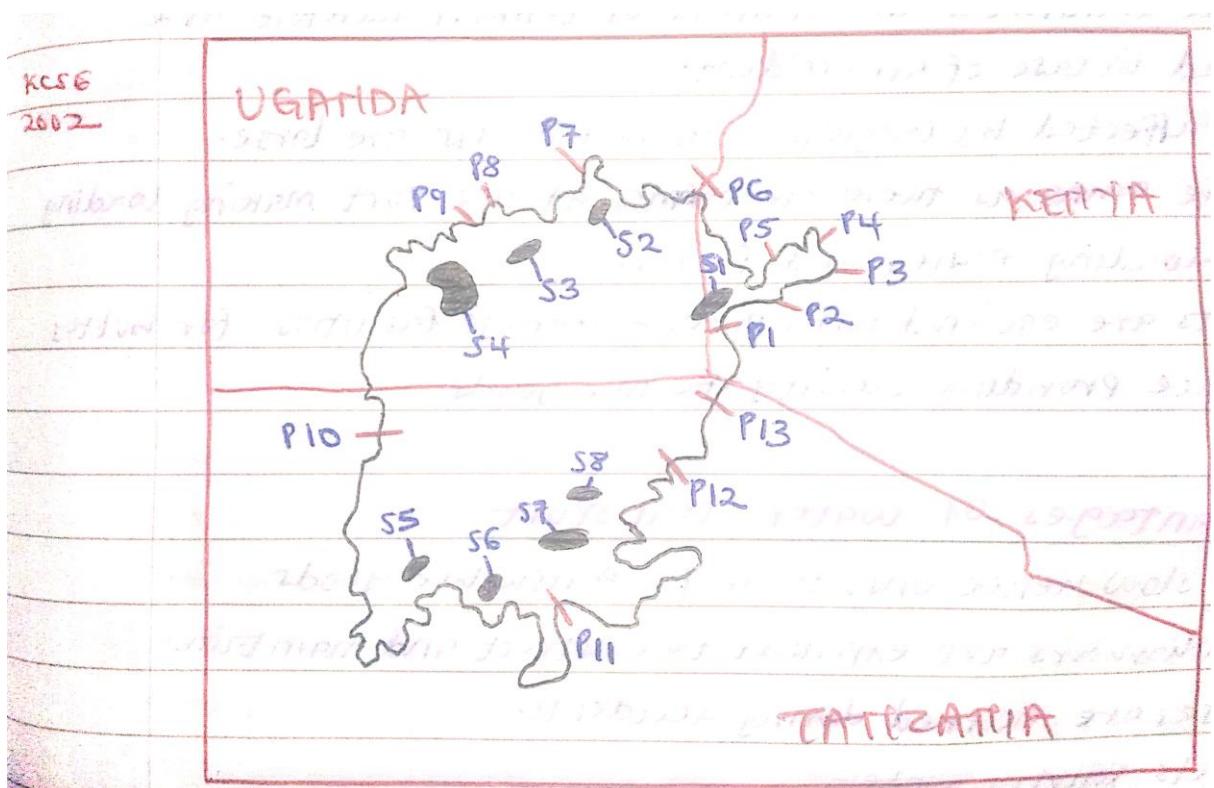
Canal Transport.

- **A canal** is a water channel that is cut through land for boats/ ships to travel along.
- Some canals join large waterbodies like sea/ oceans.
-

Examples of canals.

- **Suez Canal** which joins Mediterranean and Red sea.
- **Panama Canal** which connects Caribbean.
- **Dortmund-Ems Canal** which joins R. Rhine to the N. sea.
- **Soo Canals** which connects L. Superior and L. Huron.

Examples of ports on Lake Victoria.



Ports.

Kenya- P1- Mbita
P2- Homa bay
P3- Kendu bay
P4- Kisumu
P5- Asembo

Uganda- P6- Majanji
P7- Jinja
P8- Port bell
P9- Entebbe

Tanzania- P10- Bukoba
P11- Mwanza
P12- Musoma
P13- Shirati

Island.

Kenya- S1- Mfangano Island.

Uganda- S2- Buvuma island.
S3- Kome island.
S4- Bugala island.

Tanzania- S5- Maisome island.
S6- Kome island.
S7- Ukerewe island.
S8- Ukora island.

Advantages of water transport.

- i. It does not require much capital to establish.
- ii. It is cheap means of transporting bulky goods over long distances.
- iii. Goods are transported in containers/ tankers therefore are protected in case of an accident.
- iv. It is not affected by congestion as waterways are large.
- v. It is time saving as there are cranes at the port making loading and off-loading easier and faster.
- vi. Many ports are equipped with proper storage facilities for bulky goods hence providing security to the goods.

Disadvantages of water Transport.

- i. It is very slow hence unsuitable for perishable goods.
- ii. Ports and harbours are expensive to construct and maintain.
- iii. Great loses are incurred during accidents.
- iv. Sea vessels pollutes water.
- v. Insecurity in the oceans where pirates steal and attack sailing ships.
- vi. Water transport is only available to people who live near waterways.
- vii. Most navigable rivers/ lakes/ seas are found in areas of low economic value.
- viii. Inland waterways like rivers have waterfalls/ rapids/ floating vegetation which hinders navigation.

Containerization.

- It is the packing of goods in standardized containers designed for use in transporting cargo.
- **Container depots in Kenya are** Mombasa, Nairobi, Eldoret, and Kisumu.

Advantages of containerization –kcse 2002

- i. It reduces theft of goods as containers at the point of origin are sealed.
- ii. There is maximum utilization of space as a lot of goods are carried by a single container.
- iii. There are specialized containers to transport goods requiring special handling e.g. refrigerated containers.
- iv. There is efficient utilization of space due to usage of standard containers that are regular in shape.
- v. It reduces damage of goods as the goods are protected from adverse weather conditions.
- vi. It speeds up the speed of handling goods hence saving time at the port and reduce storage charges.
- vii. It is relatively cheaper as it requires little labour in handling i.e. use of a folk lift to load and off load it.
- viii. Loading and off-loading is easy as there are specialized cranes used saving on labour.
- ix. The movement of containers is relatively easy as they are fitted with locks which assist in their handling.

Disadvantages of containerization.

- i. High capital investment is required in the manufacture/ purchasing of containers.
- ii. It is unsuitable for small quantities of goods for profitability to be achieved.
- iii. The use of containers has led to unemployment due to increased use of machines.
- iv. Containers are unsuitable to carry certain types of goods e.g. irregular shaped goods.

- v. The method of carrying goods requires organization and management skills to keep track of the containers.

Reasons why containers are suitable in transporting cargo over long distances.

- i. It is easy to load and off load the containers.
- ii. The goods are not susceptible to any damage.
- iii. It is time saving to load and off load the containers.
- iv. The safety of goods is high reducing transport costs.
- v. Containers occupy less space because they are of specific shape.

3. Air Transport.

- It involves the movement of people and goods in air by aeroplanes/ flights/ helicopters.

International airports in Kenya –kcse 2022

- ✓ Jomo Kenyatta International Airport.
- ✓ Moi International Airport.
- ✓ Eldoret International Airport.
- ✓ Kisumu International Airport.
- ✓ Wajir International Airport.
- ✓ Isiolo International Airport.
- ✓ Malindi International Airport.

Advantages of Air Transport –kcse 2022

- i) Air transport is faster/ quicker.
- ii) It is more efficient in transporting perishable goods.
- iii) It is free of traffic congestion/ less traffic congestion.
- iv) Helicopters can land in remote areas/ inaccessible areas.
- v) Planes can be used for variety of activities/ spraying of farms/ emergency services.
- vi) There are fewer accidents/ safer.
- vii) Air transport is more comfortable over longer distances.

Disadvantages of Air Transport.

- i. It is expensive in terms of fare, maintenance and establishment.
- ii. It requires highly trained personnel and training such personnel is expensive and not easily available.
- iii. High risk of accidents/ when accidents occur, they lead to great losses of life and damage to property.
- iv. Risk of piracy. Terrorist attack and risks of hijacking may occur leading to loss of property and lives.
- v. It is prone to poor weather conditions i.e. poor visibility/ sudden pressure change/ storms may cause delays or even crashes.
- vi. It has a limited carrying capacity/ aircrafts space is limited making it expensive to transport goods.
- vii. Uneven distribution of airports due to high cost of establishing them makes it unable to be used in parts of the world.
- viii. Inflexibility of the airports/ air transport can only be used in areas served by airports/ air strips.

Problems facing air transport in Africa.

- i. High cost of running and establishing airlines has discouraged the development in Africa.
- ii. Political differences among African countries restrict free movement of people among the African countries.
- iii. Inadequate facilities at most of the airports due to inadequate capital by African countries.
- iv. Stiff competition from other means of transport which are cheaper and more convenient.
- v. Air transport has limited carrying capacity while most African countries produce goods that are heavy and bulky hence air transport is unsuitable means of transport.
- vi. Air transport requires high technology in handling equipment and other airport operations which is not available among African countries.

Benefits of air links/ international airports to Kenya.

- i. It has led to the growth of the tourism industry by transporting tourists to areas of interest in Kenya.
- ii. It has led to promotion of international cooperation as people interact.
- iii. Air freights encourage international trade.
- iv. The country earns foreign exchange from landing fees and other charges.
- v. It promotes horticultural exchange by transporting fresh produce and flowers to the international markets.
- vi. It enables cultural exchange by Kenyans interacting with other people of the world within a short time.
- vii. It has created employment opportunities to Kenyans improving their living standards.
- viii. It helps to generate revenue through taxation of goods and passengers at the air ports.

Efforts Kenyan government has taken to improve air transport –kcse 2015

- i. Expansion of existing airports/ improvement of airport facilities/ construction of airports to cope with increased air traffic.
- ii. Training personnel in modern aviation technology/ hiring trained personnel to improve service delivery.
- iii. Promoting budget flights/ package tours to lower the cost of travel/ lower operational costs/ encourage people to use air transport.
- iv. Enhancing security around the airports to reduce crime/ lower accidents risks.
- v. Installing modern aviation equipment to increase efficiency in service delivery.
- vi. Encouraging partnership with established airlines in order to get capital for expansion of air transport.
- vii. Promotion of domestic air transport to minimize use of airport facilities.
- viii. Acquisition of modern aircrafts to match international competition.

Assignment.

1. Explain five roles of transport in the economic development of Africa (10mks).
2. Explain five problems facing transport in Africa (10mks)
3. Explain five efforts being made to solve the problems facing transport in Africa (10mks)

COMMUNICATION.

- It is the process of passing information between two or more persons –kcse 2019

Types of communication.

- i. **Oral/ verbal communication**- transmission of information by the word of mouth e.g. face to face.
- ii. **Written communication**- transmission of information by writing e.g. letters, magazines, newspapers and journals.
- iii. **Audio-visual communication**- transmission of information by using sounds, signs and pictures e.g. television.
- iv. **Sign language**- transmission of information using signs.

Telecommunication.

- It is the process of passing information between two or more persons over long distances.
- **Examples;**

- ✓ Telephone
- ✓ Cellular phone
- ✓ Facsimile
- ✓ Internet
- ✓ Telex services
- ✓ Paging services
- ✓ Telegraphic services

Mass communication.

- It is the transmission of information used to reach a very wide audience.
- **Types of mass communication** –kcse 2019

- ✓ Radio
- ✓ Television
- ✓ Internet
- ✓ Newspapers/ magazines
- ✓ Films/ videos
- ✓ Billboards/ posters/ banners
- ✓ Flyers

Role of communication in the economic development of Africa –kcse 2019

- i. Communication enhances **trade** in that traders are able to communicate to get raw materials/ to sell their products.
- ii. Many people are **employed** in the communication sector leading to improvement in their standards of living.
- iii. It has helped in promoting international/ domestic **tourism** leading to gain in foreign exchange/ revenue.
- iv. Governments are able to **disseminate information** through the media for suitable economic responses.
- v. It promotes **international relations** which enhances trade between Africa and other continents.
- vi. It enhances **political stability** for economic growth.

Problems facing communication in Africa –kcse 2019

- i. Varied physical landscape that hinders construction of communication lines.
- ii. Vandalism of communication equipment hinders communication.
- iii. Inadequate capital to install communication equipment.
- iv. Inefficient/ obsolete communication systems.
- v. Language barrier due to diverse ethnic backgrounds.
- vi. Inadequate communication facilitates.
- vii. Destruction of communication facilities in some African countries due to civil wars/ terrorism.
- viii. Political interference.
- ix. Low technological knowhow.
- x. Inappropriate legislation on communication.
- xi. Inadequate skilled labour.
- xii. High tariffs/ charges.

Efforts being made to solve the problem facing communication in Africa –kcse 2019

- i. **Liberalization of communication sector** leading to modernization of the communication systems.
- ii. **Establishment of trading blocs** which have created favourable conditions for improving communication between member states.
- iii. **Installing wireless telephone** which are less prone to vandalism.
- iv. Many African countries have **established satellites facilities/ radios/ televisions boosters** in order to improve communication.
- v. Many African countries are **adopting international languages** like French/ English/ Kiswahili in order to reduce language barrier.
- vi. Many African countries are **training personnel on modern skills of communication**.
- vii. **Appropriate legislations** are being put in place to facilitate communication.
- viii. **Encouraging entrepreneurs** to invest in the communication.
- ix. **Lowering tariffs** to make communication affordable.
- x. **Establishing peace missionary** to restore political stability thus enhancing development.

Recent developments to improve communication in Kenya –kcse 2001

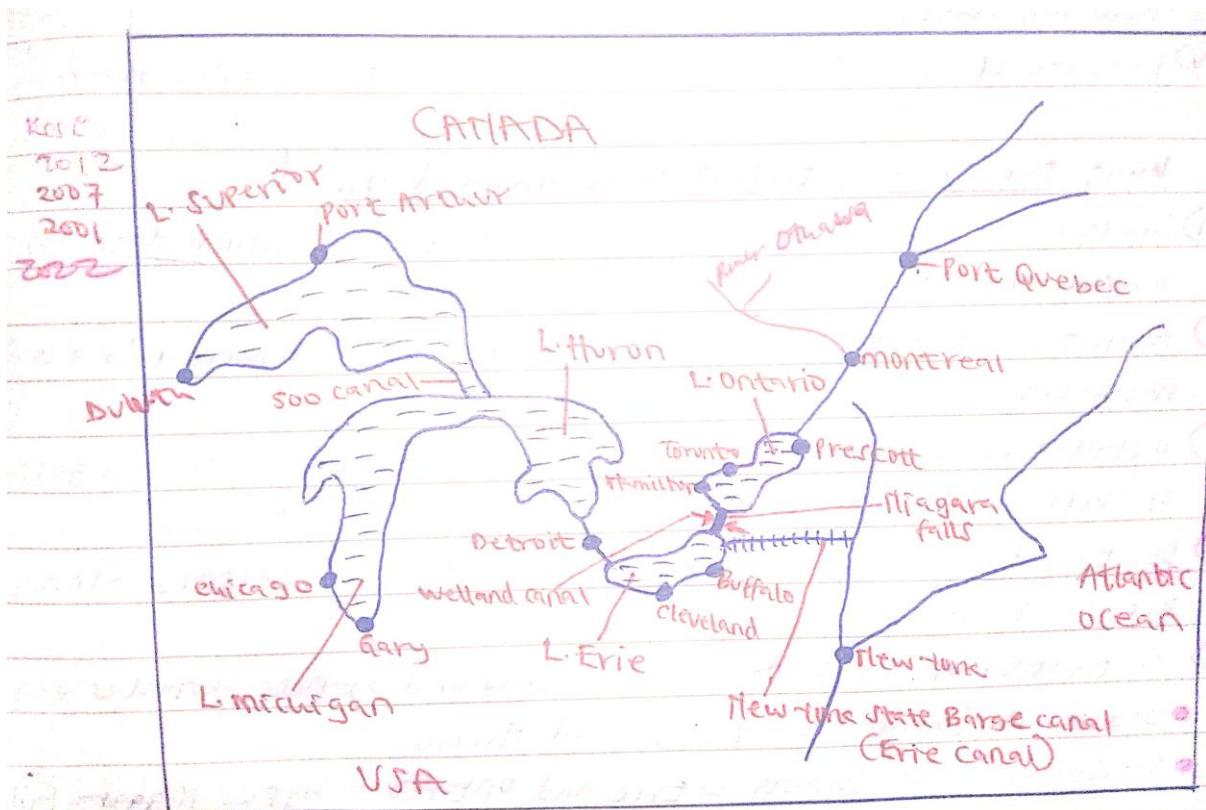
- i. Liberalization of airwaves/ licensing of more airwaves/ private radios/ television stations.
- ii. Introduction of E-mail/ internet/ fax (telefax).
- iii. Introduction of mobile phones/ cell phones/ pages.
- iv. Liberalization of the electronic and print media.
- v. Expansion of telephone services.
- vi. Liberalization of postal services e.g. courier services/ parcels/ letters.

A study of the Great Lakes and the St. Lawrence Seaway.

- It is the most important seaway in N. America shared by U.S.A and Canada.

- **The Great Lakes are;**

- ✓ Superior
- ✓ Ontario
- ✓ Michigan
- ✓ Huron
- ✓ Erie



Objectives of St. Lawrence Seaway project.

- To construct canals by-passing the sections with rapids and waterfalls along River St. Lawrence.
- To establish locks along the river channel to regulate the flow of water and movement of vessels.
- To construct dams to generate HEP and regulate flow of the river.
- To deepen the river channel and regulate the differences in the lakes level.
- To remove rock shoals, rapids and several islands in the river channel that hindered navigation.

Shortcomings of the seaway before development.

- The presence of rock shoals/ rapids/ waterfalls/ small islands along the seaway.
- Shallow and narrow sections along the highway.
- Blocked navigation during winter due to waterway freezing.
- Different levels between the lakes with some areas being shallower than the others.
- Presence of fog and mist at the mouth of St. Lawrence River.

What the seaway project was involved in.

- Dredging of the shallow sections to deepen to accommodate large shipping vessels.
- Formation of water reservoirs behind dam to drown rapids allowing navigation.
- Installation of radar and lights on ships to improve the navigation of ships in order to avoid accidents.
- Blasting to remove the rocky islands and narrow sections along the sea route.
- Construction of canals to join the lakes and by-pass obstacles e.g.
 - Soo canal joining L. Superior and Huron.
 - Welland canal joining L. Erie and Ontario to by-pass Niagara Falls.
 - New York State Barge Canal connecting L. Erie to Hudson River.

Benefits of the Great Lakes and St. Lawrence Sea way to the economies of U.S.A. and Canada –kcse 2022

- i. The dams found along the route provide **hydroelectric power** for domestic/ industrial use.
- ii. It provides cheap/ easy navigation means of transport for imports/ exports encouraging **trade**/ agriculture.
- iii. The seaway has created **employment opportunities** in the transport industry raising the standards of living of the people in both countries.
- iv. It has led to the growth of **ports/ towns** along its course, these have become focal points for various economic activities.
- v. Due to accessibility to raw materials there has been extensive **industrial development** in the area.
- vi. Tariffs charged earn the countries **income/ revenue**.
- vii. The lakes and the seaway are a source of **fresh water** for domestic/ industrial use.
- viii. The seaway is a tourist attraction, earning the two countries **foreign exchange**/ income/ revenue.

TOPICAL QUESTIONS.

1. State five reasons why it is difficult to transport goods from Mombasa to Lagos by road (5mks) –kcse 2010
2. Give four reasons why motorcycle transport has become common in most parts of Kenya (4mks).
3. State three ways in which the Great Lakes and St. Lawrence Seaway has contributed to the growth of industries in the region (3mks) –kcse 2007
4. State four causes of the decline in the use of letter writing as a means of communication in Kenya (4mks) –kcse 2016
5. Explain four problems facing telephone as a means of communication in Kenya (8mks) –kcse 2001

“END OF TOPIC SEVEN”

TOPIC EIGHT:

TRADE

By Prof. Ogoti Robert Maxwell

- Trade is the exchange of goods and services.

Types of trade.

(a) Internal/ Domestic/ Home/ Local trade –kcse 2019

- It is the exchange of goods and services within a country.

Types of internal trade –kcse 2021

- ✓ Wholesale trade.
- ✓ Retail trade.

i. Wholesalers/wholesale trade.

- It involves buying goods in bulk from producers and selling them to retailers.
- Characteristics of wholesalers;
 - Requires a lot of capital.
 - Operate from large premises.
 - Mainly found in urban centres.
 - Purchase goods in bulk from producers and sell them in retail.

ii. Retail trade.

- It involves buying of goods from wholesalers and selling them to individual consumers.
- Characteristics of retailers;
 - Stocks a variety of goods.
 - Goods are sold in small quantities.
 - Purchase goods from wholesalers.
 - Sell goods to individual consumers.

(b) Regional trade –kcse 2010

- It is the exchange of goods and services between countries within a given economic region.
- Such countries may form economic/trading blocs such as EAC, COMESA, ECOWAS, SADC etc.

(c) International/ external/ foreign trade –kcse 2005

- It is the exchange of goods and services between two or more countries/ at the global level.
- It is classified into;
 - **Export trade** – selling of goods and services to foreign countries.
 - **Import trade** – buying of goods and services from other countries.
 - **Bilateral trade** – exchange of goods and services between two countries.
 - **Multilateral trade** – exchange of goods and services between many countries.
 - **Visible trade** – the exchange of goods within a nation/ between countries/ exports and imports of goods –kcse 2023
 - **Invisible trade** – involves the exchange of services.

Factors influencing Trade.

- i) **Availability of capital** to start trade/business venture.
- ii) **Availability of well-developed transport/ communication networks** enhances efficiency of trade.
- iii) **Demand and supply of goods** i.e. the more the demand, the higher the supply hence trade.
- iv) **Differences in natural resources** enhances trade to obtain goods and services not found in a given area.
- v) **Availability of market** i.e. high population with high purchasing power promote trade.
- vi) **Trading blocs/ economic unions** among countries promote regional trade among member states.
- vii) **Good political relationship** among the member states of the trading blocs encourage trade.
- viii) **Security** is essential for trade.
- ix) **Existence of aids to trade** e.g. banking, insurance, warehousing promote trade.
- x) **Government initiatives** like Uwezo funds/ loans/ grants to people promote trade.

Factors discouraging trade.

- i) **Trade restrictions;**
 - **Tariffs-** Are taxes charged on imports to restrict importation of certain goods thus protecting local industries.
 - **Quotas-** Are restrictions on the amount of goods to be exported or imported.
 - **Trade agreements-** Are agreements signed between trading partners to regulate foreign trade. They restrict imports or exports from specific countries.
 - **Total bans-** Are restrictions imposed on certain imports to protect local industries e.g. ban on second hand clothes.
- ii) **Use of different currencies** can be obstacle to trade as different exchange rates may make imported goods expensive.
- iii) **Poor means of transport like roads** delays the movement of goods/ people hence interfering with trade.
- iv) **Poor communication networks** delays information thus limiting trade transactions.
- v) **Poor political relations** between countries leads to trade bans/ restrictions lowering volume of trade.
- vi) **Difference in technological level** leads to adverse balance of trade especially in developing countries.

Terms used in Trade.

- i) **Exports** are goods and services sold to other countries.
- ii) **Visible exports** are tangible goods sold to other countries.
- iii) **Invisible exports** are services sold to other countries.
- iv) **Imports** are goods and services bought from other countries.
- v) **Visible imports** are tangible goods bought from other countries.
- vi) **Invisible imports** are services bought from other countries.

Major Exports from Kenya.

- **Visible exports e.g.** –kcse 2010
 - ✓ Coffee
 - ✓ Tea
 - ✓ Fluorspar
 - ✓ Pyrethrum
 - ✓ Horticultural products e.g. flowers
 - ✓ Soda ash
 - ✓ Cement
 - ✓ Miraa
 - ✓ Fish
 - ✓ Timber and timber products.
- **Invisible exports e.g.**
 - ✓ Tourism
 - ✓ Banking
 - ✓ Insurance
 - ✓ Expertise

Major Imports to Kenya.

- **Visible imports e.g.** –kcse 2020
 - ✓ Crude oil
 - ✓ Machinery/ machines
 - ✓ Iron and steel
 - ✓ Pharmaceuticals/ medicine
 - ✓ Fertilizers/ chemicals
 - ✓ Motor vehicles
 - ✓ Foot ware
 - ✓ Paper
 - ✓ Furniture
 - ✓ Food stuffs
 - ✓ Textiles
 - ✓ Electronics
 - ✓ Tyres
 - ✓ Wines and spirits
 - ✓ Cosmetics
- **Invisible imports e.g.**
 - ✓ Skilled labour/ Expertise
 - ✓ Banking
 - ✓ Insurance

Factors influencing internal trade in Kenya –kcse 2020

- i) **Production of different goods** enhances trade in different areas/ production of similar goods by different regions limit the market potential.
- ii) **Security** encourages expansion of trading activities in an area/ insecurity discourages trade.
- iii) **Low purchasing power** by most of the Kenyans limits the markets of goods produced.
- iv) **The demand for variety of locally produced goods** leads to expansion of trade.

- v) **Cultural differences** leads to specialization in production of goods for exchange.
- vi) **The level of development of transport network** enhances/ limits trade since some commodities may not be carried over long distances/ the market potential is restricted.
- vii) **Availability of capital** enhances expansion of trade.
- viii) **Government policy** which encourages/ discourages trade.
- ix) **Existence of aids to trade** like banking, insurance, warehousing enhances trade.
- x) **Trade restrictions** like tariffs, quotas, trade agreements and total bans.

Problems facing internal trade in Kenya.

- i) **Poor means of transport** makes the movement of goods slow and expensive discouraging trade.
- ii) **Illegal importation and smuggling of goods** into the country gives the locally produced goods unfair competition due to fact that they do not pay duty hence is cheap.
- iii) **Insecurity** in some parts of the country has discouraged trade as people are not willing to risk their investments.
- iv) **The high tariffs** charged by the government reduce profits and discourages trade.
- v) **Inadequate capital/ high cost of borrowed capital** discourages trade due to low returns.
- vi) **Scarcity of goods** especially those affected by weather e.g. drought makes them expensive and with low profits discouraging trade.
- vii) **Craze for imported goods** by Kenyans which denies Kenya market for locally produced goods.
- viii) **Tribal clashes/ civil wars/ general insecurity** hamper trade in the country.

How Kenyan government promotes internal trade.

- i) Improving transport and communication networks for easy transportation of goods.
- ii) Facilitating the organization of trade fairs/ exhibitions/ shows enabling people to advertise their products.
- iii) Removal of restrictions of movement of goods/ produce or fixing open air markets days.
- iv) Removal of price control on the products/ manufactured goods/ produced locally.
- v) Imposition of tariffs on imported goods to support locally manufactured goods.
- vi) Facilitates the organization of conferences/ seminars to enable the business community to exchange ideas on trade.
- vii) The government through the Kenya Bureau of standards (KBS) maintains standards/ quality of goods produced locally/ imported.
- viii) Providing credit facilities to the business community through banks.
- ix) Facilitates easy distribution of goods through organizations like Kenya national Trade Corporation (KNTC).

Factors influencing external trade in Kenya -kcse 2013

- i) Demand for goods and services.
- ii) Similarities/ differences in the goods produced.
- iii) The purchasing power of the people/ availability of capital.
- iv) Availability of transport/ communication networks.
- v) Political stability/ relationships of trading partners.
- vi) International trade agreements/ restrictions.

- vii) The level of technology.
- viii) Varying exchange rates.
- ix) Availability of aids to trade.

Negative effects of international trade –kcse2005

- i) There may be overexploitation of natural resources leading to their depletion e.g. minerals.
- ii) Overspecialization/ overdependence on a particular item are risky in case of a fall in the prices in the world market.
- iii) Imported items may become a threat to the local industries leading to a closure of some.
- iv) Some imported goods e.g. expired goods or sub-standards goods may have adverse effects on the citizens.
- v) If a country relies on another, it may have to tolerate some **undesirable gestures** from such countries.

Significance of Trade –kcse 2016

- i) Trade generates **revenue** through taxation of the goods/ services.
- ii) Trade creates **employment opportunities** in the industries that are established/ creates self-employment.
- iii) The demand for manufactured goods stimulates **industrial growth/ agricultural growth**.
- iv) The export of goods enables the country to earn **foreign exchange**.
- v) The need to reach far off markets leads to expansion of **transport facilities**.
- vi) Trade leads to the development of **urban centres/ improved social amenities**.
- vii) Trade stimulates **specialization** in the production of goods.
- viii) Trade enhances cooperation between Kenya and the **trading partners/** between communities in Kenya.
- ix) Trade stimulates development of other related activities like banking, insurance and warehousing that leads to economic development.

Problems facing Trade in Kenya –kcse 2010

- i) **Cheap imported goods create unfair competition for some local products** leading to reduction in the production of such goods/ closure of some industries.
- ii) **Exports are mainly raw agricultural products which are lowly priced** hence earning little revenue for the country.
- iii) **The fluctuation of prices in the world market** varies the earnings from exported goods making it difficult to plan.
- iv) **Unexpected trade restrictions are sometimes imposed on Kenya's exports** thus lowering production of such commodities/ causes loses to the exporter.
- v) **Poor/ inadequate transport and communication facilities in some areas** delay delivery of products to the market/ delivery of raw materials to the industries/ spoilage of products thus limiting trade.
- vi) **Slow clearance of goods at the port of Mombasa** delays delivery of some goods/ increases the cost of goods.
- vii) **Some traders smuggle goods out of neighbouring countries/** import goods through improper channels thereby denying the government revenue from taxes.
- viii) **Inadequate capital for some traders** make them unable to expand their trading activities.

- ix) **The high fuel prices** increase production/ transport costs leading to increased prices of goods/ low demand for goods.
- x) **Insecurity in many places** discourages investors in the country/ causes heavy loses to traders.
- xi) **Poverty among the people** has reduced their purchasing power.

The Future of International Trade in Kenya.

- The following are measures undertaken by the Kenyan government to promote international trade- Kcse 2010
 - ✓ Improving international transport and communication links for efficient transaction.
 - ✓ Exploring new markets in order to avoid over reliance on European market.
 - ✓ Trade agreements signed by Kenya and various countries may help to increase volume of trade.
 - ✓ Processing some of the agricultural products before export/ EPZ in order to add value hence increase income.
 - ✓ Setting up of industries in the neighbouring countries by some Kenyan entrepreneurs to increase volume of trade.
 - ✓ Intensifying marketing internationally to create awareness on locally produced goods.
 - ✓ Diversifying the country's exports/ export more types of goods in order to minimize competition.
 - ✓ Implementation of vision 2030 will lead to increased production hence increased trade.
 - ✓ Joining more trading blocs to widen market for the Kenyan goods e.g. COMESA and EAC.

Trading blocs/ Economic unions.

- This is economic association among countries in a region formed with the aim of promoting trade among member states.
- Examples; -kcse 2018
 - ✓ COMESA
 - ✓ SADC
 - ✓ ECOWAS
 - ✓ EU
 - ✓ EAC
 - ✓ IGAD- Inter Governmental Authority on Development.
 - ✓ ECCAS- Economic Community of Central African States.
 - ✓ CENSAD
 - ✓ WEMA/ UEMUA
 - ✓ UMA/ AMU
 - ✓ CEMAC
 - ✓ SACU

1. EAC.

- It is the East African Community.
- Member states are Kenya, Uganda, Tanzania, Rwanda, Burundi, and Southern Sudan.
- Sea ports that handle exports in East Africa are Mombasa, Dar-es-salaam, Lamu, Tanga.

Reasons why EAC was revived in the year 2001.

- i) To promote regional integration among the member states.
- ii) To promote suitable economic growth in the region.
- iii) To establish a common market for the member states.
- iv) To encourage free movement of labour among the member states.
- v) To foster peace, stability and promote democracy among the member states.
- vi) To liberalize trade within the region/ lower tariffs among the member states.

Ways in which Kenya will benefit from the renewed EAC –kcse 2005

- i) There will be **improved access to raw materials** for industrial development.
- ii) There will be **mutual political understanding** between Kenya and its neighbours.
- iii) The **expanded market will attract new investments** from the local and foreign sources.
- iv) There will be **exchange of research findings/ training** which will help in economic development.
- v) There will be **improved negotiating powers** in the international arenas.
- vi) There will be **improved transport links** between Kenya and other member states facilitating movement of goods and people.
- vii) **Reduction of tariffs makes goods cheaper** in the region and hence affordable creating a large market.

Factors that limit trade among East African countries –kcse 2008

- i) **Political instability** in some member states like Rwanda and southern Sudan.
- ii) **Political differences and suspicion** by some member states e.g. between Kenya and Tanzania.
- iii) **Ideological differences** among the member states create suspicion among the member states hindering trade.
- iv) **The production of similar goods** by member states limits market.
- v) **Restriction of the movement of people and goods** limits trade.
- vi) **Poor transport and communication network** among the member states limits trade.
- vii) **Lack of common currency** makes it difficult to transact business.
- viii) **Different countries belong to different trading blocs** hence limit trade.

2. COMESA.

- It is the Common Market for Eastern and Southern Africa.

- Established in 1981.

- **Headquarter-** Lusaka in Zambia.

- **Member states are;** -kcse 2020

✓ Burundi	✓ Ethiopia
✓ Namibia	✓ Uganda
✓ Angola	✓ Mauritius
✓ Zimbabwe	✓ Comoros
✓ Lesotho	✓ Seychelles
✓ Eritrea	✓ Egypt
✓ Madagascar	✓ Sudan
✓ DRC	✓ Kenya
✓ Zambia	✓ Malawi
✓ Djibouti	✓ Rwanda
✓ Swaziland	

Objectives of COMESA/ why it was formed –kcse 2006

- i) To reduce duties/ taxes on goods produced within the member states.
- ii) To promote trade among the member states.
- iii) To create monetary and financial cooperation among the member states.
- iv) To create political cooperation among the member states.
- v) To create regional specialization in order to improve the quality of goods.
- vi) To remove trade barriers among the member states/ create similar trade laws.
- vii) To create a large market for goods produced among the member states.
- viii) To acquire greater economic strength/ higher bargaining power with other trading blocs of the world.

Economic benefits of COMESA to the member states –kcse 2008

- i) It has created a large market for goods produced in member states.
- ii) It has resulted in the availability of a variety of goods to member states.
- iii) It has led to establishment of a common tariff.
- iv) It has led to the generation of revenue to the member states.
- v) It has led to the expansion of regional trade.
- vi) It has provided financial assistance through financial institutions like PTA, Trade Development Bank e.t.c.
- vii) It has promoted investments through bilateral agreements.

Factors limiting trade among COMESA member states –kcse 2014

- i) Poor transport and communication networks slows/ delays movement of goods/ services.
- ii) Difference in tariffs/ custom duties hinders trading activities.
- iii) Difference in currency makes transactions difficult.
- iv) Production of similar/ duplication of goods limits trade.
- v) Different levels of industrial development/ economic development creates imbalance in trade.
- vi) Movement barriers limit free movement of people/ goods/ services.
- vii) Different political ideology.
- viii) Political instability/ insecurity/ civil wars.

3. SADC

- It is the Southern African Development Community.
- Established in 1979.

- **Headquarter-** Gaborone in Botswana.

- **Member states are;**

- ✓ Angola
- ✓ Lesotho
- ✓ Botswana
- ✓ Swaziland
- ✓ DRC
- ✓ Malawi
- ✓ South Africa
- ✓ Mauritius
- ✓ Mozambique
- ✓ Tanzania
- ✓ Zambia
- ✓ Zimbabwe

- ✓ Namibia
- ✓ Seychelles

Objectives of SADC –kcse 2010

- i) To promote regional integration among member countries.
- ii) To promote sustainable economic growth in the region.
- iii) To establish a common market/ wider market for member states.
- iv) To liberalize trade within the region/ lowering of tariffs of member states.
- v) To strengthen the bargaining power in international trade.
- vi) To foster peace, stability and democracy among member states.
- vii) To eradicate poverty in the region.
- viii) To encourage free movement of labour.

Economic benefits of SADC to the member states –kcse 2023

- i) Variety of goods are available.
- ii) Movement of labour/ capital/ technology within member countries is easier.
- iii) A large market for goods from member countries has been created.
- iv) A common tariff has been created/ removal of trade barriers.
- v) Aid/ capital for economic development is availed to member states.
- vi) It has increased employment opportunities.
- vii) It has promoted expansion of trade through free movement of goods/ people.

4. ECOWAS.

- It is the Economic Community of West African States.
- Established in 1976.
- **Headquarter-** Lagos in Nigeria.
- **Member states are;**

- | | |
|-----------------|-----------------|
| ✓ Benin | ✓ Mauritania |
| ✓ Liberia | ✓ Cameroon |
| ✓ Mali | ✓ Guinea Bissau |
| ✓ Cape verde | ✓ Gambia |
| ✓ Cote d' Ivore | ✓ Togo |
| ✓ Niger | ✓ Senegal |
| ✓ Nigeria | ✓ Guinea |
| ✓ Ghana | |
| ✓ Morocco | |
| ✓ Burkina faso | |

Objectives of ECOWAS –kcse 2020

- i) To promote trade/ expand market among member states.
- ii) To create an economic/ monetary union.
- iii) To promote social/ political interactions/ mutual development.
- iv) To promote co-operation/ integration.
- v) To harmonise economic/ financial policies.
- vi) To eliminate trade barriers.
- vii) To improve transport/ communication links.
- viii) To promote free movement of goods/ people.
- ix) To encourage agricultural/ industrial development among member states.

Economic benefits of ECOWAS to the member states –kcse 2016

- i) **The volume of trade has been boosted** as a result of expanded market.
- ii) **More transport facilities** like roads have been constructed to link member states.
- iii) **Removal of trade barriers** has extended market for the finished products/secured the market for the member states.
- iv) **The transfer of technological/ capital** within the trading bloc has been enhanced.
- v) **Cooperation in other fields** like education/ health/ communication/ research has been enhanced.
- vi) **Reduction of hostilities** between member states has enhanced peace resulting in rapid economic development.
- vii) **Provision of energy/ petroleum** at reduced prices to the member states.

5. THE EUROPEAN UNION (EU).

- Established in 1951.
- **Headquarter-** Brussels in Belgium.
- **Member states are;**

✓ Austria	✓ Greece
✓ Poland	✓ Belgium
✓ Hungary	✓ Portugal
✓ Cyprus	✓ Ireland
✓ Slovakia	✓ Slovenia
✓ Italy	✓ Latvia
✓ Denmark	✓ Estonia
✓ Spain	✓ Lithuania
✓ Luxembourg	✓ Malta
✓ Finland	✓ Sweden
✓ Netherlands	✓ Germany
✓ France	✓ Czech Republic

Objectives of EU.

- i) To establish a common market for member states.
- ii) To implement economic and monetary union.
- iii) To promote cooperation in economic/ social/ trade matters.
- iv) To negotiate trade agreements internationally.
- v) To create a common currency for member states.
- vi) To provide financial assistance to member states.
- vii) To provide assistance to developing countries like Kenya.

Economic benefits of EU to the member states –kcse 2021

- i) Removal of tariffs/ duties.
- ii) There is free movement of people/ goods/ services among member states.
- iii) Integration/ cooperation among member states.
- iv) Provision of loans/ grants to the member states through European Investment Bank/ European Central Bank.
- v) There is expansion of trade/ market among member states.
- vi) Creation of a common currency/ Euro making transactions easy.
- vii) There is promotion of agriculture among member states.
- viii) There is creation of more jobs among member states.

General benefits of Regional Trading Blocs –kcse 2020

- i) The trading blocs have promoted **expansion of markets** hence enhancing industrial/ agricultural development.
- ii) **The tariffs have been reduced** making goods cheaper for the people raising their living standards.
- iii) They have helped to **create harmony/ cooperation** among member states through trading.
- iv) Trading among member states has **boasted agricultural development** as the demand for raw material for industries increase.
- v) Expansion of agriculture/ industries has helped in **creation of employment** thus improving the living standards.
- vi) Member states have merged funds/ resources to invest in **joint projects** for economic development.
- vii) Member states have **reduced reliance for goods/ services from other parts of the world** enhancing their economic growth.
- viii) The common market has made people of member states enjoy **a variety of commodities** hence improving their living standards.
- ix) Trading among member states has encouraged the **development of transport/ communication** hence easing movement of goods.

Problems facing Regional Trading Blocs –kcse 2018

- i) Civil wars/ insecurity in some countries affects trade between member states.
- ii) Political differences among leaders due to different political ideologies affects cooperation.
- iii) The member states are not at the same level of industrialization making some countries to benefit better than others leading to disagreements.
- iv) Some member states produce similar goods lowering demand as well as the profits.
- v) Low demand for goods produced due to low quality and similarity in goods produced.
- vi) Poverty among member states due to low income and high levels of unemployment limits trade.
- vii) Some member states do not remit their annual subscription hampering their operations.
- viii) Poor transport and communication networks like roads limit/ hinder the flow of goods and services.
- ix) Free trade denies the member states revenue that they would have earned from exporting goods.
- x) Free trade affects local industries as imported goods are cheaper than locally manufactured goods.
- xi) Difference in the levels of economic development makes some countries to become reliant on others for some products.
- xii) Negative publicity of goods among countries.
- xiii) Inadequate institutional/ policy framework.
- xiv) Ideological differences among some countries.
- xv) Many African countries are still aligned to their former colonial masters.

Balance of Trade.

- It is the difference in value between a country's visible exports and visible imports.
- **Favourable balance of trade-** the value of a country's visible exports exceeds the visible imports.
- **Adverse/ unfavourable balance of trade-** the value of a country's visible imports exceeds the visible exports.
- **Balance of payment-** the difference in value between visible and invisible exports and imports of a country.

Reasons why Kenya experiences unfavourable balance of trade –kcse 2001

- i) **Kenya exports mainly agricultural raw materials** which are of low value and imports manufactured goods which are of high value.
- ii) **The agricultural goods exported from Kenya face stiff competition in the world market** leading to reduced sales and less earnings.
- iii) **Some of the goods exported are of low quality** hence generate little earnings in comparison to goods imported.
- iv) **Kenya exports semi processed goods** which earn less.
- v) **The imposed quota systems** sometimes lead to reduced sales and less earnings.
- vi) **Kenya's expenditure on imported goods is high** due to increased prices of oil.

Measures Kenya may take to reduce unfavourable balance of trade –kcse 2020

- i) **Encouraging development of Jua Kali industries** which do not require importation of heavy machinery.
- ii) **Diversify agricultural exports** to enable the country have a variety of exports.
- iii) **Look for new markets** to avoid dependence on the traditional partners.
- iv) **Advertise tourism/ increase earning from invisible trade.**
- v) **Restrict importation of luxury items/ impose high taxes on imported luxury items.**
- vi) **Establish import substitution industries** to reduce importation of some commodities.
- vii) **Encourage production of high quality export products** to earn high income.
- viii) **Developing alternative sources of energy** in order to reduce importation of fuels/ petroleum.

TOPICAL QUESTIONS.

1. Name four countries to which Kenya exports petroleum products (4mks) –kcse 2013
2. State four reasons why Kenya's agricultural export earnings are generally low (4mks) –kcse 2006
3. Explain four benefits that Kenya derives from international trade (8mks) –kcse 2015
4. Identify three political problems facing regional trading blocs in Africa (3mks) –kcse 2018

“END OF TOPIC EIGHT”

TOPIC NINE:

POPULATION.

By Prof. Ogoti Robert Maxwell

Definition of terms.

- **Human population** is the total number of people occupying/living in a given area.
- **Demography** is the study of statistical data on human population.
- **Population distribution** is the way people are spread out on the land.
- **Population density** is the number of persons per unit area i.e.

15000 people

$$X = \frac{15000 \text{ people}}{100 \text{ km}^2}$$

= 150 persons per km²

Sources of population data.

a) Primary sources of population data(main sources) -kcse 2015

- ✓ Registration of persons e.g. birth/ death/ marriage/ migration.
- ✓ Sample surveys
- ✓ National census/ Head count.
- ✓ Content analysis/Publications

b) Secondary sources of population data

- ✓ Statistical abstracts
- ✓ Textbooks
- ✓ Magazines
- ✓ Journals/periodicals
- ✓ National census report
- ✓ Internet

Census.

- It is the physical counting of people living in each household.
- It is carried out after 10 years in Kenya.
- Census gathers wide variety of information relating to the;
 - **Physical characteristics** e.g. sex, race, birth, place, tribe
 - **Social characteristics** e.g. marital status, religion, education, housing, language
 - **Economic characteristics** e.g. occupation, income

Reasons why it is necessary for a country to carry out population census –kcse 2021

- To help in the distribution of resources.
- For planning purposes/ policy making.
- To help in creating administrative units/ boundaries.
- To identify the rates of birth/ death.
- To help in estimating population growth.
- To determine total number of people.

Quiz: State and give reasons for the information collected using a well-designed population census questionnaire (10mks)

- ✓ **It reveals trends of fertility and mortality** which helps to calculate population growth rate. It is also necessary for planning of social services.

- ✓ **It reveals the place of birth of an individual.** This may help to know the migration trends.
- ✓ **It reveals the marital status** which may help to know the marriage age.
- ✓ **It reveals the prevailing trends of population** changing demands by regions.
- ✓ **The age-sex composition of the population** helps to reveal regional imbalances in working and dependence population.
- ✓ **It reveals the occupation of people** which is useful in the estimation of the level of taxation and employment.
- ✓ **It reveals the ethnicity/ nationality** which may be useful in planning for the distribution of political responsibilities.
- ✓ **It reveals the level of literacy** for purposes of educational planning.
- ✓ **It helps in calculating dependency ratio** used in determining tax relief.
- ✓ **It reveals the size of families** which is used in determining rural-urban ratio.

Quiz: What are the factors that hinder effective census (7mks)

- ✓ **Shortage of funds** that make it difficult to employ enough personnel and acquire other necessary equipment.
- ✓ **Insufficient/ inaccurate census area maps** and questionnaires.
- ✓ **Illiteracy** may lead to wrong information being given.
- ✓ **Problems of language barrier/ accessibility** that may lead to omission.
- ✓ **Inadequacies of enumerators/ poor training.**
- ✓ **Problem of double counting** leading to wrong information.
- ✓ **Fear/ suspicion/ superstition** may lead to wrong information.
- ✓ **Lack of documents on vital data** like birth and death certificate.
- ✓ **Political manoeuvrings** interferes with effective census.
- ✓ **Insecurity** in some areas makes the exercise difficult.
- ✓ **Time allocated** during the census is normally not adequate as it is conducted at night.

Factors influencing population distribution in East Africa.

a) Physical factors –kcse 2008

i. Climate.

- **Different climates will influence** different farming activities which in turn influence **population distribution.**
- Cool and wet/ hot and wet/ high and reliable rainfall areas are densely populated because they are suitable for farming.
- Hot dry areas have sparse population because they are unsuitable for farming.

ii. Relief.

Varied relief will influence population distribution.

- Mountains/ hilly areas are rugged discouraging settlement/ development of roads/ agriculture.
- Plains/ gently sloping areas are densely populated since they are suitable for settlement/ economic activities.
- Flat areas are sparsely populated because of poor drainage which cause flooding.

iii. Soils.

- Different types of soils influence varied farming activities that in turn influence population distribution.
- Deep, well drained volcanic soils supports arable farming i.e. Kenyan highlands hence densely populated.

iv. Drainage.

- Drainage influences human activities on earth surface hence determining population distribution.
- Well drained areas are suitable for agriculture hence densely populated.
- Low-lying areas are prone to flooding/ unsuitable for agriculture hence sparsely populated.

v. Incidences of pests and diseases.

- Areas infested with pests and disease carrying vectors discourage settlement since the conditions are unhealthy.

vi. Vegetation.

- Different types of vegetation influence population distribution.
- Forested areas/ savannah woodland have wild animals, disease carrying vectors discouraging settlement hence sparse population.

b) Human factors.

i) Historical factors.

- Slave trade left some parts of East Africa with low population.

ii) Security.

- Secured areas are densely populated unlike insecured areas which are sparsely populated due to tribal conflicts/ civil wars.

iii) Urbanization.

- Growth of towns leads to influx of people searching for jobs.

iv) Government policy.

- Creation of settlement schemes increases population and resettling people from densely populated areas reduce population.

v) Land ownership.

- Individually owned land is sparsely populated while communally owned land is densely populated.

vi) Establishment of game parks.

- Restrict people from settling in those areas hence sparsely populated.

c) Economic factors that influence population distribution in East Africa –kcse 2021

- i. In East Africa people tend to migrate from rural areas to urban centres to seek employment leading to an increase in urban population/ low population in rural areas.
- ii. Areas where industries are located have dense population since many people are employed/ seek employment/ offer services.
- iii. Areas that are well served with good transport network attract dense population/ areas with poor transport network have sparse population.
- iv. Mining activities attract people looking for jobs/ trade leading to dense population/ displace people affecting the population distribution.

Population Growth.

- This is the change that occurs in the number of people in an area over a given period of time.
- **Positive population growth** is an increase in the number of people in an area over a given period of time.
- **Negative population growth** is a decrease in the number of people in an area over a given period of time.

Factors influencing population growth.

- ✓ Fertility
- ✓ Mortality
- ✓ Migration

1. Fertility.

- **Fertility** is the ability to conceive or produce children.
- **Fecundity** is the ability to give birth to many children
- **Infertility** is the inability to conceive or produce children.
- **Infecundity/ sterility** is the inability to give birth to many children.
- **Fertility rate** is the number of live births in a given population in a year -kcse 2018
- **High fertility rate** leads to high/ positive/ increased population growth.
- **Low fertility rate** leads to slow/ negative population growth.

Causes of high fertility/ birth rates/ population increase/ high/ positive population growth.

- a) **Cultural belief;** -kcse 2015
 - **Sex preference** when there is a high regard for birth of a son.
 - **Polygamy** which leads to birth of many children.
 - **Early marriages** give longer child bearing span.
 - **Naming of relatives** by alternating from the man's to the woman's side results in large families.
 - **Belief in large families as source of prestige** e.g. children are a source of labour and bride wealth.
 - **Some cultures discourages the use of contraceptives** leading to couples getting many children.
- b) **Economic factors;**
 - Need for a large pool of family labour.
 - Security in old age and defence.
- c) **Lack of effective family planning practices** due to ignorance/ inaccessibility / use of traditional ineffective birth control methods.
- d) **Improved medical facilities/** health care reduces mortality rate.
- e) **Improved nutrition/ diet** which reduces mortality rate.
- f) **Modernisation** which leads to decline in social values leading to free interaction of youths hence early pregnancy.

- g) **Migration** –Political instability in some neighbouring countries has led to an influx of refugees leading to population increase- kcse 2015

Causes of reduced fertility rate/ decline/ slow/ negative population growth –kcse 2018

- a) **The cost of bringing up children has gone up** therefore parents limit the number of children they can have.
- b) **Increased use of birth control methods** has lowered the number of children women get in their life time.
- c) **More girls are attending school/ are pursuing higher education and training.** This makes them stay longer before getting married.
- d) **Modern career opportunities** have a limiting influence on a woman's fertility rate. Some employers do not want to employ women who keep going on maternity leave.
- e) **There is an increase in the number of women opting to remain single** thus reducing the number of children.
- f) **Urbanization** has influenced people to have small families.
- g) **High rate of use of drugs** that make most men unproductive.

2. Mortality.

- **Mortality** refers to deaths among members of a population.

Causes of mortality/ slow population growth –kcse 2007

- a) **Low nutritional standards** which causes deficiency diseases leading to death of infants.
- b) **Low hygiene standards** which may cause diarrhoea/ cholera causing death of people.
- c) **Prevalence of natural calamities** like droughts/ floods/ earthquakes leads to death of people.
- d) **Epidemics/ disease outbreaks** like HIV/AIDs, Corona which has killed many people.
- e) **Outbreak of war/ warfare** leads to death of people.
- f) **Emigration** reduces population at the area of origin.
- g) **Family planning practices** cause slow population growth.
- h) **Late marriage** leads to slow population growth.
- i) **Road accidents** leads to death of people.
- j) **Inadequate medical facilities** leads to death of people.

Measures that have been taken by the government of Kenya to reduce infant mortality rate – kcse 2021

- i. Improving/ increasing medical facilities/ enhancing immunization programmes for children to control diseases.
- ii. Educating/ creating awareness on better care of the children.
- iii. Granting longer maternity leave for mothers/ paternity leave.
- iv. Encouraging use of family planning techniques/ manageable families.
- v. Encourage provision of homes for orphans.
- vi. Carrying out research on infant related diseases.
- vii. Encouraging parents to feed their children on balanced diet.
- viii. Providing free medical services for infants.
- ix. Training traditional midwives.

How diseases (HIV/AIDs or Covid-19) slow down economic development –kcse 2007

- i. The sickness leads to absenteeism from work/ reduce productivity.
- ii. Money spent in treating the sick could be used for other economic activities.
- iii. Death resulting from diseases leads to loss of economically productive population.
- iv. Care takers at family level use more time caring for the sick/ orphans instead of engaging in economic activities.
- v. Leads to high dependency ratio.

3. Migration.

- It is the movement of people from one place of residence to another.

Types of migration.

- ✓ Internal migration.
- ✓ External/ international migration.

(a) Internal migration.

- It is the movement of people within a country.
- They include;
 - ✓ Rural to Urban migration.
 - ✓ Urban to Rural migration.
 - ✓ Urban to Urban migration.
 - ✓ Rural to Rural migration.

i. Rural to Urban migration.

- It is the movement of people from rural areas to urban areas/ towns.
- Reasons for rural to urban migration can be push or pull factors;
- **Pull factors;**
 - ✓ Transfers.
 - ✓ Better living standards.
 - ✓ Recreation.
 - ✓ Opportunities for better education and health.
 - ✓ Attractions of urban life.
 - ✓ Better paying jobs.
 - ✓ Industrial centralization in towns.

- Push factors;

- ✓ Insecurity
- ✓ High incidences of diseases.
- ✓ Lack of adequate land.
- ✓ Unemployment.
- ✓ Diminishing returns of land.
- ✓ Rural hard living conditions.
- ✓ Low wages/ low prices of farm produce.
- ✓ Inadequate social services- hospitals, schools.

ii. Urban to Rural migration.

- It is the movement of people from towns to rural areas.
- **Causes of urban-rural migration in Kenya; -kcse 2021**
 - ✓ Insecurity/ high crime rate in urban centres has led to some people moving to rural areas which are secure/ safer.

- ✓ People move from urban centres to seek for employment in the industries located in rural areas/ county governments/ job transfer.
- ✓ Shortage of housing facilities in urban centres has made some people move to the suburbs/ small towns (where there are houses).
- ✓ Some people move to the rural areas after retirement for settlement.
- ✓ Some people move from urban centres to invest in the rural areas where resources are cheaper.
- ✓ Pollution related diseases in urban centres have made some people move to rural areas where there is less pollution.
- ✓ High cost of living in urban centres make people to move to rural areas where the cost of living is low.

iii. Urban to Urban migration.

- It is the movement of people from town to town.

- **Causes of urban to urban migration;**

- ✓ Change of profession.
- ✓ Job transfers.
- ✓ Better employment.
- ✓ Better business opportunity/ Investment in a new town.
- ✓ Affordable housing.
- ✓ Leisure.
- ✓ Search of higher education.
- ✓ Better healthcare.

iv. Rural to Rural migration.

- It is the movement of people from one rural area to another.

- **Causes of rural-rural migration in Kenya –kcse 2018**

- ✓ People move from one rural area to another in search of employment.
- ✓ Insecurity in some rural areas make people move to safer places.
- ✓ Pressure on land makes people buy/ look for land elsewhere and settle.
- ✓ Setting up of government development projects may cause displacement of people who are settled elsewhere/ government projects may attract settlement in those areas.
- ✓ Pastoral communities migrate from rural area to another in search of pasture/ water for their livestock.
- ✓ Changes in land tenure system/ inheritance/ land disputes cause people to move and settle elsewhere.
- ✓ Natural calamities make people to move to safer places.
- ✓ Transfers of services from one rural area to another/ Retirement/ Retrenchment.

(b) External/ international migration.

- It is the movement of people from one country to another.

- They include;

- **Immigration** is the movement of people into a country. The people involved are called **immigrants**.
- **Emigration** is the movement of people out of a country. The people involved are called **Emigrants**.

Reasons for external migration.

- i. Pursuit of higher education.
- ii. International job offers.
- iii. Warfare/Refugees/political unrest.
- iv. Tourism.
- v. Visiting relatives overseas.
- vi. Attending international conferences.
- vii. Political persecution/political asylum.

Causes of migration.

- i. **Pressure on land** i.e. shortage of land in one area (push) and availability in another area (pull force).
- ii. **Employment opportunities** i.e. shortage of employment opportunities (push) and availability (pull).
- iii. **Commercial/ business activities** attract people.
- iv. **Pressure on social amenities** e.g. houses available in one area (pull) and shortage in another (push).
- v. **Natural calamities** e.g. floods and drought make people to move from one area to another.
- vi. **Political conflicts** makes people to move to safe areas.
- vii. **Religious reasons** where people move to other areas for religious matters.
- viii. **Discovery of mineral/ new resources** make people to move.
- ix. **Government policies** e.g. establishment of projects like dams construction makes people to move.

Effects of migration.

(a) At the place of origin.

- ✓ Shortage of labour on the farms.
- ✓ Family break ups.
- ✓ Under development in the rural areas.
- ✓ Depopulation especially if the migration is forced.
- ✓ Lower rate of industrialisation due to transfer of skilled labour.
- ✓ Lowering fertility rate due to long separation.
- ✓ Underemployment in rural areas due to lowered agricultural productivity.

(b) On the place of destination.

- ✓ Increase in population.
- ✓ Economic development in an area especially if the migrants are engaged in meaningful income generating activities.
- ✓ Increased cases of crime from migrants who fail to secure employment.
- ✓ Pressure on existing social amenities.
- ✓ Presence of refugees would drain the resources of a country/insecurity as some refugees may engage in unlawful practices.
- ✓ Shortage of housing/ expansion of slums.

(c) On the individual.

- ✓ Lower fertility rate.
- ✓ Immorality may arise.
- ✓ Marriage break ups.
- ✓ Improved living standards of the worker.

- ✓ Acquisition of skills and change in attitude due to exposure.

Ways of calculating population growth.

- **Population growth** is the increase or decrease in the number of people.
- Population growth can be calculated in two ways namely;
 - (a) Natural population growth
 - (b) Numerical population growth

(a) Natural population growth.

- It is the natural increase or decrease in population.
- It is calculated using;
 - i. **Crude Birth Rate (CBR).**
- This refers to the number of births per every 1000 persons in a population.

$$\text{CBR} = \frac{\text{Total Number of Births in a year}}{\text{Total Population recorded in the year}} \times 1000$$

ii. Crude Death Rate (CDR).

- This refers to the number of deaths per every 1000 persons in the population.

$$\text{CDR} = \frac{\text{Total Number of Deaths in a year}}{\text{Total Population recorded in the year}} \times 1000$$

- CBR and CDR are referred to as crude because all other characteristics of the population e.g. age and sex are not considered.
- **Natural population growth (NPG)/ Population Growth Rate (PGR)** is the difference between CBR, CDR and migration i.e.

$$\text{NPG/ PGR} = \text{CBR} - \text{CDR} - \text{MIGRATION}$$

Example: In 2019, the CBR in Kenya was 41.3 while the CDR was 11.7. Calculate PGR.

Solution.

$$\begin{aligned}\text{PGR} &= \frac{\text{CBR} - \text{CDR}}{1000} \times 100 \\ &= \frac{41.3 - 11.7}{1000} \times 100 \\ &= 2.96\%\end{aligned}$$

(b) Numerical Population Growth.

- It is the actual/ absolute increase in the number of people in an area within a given period of time.
- It is calculated every 10 years by getting the difference between two census i.e.

$$\text{NPG} = \frac{\text{Inter-censal increase}}{\text{Population of the former census}} \times 100$$

- **Example:** In 2009, the population was 2000 and in 2019, it was 2500. Calculate NPG.

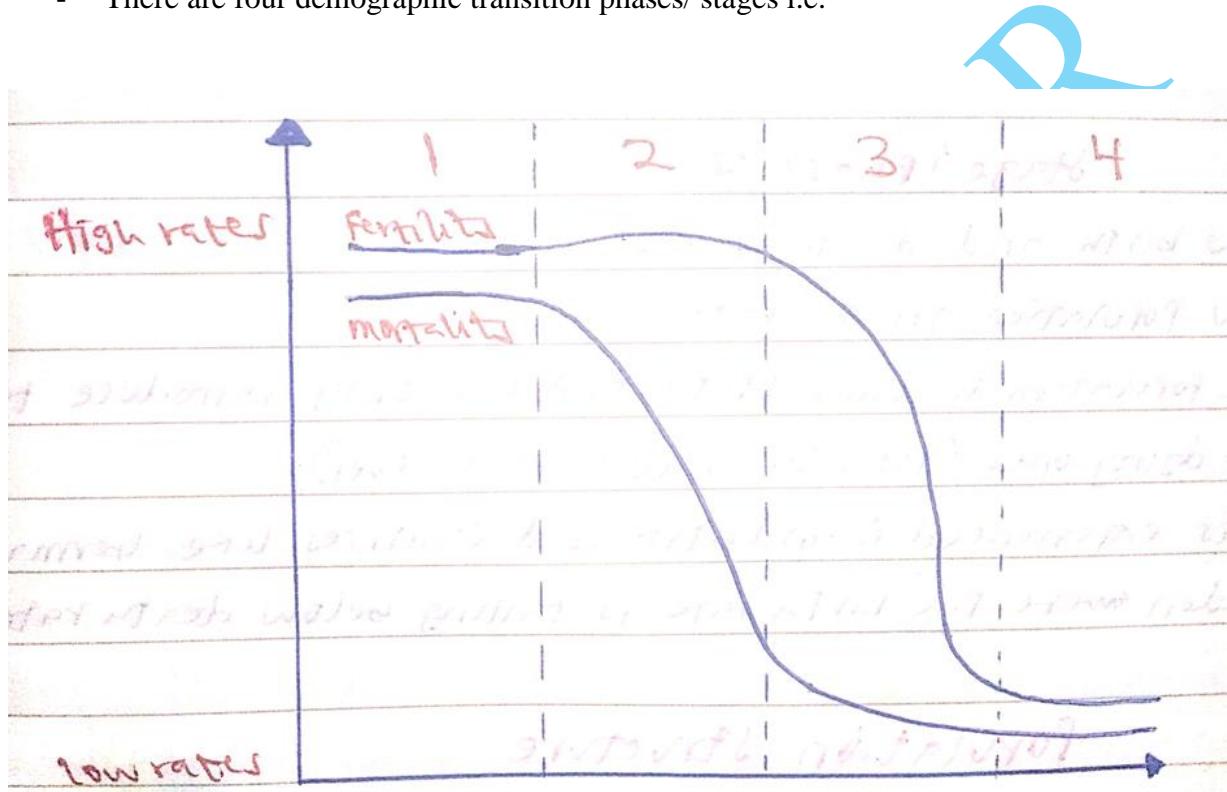
$$\begin{aligned}&= \frac{(2500 - 2000)}{2000} \\ &= 25\%\end{aligned}$$

Demographic/ Population Trends.

- Refers to the various changes which take place in the population of a given country and their impact on socio-economic environment.
- These changes can be positive or negative.
- **Demographic transition** refers to the historical change in the birth and death rates from high to low.

Demographic Transition theory.

- It states that a population's mortality and fertility decline from high to low levels as a result of economic and social development.
- There are four demographic transition phases/ stages i.e.



Stage/ phase 1.

- It was experienced in Europe before the 19th century.
- High birth rate and high death rate.
- There is little or no increase in population.
- High death rates are caused by:
 - ✓ Inadequate food supply.
 - ✓ Wars
 - ✓ Diseases
 - ✓ Insufficient medical facilities.

Stage/ phase 2.

- Kenya is in this stage.
- High birth rate and a decline in death rate.
- High population growth rate is due to:
 - ✓ Improved food supplies.
 - ✓ Improved medical facilities.

Stage/ phase 3.

- A decline birth rate and relatively low death rates.
- Moderate population growth due to;
 - ✓ Need to have small families.
 - ✓ Increased use of birth control methods.

Stage/ phase 4.

- Low birth and death rates.
- Low population growth rate.
- The population becomes static and can only reproduce to replace the dying ones (population replacement level).
- It is experienced in industrialised countries like Germany and Sweden where the birth rate is falling below death rate.

Population structure.

- It is the composition of the population in terms of age and sex/ gender.
- It can be presented graphically using population pyramid/ Age-sex pyramid.
- **Sex ratio** is the population of males to females at different age-groups.

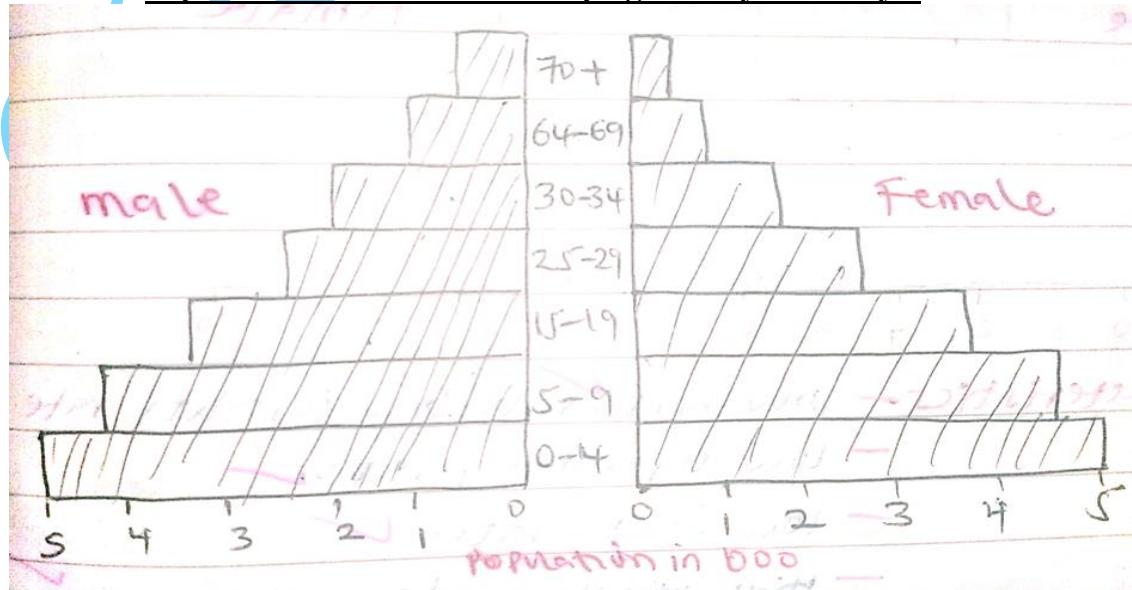
Characteristics of Age-sex pyramids/ population pyramid.

- ✓ Vertical axis represents age ranges.
- ✓ Horizontal axis represents percentage of total population.
- ✓ Right hand side represents female proportion.
- ✓ Left hand side represents male proportion.

Information that can be derived from a population pyramid –kcse 2015

- The size of population.
- The proportion of males and females.
- The proportion of youthful/ working/ ageing population.
- The composition of population by sex.
- The dependency ratio.
- The birth/ death rate.

Population structure of a developing country like Kenya.



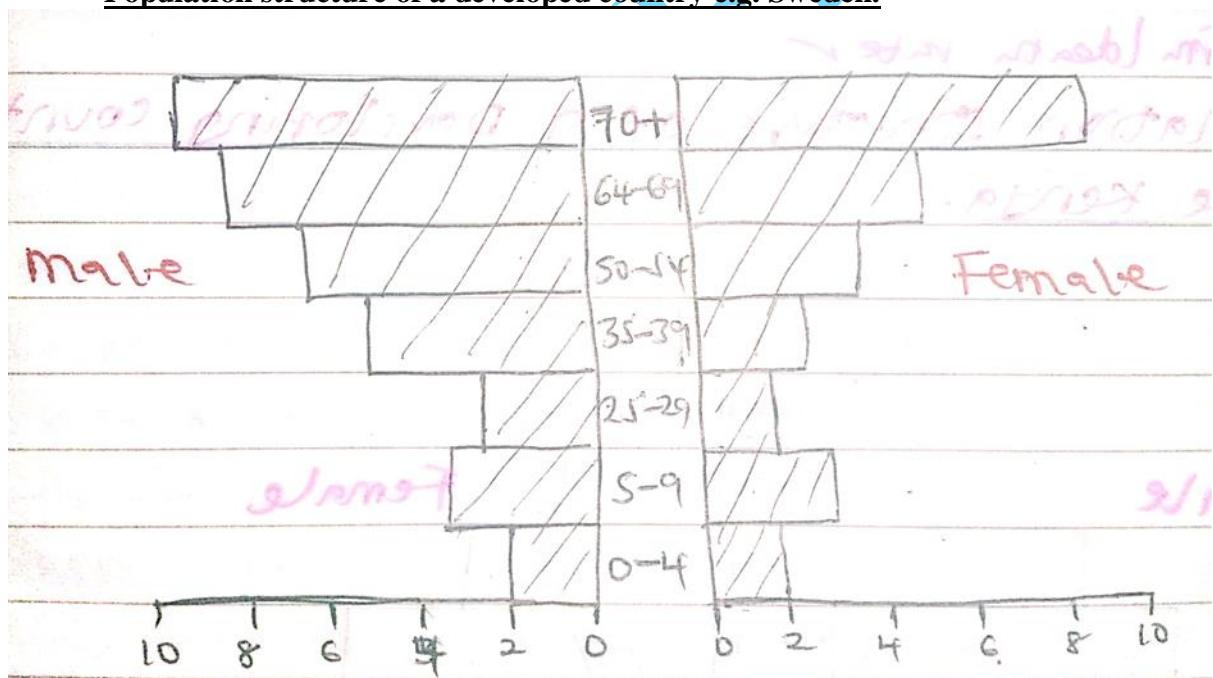
- **Characteristics; -kcse 2018**

- ✓ High birth rate.
- ✓ High fertility rate.
- ✓ High dependency ratio.
- ✓ High death rate/ mortality.
- ✓ Low life expectancy/ aging population is low.
- ✓ Low working population.
- ✓ Number of male and female is almost equal at all ages.
- ✓ Number of infants from age 0 to 4 years is high.
- ✓ Number of youthful population is high.

Quiz: Describe the characteristics of population by a pyramid of a developing country like Kenya (4mks).

- ✓ It is triangular in shape.
- ✓ It has a wide base showing high birth rate/ high number of children.
- ✓ It has a narrow top showing few old people/ low life expectancy.
- ✓ It has a high number of children and youth i.e. 10-19 years.
- ✓ It has a high number of adult population i.e. 20-60 years.
- ✓ The number of females and males is almost equal in all ages but slightly more older females than males.

Population structure of a developed country e.g. Sweden.



- **Characteristics; -kcse 2018**

- ✓ Low birth rate.
- ✓ Low fertility rate.
- ✓ Low death rate.
- ✓ Low dependency ratio.
- ✓ High working population.
- ✓ High life expectancy/ aging population is high.
- ✓ Number of male and female is almost equal at all ages.
- ✓ Number of infants from age 0 to 4 years is low.

- ✓ Number of youthful population is low.

Quiz: Describe the characteristics of population shown by a pyramid representing a developed country like Sweden (4mks).

- ✓ Narrow base showing low birth rate/ few children.
- ✓ Wide top showing high aged population.
- ✓ Bars become longer with increase with age.
- ✓ High working population/ low dependency ratio.
- ✓ Low mortality rate/ high life expectancy.

Dependency ratio.

- It is the proportion of unproductive population (below 20 years and above 65 years) in relation to the productive population (20- 64 years).

$$\text{Dependency Ratio} = \frac{\text{Children + Old people}}{\text{Working population}} \times 100$$

Over population/ Rapid population Growth –kcse 1996

- It is a situation where an area has a higher number of people than the available resources can support.

Causes of Kenya's rapid population growth –kcse 2008/ 2013

- Immigration** of large number of refugees from neighbouring countries like Somalia, Sudan and Ethiopia.
- The practice of polygamy** by some communities leads to large families/ many children.
- Improved health services/ medical facilities** has reduced infant mortality/ diseases.
- Early marriages** which gives a woman a long time to give birth to many children.
- Improved and abundant nutrition** leads to high fertility rate.
- The cultural practice of sex preference** for boys to girls leads to large families.
- Low rate of acceptance of family planning methods** has resulted in women having more children.
- Unplanned births among women** caused by reckless living and prostitution contributes to more births.
- Improved security** that reduces warfare that causes high death rate.

Consequences/ problems of high population growth –kcse 2015

- Kenya experiences a **high unemployment rate** leading to low standards of living.
- There is a **high dependency ratio** which leads to low savings by workers/ low standards of living.
- The high demand for land has caused **land fragmentation/ landlessness/ destruction of forest land**.
- The increased demand for food has led to **food shortages**.
- Increased expenditure on social amenities** slows down economic growth.
- There is **increased crime rates** due to high levels of unemployment and idleness.
- It leads to **development of slums** since people are unable to afford decent houses.
- There is a **scramble for the few available resources** like pastures and water for pastoralists leading to tribal clashes.
- There is **congestion in towns/ traffic jams** due to rural-urban migration in search of jobs.

- j. More land is likely to be used in the production of food crops at the expense of cash crops hence **reducing the country's foreign exchange**.
- k. The high population in towns has made **transport inadequate and expensive** leading to congestion at commuting points.

Under population/ slow population growth.

- It is a situation where an area has small number of people for full utilization of the available resources.

Benefits/ positive effects of low population growth –kcse 2013

- a) Reduced pressure on land making it available for economic activities.
- b) Low crime rate as most people are engaged in gainful activities.
- c) Low dependency ratio allows for investment/ savings/ high standards of living.
- d) Provision of adequate social amenities as the government has few people to provide for.
- e) The government saves funds for investment in economic activities.
- f) Reduced congestion in towns/ traffic jams.

Consequences/ problems/ negative effects of slow population growth –kcse 2018

- a) The social amenities are underutilized/ high cost of maintaining social amenities.
- b) There is inadequate labour supply/ manpower.
- c) The dependency ratio is high in old age.
- d) There is reduction in revenue collection.
- e) There is underutilization/ under exploitation of resources.
- f) There is inadequate local market for the locally produced goods/ decline of industries.
- g) There is limited defence.
- h) There is limited investment.
- i) There is high cost of transport/ services.

Implications of a young population.

- a) High demands for unproductive goods e.g. toys, sweets.
- b) Increased demands for social amenities like hospitals.
- c) High dependency ratio.
- d) High cases of juvenile delinquency i.e. street children pick pocketing.
- e) Increase in large numbers of unemployed people.

Effects of high ageing population in a country –kcse 2021

- i. Increased cost of health care as the aged are more prone to illnesses.
- ii. Increased dependency ratio.
- iii. Shortage of labour force.
- iv. Slow economic growth/ low revenue collection.
- v. Underutilization of social amenities.
- vi. Inadequate local market for goods.

Factors influencing population distribution in Sweden.

a) Relief.

- Population in highlands is low and scattered since mountainous areas have steep slopes, thin stony soils and the subsoil is permanently frozen hindering agriculture.

b) Climate.

- The chilly climate with cold winters and snow covering northern part leads to low population densities.

c) Forests.

- Forested areas are ideal for cultivation thus they are more populated.
- The plains not covered by forests have less population because they are permafrost.

d) Drainage.

- The population of Sweden is scattered since several small lakes and rivers are not inhabited.

e) Mining centre.

- Mining centres like iron ore mining areas have high population densities due to immigrants who provide labour.

f) Urbanization.

- The largest number of people live in urban areas e.g. Stockholm, capital city.

Factors which have contributed to slow population growth in Sweden.

- i. High number of females in employment.
- ii. Extensive non-marital cohabitations.
- iii. High rate of divorce and separation.
- iv. Use of contraceptives quite early.
- v. Literate population that understands the need for small population.
- vi. Improved medical facilities.

Similarities between population trends in Kenya and Sweden.

- i. Both countries have uneven distribution of population due to factors like relief, climate and presence of economic activities.
- ii. Both countries have low mortality rate due to improved medical care.
- iii. In both countries, population density in urban areas is high.
- iv. Both countries have population policies to study the trends and give recommendations.
- v. In both countries, there is use of family planning methods to control population growth.
- vi. In both countries, the population is involved in migration.
- vii. Both countries have parts which are not inhabited e.g. northern Sweden and Chalbi desert in Kenya.
- viii. In both countries there is dependency ratio.

Differences between population trends in Kenya and Sweden –kcse 2015

- i. The population of Kenya consists of mainly a large number of young people below 20 years of age while Sweden has an ageing population.
- ii. Kenya's population has a relatively low life expectancy while Sweden has a high life expectancy.
- iii. Kenya has a high population birth rate while that of Sweden is low.
- iv. Kenya's fertility rate is high while in Sweden is slow.
- v. Kenya's death rate is high while that of Sweden is low.
- vi. Kenya's population growth rate is high while that of Sweden is low.
- vii. Kenya has a high dependency ratio while in Sweden it is low.
- viii. Most of Kenya's population live in rural areas while in Sweden they mostly live in urban centres.

OGOTTI SENIOR

“END OF TOPIC NINE”

- **Human settlement** refers to a place with houses where people live.

Types of human settlement.

(a) Rural Settlements.

- They consist of villages/ scattered homesteads in the countryside where people engage mainly in agricultural activities/primary economic activities- **kcse 2011**
- Agriculture is the main source of occupation.
- Dominant activities are extractive/primary activities like mining, lumbering, fishing, livestock keeping, crop production, etc

(b) Urban Settlements.

- They are built-up areas in town with dense population and people engage mainly in industrial/commercial activities- **kcse 2011**
- They are pre-occupied with industrial and commercial activities.
- Trading is the main activity.
- Have dense settlements.
- Some towns perform religious functions e.g. cities of Rome, Jerusalem and Mecca.

Factors influencing location and patterns of settlements.

1. Physical Factors- kcse 2016

i. Climate- kcse 2011

- Different climates will influence the location of settlements.
- Areas that receive high rainfall have dense settlements because they are conducive to a variety of agricultural activities.
- Areas with low rainfall are sparsely settled because the climate limits economic activities.
- Areas prone to strong winds are often not settled to avoid destruction of property by the wind.
- Areas with extreme temperatures discourage settlements because of the unpleasant conditions.
- Low to high temperatures/ cool to hot conditions encourage dense settlements because they are conducive for human habitation.

ii. Relief- kcse 2011

- Varied relief will influence the location of settlements.
- Gentle slopes/lowlands are densely settled because they are conducive to agriculture/ building houses/ building roads.
- Steep slopes are sparsely settled because they have thin soils making them unsuitable for farming/ building roads.
- High mountain tops are not settled because they are too cold for plant growth/ human habitation.
- Mountainous areas are thinly settled because of their steep/rugged nature making them inaccessible.
- The leeward side of mountains are sparsely settled because they are dry and limits agricultural activities.
- Some hills have dense settlement because they are safe and secure.

iii. Soils

- Areas with well drained soils attract settlements as a wide range of crops can be grown.
- Areas with thin/ waterlogged soils discourages settlement as they are unsuitable for arable farming.

iv. Environmental diseases

- Regions infested with environmental diseases e.g. sleeping sickness have low concentration of settlements as they are avoided by people due to fear of contracting diseases.

v. Vegetation

- Different types of vegetation will influence the location of settlements.
- Thick vegetation e.g. forest may discourage establishment of settlements as they may not be easily accessible and can be habitats to disease causing organisms and dangerous animals.

vi. Drainage/presence of water bodies

- Rivers and springs with clean water may attract settlement as they provide water for domestic/ industrial uses.
- Swampy and marshy areas discourage settlement as they are hosts to disease causing organism and it's also difficult/expensive to put up housing units.
- Some rivers/lakes discourages settlements due to fear of floods/ attack by wild animals/ outbreak of diseases.

2. Human Factors

i. Government policy- kcse 2009

- The government may displace people in order to set up projects in an area/ projects set up by the government may attract settlements.
- The government may set up settlement schemes to resettle the landless.
- The government may gazette certain areas as reserves thus controlling settlement.

ii. Historical factors

- In the historical times, many communities settled in areas that were safe/secure from hostile communities. They also lived in groups.
- Historically, land was communally owned hence people settled anywhere.
- During colonialism, land was partitioned and people were confined to the areas they had settled. Africans were confined at native reserves while British colonialists settled in large farms where settlements were low.

iii. Economic factors- kcse 2014

- Mining attract workers who settle near the mine fields.
- Trade leads to development of market centres thereby attracting many people.
- Industrialisation leads to creation of jobs hence encouraging many people to live near industries.
- Transportation results to accessibility of services/goods thus attracting more settlements.
- Agriculture/irrigation schemes leads to siting of collection centres hence development of urban centres/new settlements.
- To sustain nomadic pastoralism, temporary settlements are put up.

iv. Social-cultural practices.

- Some Africans find it difficult to migrate out of the ancestral lands.
- Cultural practices like land inheritance may lead to land fragmentation thus dense settlements.
- Cultures like communal land ownership may influence dense settlement patterns.

Settlement Patterns.

- These are layout/arrangement of dwellings/housing units/buildings in a particular place.
- They include;- **kcse 2016**
 - Nucleated/clustered settlement pattern.
 - Dispersed/scattered settlement pattern.
 - Linear settlement pattern.
 - Radial settlement pattern.

(a) Nucleated/Clustered settlement pattern- **kcse 2017**

- The houses, shops and other buildings are close to each other/ in one place.

Factors that lead to the development of nucleated settlement patterns- **kcse 2013**

- i. Assurance of security/defence.
- ii. Availability of social amenities.
- iii. Limitation of land for building.
- iv. Presence of a natural resource.
- v. Presence of an industrial plant.
- vi. Government policy on settlement.

(b) Dispersed/ scattered settlement pattern- **kcse 2017**

- Dwellings/structures are scattered.
- The dwellings may be separated from one another by physical features.
- The dwellings are found a distance apart.

Factors that lead to the development of dispersed/scattered settlement patterns.

- i. Presence of adequate land for expansion and settlement.
- ii. Improved security over a wide area.
- iii. Presence of evenly distributed water points/resources.
- iv. Uniform deep, well drained soils.
- v. Individual ownership of land.

(c) Linear Settlement Pattern

- The dwellings/buildings are found along a line of transport like a river/canal/road/railway.

Factors that influence development of linear settlement pattern- **kcse 2019**

- i. People settle along rivers for water provision.
- ii. People settle along roads/railway line for ease of transport.
- iii. People settle along lakes/sea shores for fishing activities/ tourism.
- iv. People settle along ridges for easy house construction/security.
- v. People settle along forest fringes to access forest products.
- vi. People settle along the foot/base/bottom of escarpment for water/farming/easy house construction.

(d) Radial/star shaped settlement pattern.

- The dwellings/buildings are found where major/busy roads meet e.g. at road junction.

Distribution of major urban centers in East Africa

a) Capital Towns.

- They are main seat of the governments.
- They house the national assembly.
- They are administrative headquarters of each country.
- Examples- Nairobi, Dodoma, Kampala

b) Cities

- They are largest towns of East Africa.
- They have city council status, house diplomatic missions and United Nations and other international organisations.
- They house universities, referral hospitals and other specialized services like insurance, banking, air travel, high class hotels and casinos.
- Main cities are Nairobi, Dar-es-salaam, Kampala.

c) Sea ports

- They are located in the Indian Ocean coast e.g Mombasa, Malindi, Dar-es-salaam, Tanga, Mtwara and Lindi.

d) Lake Ports

- They are located along the shores of Lake Victoria e.g Kisumu, Mwanza, Kigoma, Musoma, Bukoba, Jinja and Masindi.

e) Mining Towns

- They are towns which evolved due to mining activities e.g. Magadi(soda ash), Kakamega(gold), Kilembe(copper), Tororo(limestone), Shinyanga(diamond).

f) Industrial towns.

- Their main activities are industrial activities e.g Athi River, Thika, Tororo, Jinja, Tanga.

g) Collecting towns.

- They are located in rich agricultural areas e.g. Nakuru, Kisii, Eldoret, Mbale, Mbarara, Iringa, Mbeya.

h) Gap towns.

- They are urban centres located at points of convergence of transport routes e.g. Voi, Moshi, Tabora, Hoima

i) Administrative towns.

- They are headquarters of government ministries, organisations and development agencies e.g All regional and county headquarters in Kenya, Dodoma, Singida, Morogoro, Masindi, Lira, Arua.

Factors favouring the growth of major urban centres in East Africa.

Urban growth is the expansion of towns/cities in terms of population and size.

- i. **Rural – urban migration:** - This leads to the expansion of the facilities in the urban areas to cater for the increased population.
- ii. **Industrialization:** - establishment of industries in the urban centres attract people as they offer employment opportunities. As industries expand, people move closer and settle near them to provide labour.
- iii. **Natural population growth:** - this is due to high birth rates and relatively low death rates in most of the East African countries. This because most of the migrants are in their reproductive age.
- iv. **Development of transport and communication networks:** - most urban centres in East Africa tend to grow due to development and improvement of transport and communication network i.e. most are accessible by good roads, railway lines, airports and waterways. This enables import/export trade, accelerates migration and avail social amenities and recreational facilities.
- v. **Administration:** - regional, district and provincial headquarters lead to the development of urban centres as government employees are posted to provide services. Also administration offices and workers' houses are built leading to expansion of the towns.
- vi. **Agriculture:** - makes a town to grow in the following ways:
 - ✓ Provide market for the industrial products from the urban centres.
 - ✓ Provide food for the urban residents.
 - ✓ Provide the raw materials for the industries established in urban areas

As such urban centres located in rich agricultural lands grow faster.

- vii. **Mining:** - attracts workers who move and settle near the mineral works. The mining company takes up the responsibility of providing the workers with social facilities leading to expansion of towns e.g. Magadi Town (soda ash mining).
- viii. **Tourism:** - the influx of tourists in a town may lead to its growth/expansion because of high demand for hotels, social and recreational facilities.
- ix. **Trading activities** have led to growth of some urban centres like Karatina, Thika.
- x. **Educational institutions** like universities have contributed to the growth of some urban centres like Dar-es-salaam.

Urban Morphology

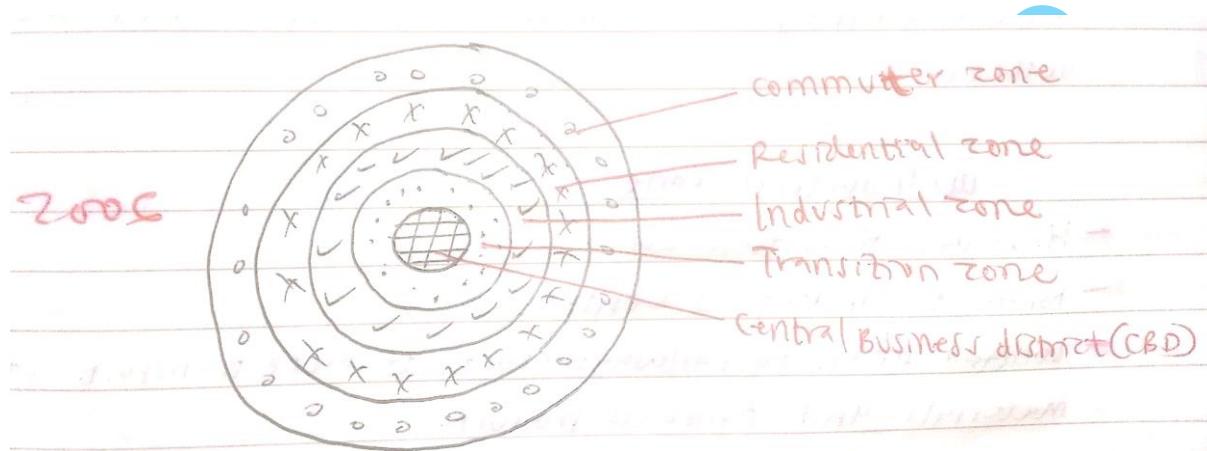
- It refers to the internal structure and arrangement of towns. It is concerned with the physical shape of towns, their history of development, variations in land uses and functions within towns.

Internal Structure of an ideal urban centre/urban zoning.

- **Urban zoning** is the division of a town into concrete rings/zones with specific functions. It also involves classifying urban centres on the basis of land use within them,

The functional zones of an ideal urban centres- kcse 2000

- i. Central Business district
- ii. Transition zone
- iii. Industrial zone
- iv. Residential zone
- v. Commuter zone



(a) Central Business District (CBD)

- Also known as the town centre/downtown.
- It is centrally located in the urban centre.
- Has the highest concentrations of the tallest buildings/vertically extended buildings.
- Has high rental values.
- Houses are mainly income generating.

Functions of CBD- kcse 2006

- i. Trading
- ii. Administration
- iii. Recreation
- iv. Commerce/Banking/Insurance
- v. Offices
- vi. Location of light industries

(b) Transition Zone

- Surrounds the CBD.
- Has older buildings and may be replaced by expansion of the CBD.
- Suitable for activities requiring proximity to the CBD.
- Land values are slightly low.
- Includes shopping malls, government offices and wholesale outlets.

(c) Industrial Zone

- Border transition zone.
- Forms the industrial centre.
- Located next to railways/ports to ease transport of raw materials and finished products.

(d) Residential Zone

- Houses workers hence located close to industrial zones.
- Starts with low class residential estates to middle and high class.

(e) Commuter Zone

- Emerges into the surrounding rural areas.

Quiz.

The diagram below represents the functional zones of an urban centre -kcse 2006



a. Name the zones marked X and Y (2marks).

- X – Industrial zone/ lower class housing.
Y – Suburb area.

b. State three ways in which the residents of the zone labelled agricultural land benefits from the urban centre (3marks)

- ✓ They have easy access to social amenities like medical and educational facilities.
- ✓ They have ready market for their farm produce.
- ✓ The working class can commute to and from the centre of work while living in cheaper houses.
- ✓ They have better chances of job opportunities than those living far away from the centre.
- ✓ They enjoy cheaper goods and services from the centre due to closeness to the town.

CASE STUDIES OF SAMPLE TOWNS IN KENYA.

A. THIKA TOWN.

- This is an **industrial town**.
- Has many industries e.g. Delmonte (for processing & canning of pineapples), Fabrication of metal containers, Motor Vehicle Assembly, cooking fat making and coffee processing amongst others.
- **Other industrial towns in Kenya are Athi River, Magadi, Mumias, Webuye.**

Non-food Agricultural industries in Thika- kcse 2004

- ✓ Leather tanning
- ✓ Cotton spinning
- ✓ Tobacco treatment/processing
- ✓ Textiles
- ✓ Tanning industry

Functions of Thika town –kcse 2020

- ✓ **Educational centre-** It is a home of several educational institutions/ universities/ colleges/ polytechnics e.g. Mount Kenya University/ Gretsa university/ KMTC.
- ✓ **Recreational centre** since there are several hotels/ stadium/ golf course and entertainment centres e.g. Blue post hotel/ Thika Greens Golf resort/ Flame tree bike park.
- ✓ **Industrial centre-** It has several manufacturing/ processing industries/ companies e.g. Delmonte/ Bidco/ Devki steel mills/ Kenblest industry/ Thika rubber industries.
- ✓ **Transport centre-** It has major roads/ road junctions e.g. Thika Super highway/ Thika bypass.
- ✓ **Communication centre e.g.** Thika post office/ Madaraka post office/ Safaricom centre.
- ✓ **Residential centre e.g.** Makongeni estate/ Kiganjo estate/ Kiandutu estate/ Nguingwa estate.
- ✓ **Administrative centre e.g.** It is the headquarter of Thika district.
- ✓ **Commercial centre –** It has booming trade in all commercial products e.g. Ananas mall/ Makongeni mall/ Thika west business centre.
- ✓ **Religious centre e.g.** PCEA Thika town/ Redeemed gospel church/ CITAM Thika town church/ Masjid noor mosque/ MKU mosque.
- ✓ **Agricultural centre e.g.** National cereal and produce board/ Kenya Farmers Association/ Thika farmers centre.
- ✓ **Health centre e.g.** Thika level 5 hospital/ The Mater hospital/ Thika satellite hospital.
- ✓ **Cultural centre e.g.** Elaganee cultural collections/ Thika language of communication centre.
- ✓ **Tourist centre e.g.** Chania falls/ Fourteen falls/ Thika museum/ Thika falls.

Factors favouring the growth and development of Thika town as an industrial town- kcse 2004

- i. **The widespread railway/road transport network** which provides easy movement of food/people/raw materials/finished products.- **kcse 2016**
- ii. **Its proximity to Nairobi/strategic location** has led to industrial expansion as Nairobi acts as market to its products/supplies-**kcse 2016**
- iii. **The rich agricultural hinterland** has provided raw materials for industries-**kcse 2007**
- iv. **The abundant water supply from river chania** which is used for industrial purposes-**kcse 2007**
- v. **The cost of land is relatively cheap** hence attract investors. **There is ample/flat land** for development of industries/settlement-**kcse 2016**
- vi. **The high population** around Thika provides **ready market/labour** for the industrial products.
- vii. **The government policy of decentralization** of industries has encouraged the growth of Thika.
- viii. **Availability of building materials** like sand harvested from River Chania.

- ix. **Availability of hydro-electric power** harnessed from river Chania used in industry.
- x. **Adequate social amenities** like hospitals and schools attract settlement.

B. KISUMU

- This is third largest town in Kenya.
- The largest **lake port** in East Africa.

Functions of Kisumu town –kcse 2011

- ✓ **Educational centre-** It is a home of several educational institutions/ universities/ colleges/ polytechnics e.g. Kisumu National polytechnic/ Kenya Utalii college/ University of Nairobi Kisumu campus/ Nairobi aviation college Kisumu campus/ KMTC.
- ✓ **Recreational/ Tourist centre** since there are several hotels/ stadium/ golf course and entertainment centres e.g. Dunga hill camp/ Dunga beach/ Kisumu impala sanctuary/ Kisumu museum/ Hippo point/ Winam gulf/ Dunga broadwalk/ Ndere island national park.
- ✓ **Industrial centre-** It has several manufacturing/ processing industries/ companies e.g. Fish processing factory/ Equator bottlers/ Jubilee jumbo factory.
- ✓ **Transport centre-** It has major roads/ road junctions/ airports e.g. Kisumu international airport/ Kisumu bus terminus/ Kisumu railway station.
- ✓ **Communication centre e.g.** General post office Kisumu/ E.M.S posta Kisumu/ Safaricom centre.
- ✓ **Residential centre e.g.** Milimani estate/ Riat hills estate/ Mamboleo estate/ Tom mboya estate/ Lolwe estate.
- ✓ **Administrative centre e.g.** It is the headquarter of Kisumu county.
- ✓ **Commercial centre –** It has booming trade in all commercial products e.g. The west end shopping mall/ Mega plaza mall/ Mega city mall/ United mall Kisumu/ Nyamasaria market.
- ✓ **Religious centre e.g.** Jamia mosque/ The mosque of Jesus Christ son of Mary/ Jubilee Christian church Kisumu/ CITAM church Kisumu.
- ✓ **Health centre e.g.** Aga khan hospital/ milimani maternity hospital/ The Kisumu specialist hospital/ Avenue hospital.
- ✓ **Cultural centre e.g.** Rich Luo culture/ Luanda magere site and grave/ Susan owiyo art centre.

Factors favouring the growth and development of Kisumu as a lake port- kcse 2017

- i. **Early settlement by Asians** led to commercial development of the town.
- ii. **It is strategically located on the shores of Lake Victoria** hence handling trade among the East African countries.
- iii. It is surrounded by areas with **high population which provide labour/market**.
- iv. It has **abundant water supply from Lake Victoria** for domestic/industrial use.
- v. It has **well developed road/railway networks** making the town easily accessible.
- vi. It has a **rich agricultural hinterland** which provides raw materials for industries.
- vii. It has **many industries** like fish processing, breweries, making of soft drinks, boat making, and soap making.
- viii. It is the **headquarters of Kisumu County** hence setting up of administrative offices leads to its growth.

Kisumu was a **terminus for the Kenya-Uganda railway** allowing the influx and settlement of early Asian traders.

C. ELDORET

- This is an **agricultural collection centre**.
- **kcse 2011 - Other towns in Kenya that started as agricultural collection centres are;**

- ✓ Nakuru
- ✓ Eldoret
- ✓ Nanyuki
- ✓ Kitale
- ✓ Nyeri
- ✓ Nyahururu

Functions of Eldoret town –kcse 2023

- ✓ **Educational centre**- It is a home of several educational institutions/ universities/ colleges/ polytechnics e.g. Catholic university/ KMTC/ Eldoret National polytechnic/ Rift Valley technical institute.
- ✓ **Recreational centre** since there are several hotels/ stadium/ golf course and entertainment centres e.g. Sirikwa hotel/ Eldoret Golf club/ Tamasha club/ Kipchoge Keino.
- ✓ **Industrial centre**- It has several manufacturing/ processing industries/ companies/ cooperative creameries e.g. Rivatex/ Unga limited/ Raiply/ Brookside.
- ✓ **Transport centre**- It has a railway station/ international airport/ road junction e.g. Eldoret railway station/ Eldoret international airport/ Eldoret pipeline.
- ✓ **Communication centre** e.g. Posta Eldoret/ Safaricom centre.
- ✓ **Residential centre** e.g. West Indies/ Kapsoya/ Langas/ Kamukunji/ Annex/ Huruma.
- ✓ **Administrative centre** e.g. It is the headquarters of Uasin Gishu County.
- ✓ **Commercial centre** – It has booming trade in all commercial products e.g. Central Bank/ Rupers mall/ Zim mall.
- ✓ **Religious centre** e.g. St. Mathew cathedral sacred heart of Jesus.
- ✓ **Agricultural centre** e.g. National cereal and produce board/ Kenya Farmers Association.
- ✓ **Health centre** e.g. Moi Teaching and Referral Hospital/ Eldoret hospital.

Factors for the growth and development of Eldoret Town as an agricultural collection centre- kcse 2009

- i. **Eldoret started as a railway station on the Kenya-Uganda railway** and thus attracted settlement.
- ii. **It has a rich agricultural hinterland** which has led to its growth as an agricultural collecting and processing centre.
- iii. **It is located in an area that experiences cool and wet climate** ideal for settlement.
- iv. **The terrain of the land is a plateau** which allows room for expansion.
- v. **The modern international airport** has encouraged trade.
- vi. **Investment by local entrepreneurs/athletes** has led to the expansion of the town.
- vii. **High population** in the surrounding region **provides market** for agricultural, manufactured goods/**provides labour** for the industries.
- viii. **The government policy of decentralization of industries** led to setting up of some industries in the town.
- ix. **Eldoret is the headquarter of Uasin Gishu County** and this has attracted administrative services in the town.
- x. **Establishment of many educational institutions** has attracted settlement.

RELATED STUDIES ON NAIROBI CITY AND NEW YORK CITY.

1. NAIROBI CITY.

- This is the capital city of Kenya and the largest urban centre in East Africa.
- It is the headquarters of many international organizations e.g. UNEP, ILRI, ICIPE, ICRAF, HABITAT, etc

Factors that influenced the growth of Nairobi City.

- i. **Presence of many industries** that attract many people for employment opportunities.
- ii. **Well-developed transport and communication networks** like roads/railway/Wilson airport and JKIA that connects it to the rest of the world.
- iii. **Administrative centre** ie capital city and the main seat of the government of the Republic of Kenya, houses the parliament and headquarters of Nairobi City County.
- iv. **Internationally recognized facilities** like KICC, Hotels like Inter-continental/Serena that hosts international meetings and headquarters of many international organizations e.g. UN, ICRAF, ICIPE.
- v. **Presence of abundant supply of water from Nairobi River** as well as the surrounding areas used for industrial purposes.
- vi. **A large supply of cheap labour from the surrounding neighbouring areas** led to the growth of industries.
- vii. **The presence of a large and ready market** as a result of Nairobi's large population boosts trading activities.
- viii. **It served as a resting place for the railway construction workers** for it was seen as half way between Kisumu and Mombasa.
- ix. **Establishment of many educational institutions** both public and private universities that attract people.
- x. **It is a destination for local/international immigrants** who seek employment/invest/trade.
- xi. **It is a tourist attraction city** with Nairobi National park/ international hotels/ efficient JKIA has led to its development.
- xii. **It is a business/ commercial centre** with Nairobi stock exchange/ financial institutions like banks that favour business.

Examples of industries in Nairobi city.

- ✓ Beer brewing
- ✓ Soft drinks making
- ✓ Motor vehicle assembling
- ✓ Milk processing
- ✓ Textiles
- ✓ Flour milling
- ✓ Printing
- ✓ Publishing
- ✓ Fruit canning
- ✓ Soap manufacture
- ✓ Steel rolling
- ✓ Iron sheets making
- ✓ Shoe making
- ✓ Cell phone industry

Problems facing Nairobi City- kcse 2017

- i. Traffic congestion during rush hours.
- ii. High rate of unemployment.
- iii. Shortage of housing.
- iv. Increased noise and air pollution.
- v. Inadequate social amenities like schools, water supply, health services and recreation facilities.
- vi. Increased crime rate.
- vii. Development of slums/ unplanned settlement.

Functions of Nairobi city.

- ✓ **Educational centre-** It is a home of several educational institutions/ universities/ colleges/ polytechnics e.g. University of Nairobi/ Kenyatta university/ Technical university of Kenya/ KMTC/ East African school of Aviation.
- ✓ **Recreational centre** since there are several hotels/ stadium/ golf course and entertainment centres e.g. Muthaiga golf club/ Karen golf club/ Kenya railway golf club/ Villa Rosa Kempinski hotel/ Radisson Blu Hotel.
- ✓ **Industrial centre-** It has several manufacturing/ processing industries/ companies/ cooperative creameries e.g. Osho chemicals limited/ crown paints Kenya limited/ Twiga chemicals/ Pipe manufactures limited/ Nestle Kenya limited.
- ✓ **Transport centre-** It has a railway station/ international airport/ road junction e.g. JKIA/ Nairobi expressway/ Thika super highway/ Nairobi railway station/ Nairobi terminus.
- ✓ **Communication centre e.g.** City square post office/ Ruaraka post office/ post office GPO branch/ Safaricom centre.
- ✓ **Residential centre e.g.** Karen estate/ Runda estate/ Kitisuru estate/ Lavington estate/ Muthaiga estate.
- ✓ **Administrative centre e.g.** It is the headquarters of Nairobi city County/ capital city of Kenya.
- ✓ **Commercial centre –** It has booming trade in all commercial products e.g. Two rivers mall/ Garden city mall/ Yaya centre/ West gate shopping mall.
- ✓ **Religious centre e.g.** Jamia mosque/ Masjid Abubakar mosque/ All saints cathedral/ Cathedral Basilica of the Holy family churches/ Nairobi chapel CBD.
- ✓ **Agricultural centre e.g.** National cereal and produce board/ Kenya Farmers Association.
- ✓ **Health centre e.g.** The Nairobi hospital/ Kenyatta national hospital.
- ✓ **Cultural centre e.g.** National museum/ Bomas of Kenya/ Kenya national archives.
- ✓ **Tourist centre e.g.** Nairobi national park/ Karura forest/ Ngong hills/ Nairobi national museum/ Giraffe centre/ KICC.

2. NEW YORK CITY.

- This is the largest and most cosmopolitan (contains people of different types from different countries, and influenced by their culture) urban centre in North America.
- Situated at the estuary of Hudson River on the islands in Atlantic Ocean.
- It has a unique pattern of streets called the **manhattan distance ie** a street pattern where the shortest distance between any two places in a series of right- angled segments.

Factors favouring the growth of New York City.

- i. **Great Sea Port** which handles over 25% of all the trade in North America.
- ii. **Well-developed transport & Communication networks** like sea routes/ canals/ international airports (**J.F kennedy/ Newark/ La Guardia Airports**).
- iii. **International Centre** ie headquarters of several international organizations e.g. UN, IMF and World Bank leading to world trade/finance centre.
- iv. **Well planned internal city structure** ie manhattan distance which reduce traffic congestion.
- v. **Presence of many industries** that deal with paint, pulpwood, paper, machinery, electrical equipment, pharmaceuticals, food processing, leather goods and textiles.
- vi. **Education centre** ie has many educational institutions which attract many people.
- vii. **Cultural centre** ie the city is internationally recognised as a fashion and art centre.

Functions of New York City –kcse 1996

- ✓ **Educational centre** e.g. Stony Brook University / Columbia University / New York University.
- ✓ **Recreational/ Tourist centre** e.g. Times Square/ Central park/ The museum of modern art/ Rockefeller park/ Pelham bay park.
- ✓ **Industrial centre** e.g. Fashion industry/ Food and beverage industry/ media industry.
- ✓ **Transport centre** e.g. International airports (J.F Kennedy/ Newark/ La Guardia)/ Erle canal.
- ✓ **Communication centre** e.g. United States postal service.
- ✓ **Residential centre** e.g. The Riker estate/ Cargle house/ Arch brook estate/ Williamsburg estate/ Brooklyn estate.
- ✓ **Administrative centre** e.g. It is the headquarter of UNO.
- ✓ **Commercial centre** – It has booming trade in all commercial products e.g. The Fulton centre/ Queens centre/ The shops at Columbus circle/ Brookfield place.
- ✓ **Religious centre** e.g. Cathedral of saint John the Divine/ Central synagogue/ All saints church/ Masjid Malcolm shabbaz mosque.
- ✓ **Health centre** e.g. Bellevue hospital centre/ metropolitan health centre/ Harlem health centre/ Elmhurst health centre.

Problems facing New York City.

- Inadequate space for expansion because the city is mostly located on islands.
- Unemployment and underemployment since most immigrants are unskilled/employment opportunities less than the available labour force.
- Pollution due to heavy industrial wastes and exhumes from several motor vehicles.
- Development of slums/ghettos due to inadequate housing.
- Traffic congestions.
- Terrorist attacks.
- High crime rates especially drug trafficking/abuse due to higher rates of unemployment.

Similarities between Nairobi and New York Cities.

- ✓ Both cities are headquarters of international organisations.
- ✓ Both are the largest cities in their respective regions.
- ✓ Both cities are well linked internationally through airports.
- ✓ Both cities are residential centre.
- ✓ Both cities experience traffic congestions during rush hours.
- ✓ Both cities are affected by high crime rates including terrorist attack.
- ✓ Both cities are leading industrial towns in their regions.

- ✓ Both cities are leading recreational and cultural centres with sports grounds, cinema/theatres and other social activities.
- ✓ Both cities have rivers passing through them.
- ✓ Both have Open Park for recreation within their CBD e.g Uhuru Park and Rectangular central park (New York).
- ✓ Both cities are financial/ trade centre e.g CBK, World Bank, IMF.
- ✓ Both cities are religious centre e.g churches/mosques/temples.

Differences between Nairobi and New York Cities.

- i. Nairobi is a national capital city while New York is a state capital city.
- ii. Nairobi is an inland/dry port while New York is a seaport.
- iii. Nairobi is a regional commercial centre while New York is an international commercial centre.
- iv. Nairobi has a large space for expansion while New York is built on islands hence limited space for expansion.
- v. Nairobi has few tall buildings while New York has many tall buildings.
- vi. New York developed as a sea port whereas Nairobi developed as a town following construction of Kenya-Uganda railway.
- vii. New York is located in a developed country while Nairobi is located in a developing country.
- viii. New York has an approximately 12 times larger population than Nairobi.
- ix. New York has a variety of modes of transport (road, railway, canals, underground passages) while Nairobi has road transport and limited railway services.
- x. New York is a coastal city while Nairobi is an inland city.
- xi. Nairobi experiences problem of tribalism while New York experiences the problem of racism.

Kcse 2013: Identify two differences in the functions of Nairobi and New York.

(Answers are points i, ii, iii above)

RELATED STUDIES ON THE PORTS OF MOMBASA AND ROTTERDAM

1. MOMBASA

- This is the largest sea port in the coast of East Africa and the second largest town in Kenya.
- It is partially situated on the mainland and partially on Mombasa Island.
- It started as a small settlement during the slave trade era – as a resting place and a calling port for the long distance traders
- The growth and development of modern Mombasa was influenced by the beginning and eventual construction of the Kenya – Uganda Railway in 1896
- Today, Mombasa is one of the best ports in East Africa with modern port facilities for handling import – export trade

Factors influencing the growth of Mombasa Port- kcse 2001

- i. **Deep and well sheltered harbour** for port development.
- ii. **Its strategic position of east coasts of Africa** was ideal calling point for early traders to and from the Far East.
- iii. **Large hinterland** rich in agricultural produce and mineral wealth.
- iv. **Establishment of oil refinery and other industries** has attracted many people to the town.
- v. **Modern Port Handling Equipment e.g** cranes for effective handling of goods.

- vi. **Tourism has contributed to the development of many hotels** which attract large population/bring foreign exchange/ create employment.
- vii. **The island provides a good defensive site** against external attacks.
- viii. **The flat land** was ideal for construction of buildings.
- ix. **The coral limestone found in the area** was used as building stones for houses.
- x. **Early trading** which promoted early settlement.
- xi. **The construction of the railway and other lines of transport** to the interior contributed to the growth of the town.

Examples of industries located in Mombasa.

- ✓ Oil refinery
- ✓ Cement manufacture
- ✓ Brewing
- ✓ Making fertilisers
- ✓ Motor vehicle assembling
- ✓ Aluminium and steel rolling
- ✓ Food processing
- ✓ Boat making
- ✓ Ship repairs
- ✓ Soap making
- ✓ Shoe making
- ✓ Textiles

Functions of Mombasa city.

- ✓ **Educational centre-** It is a home of several educational institutions/ universities/ colleges/ polytechnics e.g. Coast institute of technology/ Daystar University/ African institute of research and development studies/ cooperative university college of Kenya.
- ✓ **Recreational/ Tourist centre e.g.** Sandy beaches/ Fort Jesus/ Vasco da gama pillar/ Haller park/ Old town/ wild waters/ Mombasa marine national park/ Nyali beach.
- ✓ **Industrial centre e.g.** Oil refinery at Changamwe/ Cement factory at Bamburi.
- ✓ **Transport centre e.g.** Moi international airport/ Mombasa terminus/ Likoni ferry/ Kilindini harbour
- ✓ **Communication centre e.g.** General post office Mombasa/ Old post office/ Safaricom centre.
- ✓ **Residential centre e.g.** Nyali estate/ Mtwapa estate/ Shanzu estate/ Bamburi estate/ Kizingo estate/ Kibokoni estate/ Likoni estate.
- ✓ **Administrative centre e.g.** It is the headquarter of Mombasa County.
- ✓ **Commercial centre –** It has booming trade in all commercial products e.g. Nyali centre/ City mall/ Mombasa mall.
- ✓ **Religious centre e.g.** Burhani mosque/ Mombasa memorial cathedral/ Holy Ghost Roman cathedral/ Shiva temple/ Azhar mosque.
- ✓ **Health centre e.g.** Port Reitz district hospital/ Coast general teaching and referral hospital/ Premier hospital/ The Mombasa hospital.
- ✓ **Cultural centre e.g.** Swahili culture centre/ Mombasa old town conservation society/ Mombasa cultural village.

Problems facing Mombasa -Kcse 2001

- ✓ Acute shortage of water as the population has outgrown the available supply.
- ✓ Inadequate social amenities like schools/health services.
- ✓ Shortage of housing.
- ✓ Limited space for expansion.
- ✓ Traffic congestion during rush hours.
- ✓ Increased crime rates.
- ✓ Increased noise/land/water/air pollution.

Definition of Terms

- i. **Hinterland** is a wide area served by a port/city/town.
- ii. **Entreport** is an area where export and import of goods occurs.
- iii. **Dry port** is an inland port which holds goods on transit.
- iv. **Seaport** is an entreport.

Countries that make hinterland of Mombasa port.

Rwanda, Uganda, Tanzania, Zambia, Burundi, D.R.C, South Sudan

Factors considered when siting a seaport/ entreport.

- i. **Deep waters** to provide wide berths for holding large vessels at the port.
- ii. **Sheltered sites** from strong winds and high/low tidal range for ships to enter the port at any time.
- iii. **Large extensive flat land** for expansion of port facilities.
- iv. **An extensive and developed hinterland** to provide goods to the port.
- v. **Adequate capital** invested to construct modern port facilities/ container depot/ cranes.
- vi. **Availability of modern skills** and technology in maintaining port facilities/ ship building.

Examples of Dry/ inland ports in Kenya.

- ✓ Naivasha dry port
- ✓ Eldoret inland port
- ✓ Inland container Depot in Embakasi (ICDE)
- ✓ Kisumu inland port

2. ROTTERDAM

- This is the largest port in the world and the most important entreport in Europe.
- Located at the mouths of rivers Rhine and Maas.

Countries which make hinterland of Rotterdam port.

- ✓ Belgium
- ✓ Germany
- ✓ Luxembourg
- ✓ Netherlands
- ✓ Switzerland
- ✓ France
- ✓ Austria

Major world entreports.

- i. Rotterdam port in Europe
- ii. Antwerp port in Belgium
- iii. Amsterdam port in Netherlands
- iv. Mombasa port in Kenya

Factors for the growth and development of Rotterdam port.

- (a) **Large and rich hinterland** that makes it a leading international entreport.
- (b) **Suitable location at the focal point of sea routes** to and from Europe, Africa, America and Asia. This has made it an important port of call.
- (c) **Warm weather ie** warm North Atlantic drift currents keeps the port free from ice throughout the year.
- (d) **Modern port handling facilities like** container terminals, loading and off-loading equipment which handle large cargo volumes and serve many ships at a time.
- (e) **Deep harbour and canals** that accommodate larger/ wide vessels hence much larger volume of trade.

Functions of Rotterdam.

- ✓ **Educational centre e.g.** Rotterdam Business School/ Erasmus university Rotterdam/ Tio business school.
- ✓ **Recreational centre e.g.** Splashtours/ Euromast/ Climbing park fun forest/ Dekuip stadium.
- ✓ **Industrial centre e.g.** maritime and port industry/ steel industry.
- ✓ **Transport centre e.g.** Hague airport/ Antwerp international airport/ port of Rotterdam.
- ✓ **Residential centre e.g.** Delfshaven estate/ Rotterdam Noord estate/ Katendrecht estate/ cube houses.
- ✓ **Administrative centre e.g.** Dutch headquarters of Allianz/ headquarter of port of Rotterdam.
- ✓ **Commercial centre** – It has booming trade in all commercial products e.g. Markthal shopping mall/ Alexandrium shopping centre/ Mini mall/ De Bijenkorf Rotterdam.
- ✓ **Religious centre e.g.** Merlana mosque/ Orthodox Church of Saint Alexander/ Orthodox cathedral of Saint Nicolas/ Lawrence church.
- ✓ **Health centre e.g.** Erasmus MC hospital/ Erasmus university medical centre/ Kazia hospital Rotterdam/ maastad hospital.
- ✓ **Tourist centre e.g.** Rotterdam zoo Blijdore/ Euromast/ Floating farm/ Hotel New York.

Similarities between ports of Mombasa and Rotterdam- kcse 2020

- i. **Both ports have modern facilities/ spacious harbours** which enable them to handle large quantities of exports and imports.
- ii. **Both ports handle containerized cargo** which ensures the goods are safe since they have tamper proof seals.
- iii. **Both ports have rich/ extensive hinterland** which help their countries to collect a lot of revenue/ markets.
- iv. **Both ports are well served by transportation routes** which ensures easy movement of goods to and from the interior.
- v. **Both ports are commercial centres** where a lot of trade takes place.
- vi. **Both ports have social amenities** which serve the residents/tourists.

- vii. **Both ports are located at the mouth of drowned rivers** providing sheltered/ deep harbours.
- viii. **Both ports are ice free** thus used throughout the year.
- ix. **Both ports are tourist destinations** earning their countries foreign exchange.
- x. **Both ports are industrial centres** creating employment opportunities improving people's living standards.

Differences between ports of Mombasa and Rotterdam - kcse 2019

- i. Rotterdam handles more **cargo** than Mombasa.
- ii. Rotterdam port has up to date cargo handling **technology** while Mombasa port is less mechanized.
- iii. Rotterdam port has room for **expansion** while Mombasa port has limited space- **kcse 2009**
- iv. Rotterdam port is **linked** by road, railway, pipeline, air, **waterways** while Mombasa port is linked by road, railway, pipeline and air- **kcse 2009**
- v. Rotterdam port **exports** mainly manufactured goods while Mombasa port exports mainly raw materials.
- vi. Rotterdam serves a **hinterland** of developed countries while Mombasa serves a hinterland of developing countries- **kcse 2009**
- vii. Mombasa has a hot and humid **climate** while Rotterdam experiences cool winters and hot and humid summers- **kcse 2001**

Urbanization -**kcse 2003**

- It is the process by which a population is transformed from rural based agricultural lifestyles to urban based non-agricultural lifestyle.
- It is the process whereby an increasing population of the total population in a country settles in towns.
- It is the process through which towns/ cities grow in numbers and size.

Positive effects of urbanization -**kcse 2020**

- i. It encourages **national unity** since people of different ethnicity/ nationality interact.
- ii. It creates **employment opportunities** through trading/ industrial activities raising people's living standards.
- iii. It leads to development of **transport/communication networks** which facilitate faster movement of goods/ services.
- iv. It leads to development of **social amenities** improving the people's living standards.
- v. It provides market for agricultural/ industrial goods produced in a country hence encourage the farmers/ industrialists to produce more.
- vi. Some urban centres are **tourist attraction** which earn the country foreign exchange.

Negative effects of Urbanization – **kcse 2014**

- i. **Inadequate housing** leads to development of slums/ shanties in urban centres.
- ii. There is **traffic congestion** in urban centres resulting in delays.
- iii. **Unemployment** in urban centres leads to high crime rate.
- iv. There is **pollution** in urban centres due to dumping of garbage/ disposal of waste into drainage systems/ noise from vehicles/industries/ emission of smoke from vehicles and industries.
- v. There is **strain on social amenities** in urban centres due to rapid population growth.
- vi. There are **street families** in the urban centres due to poverty.
- vii. **Cultural erosion** due to cosmopolitan population.

- viii. **Increased crime rates like** pick pocketing/ carjacking/ thuggery.
- ix. **Breakdown of the family unit** as men move to towns to seek job opportunities.

Kcse 2006- **State factors that contribute to the emergence of slums in urban centres.**

- ✓ Low income due to unemployment/ underemployment.
- ✓ Shortage of proper houses.
- ✓ Inadequate financial ability.
- ✓ High cost of land/ houses in other parts of the towns.
- ✓ Poor urban planning.
- ✓ High rate of migration into urban centres.

OGOTTI SENIOR

“END OF TOPIC TEN”

TOPIC ELEVEN: MANAGEMENT AND CONSERVATION OF THE ENVIRONMENT.

By Prof. Ogoti Robert Maxwell

Definition of Environment –kcse 2015

- It is **all the external conditions surrounding an organism** and which have influence over its behaviour/ activities.

Environmental Management –kcse 2017

- It is effective planning and control of the processes and activities that could cause the deterioration of the environment/ improving resources in the environment.

Environmental Conservation.

- It is the protection, preservation and proper utilization of natural resources from destruction/ wastage/ loss.

Need for Environmental Management and Conservation.

- The following are reasons for/ significance of conserving and managing the environment -kcse 2014
 - i. **To ensure effective utilisation of the available resources/** avoid wastage/ depletion.
 - ii. **To reduce pollution** which causes diseases to animals/ plants resulting into good health/ prolonged life/ reduce global warming.
 - iii. **To protect the endangered plant/ animal species/** preserving them for posterity.
 - iv. **To preserve the aesthetic value/** beauty of landscape/ wildlife to promote tourism.
 - v. **To protect the water catchment areas/** wetlands in order to preserve water sources/ maintain water cycle.
 - vi. **To increase/ maintain source of food/** to maintain soil fertility because soil is the source of food.
 - vii. **For economic value.** Some natural resources like forests and minerals are extracted/ processed and sold earning income.
 - viii. **To sustain sources of raw materials for industries** e.g. forests and mineral reserves need to be managed well.

Environmental Hazards.

- They refer to dangers or disasters within the environment due to natural causes or human activities.
- They include; -kcse 2009/ 2018/ 2023
 - ✓ Windstorms
 - ✓ Floods
 - ✓ Lightning
 - ✓ Pests and Diseases
 - ✓ Pollution
 - ✓ Volcanic eruptions
 - ✓ Drought/ Desertification
 - ✓ Earthquakes/ seismic disturbances
 - ✓ Heat waves/ fires

Kcse 2009- Name three environmental hazards associated with climatic conditions (3mks)

- ✓ Windstorms
- ✓ Lightning/ Thunderstorms
- ✓ Floods
- ✓ Drought/ desertification
- ✓ Landslides
- ✓ Heatwaves

Kcse 2023- Name two environmental hazards that occur as a result of human activities.

- ✓ Desertification
- ✓ Pollution
- ✓ Flooding
- ✓ Soil erosion
- ✓ Forest fires
- ✓ Earthquakes/ tremors- Dam failure
- ✓ Diseases
- ✓ Landslides
- ✓ Pests
- ✓ Drought
- ✓ Land dereliction (ugliness of land)

1. Floods.

- A flood is an overflow of large amount of water over dry land.

Examples of rivers that causes large scale flooding -kcse 2021

- ✓ River Yala
- ✓ River Nyando
- ✓ River Nzoia
- ✓ River Kuja
- ✓ River Tana
- ✓ River Ewaso Nyiro
- ✓ River Sondu Miriu

Areas which occasionally experience flooding.

- ✓ Budalangi
- ✓ Nyando
- ✓ Kano plains
- ✓ Tana River county/ Lower Tana
- ✓ Baringo
- ✓ Narok

Causes of floods.

- i. **Blockage of drainage** in the urban centres by garbage as well as constructors hence water spills to the surrounding streets/ roads.
- ii. **High rainfall** rises the sea level/ lake/ river levels causing flooding in the adjacent lands.
- iii. **Landslides** blocking river channels leading to flooding.
- iv. **Tsunamis** cause sea waves which floods the adjacent lands.

- v. **Low-lying land** limits the flow of surface run-off hence causing water to stagnate leading to flooding.
- vi. **Deforestation** limits infiltration of surface run-off hence causing flooding.
- vii. **Siltation of rivers and lakes** making them shallow unable to handle large amounts of water hence flooding.
- viii. **Presence of impermeable soils like clay** limits water percolation resulting to flooding.
- ix. **Breaking of a dam** making the water in the reservoir to drown the land on the downstream side of the valley.

Effects of flooding in Kenya –kcse 2021

- i. Flooding causes water logging/ leaching of the soils hence lowering crop production.
- ii. Flooding creates stagnant water that causes diseases which weaken people/ cause death.
- iii. Floods destroy transport/ communication networks hence hindering/ disrupting movement of people/ goods/ services.
- iv. Flooding leads to loss of property.
- v. Floods leads to loss of life.
- vi. Floods disrupts the farmers' calendar/ destroy crops causing food shortages/ famine.
- vii. Flooding displaces people/ leaves people homeless leading to destruction of human settlement.
- viii. A lot of money is used for dredging silt deposits in rivers/ lakes/ reservoirs caused by flooding.
- ix. Floods destroys aquatic habitat hence reduced fish production.
- x. Floods pollutes water sources/land.

Ways through which floods can be controlled in Kenya –kcse 2021

- i. **Planting of vegetation along the river banks/** river catchment areas in order to reduce surface run off/ increase seepage.
- ii. **Construction of dykes/ embankments** to restrict the overflow of rivers.
- iii. **Regular dredging/ cleaning the drainage system** in order to ease flow of water/ accommodate more water.
- iv. **Construction of dams/ canals/ water pans/ water reservoirs** to reduce the velocity/ discharge of river downstream.
- v. **Realigning/ training/ re-directing/ straightening** river meanders to enable quick flow of water.
- vi. **Construction of drainage channel/ ditches/ furrows** to drain away of excess water.
- vii. **Land use zoning** i.e. government uses flood prone areas for development purposes like irrigation displacing people.

Kcse 2001- Explain four factors that lead to frequent flooding in the lake region in Kenya (8mks)

- ✓ Most of the land is low lying which causes lake water to spread over wide area.
- ✓ The rivers are at their old stage thus have flood plain which allows water to spread over large area.
- ✓ The high rainfall received in the area is discharged into the lake making its level rise thus flooding adjacent lowlands.
- ✓ Deforestation in the catchment areas reduces water infiltration and encourage surface run-off which ends up in lakes increasing water volume hence spilling over to land.
- ✓ Siltation of lakes makes them shallow unable to hold large water hence flooding.

- ✓ Some areas have black cotton soils which are non-porous when it soaks up allowing water to flow and spread over.

2. Lightning.

- Flash of brilliant light in the sky produced by natural electricity passing between clouds or from clouds to the ground.

How lightning occurs.

- Intense heating occurs during the day.
- Localised movement of air masses in form of breezes occurs.
- Cumulo-nimbus clouds are formed.
- High terrestrial radiation results in convectional upsurge of air and rapid transfer of heat into the atmosphere.
- In the process, the earth surface is negatively charged while the air in the atmosphere is positively charged.
- This creates a severe mix-up of the heated air leading to thunder caused by collision of the charged molecules.
- A visible electrical discharge that appears in the atmosphere in form of a flash called lightning is formed.

Areas in Kenya that are prone to lightning –kcse 2017

- ✓ The Lake Victoria region.
- ✓ West of the Rift valley.
- ✓ The highlands of Kisii, Kericho and Nandi.

Effects/ problems caused by lightning –kcse 2017

- i. It has killed many people/ animals.
- ii. It has destroyed property/ buildings/ trees.
- iii. It causes fires that may destroy vegetation.
- iv. It has interrupted electricity causing power failures.
- v. It has interrupted communication.

Ways/ measures of controlling lightning –kcse 2014

- i. Installing lightning arrestors on buildings.
- ii. Creating public awareness on dangers of lightning.
- iii. Educating people to avoid sheltering under or near trees during rainstorms.
- iv. Proper earthing of electrical installations.
- v. Switching off electrical appliances during thunderstorms.
- vi. Use of aircrafts to spray carbon dioxide/ silver iodide to disperse clouds reducing formation of lightning clouds.
- vii. Use of early warning systems e.g. radars that detect lightning before it strikes.

Quiz: Explain how lightning arresters works (4mks).

3. Windstorms.

- They are strong destructive winds blowing across landmasses.
- They form due to great differences in atmospheric pressure on the ground.
- They include;
 - Tropical cyclones/ hurricanes in Carribbeans.
 - Willy willies in Australia.

- Tornadoes in North America.
- Typhoons in the Far East.

Effects of windstorms –kcse 2009

- Windstorms destroy trees/ crops.
- They blow off roofs of houses.
- They disrupt transport/ communication lines.
- They spread bush fires.
- They cause strong sea storms.
- They accelerate soil erosion.

Control of windstorms.

- Planting trees to act as windbreaks.
- Monitoring windstorms so as to put mitigation measures.
- Warning people about the dangers of windstorms for them to take precautionary measures.
- Taking shelter in bunkers.

4. Pests & Diseases.

- **Read on** pests and diseases affecting crops, animals and human beings, their effects and control.

Effects of pests and diseases.

- Some pests like locusts/ army worms destroy vegetation resulting in shortage of pasture for herbivores.
- Some pests like ticks/ fleas transmit diseases to animals weakening them.
- Some pests like jiggery cause wounds in human feet through which infections may enter the body.
- Some pests like aphids feeds on crops lowering the yields.
- Pests/diseases may lead to death of animals/ humans.

Control of pests and diseases –kcse 2017

- Use of chemicals/ herbicides/ fungicides/ pesticides to control/ kill the pests.
- Developing plant species that are resistant to pests and diseases.
- Use of biological control measures such as breeding sterile male which does not allow breeding of some pests/ tse tse fly/ organisms that destroy undesirable pests are introduced.
- Development of improved and effective alternative pesticides.
- Education on proper use of chemicals to control pests and diseases.
- Clearing the vegetation/ habitat for pests.
- Creating awareness on the effects of human diseases like HIV/ AIDS and Covid-19.

5. Pollution.

- It is the introduction of harmful/ poisonous substances into the environment which interferes with its quality–kcse 2004

Types of pollution –kcse 2001

- Air pollution
- Water pollution
- Sound pollution
- Land pollution

a) Air Pollution.

- It is the introduction of toxic/ harmful substances into the atmosphere which destroy its purity.

Causes of air pollution.

- i. Volcanic eruptions releases poisonous gases/ dust/ ash to the atmosphere.
- ii. Burning of fossil fuels like coal.
- iii. Industrial emissions like SO₂, CO₂
- iv. Cigarette smoking.
- v. Dust and carbon particles added by quarrying and factories.
- vi. Smoke and poisonous gases from motor vehicle emissions.
- vii. Use of more carbon filled and leaded fuels.
- viii. Burning of agricultural residuals.
- ix. Rice production in irrigation scheme releases methane.
- x. Charcoal burning.

Effects of air pollution on the physical environment –kcse 2023

- i. Formation of acid rains leading to withering of plants.
- ii. There is excess carbon dioxide leading to increase in temperatures/ depletion of ozone layer.
- iii. Reduction of oxygen in the atmosphere.
- iv. Excess dust in the air inhibiting photosynthesis in plants.
- v. Gases emitted cause bad smell.
- vi. Dust/ smoke/ smog reduces visibility.

Control of air pollution.

- i. Use of unleaded fuels for the vehicles and farm machinery.
- ii. Regular inspection of factories to ensure that toxic fumes are not released into the atmosphere.
- iii. Warning cigarette smokers that smoking is harmful to their health and the environment.
- iv. Planting of many trees/ vegetation to use CO₂ for photosynthesis.

b) Water Pollution.

- It is the introduction of harmful/ poisonous substances in water interfering with its quality.

Causes of water pollution –kcse 2007

- i. Discharge of untreated industrial waste into waterbodies.
- ii. Disposal of domestic waste into waterbodies.
- iii. Discharge of agro-chemicals into rivers/ lakes by rainwater.
- iv. Surface run-off washes silt into waterbodies.
- v. Pollution of water by human beings through washing clothes/ cars/ bathing in the rivers/ lakes.
- vi. Discharge of raw sewage into waterbodies/ sewage from blocked pipes.
- vii. Oil spillage from tankers.
- viii. Dumping of solid waste into water courses.
- ix. Poor methods of farming like cultivation along the river banks leads to soil erosion/ soil disposal into waterbodies.

Effects of water pollution—kcse 2007

- i. It may cause death of aquatic life.
- ii. It destroys aesthetic/beauty of beach/ waterbodies.
- iii. It leads to spread of waterborne diseases.
- iv. It leads to eutrophication/ growth of water weeds.
- v. It causes foul smell to the environment.

Control of water pollution.

- i. Treating industrial waste before being discharged into waterbodies.
- ii. Recycle industrial waste in order to reduce industrial waste turn over.
- iii. Biological control of weeds should be encouraged instead of weed killer chemicals.
- iv. Enforce environmental laws on the use of improved technology industrial efficiency to reduce harmful discharge into waterbodies.
- v. Enforcing laws on environmental management and charging those who break the laws.
- vi. Educating people on the appropriate ways of waste disposal/ effects of water pollution.
- vii. Farmers to be advised to use more of organic manure to reduce use of agro-chemicals fertilisers.
- viii. Clean up campaigns to be done/ clean beaches and dumps along river valleys and lakes.
- ix. Planting trees along river banks/ ploughing along contours to control soil erosion.

c) Sound/ Noise Pollution.

- It is a discordant sound which is excessive, unwanted and of a disturbing nature.

Causes of noise/ sound pollution.

- i. Repeated hooting of motor vehicles.
- ii. Booming music in night clubs/ shops/ vehicles.
- iii. Large flying aircrafts.
- iv. Machines that produce loud sound in factories.
- v. Blasts from mines.
- vi. Banging of metal by Jua kali artisans.
- vii. Excessive loud music from churches/ singing/ people like touts.
- viii. Celebrations during Diwali/ Happy New Year.
- ix. Thunder.
- x. Reveting of machines in steel rolling mills and welding of metals.

Effects of sound pollution.

- i. Headache.
- ii. Stress leading to physical/ mental illness like neurosis.
- iii. Cause people to become irritable.
- iv. Raising blood pressure.
- v. Damaging of ear drums/ leading to impaired hearing.

Control of sound/ noise pollution.

- i. Vehicles/ industrial machines should be fitted with silencers to reduce noise pollution.
- ii. Workers in noisy factories should wear gadgets to block loud noise.
- iii. Doors/ ceilings/ walls of noisy factories should be fitted with earth sound proof boards to restrict noise.

- iv. Zoning noisy industrial areas from residential areas to protect people from noise pollution.
- v. Empowering traffic policemen to arrest vehicles with loud music/ exhaust pipes.
- vi. Creation of bodies like NEMA (National Environment Management Authority) to deal with environmental matters like sound.
- vii. The government should come up with punitive legislative measures to control noise pollution.

d) Land Pollution.

- It is the introduction of harmful/ poisonous substances in the soil/ land leading to deterioration of their state.

Causes of land pollution.

- i. Dumping of garbage particularly in urban areas.
- ii. Dumping of industrial waste on the land.
- iii. Disposal of human and animal waste on land.
- iv. Mining/ quarrying leading to land dereliction.
- v. Burning of vegetation destroying soil humus/ exposing land.
- vi. Excessive use of agricultural farm chemicals.
- vii. Oil spillage by tankers transporting oil using roads.
- viii. Nuclear testing.

Effects of land pollution –kcse 2012

- i. Garbage heaps are unattractive/ eye sore/ make environment ugly.
- ii. Garbage produce foul smell/ air which is hazardous to human health.
- iii. Garbage washed into waterbodies cause pollution.
- iv. Organisms that thrives in the garbage may transmit diseases/ habitat for diseases causing vectors.
- v. Garbage blocks drainage systems leading to flooding in urban centres.
- vi. Some toxins from the garbage pollutes the soil reducing crop production.
- vii. Some garbage can cause injuries e.g. glasses/ metal.
- viii. Garbage may cause obstruction on roads// pavements leading to traffic/ human jam in urban centres.

Types of waste found in urban areas.

- i. Household waste.
- ii. Industrial waste.
- iii. Biomedical/ clinical waste.
- iv. Commercial/ business waste.
- v. Agricultural waste.
- vi. Construction/ demolition waste.
- vii. Sewage/ sludge waste.
- viii. E-waste/ electronic waste.

Control of land pollution –kcse 2004

- i) Burning waste materials.
- ii) Digging pits for throwing rubbish.
- iii) Minimizing use of harmful chemicals/ use of organic manure.
- iv) Creating awareness on the dangers of land pollution/ how to control it.
- v) Recycling of waste materials/ treatment of industrial waste.

- vi) Government legislation against dumping.
- vii) Setting up proper garbage collection/ management program.

Measures being taken to manage and conserve the environment in Kenya –
kcese 2017

- i) Making legislative laws that govern environmental management and conservation.
- ii) Setting up organizations such as green belt movement to protect the environment.
- iii) Creating public awareness through mass media/ seminars education on the need to conserve the environment.
- iv) Research on various aspects of conserving/ managing the environment in institutions like KARI/ ACIPG.
- v) Setting up of recycling plants to recycle waste materials in order to protect the environment and keep it clean.
- vi) Setting up ministries to deal with various aspects of environment like ministry of Environment and natural resources.
- vii) Presidential decrees and directives e.g. declaration of “kayas” protecting the aloe plant.
- viii) Signing international agreement to reduce greenhouse gases emission to protect the environment from pollution.
- ix) Rehabilitation of derelict land by filling pits with rocks/ soils then planting vegetation.
- x) Participating in environmental activities like tree planting during environmental day.

“THE END OF GEOGRAPHY FORM FOUR WORK.”

BY MR. OGOTTI ROBERT MAXWELL

@ 0720780149 OR 0736399175

TO GOD BE THE GLORY.