

Geography paper 2continuation....(Rest of Africa) copy in your book**MINING IN AFRICA**

Mining refers to the extraction of mineral resources on the earth's crust by man to satisfy his needs and wants. It is one of the most important economic activities in many African countries sustaining their industrial and economic growth.

Major minerals on the African continent include,

- Gold and diamond in South Africa
- Iron ore in Liberia and Ghana
- Copper in Democratic Republic of Congo and Zambia
- Oil in Nigeria Liberia Egypt Mauritania and Algeria

Methods of mining**▪ Open Cast**

This involves the removal of overlying rock layers to expose the mineral bearing rock to the surface of the earth. It is sometimes called **quarrying** and it is employed majorly in the extraction of copper.

▪ Underground Or Adit

This method is used to extract minerals that lie deep within the Earth's crust. Tunnels are dug horizontally and vertically into the crust to reach the mineral bearing rock which is later blasted and transported to the surface. This method is used in mining of gold and copper minerals that lie deep in the outer crust.

▪ Placer method or alluvial

This is done mainly on individual basis on the banks of rivers where the people use a pan to collect sand from a river, swirl it around and dispose off sand and retain the heavier ores such as gold and tin.

Factors favoring the development of the mining sector in Africa.

- ✓ The existence of a wide range of minerals in Africa such as iron ore and gold from Ghana and the Orange free State, silver and diamond from Kimberly which attracts the mining activities.

- ✓ The existence of abundant hydroelectric power for processing of minerals. Other forms of energy include coal, nuclear energy and oil.
- ✓ Existence of foreign investors from other countries outside of Africa such as India, Canada and USA investing in different mineral rich countries such as Ghana and the South Africa for gold, Libya and Nigeria for oil.
- ✓ Availability of modern and efficient technology used in mining processes which involves the use of efficient machines such as Derricks used in extraction of minerals.
- ✓ Presence of large sums of capital invested in mining activities through purchase of mining equipment, paying the workers and to compensate local citizens who lose the mining lands.
- ✓ The supportive government policy of developing mining through provision of mining contracts to potential mining companies giving tax holidays and exemptions.
- ✓ Minerals in Africa are located near the earth's surface and this reduces on mining costs hence minerals are efficiently extracted for example Iron ore, gold, coal limestone etc.
- ✓ Presence of both skilled and semi-skilled labour which is used in extraction of minerals and processing provided by the large local populations.
- ✓ Existence of efficient transport and the communication facilities such as roads, railways connecting major mining centers to processing points such as refineries and melting centers.
- ✓ Political stability in some African countries which attracts foreign investors to invest into mining centers such as in South Africa and Egypt.
- ✓ Abandon supply of water provided by rivers and Lakes required during processing of some minerals.
- ✓ Availability of wide market both local and international for minerals extracted which encourages further investment into the mining sector in Africa.

Contribution of mining sector to the development of Africa

- ✓ Mining is a source of foreign exchange to countries such as Democratic Republic of Congo Ghana from mineral exports which is used for development of other sectors.

- ✓ It has promoted development of industries such as copper smelting industries at Mufulira in Zambia and oil refineries in Nigeria.
- ✓ It has generated employment opportunities to a number of Africans such as those who work in mines, in exploration, processing and the transportation of minerals which earn them income to improve on their standards of living.
- ✓ It has encouraged the development of transport and communication lines such as roads and railways which link up mining areas to major markets and processing centers.
- ✓ It has promoted growth of towns and urban centers such as Mufulira and Ndola in Zambia, Cairo in Egypt with their associated benefits such as improved medical care.
- ✓ It has promoted economic diversification of African countries hence reducing over dependence on a few sectors such as agriculture which is prone to climate problems.
- ✓ Generation of domestic revenue through taxes imposed on mining companies and income tax on workers used in establishment of social services and infrastructure.
- ✓ It has encouraged the development of hydroelectric power stations through the need to provide power for mining and processing industries which ends up benefiting domestic households.
- ✓ It has encouraged development of social services like schools, banks in relation to the mines thus improved standards of living.
- ✓ Mining has encouraged international friendly relations between African countries and those importing minerals from Africa such as Germany, China, USA, boosting international trade and peace.
- ✓ Some mining areas are important tourist attractions such as Gold Mines in South Africa and the Zambian Copper belt which fetches foreign exchange for African countries from foreign tourists.
- ✓ Mining has improved on acquisition of skills in Africa such as driving, accounting, machine repair which are important in improving people's standards of living.
- ✓ Mining activities have provided potential market for agricultural products by the workers in the mines who buy agricultural products which boosts development of agriculture sector in Africa.

Problems arising from mining activities in Africa.

(Effects of mining on physical environment)

- ✓ It leads to air pollution when its dust goes up into the air leading to health problems.
- ✓ It also increases water pollution when mineral wastes are released into the sea affecting aquatic life and water bodies and noise pollution from the moving machines.
- ✓ Exploitation of minerals has led to clearing of forests leading to global warming and low rainfall amounts.
- ✓ Mining has led to loss of lives due to accidents involved in mining after collapse of some mines or quarries.
- ✓ Mining methods such as open cast have left behind hollows which when filled with water become breeding grounds for disease spreading vectors such as mosquitoes for malaria.
- ✓ The trenches left behind during open cast mining accelerate soil erosion leading to loss of soil fertility and reduced agricultural productivity.
- ✓ It accelerates landslides since quarrying involves vibrations in the crusts which may trigger rocks to fall and the earth flows.
- ✓ Mining has led to over exploitation of mineral resources which leads to their exhaustion hence hindering development.
- ✓ Mining has led to encroachment on agricultural land such as coal mining in Natal province which has affected growing of tea and sugar canes.
- ✓ Mining has led to displacement of people from their lands rendering many homeless.
- ✓ Mining leads to formation of acidic rains as processing industries pollute the atmosphere leading to healthy problems.
- ✓ Mining leads to destruction of the land scape through creation of mining pits destroying the natural beauty.

- ✓ It has resulted into urbanization and its related problems such as slum development and unemployment.

Problems facing mining sector in Africa

- ✓ Inadequate capital to purchase modern mining equipment leading to inefficiency.
- ✓ Most minerals in Africa exist in small quantities making them less profitable after mining discouraging investment.
- ✓ Some minerals exist in poor grades and this is worsened by their location in remote areas hindering accessibility.
- ✓ Political instabilities in Africa disrupt mining activities for example in the Democratic Republic of Congo, Egypt and Libya.
- ✓ Price fluctuation resulting into low profits when price levels decline.
- ✓ Limited labour supply due to poor salaries and working conditions.
- ✓ Competition on the world market which reduces mineral sales.
- ✓ Insufficient power supply which limits the running of machines during mining processes.
- ✓ Mineral exhaustion in some mines around Johannesburg and parts of Shaba Copper belt leading to a standstill in mining activities.
- ✓ Strikes by workers due to poor payment and the poor working conditions leading to destruction of property affecting production.
- ✓ Profit repatriation by many foreign countries that invest in African mines leading to low development levels as result of reduced re investment levels.
- ✓ Inadequate market for mineral ores extracted due to inability by African countries to establish heavy capital intensive iron and steel industries.
- ✓ Continuous heavy rains which make some minerals such as iron ore turn into muddy making them difficult to mine.

Measures being taken to improve mining

- ✓ Regulation of mining activities to prevent over exploitation which leads to exhaustion.
- ✓ Provision of better working conditions and raising workers' salaries to reduce strikes.
- ✓ Ensuring maximum quality output in order to compete favorably on the world market.
- ✓ Controlling production to avoid price fluctuation.
- ✓ Putting fresh air in the underground mines to prevent suffocation.
- ✓ Construction and repair of worn out pillars in the mines to prevent collapsing of roofs and accidents
- ✓ Attraction of foreign investors to provide the necessary capital to the mining industries.
- ✓ Carrying out market research to produce only those minerals that are highly demanded on the world market.
- ✓ Development of roads and railways to access the mining areas.
- ✓ Campaigning for national security and promotion of democracy to restore political stability in the mining areas.
- ✓ Construction of more hydroelectric power stations and resorting to other sources of energy to provide enough power for mining.
- ✓ Treatment of Wastes from mining areas before they are dumped into water bodies to reduce pollution.

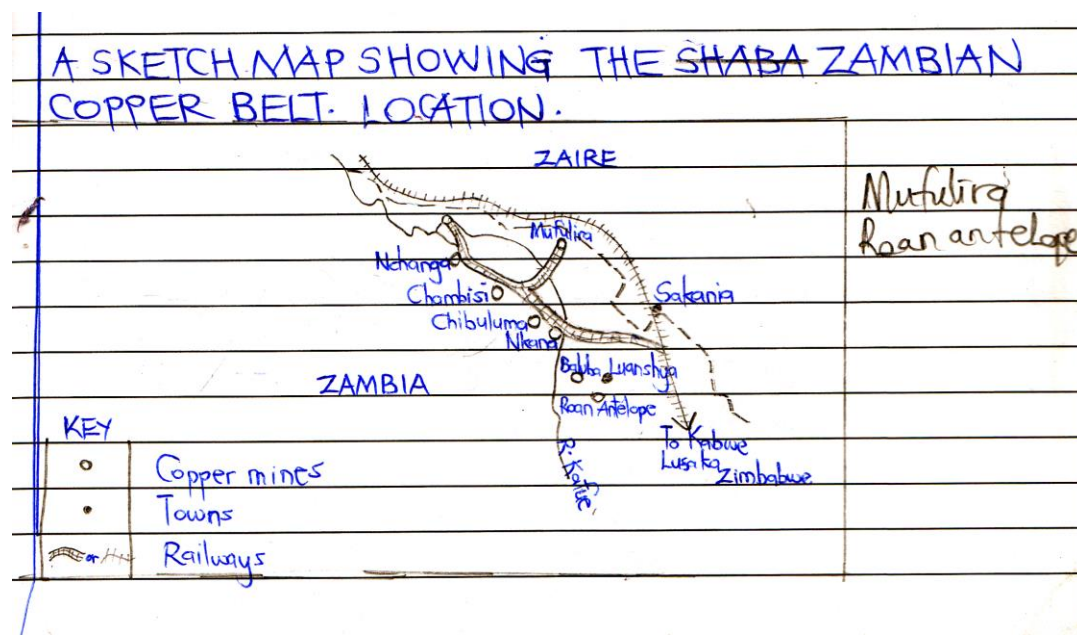
COPPER MINING IN AFRICA.

Zambia and the Democratic Republic of Congo

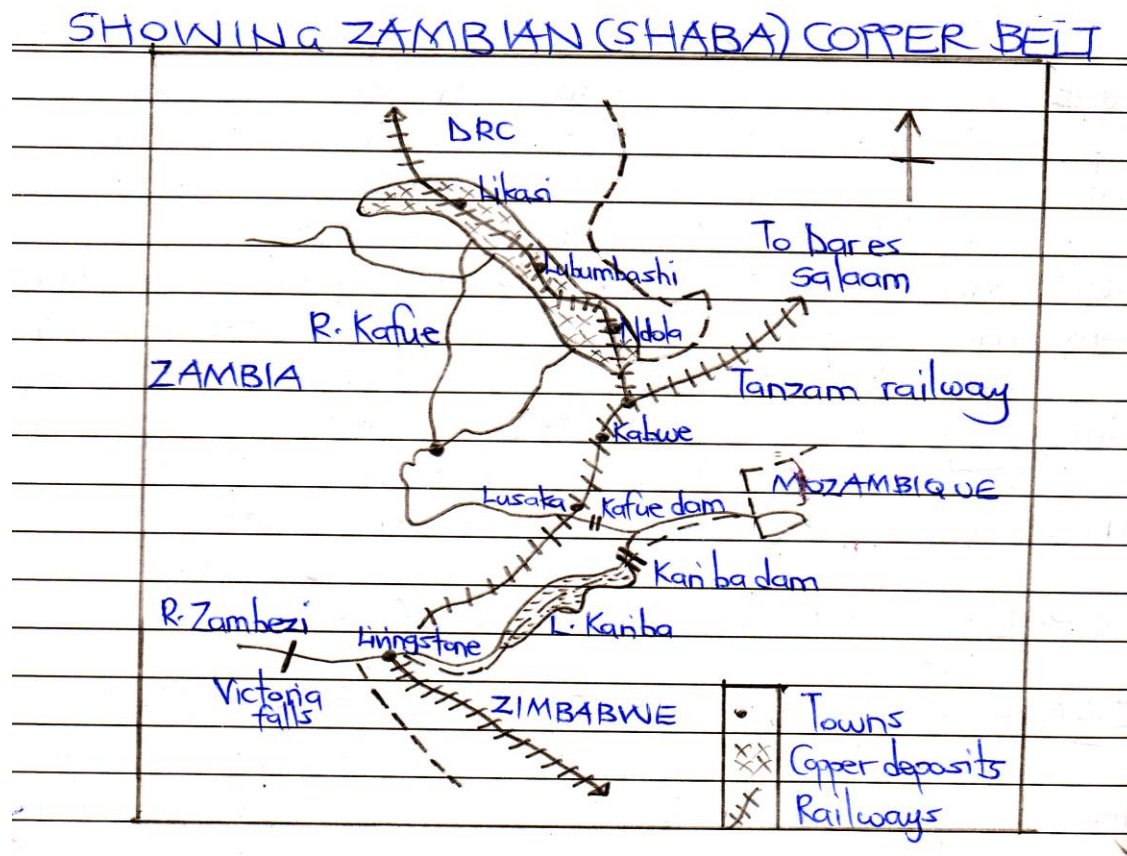
Zambia and the Democratic Republic of Congo are located in Central Africa and they are the second and third largest copper exporting countries respectively behind Chile. Copper Production began in 1909 and today, the Zambian copper belt covers a zone of 110 km long and 50 km wide. Zambia also produces other minerals for example cobalt, gold, silver and diamond. Major mining methods used are open cast and underground.

The major copper mining areas in Zambia include Chililambombwe, Mufulira, Roan Antelope, Bwanamkubwa etc.

A sketch map showing the location of Zambian copper belt



A sketch map showing the location of Zambian (Shaba) copper belt.



Uses of copper

- It is used for making coin money.
- Used in manufacture of household utensils.
- Used for making bullet shells.
- Used in manufacturing of bullets.
- Used in manufacturing of wires used in electric equipment.

- Used in making of machinery such as dynamos.
- Use the in the manufacturing of ornaments and jewelry.

Factors favoring copper mining in Zambia

- ✓ Availability of Large reserves of high grade copper in copper belts which attract investors.
- ✓ Abundant supply of water from River Kafue and Zambezi required during copper processing.
- ✓ Presence of Tanzam railway that connects copper belts to Dar es Salaam for easy exportation of copper.
- ✓ Supportive government policy of attracting rich foreign investors and developing infrastructure like railways to connect mining areas.
- ✓ Adequate power supply generated from Kafue and Kariba dam and the coal from Wankie region of Zambia to facilitate mining.

Major problems facing copper

- ✓ Exhaustion of minerals due to over mining.
- ✓ Price fluctuations affecting incomes of miners when price levels fall.
- ✓ Zambia's land lockedness which affects exportation of minerals.
- ✓ Fluctuations in power supply which affects the mining process.
- ✓ Competition from other copper mining regions in the world which reduces copper sales from Zambia.

Iron Ore Mining in Africa

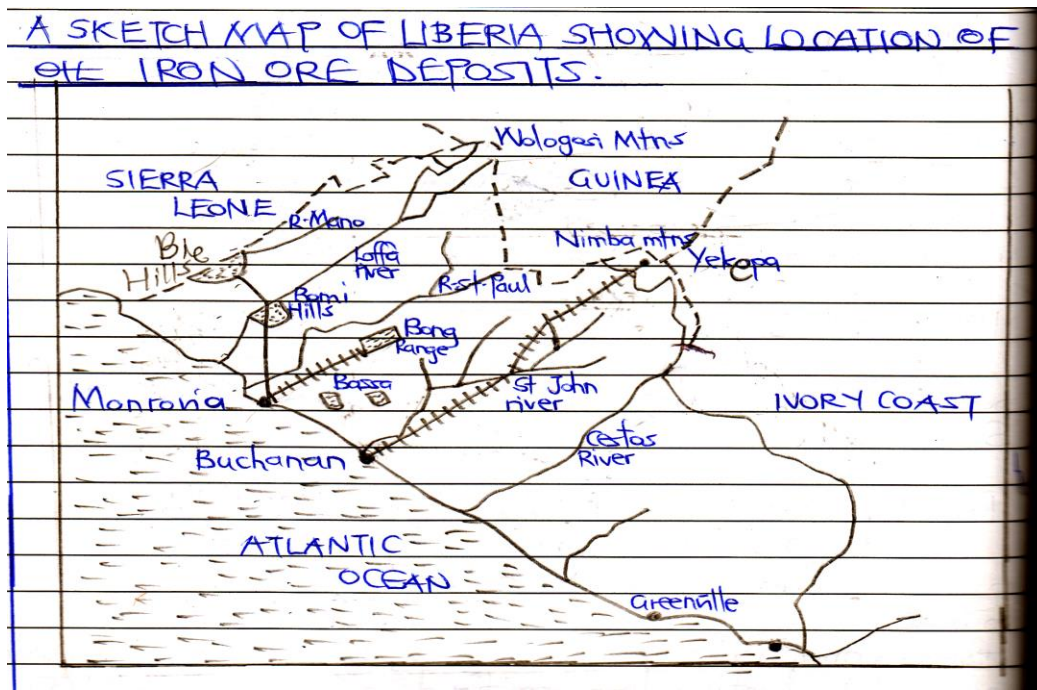
Many countries on African continent process iron ore. The most notable ones include South Africa, Nigeria, Liberia, Mauritania and Sierra Leone.

Iron ore mining in Liberia

In the 1980s, Liberia was the 10th largest iron ore producer in the world. Iron ore contributes 65% of the country's total export income. The country is gifted with over 1 billion tons of iron ore reserves and the Liberian iron ore is of a high grade at 65% metal content. The most productive iron ore fields are run by LAMCO (Liberia American

Swedish Mineral Company) on the Western slopes of Nimba mountains. The Iron ore exports go to USA, Sweden, Japan and UK.

A Sketch map of Liberia showing the location of iron ore deposits.



Iron ore mining in Mauritania.

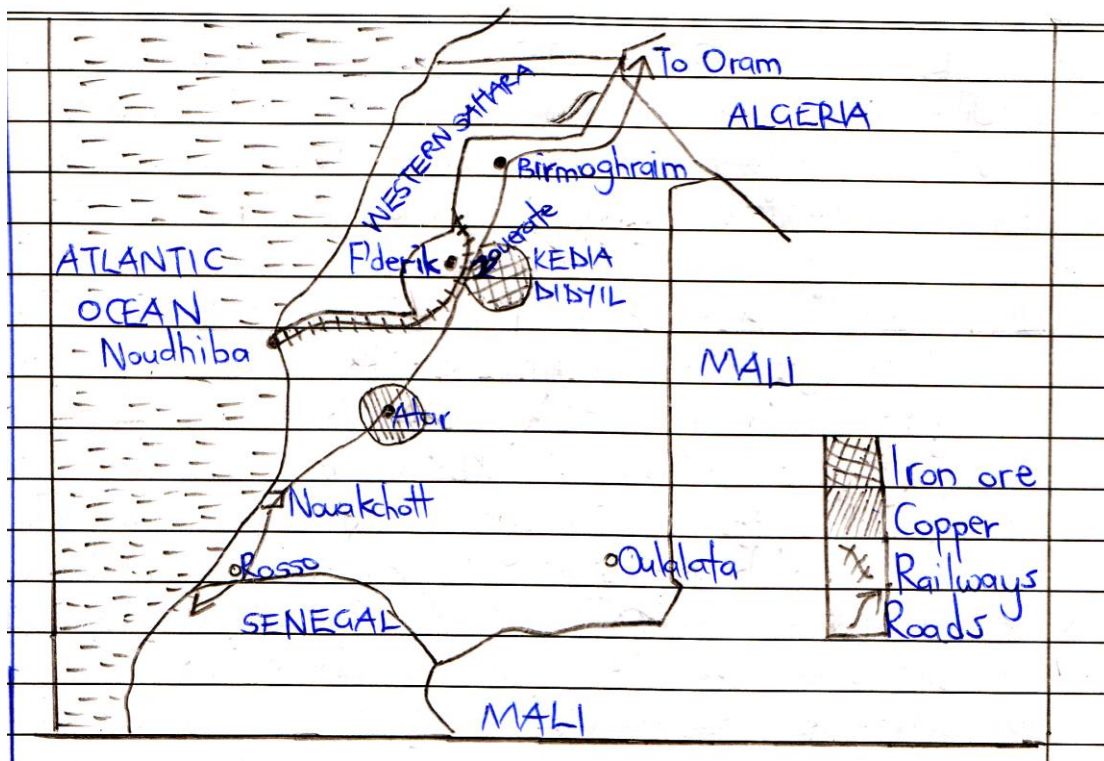
Mauritania is located in West Africa and it is largely covered by Sahara desert. The country's iron ore deposits are found in D'lail mountains and its reserves estimated at atleast 150 million tons of 65% metal content iron ore making it of better quality on international markets. It is exported to Britain and Japan.

Mining and processing of iron ore

In both Liberia and Mauritania, open cast method is used where trenches of about 10 to 15 m high a cut into the mountain face exposing the iron ore which is then extracted, loaded into trucks which then transported to crashing plants.

It is crushed into smaller pieces and it then transported by railway to the exporting ports where the ships are waiting to be loaded to the final industrial towns in USA, Britain and Germany. Other iron ore mining countries include Algeria, Egypt, Gabon, Angola, and Democratic Republic of Congo.

A Sketch map of Mauritania showing location of iron ore deposits.



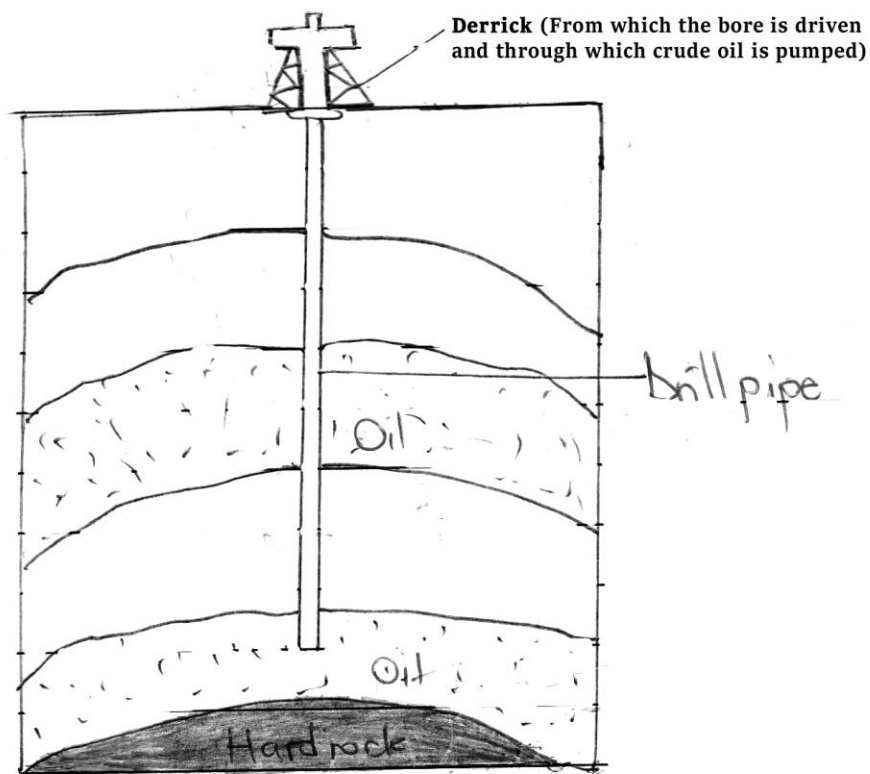
OIL MINING IN AFRICA

Oil makes one of the most important minerals on African continent and it is the major foreign exchange earner to countries in West Africa, North Africa and the sub-Saharan Africa.

Methods of oil mining and processing in Africa

The oil mining method is **drilling**. The mineral is extracted using an instrument called Derrick which is a steel tower of about 40 meters high. It is on this Derrick that a steel drill pipe is attached. The pipe drills through the crustal layers until when it reaches the oil bearing strata and later crude oil is pumped up the pipe to the reservoir on the surface. It is then transported through pipe lines to the refineries where it is transformed into paraffin, petrol, plastics and Vaseline.

Illustration of a Derrick



Uses of oil.

- Used in the manufacturing of diesel, paraffin etc.
- Manufacturing of plastics.
- Creation of thermal Electricity.
- Bi-products are used to make synthetic rubber and fertilizers.
- Manufacturing of cosmetics.
- Raw materials used in manufacturing of acid, perfumes, drugs.

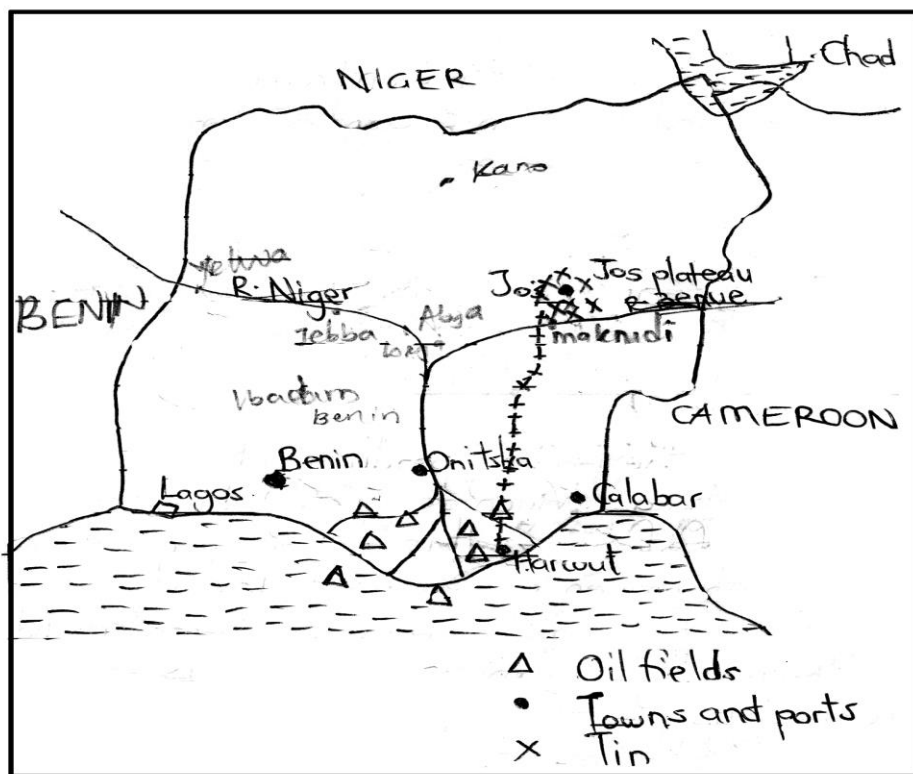
Oil mining in Nigeria

Nigeria is located in West Africa and her oil mining began in early 1950s. By 1978, the country was 8th largest oil producer in the world and major concentration of oil was discovered in the Niger Delta and since 1968, oil has been a leading export earner in Nigeria.

Factors favoring oil mining in Nigeria

- ✓ Availability of large oil deposits in the Niger Delta attracting rich investors.
- ✓ Presence of large sums of capital provided by foreign companies to buy drilling equipment and pay workers.
- ✓ Availability of advanced technology which involves the use of derricks to extract the mineral.
- ✓ Presence of efficient pipeline transport used in transportation of crude oil to the refineries.
- ✓ Supportive government policy of attracting foreign investors.

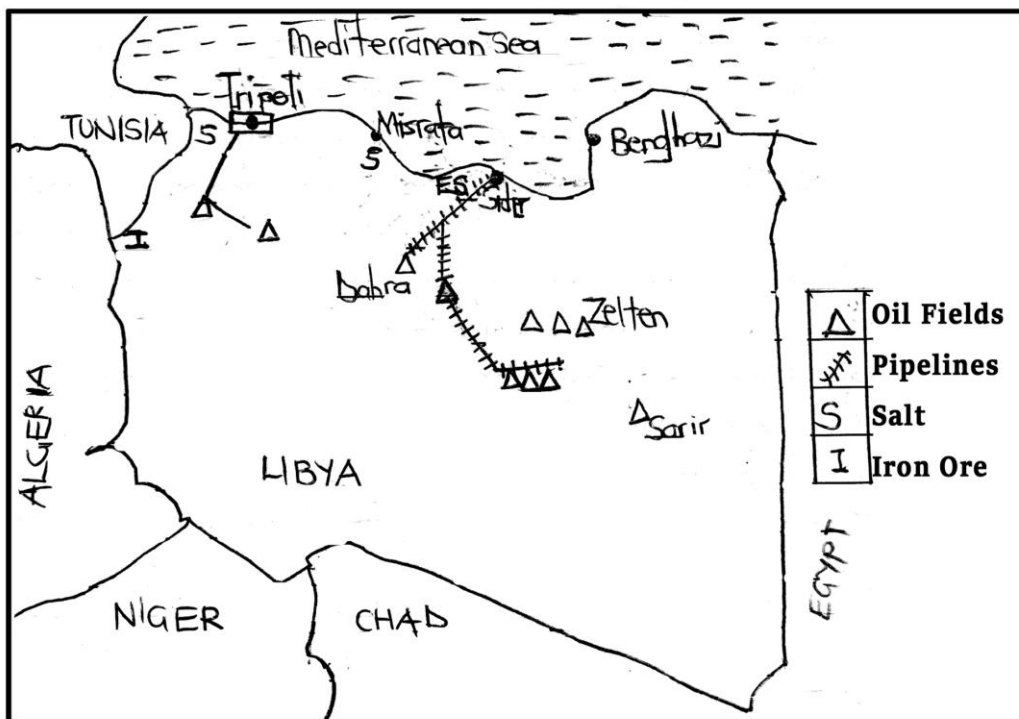
A Sketch map of Nigeria showing oil fields.



Oil mining in Libya

Libya is located in West Africa and covered by Sahara desert. The oil fields are found between 200 and 500 km from Northern coast inland. The country's oil is very much demanded since it is Sulphur free hence less pollution when it is burnt. The oil is transported by use of pipelines to coastal ports of Tripoli, Es Sider for refining and exportation to Europe.

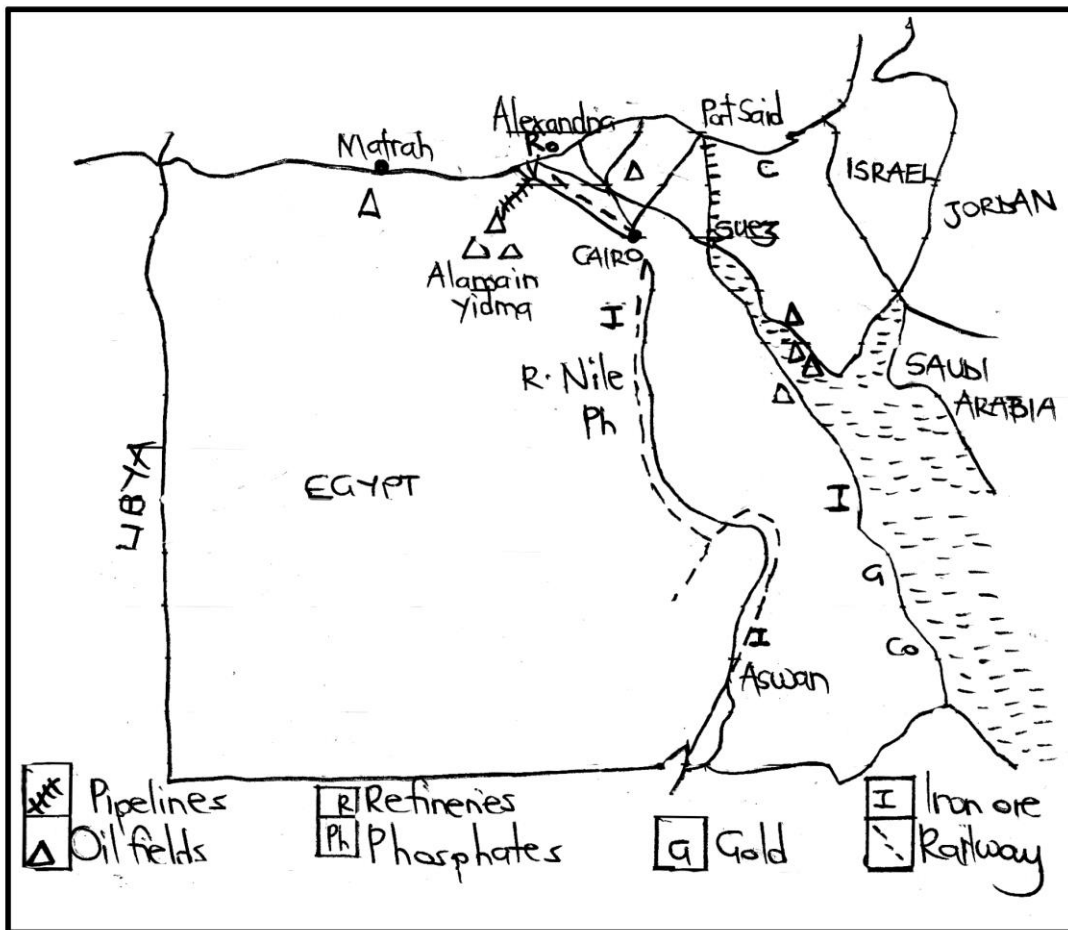
A sketch map showing oil fields in Libya



Oil mining in Egypt

Egypt is one of the leading producers of oil in the world today. It is located in North Africa, much of the country's oil is produced in and around the Gulf of Suez. It is also an important producer of natural gas with proven reserves of 1060 billion m³. Natural gas is also found off shores near Alexandria and in the Nile Delta. The country's oil mining industry is boosted by efficient technology, plentiful supply of skilled labour, large oil deposits and supportive government policy which attracts foreign investors and involving in the construction of pipelines that link the oil fields to the refineries.

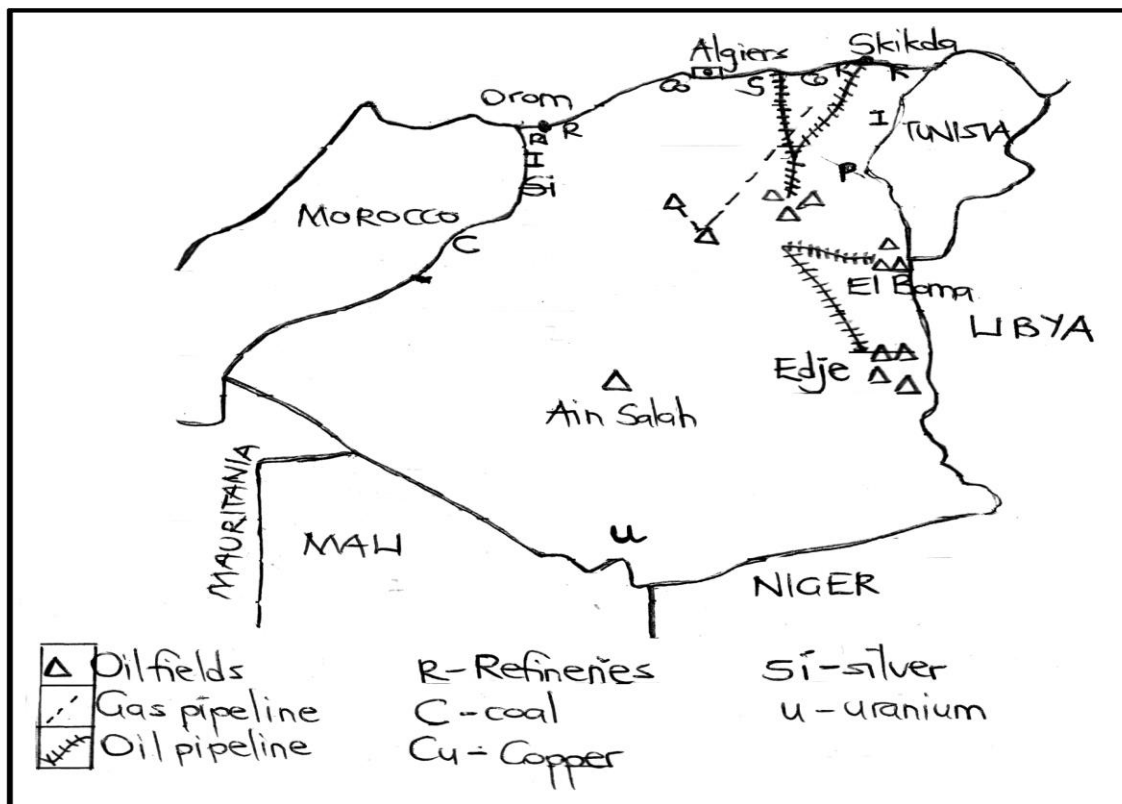
A Sketch map of Egypt showing oil fields



Oil mining in Algeria

Algeria is also located in North Africa and the much of it is in the Sahara desert. Oil and natural gas in this country were discovered in 1955 and the production has gone on since then. The country uses the first fraction of her oil and the rest is exported to Europe especially to France and England. Important to note is that, most of her oil is refined before it is exported through ports like Orom, Algiers and Skikda.

A sketch map of Algeria showing the location of her oil fields.



Gold mining in Africa

Gold is a heavy fairly soft yellow metal which is one of the most prestigious minerals in the world. On the African continent, South Africa is the largest producer of gold followed by Ghana, Zimbabwe and Democratic Republic of Congo.

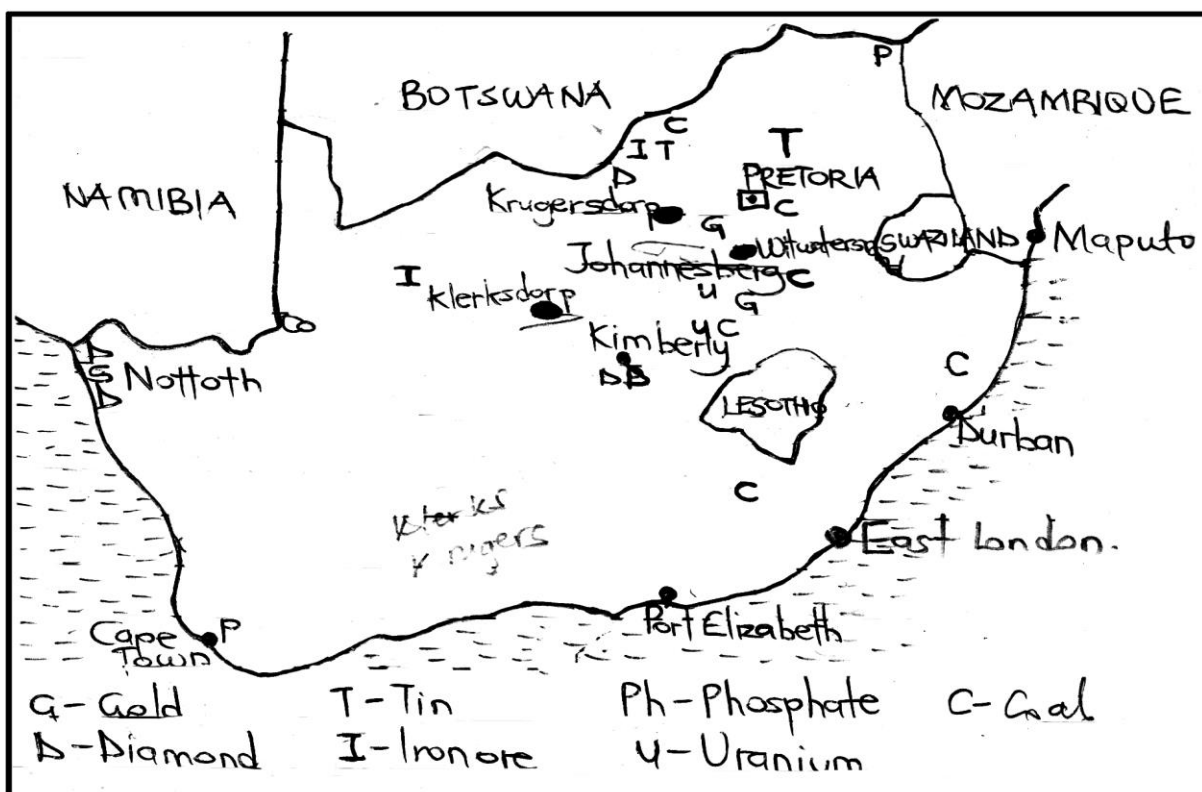
Uses of gold

- Used in making of jewelry.
- Used in gold craft industry.
- Is internationally accepted as money and therefore used as a standard of monetary system or as a medium of exchange.
- Making artificial teeth.

Gold mining in South Africa.

South Africa is the largest world producer of gold and she has the greatest known gold reserves on earth. The gold fields are found in the Rand region and stretches across much of Southern Transvaal. Gold is mined in Orange free state and in Transvaal. Open cast is used during gold mining. Other important minerals in South Africa include diamond at Kimberly, coal and iron ore etc.

A Sketch map of South Africa showing the location of major minerals.



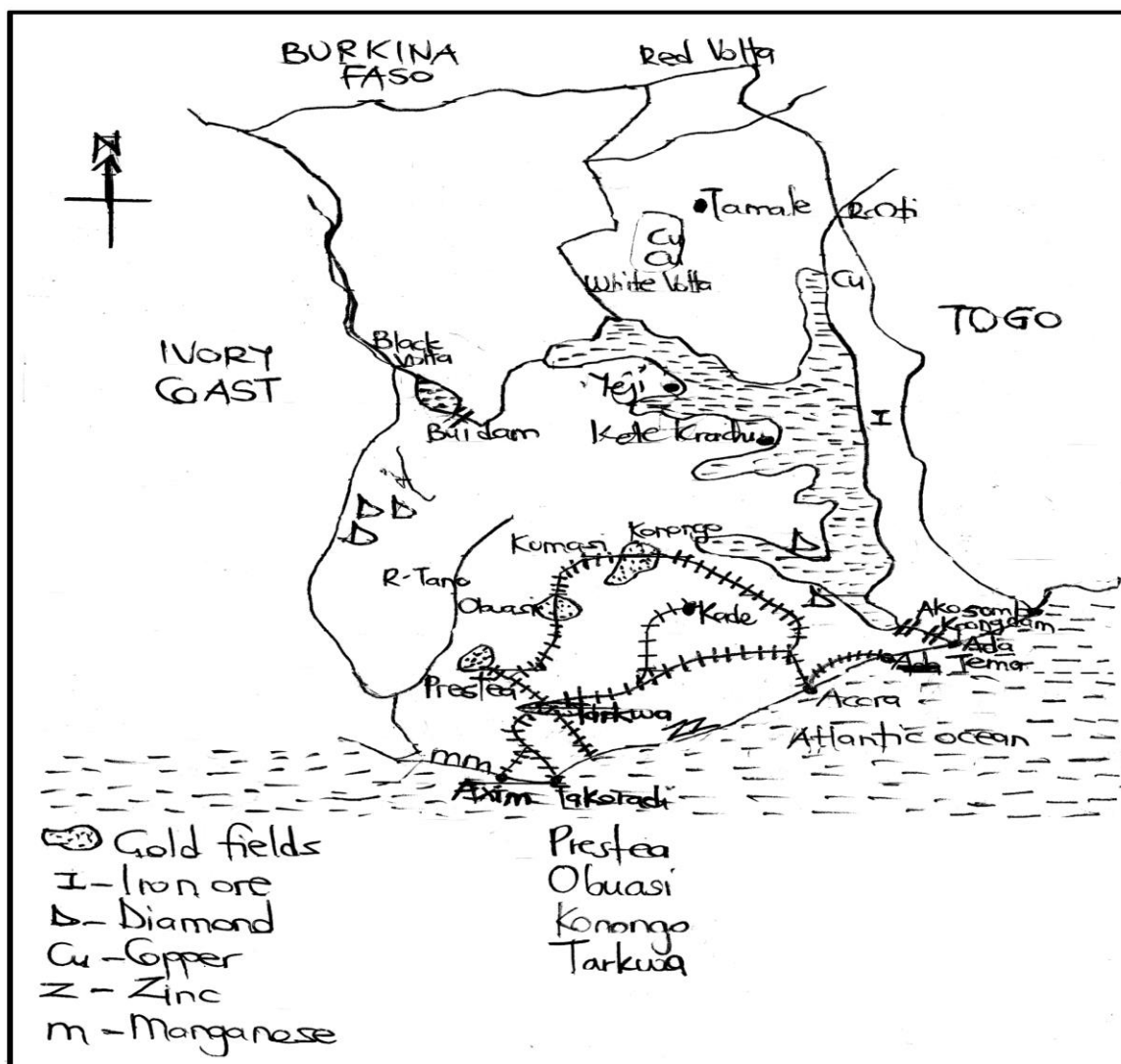
Gold mining in Ghana

Ghana has a variety of minerals especially gold hence its former name "**Gold coast**". Other important minerals include Bauxite, coal, manganese and diamond. Golden mining towns include Dunkwa, Prestea, Konongo and Obuasi. The major mining method is **tunnel**.

The major factors that have boosted gold mining in Ghana include,

- ✓ Presence of large deposits of high quality gold.
- ✓ Abundant hydroelectric power for gold mining.
- ✓ Skilled labour to work as engineers and managers in gold mines.
- ✓ Relative political stability facilitated by supportive government of attracting foreign investors and ensuring sustainable gold remaining in the country.

A Sketch map of Ghana showing the location of major minerals.



Factors that have favored mining in Ghana.

- ✓ Availability of a wide range of minerals such as gold copper.
- ✓ Presence of a variety of minerals of a high value such as gold at Obuasi, Prestea.
- ✓ Abundant supply of water for processing of minerals from Lake Volta and rivers such as Pra and Tano.
- ✓ Existence of minerals near the surface making them easy and cheap to extract using open cast method.
- ✓ The relatively flat landscape that has favored the development of roads and railways for transportation of minerals.
- ✓ Abundant supply of hydroelectric power from Akosombo dam which is used in mineral extraction and the processing.
- ✓ Availability of large sums of capital to purchase mining equipment.
- ✓ High levels of technology provided by foreign companies to facilitate the mining operations.
- ✓ A wide market for minerals both home and international for the minerals mined.
- ✓ Supportive government policy of financing large mining operations and establishing the necessary infrastructure.

Benefits of the mining sector in Ghana.

- ✓ Employment opportunities to the citizens.
- ✓ Source of government revenue.
- ✓ Source foreign exchange through gold exports.
- ✓ Economic diversification.
- ✓ International relations and friendship.
- ✓ Development of towns with related advantages.
- ✓ It has encouraged industrialization by providing mineral raw material.
- ✓ Development of infrastructure.

Problems facing the mining sector in Ghana

- ✓ High costs of mining.

- ✓ Exhaustion of mineral deposits.
- ✓ Accidents in mines.
- ✓ Competition on the world in market.
- ✓ Pollution in mining environment.
- ✓ Shortage of skilled man power.
- ✓ Labour strikes which affect production.
- ✓ Flooding of mines which hinders mining activities.

Solutions to the problems

- ✓ Recycling wastes to solve the problem of mineral exhaustion.
- ✓ Improving workers conditions to reduce strikes.
- ✓ Controlling mineral production to reduce fluctuations.
- ✓ Carrying out mineral exploration to discover new mineral deposits.
- ✓ Recruitment of labour from neighboring countries such as Togo to reduce labour shortages
- ✓ Carrying out market research to widen the market for gold.
- ✓ Processing of minerals into manufactured commodities to reduce effects of price fluctuation.

Questions

- a. Draw a sketch map of the Republic of South Africa and on it mark and name.
 - i. Towns: Johannesburg and East London
 - ii. Rivers: orange and Vaal
 - iii. Golden Fields: Klerksdorp, Krugersdorp and Witwatersrand
- b. Describe the methods used in the mining of gold in any one of the gold fields in a(iii) above.
- c. Explain the conditions which have favored gold mining in the Republic of South Africa.

- d. Outline the effects of gold mining on the environment.

INDUSTRIALIZATION IN AFRICA

Industries can be referred to as establishments that are meant to change a product from one state to another. Industrialization therefore refers to the process of establishing industries which process raw materials and manufactured goods. The republic of South Africa is the most industrialized nation on African continent followed by Egypt and other countries

Factors that determine the location and establishment of industries

Question: Explain the reasons for the growth and location of industries in Africa.

- ✓ Reliable supply of power such as hydro electric power, thermal power and the oil which satisfies the needs of industries.
- ✓ Availability of abundant raw materials which act as inputs for the industries for example cotton for textile and the iron ore for engineering industries.
- ✓ Availability of improved transport and communication systems such as roads and railways to simplify the movement of raw materials to industrial sites and finished goods to markets.
- ✓ Presence of wide market both local and international to buy industrial products.
- ✓ Availability of adequate labour both skilled and semi-skilled to work in industries as engineers, industrial managers, importers etc.
- ✓ Availability of large sums of Capital to establish and maintain industries through buying industrial equipment and the paying industrial workers.
- ✓ The positive government policy towards industrialization through provision of soft loans to investors, carrying out market research and protecting local industries from foreign competition.
- ✓ Industrial inertia for example some industries are located in places because of existing advantages provided by other industries available such as roads, markets and the raw materials.

- ✓ Historical factors for example South Africa is heavily industrialized because of the establishment of industries by the Dutch and the British settlers.
- ✓ Plentiful supply of water which acts as a raw material for beverage industries and as a coolant of machines during industrial operations
- ✓ Presence of a large population in major towns and cities with the capacity to pay for the industrial goods produced.
- ✓ Presence of strategic location since some industries need ideal locations to access markets and raw materials.

INDUSTRIALIZATION IN SOUTH AFRICA

South Africa is the most industrialized nation on African continent whose level of industrialization can be compared to USA, France and Germany. The most industrialized zones of South Africa include:

Cape Town. It has industries like food processing, chemical plants, vehicle assembly, paper industries and ship building industries.

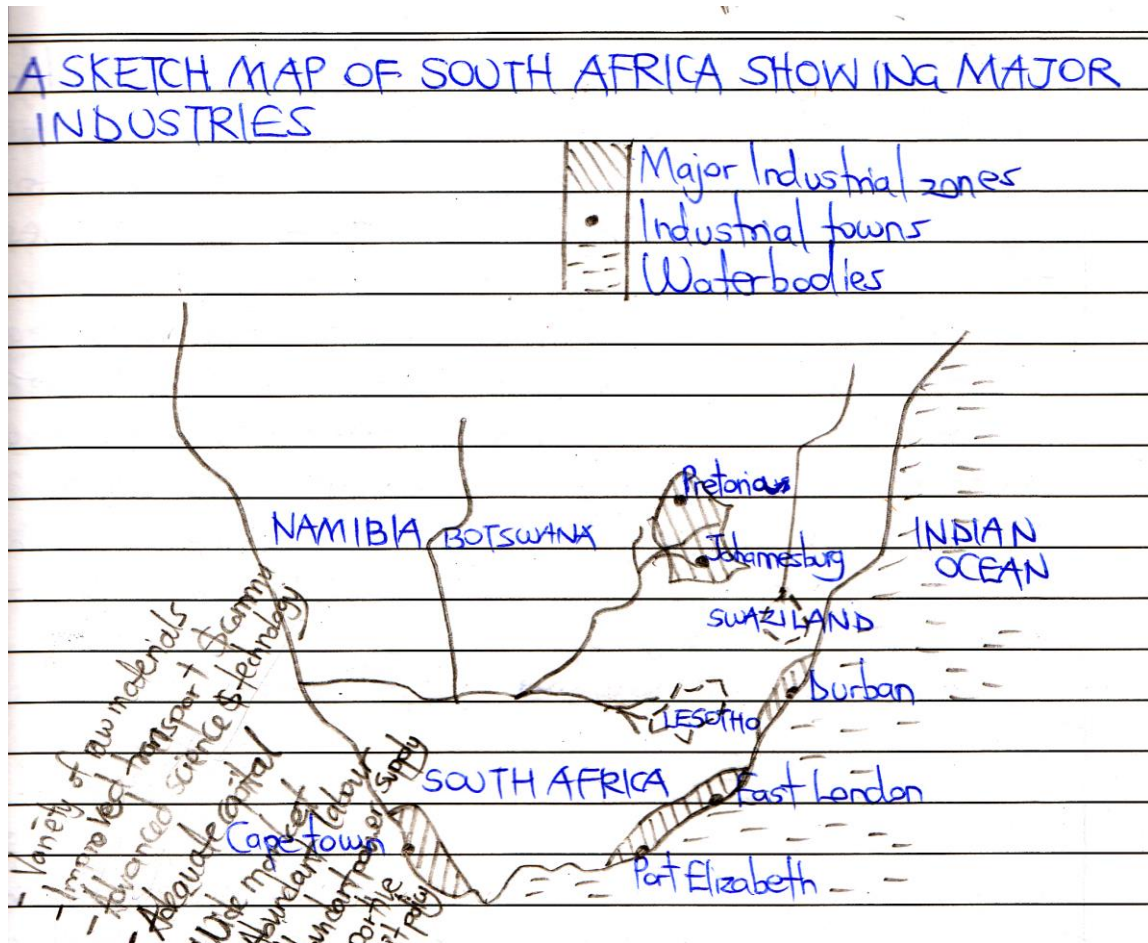
Johannesburg. Major industries include metal works, engineering, vehicle assembly, and food processing.

Pretoria. This is south Africa's capital and major industries include, manufacturer of railway wagons, cement industries and engineering.

Durban. It is located on the eastern coast line with major industries such as ship repairing and building, textiles, chemical industries, engineering and the soap manufacturing.

Port Elizabeth. Industries include food processing, tyre manufacturing, vehicle assembling, textile industries, engineering industries etc.

SKETCH MAP OF SOUTH AFRICA SHOWING THE MAJOR INDUSTRIES



Factors that have favored industrial growth in South Africa.

- ✓ Availability of a variety of minerals that provide raw materials for industries such as gold, diamond.
- ✓ Abandoned power supply from Hydro Electric Power stations on rivers Orange and Vaal and the coal which is used to run industries.

- ✓ Presence of a strong agricultural base such as sugar cane growing in Natal and vine growing which provide raw materials for Agro-based industries.
- ✓ The improved transport and communication systems in form of roads and the railways which link industries to market center
- ✓ Availability of large sums of capital provided by rich white settlers which is used to pay workers and buy industrial equipment
- ✓ Availability of a wide domestic and foreign market due to large European population in the country which buys industrial products
- ✓ Availability of cheap abundant labour provided by blacks and skilled labour by whites to run industrial operations.
- ✓ Advanced technology provided by wealthy investors for example the automation of industrial activities which improves on the efficiency of industrial works.
- ✓ Positive government policy towards industrialization for example restricting certain imports in order to encourage the development of home industries.
- ✓ The earlier occupation of white settlers who came with a lot of capital to start industrial establishment in the country.
- ✓ The trade sanctions that were imposed on South Africa during the apartheid regime encouraged white settlers to promote self-reliance of industries in South Africa.

Contributions of industries to the development of South Africa

- ✓ Industries provide employment opportunities to industrial workers such as engineers, managers which earns them income used to improve on their standards.
- ✓ The country earns foreign exchange from industrial exports to far and neighbor countries such as chemicals, cars and ships which is used for economic development.
- ✓ Industrialization has encouraged infrastructure development in form of roads, railways, hospitals which improve on people's standards of living.
- ✓ Industries provide market for agricultural products such as sugar canes in Natal province and the vines in Stellenbosch which boosts development of agricultural sector.

- ✓ It has encouraged the development of towns and ports for example Cape town, Pretoria with their associated benefits such as improved medical care and education.
- ✓ It is a source of government revenue through taxation of industries and workers which is used in establishment of social services.
- ✓ Industries have led to provision of consumer goods such as food, textiles and the drugs which are used to improve on people's standards of living.
- ✓ It has helped to diversify the economy of South Africa through creating an alternative source of income and jobs reducing over dependency on mining and agriculture.
- ✓ It has helped to create better international relations between south Africa and the countries that import her industrial goods such as USA and Japan allowing inflow of foreign aid.
- ✓ It has encouraged the power generation through establishment of hydro electric power stations on rivers Orange and Vaal used for running industrial machines and for domestic purposes
- ✓ It has promoted acquisition of skills such as driving, machine operations and accounting which are essential in improving people's lifestyle.

Environmental problems caused by industries in South Africa

Question. Outline the effects of industries on the physical environment of South Africa.

- ✓ Industries cause air pollution due to emission of industrial fumes into the atmosphere causing health problems for example asthma.
- ✓ It has led to over exploitation of mineral resources in South Africa such as gold and copper causing depletion of non renewable resources.
- ✓ It has increased swamp reclamation so as to create more land for industrial establishment leading to loss of biodiversity.
- ✓ They have increased deforestation leading to loss of flora and fauna valuable for the tourism sector and conservation.
- ✓ It has led to the development of towns and urban centers with their associated negative effects such as slum development.

- ✓ Industrial activities have promoted mining in search for raw materials which has led to deformation of landscape through creation of pits left after mining associated with stagnation of water encouraging breeding of disease vectors.
- ✓ Accidents during industrial operations which sometimes lead to death of valuable skilled workers.
- ✓ It competes with other economic activities for land and labour with sometimes living other economic sectors under developed.
- ✓ It has increased global warming due to emission of greenhouse gases such as carbon dioxide and carbon monoxide that increase global temperatures.
- ✓ It has led to over exploitation of water resources thereby leading to water shortages for domestic purposes.

Problems faced by industrial sector

- ✓ Water shortages especially in Johannesburg due to availability of many industries.
- ✓ Pollution due to gases emitted by industries which causes healthy problems especially to industrial workers.
- ✓ Accidents in industries leading to loss of people's lives.
- ✓ Industrial strikes by workers destroying industrial premises which affect production in some seasons.
- ✓ Development of slums in industrial regions with associated evils such as high crime rates and prostitution.
- ✓ Stiff competition from high quality imported goods which limits market for South Africa's industrial products.
- ✓ Price fluctuation due to over production from many industries which affect income of producers.
- ✓ Profit repatriation since many industries are owned by foreigners which reduces the level of reinvestment hindering the development of South Africa.
- ✓ Inadequate power supply due to fewer power stations compared to the number of industries hinder affecting efficiency.
- ✓ Limited capital to expand industrial activities

- ✓ Competition for labour with the other economic activities which causes delay in running industry operations.
- ✓ Exhaustion of minerals leading to limited supply of industrial inputs.
- ✓ Unfavorable government policies such as high taxes which increased production cost

Solutions to problems

- ✓ Treatment of industrial wastes before they are released into the atmosphere to reduce pollution.
- ✓ Regular industrial distribution to reduce congestion of industries in one area and avoid over exploitation of resources.
- ✓ Supplying workers with protective gear such as helmets to limit occurrence of accidents.
- ✓ Redevelopment of slum areas into organized settlements to avoid evils associated with slums.
- ✓ Restricting importation of goods that compete with the local manufactured goods through protectionism to widen home market.
- ✓ Giving production quota to avoid over production.
- ✓ Controlling activities to foreign industries to reduce profit repetition.
- ✓ Offering life insurance to workers such as to be compensated in case of accidents.
- ✓ Application of coal as power source to supplement the inadequate hydroelectric power supplies.
- ✓ Automation of industrial operations like use of robots to solve the problem of labour shortage.
- ✓ Encouraging agricultural mechanization to increase production of more agricultural materials for agro based industries.

- ✓ Attracting foreign investors with large sums of capital to inject in industrial expansion and maintenance.
- ✓ Hiring migrants from neighbor countries such as Botswana, Namibia and Lesotho to reduce labour shortage.

INDUSTRIALIZATION IN EGYPT

Egypt is the second largest industrial nation in Africa next to South Africa. Industrial expansion is boosted by large reserves of oil, abundant power supply from Aswan high dam and strategic location near European wealthy countries that provide a wide market for her industrial products.

The major industrial centers included the following.

The Suez and Nile delta: Industries in this region include textile, oil refineries, and the petrol chemical plants etc.

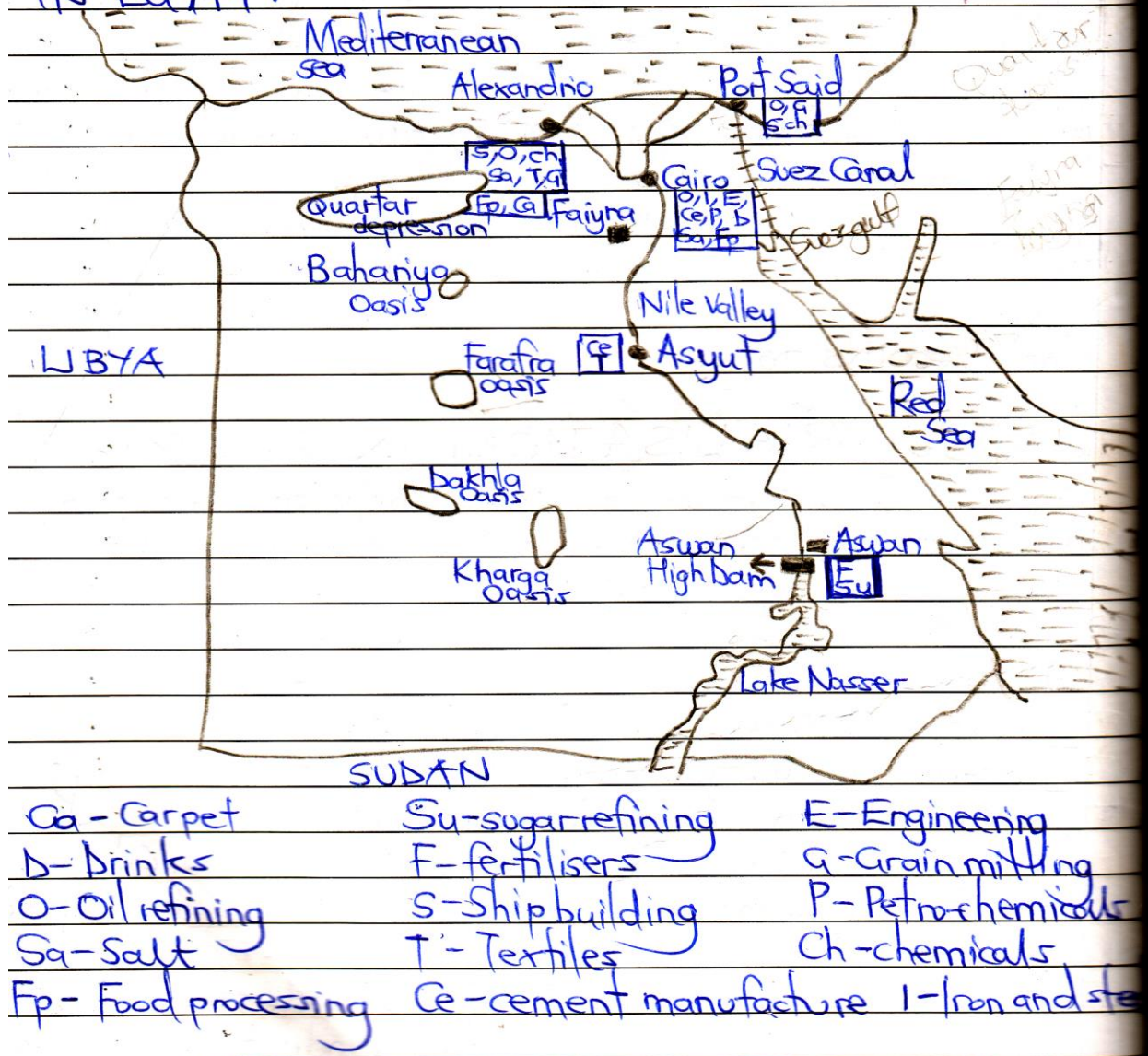
Alexandria: It is the second most industrialized city in Egypt after Cairo. It has various industries for example oil refining, textile, salt industries, chemical industries, ship building and repair as well as food processing. etc.

Cairo: It is the most industrialized city in Egypt and the capital city. Major industries include oil refineries, textiles, electrical engineering, iron and steel industries, cement manufacturing, food processing, breweries, and petrol chemical industries etc.

Port Said: Industries include textiles, food processing, iron and steel industries, oil refineries etc.

A Sketch map of Egypt showing major industrial towns.

A SKETCH MAP OF EGYPT SHOWING INDUSTRY IN EGYPT



Factors for the development of Egypt's industrial sector

- ✓ Availability of various mineral resources such as oil, limestone which provide necessary raw materials to different industries.
- ✓ Reliable supply of fresh water from the Nile water and the Mediterranean Sea which acts as a raw material for the beverage industries and as a coolant to industrial machines.
- ✓ The relatively flat land scape of the Nile valley which makes it easy to construct industrial building as well as establishing transport routes.

- ✓ Availability of large tracts of land allowing establishment and expansion of industrial sites in Egypt.
- ✓ The desert conditions in the most country parts which limit most of the economic activities living industrialization as the sole source of lively hood.
- ✓ Abundant supply of power such as Hydroelectric Power from Aswan high dam and petroleum which is used to run industrial machinery
- ✓ Availability of a variety of agricultural materials such as sugarcane and cotton in the Nile valley which act as industrial inputs.
- ✓ The well developed efficient transport system of water canals, roads and railway network for movement of raw materials to industries and finished goods to markets.
- ✓ Presence of a wide home market provided by Egypt's population of over 80 million people and the international market which buys the industrial goods produced.
- ✓ Availability of abundant skilled and cheap semi skilled labour provided by the natives of Egypt to work in industries as engineers and industrial managers.
- ✓ Availability of large sums of capital from both local and foreign investors used to establish industrial infrastructure and pay workers.
- ✓ High levels of technology such as automation of industrial activities which promotes efficiency and production of high quality goods.
- ✓ The intensive continuous research which is carried out to improve industrial output.
- ✓ The relatively suitable political climate that has attracted investors to start up and develop industries.
- ✓ This supportive government policy of offering soft loans and tax holidays to industrial investors has attracted more sums of capital into industries
- ✓ The strategic location of Egyptian industrial centers such as Alexandria and port Said which are located near rich countries of Europe which provide abundant market for goods.

Benefits of industrialization to the development of Egypt.

- ✓ The industries produce consumer goods such as food stuffs, textile and medicine which improves people's diet, healthy and general standards of living.
- ✓ Creation of employment opportunities to engineers, drivers which earns them income to improve on their standards of living.
- ✓ It is a source of foreign exchange through exportation of manufactured goods which is used for development of other sectors of the economy.
- ✓ It is a source of income to the industrial workers and investors which is used to access their basic needs and wants hence improving on their standards of living.
- ✓ It is a source of government revenue through taxes collected from industrial workers and the VAT from manufactured goods which is used to finance development projects.
- ✓ It has promoted the development of transport and the communication lines hence enabling the movement of goods and services
- ✓ It has encouraged development of social services such as schools and hospitals which improves on people's lifestyles.
- ✓ It has helped to diversify the economy of Egypt through creating an alternative source of income and jobs reducing over dependency on mining and agriculture.
- ✓ It has promoted development of towns and ports such as Alexandria, Aswan and Cairo with their related benefits for example better health services and accommodation.
- ✓ Promotion of international relationships between Egypt and countries which import her industrial products hence encouraging international trade.
- ✓ Industries provide market for agricultural products such as cotton in the textile industries hence boosting development of agriculture sector.
- ✓ Industries act as tourist attractions especially the industrial automated activities hence generating foreign exchange used for development of Egypt.
- ✓ They are used as research and study centers encouraging development of skills technology and the knowledge as well.

Problems facing industrial sector

- ✓ Exhaustion of minerals due to over exploitation which limits progress of some industrial activities.
- ✓ High levels of pollution in the industrial belts which cause health problems to industrial workers reducing their efficiency.
- ✓ Overcrowding and congestion of industrial areas leading to land shortages especially at Cairo.
- ✓ Industrial strikes by workers leading to destruction of industrial infrastructure and equipment affecting production.
- ✓ Labour shortages since people prefer better paying jobs in the service sector leading to delays in execution of industrial activities and operations.
- ✓ Water shortages caused by desert climate limiting operations of many beverages and heavy industries.
- ✓ Industrialization has increased the government expenditure on imported food stuffs since a large population is employed in industries.
- ✓ Overproduction which leads to price fluctuation on the world's market hence affecting incomes of industrial owners.
- ✓ Profit repatriation by foreign investors which takes away the country's money limiting further re investment and development.
- ✓ Competition from other industrial countries in the world such as USA which reduces market for Egypt's industrial goods.
- ✓ Shortage of housing facilities for industrial workers which has led to slum development.

Solutions to problems

- ✓ Regulation of industrial output to minimize of over production.
- ✓ Importation of scarce minerals to solve the problem of mineral exhaustion.
- ✓ Promotion of better working conditions for the workers to minimize industrial strikes.

- ✓ Treatment of industrial wastes before emission to the environment to minimize pollution.
- ✓ Controlling industrial distribution through establishing industrial belts in rural areas to minimize industrial congestion.
- ✓ Improving on the quality of products manufactured by Egypt's industries to compete favorably on the world market.
- ✓ Attracting more foreign investors with more capital and skills to solve the problem of limited capital
- ✓ Hiring migrant labour from Sudan and Libya to solve the problem of labour shortage.
- ✓ Market research and intensive advertisements have been done to create international awareness about Egypt industrial goods.
- ✓ Automation of industrial operations to solve the problem of limited labour.