

AGRICULTURE

Agriculture is the growing of crops (arable farming) and rearing of animals (livestock farming) for man's use. Agriculture is the dominant activity in African activities and it is the largest employer of active labour up to 90% of labour force.

It contributes more than 50% of GDP (growth domestic products). It supplies more than 60% of the continent's exports.

Agricultural production of is unfortunately low/poor area production in many countries is limited to the growth of the sector and the majority of the farmers are among the poorest on the continent.

QN; Why is agriculture in Africa limited to subsistence production?

1. Use of out dated/rudimentary equipment like hoes, digging sticks, slashers etc. which limits the size of farm lands.
2. There is very little investment made in agriculture by governments especially in research and human resource. (farmers are not educated at all about the farming practices which leads to low production
3. There is shortage of capital to modernize farming practices.
4. The level of management is low, farming is basically done as a family business and very little is invested.
5. Agricultural technical skills are almost lacking.
6. There is heavy dependency on nature.
7. Challenges of transport and communication which makes marketing of producers very difficult.
8. Primitive land tenure system which does not encourage commercial farming e.g. communal land ownership.
9. Inadequate storage facilities which results into wastage of produce.
10. High prevalence of pests and diseases which destroy most of the crops from the fields leading to low out puts.
11. Shortage of extension services or workers to teach the population of farmers in better methods of production

Never the less, the farming sector has made considerable achievements in the recent years. Modern farming systems have been put in place and industrial growth in Africa has stimulated commercial farming to provide raw a materials.

As a result, farming is carried out on two levels;

- Subsistence farming
- Commercial farming.

SYSTEMS BASED ON SUBSISTANCE FARMING

These include simple farming activities aimed at providing food for consumption for the local population with any surplus for sale.

Examples of subsistence farming methods includes;

- i. Rotational bush fallowing.
- ii. Shifting cultivation.
- iii. Small holding/peasant agriculture.
- iv. Nomadic pastoralism.

SHIFTING CULTIVATION

It is a system of farming where farmers shift or move from one place to another after the old plot has lost its fertility. Farmers clear small plots and grow crops for a short period of time from which they shift to new/fresh plots due to decline in yields.

It is practiced in many parts of Africa such as Northern Zaire by the Azande, in southern Sudan by the Azande, eastern Malawi, in Zimbabwe where it is called the chipanga system and in Zambia among the Bemba.

Shifting cultivation is also practiced in Liberia and Central African Republic.

CHARACTERISTICS

- Small plots are cleared through cutting and burning of bushes
- Plots are small and highly scattered
- Crops are grown for home consumption
- Food crops such as beans, maize, etc. are mainly grown
- Simple tools such as digging sticks, machetes are used for clearing land
- Its practiced in areas of low and sparse population
- Farm output is supplemented by hunting and gathering
- Scientific methods such as spraying are not applied
- Little attention is given to crops in the field until harvesting is done
- It relies on family labor
- Once land productivity declines, the plots are abandoned and virgin ones are cleared.

ADVANTAGES

- Burning of grass improves soil fertility by adding potash
- Constant movement may control spread of pests and diseases
- Farmers have time for other income generating activities such as fishing
- Mixed cropping reduces loss of soil nutrients

- Less labor is required to operate farm activities
- Clearing of land through burning takes less time and is cheaper than digging
- Yields are high in the short run due to use of fresh fertile land
- It reduces the risk of soil erosion and soil deterioration as land is not overused.

DISADVANTAGES

- Bush burning leads to destruction of soil nutrients and organisms that are responsible for soil formation
- Burning causes pollution and warming due to ozone layer destruction
- It's not capable of supporting an increasing population with food demands
- Bush burning leads to deforestation leading to soil erosion eg. In zaire and Zambia
- It doesn't allow maximum utilization of land. Land is left idle without efforts of improving its productivity
- It doesn't encourage investment in transport and industrial infrastructure because farmers shift from time to time
- It hinders agricultural modernization such as use of tractors and other heavy farming equipment.
- Its operation is restricted to only areas with a small population
- It's affected by natural conditions such as weather failures like hailstorms, prolonged drought, etc.

Why shifting cultivation is practiced.

- Small population densities which results into a lot of vacant land which encourages the practice.
- Conservatism among the societies that still practice the system because they are primitive.
- The system of land ownership permits shifting from one place to another (land is communally owned).
- Poverty encourages them to use shifting cultivation method because it is cheap.
- Climatic changes may also cause farmers to shift especially at the appearance of a long drought season.
- Government neglect. Governments where these communities are found have neglected them since they live in remote areas.

REASONS FOR DISAPPEARANCE OF SHIFTING CULTIVATION

- Increase in world population which requires a lot of land for settlement and agriculture, there is limited land for shifting cultivation in DR Congo and Zambia
- Increased food demands to meet the rapid population growth cannot be solved by shifting cultivation but plantation farming.
- Introduction of perennial crops such as coffee, cocoa, rubber that cannot be grown on shifting basis

- Introduction of plantation farming that requires large pieces of land has led to the disappearance of shifting cultivation
- Introduction of monetary economy which requires surplus production has caused the disappearance of shifting cultivation
- Government policy of gazetted forest and game reserves has limited access to forests or bush lands by shifting cultivators.

QUESTIONS

- A) Define rotational bush fallowing
- B) Describe the advantages and disadvantages of rotational bush fallowing.
- C) Give reasons for the development of this farming system in Africa.

MOVEMENT FROM SUBSISTANCE FARMING TO CASH ECONOMY (AGRICULTURE MODERNISATION)

Transforming agriculture in Africa has taken different forms or approaches in different countries. It has involved transforming of the farmers from producing for consumption to commercial farming.

For agriculture transformation to take place, a number of things have to be done e.g.

- Farmers need to accumulate capital in order to buy the necessary farm inputs.
- Farmers need to acquire knowledge on new machines, seeds, chemicals etc
- Research into different crops must be carried out because it is only through research that productive and resistant varieties can be developed.
- Cash crop production necessitates processing plants and factories for example cotton ginneries, coffee hulleries hence the need by countries to establish processing plants.
- Introduction of resistant and high yielding varieties.

COCOA GROWING IN GHANA

Cocoa originated from Central America where it is a native plant. In Ghana, it was introduced in 1870 and is the leading producer in Africa, accounting for 80% of the country's exports.

Cocoa is a tropical plant that is grown only in the southern region of Ghana where conditions for its growth exist. Cocoa growing requires the following physical factors;

- Heavy rain fall at least 1500mm of mean annual rain fall which should be fairly or evenly distributed throughout the year.
- It requires hot temperatures throughout the year with a minimum of 21°C.

- It requires shelter from strong winds (dense forests).
- It also requires deep well drained fertile soils.
- It grows in areas of low altitude.
- It also requires high humidity of about 80%.
- Low incidence of pests and diseases for high yields.

Other requirements for cocoa include;

- Sufficient skilled labor to plant and harvest.
- Efficient transport to market and processing centres.
- Adequate capital to buy farm equipment.
- Ready market for the cocoa products.
- Relative political stability to encourage investment.

The main cocoa producing belt stretches from Koforidua in the east to Buyini in the North West. cocoa production is entirely in the hands of the peasants who work less than two hectares of land. Such small holding are managed by family labor. However, some farms are large and therefore care takers have to be employed. Most of the cocoa farmers also grow some food crops for their own consumption (yams and bananas).

Cocoa is propagated from seedlings that are inter cropped with yams and bananas.

The banana provide shelter to the seedlings and later after maturing, they provide shade from sunlight and strong winds. after 3 to 5 years, the cocoa plants begins to bear fruits. Once mature, harvesting is done for only the ripe fruits. Harvesting is done using knives between September and January and April to august.

The harvested fruit is split open and the beans scooped. The beans are heaped and covered with banana leaves in order to be fermented.

Fermentation is done for six days and it enables to get rid of the white milky substance that covers the seeds. The fermented seeds are then dried on racks for 1-2 weeks. The dry beans are graded and sold according to their quality.

Marketing of cocoa in Ghana is done by the state cocoa marketing board. However, there are also private companies that market cocoa such as cads bury and fly united Africa Company.

Cocoa is used as;

A beverage or drink which is actually called cocoa.

It is used to make chocolate.

It is used to make cocoa butter, cosmetics.

It is used in the manufacture of confectioneries.

It is used in the manufacture of drugs (pharmaceuticals).

PROBLEMS FACING COCOA PRODUCTION INCLUDES

1. A wide range of pests and diseases was a problem e.g. the swollen shoot which prevents upward growth of the plants, the only solution is to cut off the affected part of plant. Another disease is the black pod which is a fungal stage and also destroy the beans, it only cures with application of pesticides.
2. Climate changes. The north of Ghana receives insufficient rain whereas the south receives very heavy rain fall. Both conditions are not favorable for cocoa production i.e. long drought and too much rain fall.
3. Competition from other producers such as Ivory Coast, the leading producers of cocoa.
4. Hail storms which destroys cocoa plants.
5. Price fluctuation which affects incomes of the farmers.
6. Inadequate storage facilities leading to losses.
7. Transport challenges such as slippery roads which limit marketing.
8. Wild or bush fires destroy cocoa farms.
9. Expensive farm inputs like fertilizers which reduces profit margins.
10. Inadequate land due population increase
11. Soil exhaustion due to monoculture leading to low yields.

BENEFITS OF COCOA GROWING TO GHANA

- It is a source of income to the farmers thus improving the standards of living.
- It is a source of foreign exchange after exporting cocoa and this is important for importing foreign goods thus economic development of the country and improved living standards.
- It is a source of government revenue through taxes charged on the farmers, processing plants and marketing boards. Revenue is used to provide social services.
- It has led to diversification of the economy thus reducing on over reliance on one sector, generating more revenue and jobs.
- It is a source of raw materials for other industries e.g. cosmetics industries which employ many people and generate more revenue and income.
- It has led to development of infrastructures like roads in the area where cocoa is produced thus simplifying movement of people and goods..
- It has promoted international co-operations with outside countries through cocoa exports thus international trade and peace.

- It has stimulated the growth of towns like Kumasi as buying or processing centres for cocoa but also for other necessities.
- Encourage acquisition of skills by the workers through on job training as harvesters, mechanics, etc.
- It has also encouraged the growth of out growers' scheme in the cocoa region thus benefiting the local people through ready market and income.

STEPS TAKEN TO IMPROVE COCOA GROWING IN GHANA

- Spraying to control pests and diseases.
- Planting legumes to improve soil fertility.
- Hiring labor from neighboring countries during harvest period.
- Formation of cooperatives to help in the marketing of cocoa.
- Improving on the roads in the cocoa region to simplify transport.
- Planting more trees to provide shade to the cocoa trees.
- Setting up industries to add value and improve profit margin of the farmers.
- Set up modern storage facilities for the cocoa during times of over production.

MAP SHOWING COCOA PRODUCING AREAS OF GHANA

(LEAVE SPACE FOR MAP)

PALM OIL GROWING IN NIGERIA

Palm oil is the most important crop grown on large plantations throughout Nigeria. Most of the palm oil plantations are located in the south near Port Harcourt and Onitsha. Today Nigeria is one of the leading producers of palm oil.

However, other crops such as cocoa, cotton, coffee and sugarcane are also grown on plantations. Oil palm is also grown in Ivory Coast, Liberia, Togo, Benin, Ghana and Sierra Leone.

CONDITIONS THAT FAVOUR GROWTH OF PALM OILS

- ❖ Low altitude of not more than 1000 meters above the sea level.
- ❖ Heavy rain fall of above 1500mm per year well distributed throughout the year.
- ❖ Well drained fertile soils.
- ❖ Weeding after it has just been planted.
- ❖ It also requires hot temperatures of above 21°C.
- ❖ High humidity is also needed.
- ❖ Vast land for extensive farms
- ❖ Gentle landscape for easy working.

Other requirements include;

- ❖ Efficient transport networks.
- ❖ Sufficient skilled labor to work on the plantations.
- ❖ Adequate capital for buying arm equipment etc.
- ❖ Ready market for palm oil.
- ❖ Supportive government policy.

EXTRACTION OF PALM OIL

One year old seedlings are planted on rows of about 9m apart.

Palm oil is harvested three years after the seedlings have been planted. Six months after flowering, the fruit is ripe and is ready for harvesting by climbing each palm oil tree trunk with the help of long belts which support him as he jerks himself to the tree. The man carries a panga which he uses to cut the ripe bunches.

The Nigerian institute for oil palm research and introduced two other methods of harvesting which are less harm full to the trees because cutting of bunches reduces the yields. These involve use of a harvesting chisel to cut off the bunches while the trees are still short. The other methods is by use of a harvesting hook which is used to hook and pluck off the ripe bunches from the trees.

USES OF PALM OIL

- Used to make margarine.
- It is used to make candles.
- It is used to make soaps.
- Palm oil is also used in making of cosmetics.
- The sap which drains of the trunk of palm oil can be located and fermented into a strong alcoholic drinks.
- It is also used in making of some drugs e.g. pharmaceuticals.
- The leaf ribs are used for local buildings.

PROBLEMS FACED BY PALM OIL FARMERS

- Shortage of labor in the production process which reduces the production margin.
- Political unrest which affects production.
- There is a problem of pests and diseases, diseases include anthracnose, freckle disease, among others which reduces yields.
- The business is carried out on subsistence level and thus cannot easily expand the oil palm farms.
- Disorganized market system which encourages the traders to cheat the farmers on the prices.
- There is a problem of deep rooted weeds such as siams.
- There is competition for market from other oil palm producing areas.
- There is low level of technology used in harvesting e.g. climbing with a panga in order to cut the bunches.
- Soil exhaustion due to mono cropping.
- Fluctuating of palm oil prices on the world market which discourages farmers.
- Occasional droughts which affects production.
- High costs of production.

A SKETCH MAP OF SOUTHERN NIGERIA SHOWING MAJOR CROPS

(LEAVE SPACE FOR MAP)

MODERN AGRICULTURAL PRACTICES IN AFRICA

PLANTATION FARMING

What is plantation farming?

Plantation farming is also known as estate farming. It involves opening up extensive farms or pieces of land for cultivation of a limited number of crops under scientific management for commercial purposes.

In brief, it is the growing of limited number of crops on large piece of land majority for sale.

This system of farming was introduced to Africa by Asians and Europeans

CHARACTERISTICS OF PLANTATIONS

1. Extensive areas used to cultivate one crop (an average area of 5km² of land).
2. It is based on mono culture (one crop growth at a time)
3. It is capital intensive (a great deal of capital is involved in establishing plantations because plantations own a lot of machinery and processing plants).
4. Its labour intensive (a lot of labour is needed because of the manual work on plantations in the farm and factory).
5. Plantations employ scientific methods e.g. use fertilizers, herbicides, pesticides etc.
6. Plantations are self-sufficient or sustaining in terms of marketing, transport, social services etc.
7. They are mostly owned by foreigners or government.
8. There is on site processing of products because raw materials are usually bulky.
9. The production process is mechanized i.e. they use machines such as tractors to till land, transport and factory.
10. Crops are grown mainly for commercial purposes.
11. They mainly grow perennial crops like tea, sugar cane.

ADVANTAGES OF PLANTATION FARMING

- Methods of crop production are scientific and efficient leading to high yields.
- Plantations enjoy benefits of specialization of labour which results into quality and quantity of the produce.
- Plantations are run by companies with a huge financial base hence they tend to be self-sustaining or self-sufficient.
- Plantations encourage out growers which improves incomes of the out growers because they sell their produce to plantation owner.
- Research can easily be carried out on plantation which results into improvement in the varieties of crops, elimination of pests and diseases etc.

- Plantations ensure no wastage. I.e. after processing the crop into final products, the by-products are also put to use, e.g. in sugar cane plantation, bagasse is used as fuel or manure in the field, molasses is used in the manufacture of sweets and spirits.
- Plantations create a lot of employment opportunities to the surrounding areas because they are labour intensive enterprises. This improves income and standards of living of the people.
- They result into development/improvement of social infrastructure which benefits the surrounding areas. Plantation built school, hospitals, recreational facilities etc. which benefits all people around the plantation.
- They also result into improvement of economic infrastructures such as roads connecting a plantation with the out growers in the surrounding areas.
- Labourers become trained in different skills on the plantations e.g. as drivers, machine operators etc. hence ensuring efficiency and effectiveness in production.
- Plantation ensures large supplies of produce to the processing factory. This explains why processing plants are located within in the plantation.
- Plantations market their produce.
- Plantations encourage growth of urban areas which extends social services to the people.

DISADVANTAGES OF PLANTATIONS

- ❖ They practice mono culture which leads to decline in soil nutrients and may affect yields.
- ❖ Specialization in farming as practiced by plantations discourages diversification of agriculture.
- ❖ They deprive natives from owning land because they cover large areas of land.
- ❖ A lot of capital is required to establish the plantation and run the plantation e.g. paying labour and buying machinery.
- ❖ There are increased risks of pests and diseases because of mono culture.
- ❖ Plantations are affected by price fluctuations on world market which affects the income of workers.
- ❖ They are affected by fire out breaks which usually destroys large area of plantation leading to losses.
- ❖ Most plantations are owned by foreigner who repatriate all profits incurring from their sales.
- ❖ Most plantations also employ foreign expatriate famers which reduce job chances for the local.
- ❖ Plantations are affected by weather changes or natural calamities such as too much rain fall which leads to failure of crops thus causing losses.
- ❖ Strikes by workers normally resulting into loss of property.
- ❖ They face competition for market since they are producers of a common crop.

- ❖ Plantations also face competitions from synthetic fibers (products) hence reducing the profit margin.
- ❖ Plantations cause pollution because they have factories that pollute air, land, and water around them.

SUGAR CANE PLANTATIONS IN NATAL

SUGARCANE PLANTATION

A good number of African countries grow sugar cane both on large and small scale e.g. in Congo (DRC), sugarcane is grown in Matadi and Kinshasa, in Sudan, it is grown in Kenana, in Zambia, it is grown around R. Kafue, it is grown in Swaziland and Angola.

South Africa has the largest sugarcane growing area around the eastern coast of Natal.

Factors that favour Sugarcane growing include the following;

- High temperatures of 21°C
- Abundant moisture or heavy rainfall of more than 1000mm brought by onshore winds during the summer.
- It requires a dry weather during harvesting.
- Land should be reasonably flat or undulating to allow irrigation and mechanization. Where it is under irrigation, rainfall should be less than 1000mm.
- It also requires capital market transport and labour.

Natal is located along the eastern coast of South Africa. It is the largest sugarcane region in the continent.

The sugarcane growing region stretches for about 200km between lake st. Lucia and Margate with over 362,000 hectares under sugar cane production.

The sugarcane industry in South Africa is managed by the South African sugarcane association which runs the daily activities on farms owned by companies and individual farmers.

Natal have favoured sugarcane growing because;

- It experiences hot temperatures brought down by Mozambique temperatures.
- It receives heavy rain fall of about 1000mm brought by on shore winds during summer.
- Natal has deep well drained fertile soils.
- The region is generally flat which allows mechanization and irrigation of fields during dry period.
- Abundant water for irrigation supplied by rivers such as Umfolosi, Tugera and Umgeni.
- Existence of low altitude for hot conditions.
- There is extensive land which has favoured establishment of large farms.

- There is cheap transport network in form of railways and roads for movement of raw material and finished products.
- There is a wide market for the sugar and its other by-products.
- A lot of capital establishment and management of the farms provided by companies.
- Modern technology for large scale farming such as use of tractors.
- Availability of skilled and semi labour provided by whites and Africans to manage the farm.
- Extensive research to improve the quality of the sugarcane done by south African sugar association.

Sugarcane is propagated from stems. Cane of about 40cm is dipped in fungicides before it is planted. Planting is done in rows manually.

Fertilizers are applied during planting.

Harvesting is done after two years. The first harvest of cane is called plant cane and the other is called rotten cane.

Harvesting continues for eight years after which the old plant is uprooted or removed and regumes are planted to replace nutrients.

Harvesting is done manually using pangas and machetes. Harvested cane is tied in bundles and loaded on trucks which transport it to the mills.

At the factory, cane is weighed, chopped and squeezed to produce juice, a process known as juice extraction.

At this stage, the fibrous waste is left as a bi-product known as bagasse.

Juice is then chemically treated by adding some quantity of lime to remove impurities.

The pure juice is then boiled and evaporated into a semi-solid syrup.

The semi- solid syrup undergoes crystallization under extreme temperature in a vacuum pan.

The crystals are then bleached to produce white crystals. During crystallization, another bi-product is called molasses is produced.

USES OF SUGARCANE/SUGAR

- ❖ It is used in making confectionaries.
- ❖ It is used in the manufacture of beverages e.g. wines.
- ❖ It is used in the manufacture of pharmaceuticals.
- ❖ It is used in the manufacture of industrial chemicals, acids and explosives.
- ❖ Molasses is also used in making of spirits and alcohols.
- ❖ Molasses are used in manufacture of stock feeds and industrial fertilizers.
- ❖ Bagasse is used in making manure in the fields and also serves as a source of fuel.

PROBLEMS FACING SUGARCANE GROWING IN NATAL

- ✚ Competition from other sugarcane producing countries such as Cuba and Brazil.
- ✚ Weather changes especially during the drought (dry spell) which increases expenses as it requires irrigation.
- ✚ Sugarcane also faces a problem of pests and diseases which reduces the quality of cane.
- ✚ Fire outbreaks which leads to loss of plantation.
- ✚ Mono culture which results into soil exhaustion.
- ✚ Strikes by workers which leads to losses.
- ✚ Labour shortage especially during harvesting period.
- ✚ Price fluctuation.
- ✚ High costs of maintaining the plantation and factories.
- ✚ Shortage of land for expansion due to population growth.

BENEFITS OF SUGARCANE GROWING TO SOUTH AFRICA

- It creates employment chances thus improving incomes and living standards.
- It supplies raw materials to factories thus stimulating growth of agro based industries which produce consumer goods.
- It has caused infrastructural development such as roads and railways which help in the movement of goods, services and people.
- It earns the country foreign exchange from sugar sales/exports. Forex is used for development purposes.
- It generates revenue through taxes paid by the factory, farm and workers. Revenue is used to provide social services and improve living standards.
- It has caused urban growth in the sugarcane growing and processing area. Towns bring services near the people hence improving people's living standards.
- Leads to economic diversification thus reducing over reliance on sectors like mining, creation of more jobs and revenue.
- It has caused international relationship through import-export trade which also enables transfer of technology.
- It has promoted out-growers who sell their produce to the plantation owners and earn income to improve their lives.
- It's a source of income through employment leading to improved standards of living.

A MAP SHOWING SUGARCANE PLANTATION IN NATAL

(LEAVE SPACE FOR MAP)

RUBBER IN LIBERIA

Rubber is another tropical plant grown in the rain forests areas/countries such as Liberia, Zaire, Ivory Coast and Nigeria.

Rubber requires the following conditions for its growth;

- ✓ Hot temperature throughout the year with an average of 21°C.
- ✓ Heavy rainfall well distributed throughout the year (2000mm).
- ✓ It grows in a variety of soils which are fertile and well drained throughout the year
- ✓ It grows in low altitude areas where temperature are constantly hot.
- ✓ It requires high humidity (above 80%)
- ✓ It grows well in low altitude areas where hot temperatures exist.
- ✓ It requires gently sloping land for easy movement or mechanization.
- ✓ Extensive land for plantation establishment.
- ✓ Large supply of labour
- ✓ Adequate supply of capital
- ✓ Ready market for the products
- ✓ Efficient transport network
- ✓ Supportive government policy

In Liberia was the first grown in 1910 but the actual development started in 1926 when an American company firestone obtained a 99 year lease on land where thousands of rubber trees were planted.

By 1973 firestone owned more than 37,000 hectares of rubber trees.

Plantations of rubber were established in harbel and Cavalla owned by firestone.

However, there are also many small scale rubber growers who account for over 47% of Liberian rubber.

EXTRACTION OF RUBBER

On a mature rubber tree, v shape cuts are made.

- A cup is tied below the v-cut in the morning and removed in the evening.
- A milky liquid called latex drips into the cup from the cut.
- Latex is collected by farmers and sold to the factories.
- The latex is mixed with acetic acid to form coagulated rubber or spongy rubber.
- The coagulated rubber is squeezed between sheets to remove the air.
- This produces rubber sheets that are dried and the dry rubber is treated into different products such as;
- Tyres and tubes for vehicles, planes and bicycles.
- Insulating materials
- Carpet barking
- Washers and trims
- Water proof materials used in building.
- Rubber shoes and soles
- Gum- boots.
- Erasers.
- Bottle lids
- Water pipes

PROBLEMS FACED BY RUBBER GROWERS

- Competition from synthetic rubber.
- Competition from other rubber growing areas especially Malaysia and Indonesia.
- Weather changes especially heavy rainfall which dilutes the latex.
- Price fluctuation on the world market which reduces profit margins.
- Pests and diseases which attacks the trees and reduce the latex.
- Fire outbreak which destroys rubber trees.
- Soil exhaustion due to monoculture hence low output.
- Political instability in rubber growing areas.
- Transport challenges especially in the wet season which causes slippery roads.
- Labour shortages especially during harvesting period leads to low output.

BENEFITS OF RUBBER GROWING

- Many towns have been developed due to construction of roads, schools, hospitals. Etc.
- Rubber plantations assists small scale growers by extending roads and marketing their produce which has increased income and standards of living.
- It is a source of revenue through taxes and royalties from companies.
- Employs big number of people thus improving their standards of living.
- It is a source of foreign exchange in Liberia (second important after iron ore).
- Research is carried out on crops and such research led to successful growing of other crops coffee, cocoa.
- It has led to growth of towns that acts as trading centers.
- It has contributed to growth of industries.

LARGE SCALE IRRIGATION IN AFRICA

It is a farming practice where man artificially supplies water for crop growth either temporarily or permanently. It is mainly required where;

- ❖ Rainfall is seasonal so that farming can go on even in dry seasons.
- ❖ Natural rainfall is insufficient to meet plant water requirements
- ❖ Flooding is common, to put the would be flood areas to farm use.
- ❖ Areas where there is acute need for food especially in long dry spells.

Requirements of irrigation farming

- i. Capital is required to establish the irrigation farms by buying irrigation equipment.
- ii. Permanent water source.
- iii. Well drained soils with the capacity to retain water and its nutrients.

Irrigation is carried out in three ways.

1. Overhead irrigation/sprinkler.
2. Drip method/ trickle irrigation.
3. Gravitation flooding/canal irrigation.

In Africa, irrigation is practiced in many countries on a large scale for example Gezira irrigation scheme in Sudan, Aswan valley in Egypt, Richard toll scheme in Senegal , awash valley authority in Ethiopia, etc.

These schemes deal in the production of different crops such as rice, cotton, sugarcane etc.

IRRIGATION FARMING IN SUDAN

Only 7% of Sudan's land area is suitable for agriculture. Large areas of the country are desert land hence not favourable to crop cultivation. That notwithstanding, Sudan produces large quantities of cereals/ grains like sorghum.

Major cash crops include cotton and sugarcane, grown on irrigation schemes.

THE GEZIRA IRRIGATION SCHEME

Gezira scheme is located north of Sennar on the plains between the Blue Nile and the White Nile. It was established on a large piece of land which slants westwards from the Blue Nile towards the White Nile. The scheme was established in 1923 after the establishment of Sennar dam and it is famous for growing of long staple cotton.

It is one of the most successful and largest single irrigated areas in the world.

The region receives low and unreliable rainfall less than 500mm a year, was mainly used for cultivation of cereals. When the rains failed, they suffered serious famine thus the need for irrigation.

It has two branches or extensions.

- Gezira
- Managil extension.

The Gezira scheme was established with the following aims / objectives;

- To improve on farming systems in the area.
- To improve on the living standards/welfare of the nomads.
- To provide employment as a means of stopping their nomadic practices.
- To control floods on the Nile which were frequent in this area.
- To increase food supply for the population and save foreign exchange.
- To develop domestic industries and create jobs.
- To utilize the formally useless land between the blue and white Nile.
- To open up more land for settlement and farming.
- To diversify the agricultural sector by growing a variety of crops.

ESTABLISHMENT OF THE SCHEME

The idea of establishing the scheme was developed in 1904 when the British started carrying out experiments on cotton growing which eventually produced positive results and in 1911, a large farm cotton was established.

When the Sennar dam was completed and it started supplying water to the farms and the government of Sudan nationalized the scheme in 1950, the government then set up the Gezira irrigation board to manage the scheme.

In 1962, the farming area was extended or widened after the completion of managil extension. There are two canals which supply water to the scheme (Gezira scheme and managil).

It is from these two canals that thousands of kilometers of canals channel water to the field.

Describe the conditions that favoured the establishment of the Gezira scheme (why the area of Gezira was chosen for large scale irrigation).

- ❖ Presence of water for irrigation from the blue Nile which is used to flood during the rainy season.
- ❖ Presence of fertile dark brown clay soils favourable for growing cotton.
- ❖ The generally flat and gently sloping land made it suitable for irrigation by gravitational flow of water.
- ❖ The climate of this area is semi-arid with a moderate rainfall totals which was ideal for cotton growing.
- ❖ The aridity of this area also meant that there would almost be low expenses arising from clearing of vegetation.
- ❖ The area was sparsely populated hence there would be no problem of resettling people.
- ❖ The semi-nomadic people in this area would also supply labour to the irrigation scheme.
- ❖ There was adequate capital, wide market and the government favoured the establishment of the scheme.

How the scheme was organized

Land on which the scheme was established belongs to government but the scheme is managed by a state corporation (parastatal) i.e. the Gezira irrigation board which rents out land to the tenants.

The board controls water supply during the growing season, it organizes the layout of land use, decides on the crop to be grown, it ploughs the land, provides seeds to farmers as well as fertilizers, it buys all the cotton which is grown by all the peasants and markets the cotton.

The tenants known as the Fellahin produce the crop. Each tenant is given 3-4 hectares of land near his village.

The tenant plants, weeds, harvests, maintains the irrigation canals, removes all the old cotton stocks and carries out any other local farm activities.

After producing the cotton and marketing it, the profits are divided as follows;

50% is taken by the peasants.

36% is taken by the Sudan government.

10% is taken by the Gezira irrigation board.

4% is taken to social service and village councils.

Cotton is transported by camels, Lorries and mostly trailers to ginneries. Most of the cotton is exported to USA, Britain, Japan and the Rhine lands.

85% of Sudan's cotton sale come from Gezira besides cotton, the other crops grown include;

Dura millet or sorghum

Ground nuts

Lubia.

A SKETCH MAP OF THE GEZIRA IRRIGATION SCHEME

(LEAVE SPACE FOR MAP)

BENEFITS OF THE GEZIRA IRRIGATION SCHEME

- On a national scale, the scheme has acted as the heart of the economy by providing raw materials for many industries e.g. cotton for textile industries.
- It is responsible for the growth of many agro- based industries in Sudan by supplying them with basic raw materials.
- The scheme has increased the food production e.g. Dura sorghum, corn, ground nuts, rice are all produced for substance.
- The scheme has diversified income of the farmers by encouraging them to grow crops rear dairy cattle and plant trees or forests. This has improved standards of living.
- The scheme provides employment opportunities to the Sudanese population both directly and indirectly in different sectors better lives.
- It has resulted into development of infrastructure in terms of roads, railways which simplifies transport.
- It is a source of revenue to the Sudanese government through taxes paid by the tenants.
- It is a source of foreign exchange through cotton and textile exports from Sudan.
- It is a tourism attraction as many people from different countries visit Gezira for study purpose hence more revenue.
- It has greatly contributed to the growth of some towns such as Wad medan, wad halfa, Barakati, Marangani.
- The formally pastoral communities are now settled as tenants in the scheme. In addition, the scheme has managed to put the former wastelands into proper use.
- Training schools have been set up and home management lessons / training has been extended especially to women which has up lifted standards of their families.
- The scheme has improved on the supply and availability of clean water in this area by constructing deep wells that are sources of clean water.

PROBLEMS FACED BY PEOPLE LIVING IN THE GEZIRA SCHEME

1. Land fragmentation due to increasing population of tenants. This has affected output on the field.
2. There are pests and diseases which affect yields' quality and quantity.
3. Siltation of canals which calls for constant dredging thus increasing costs.
4. There is a problem of pollution by factories that process the cotton.
5. Farmers face problem related to price fluctuation of the crops which affects their income.
6. Due to the arid-climate, the scheme experiences excessive evaporation leading to excessive loss of water.
7. There is soil exhaustion due to monoculture practices.
8. There is competition from other cotton producers and synthetic sources.
9. Stagnation of water in canals which results into water borne diseases like malaria and bilhazia.
10. Water weeds also chocks or block canals thus affecting flow of water.

11. Displacement of people leading to high costs of management.
12. Growth of rhizome-like weed which competes with the crops hence lowering crop yields.
13. Urban related problems like high crime, poor sanitation lowering living standards.

SOLUTIONS TO PROBLEMS

- ❖ Dredging of canals to reduce on blockage of canals by silt.
- ❖ Intensifying education to farmers to create awareness.
- ❖ Encouraging farmers to diversify crops.
- ❖ Planting trees to improve climate.
- ❖ Spraying with pesticides to reduce crop damage by pests and diseases.
- ❖ Spray with herbicides to control weeds.
- ❖ Applying fertilizers to improve fertility.
- ❖ Construction of health centres to treat the sick.

IRRIGATION FARMING IN SENEGAL

River Senegal forms a boundary between Mauritania and Senegal. These countries are in West Africa bordering the Atlantic coast.

Annual rainfall is about 400mm but often less. However most of the northern parts of Senegal are desert environment. And so there was need to set up irrigation schemes to produce more food. The most notable irrigation scheme is the Richard toll scheme

Crops grown include rice, sweet potatoes, maize, tomatoes, sorghum, millet, sugarcane, beans.

FACTORS WHICH FAVOURED LARGE SCALE IRRIGATION ON RICHARD TOLL SCHEME

- Presence of gently sloping relief which allows gravitational flow of water to all areas of the scheme.
- Presence of flat/gently sloping relief allows the use of mechanization on the farms.
- Presence of fertile alluvial soils periodically deposited by river Senegal favouring the growth of crops.
- Presence of a permanent source of water i.e. Senegal River for irrigation.
- Existence of large tracts of land with a relatively low population ideal for irrigation.
- Existence of dry conditions which necessitated irrigation.

HUMAN FACTORS

- Availability of adequate capital to invest in large scale irrigation.
- Availability of positive government policy to support agriculture development through provision of land, capital, market, etc.
- Availability of advanced technology to pump water to all areas of the scheme.
- Highly skilled labour to carry out irrigation, growing and harvesting crops.
- Availability of flexible means of transport e.g feeder roads to deliver inputs to the scheme or transport produce to market centres as well as transporting produces to market centres.

BENEFITS OF THE RICHARD TOLL SCHEME

- Source of valuable food to feed the population e.g fruits , vegetables ,rice ,sugarcane.
- It promoted reclamation of land in order to resettle land – less people.
- It improved farming skills through training farmers.
- Controlled flooding therefore protecting agricultural land or land for settlement.
- Generated revenue through taxation used in the setting up of social services.
- Provided employment to farmers who earn income to meet their life necessities.
- It promoted exportation of agricultural products leading to earning of foreign exchange used in the development of international trade.
- Development of infrastructure e.g roads, canals, railways , schools which extend services to people hence improving standards of living.
- Provision of raw materials for agro-based industries leading to industrial growth.
- Contributed to urbanization e.g St. Louis, Daker which extend social services to people.
- Led to tourism leading to generation of foreign exchange for development.
- Led to international relations through exports and tourism leading to peace and unity.

PROBLEMS WHICH HAVE RESULTED FROM ESTABLISHMENT OF THE SCHEME

- Loss of the periodic alluvial soils deposited by flood waters.
- Salinization due to high evaporation in the arid area.
- High costs of maintaining irrigation agriculture.
- Industrialization has led to loss of vegetation causing degradation.
- Pollution of air, water, land due to Agro-based industries use of agro-chemicals.
- Waterborne diseases e.g bilharzia have spread and killed people.
- Rapid growth of weeds due to irrigation.
- Siltation of canals which require constant dredging.

PASTORALISM IN AFRICA (LIVE STOCK FARMING)

It's a term used to describe an economy based predominantly on raising animals such as cattle, goats, sheep, camels, etc. practiced in the semi arid environments of Africa that receive low and unreliable rainfall.

In most parts of the Africa livestock rearing is part of the human activities among the pastoral groups. Livestock rearing takes different forms in the continent such as;

- 1) Nomadic pastoralism which involves continuous movement of herdsmen with their animals in search of water and pasture e.g. karamajong, Turkan, Somali etc.
- 2) Transhumance which is the seasonal movement of the herdsmen with their animals between wet season and dry season pastures e.g. Fulani, Masai
- 3) Sedentary farmers e.g. Iteso, these are settled pastoralists who rear animals like cattle as well as grow crops on small scale
- 4) Mixed farming
- 5) Dairying and ranching.

Pastoralism in general is practiced mainly in the grass land belts of Africa with low unreliable rainfall.

Such areas have marked dry season.

Cultivation of crops is difficult unless under irrigation.

They are mostly remote.

Sometimes infected by pests and diseases.

There is overstocking as they emphasize quantity.

Burning of grass is practiced always at the end of the dry season.

Grazing is done communally and purely traditional.

Land is owned communally by the nomads.

NOMADIC PASTORALISM

The major nomadic pastoral groups include the Fulani of West Africa, the Tuaregs of the Sahara. Some are nomads and others transhumant's.

True nomads are on the move continuously with their flocks and herds whereas transhumants move seasonally between wet and dry season pasture.

They follow the seasonal availability of water and pasture, tsetse flies born and water born diseases, wild animals and the prevalence of biting insects.

Characteristics of nomadic pastoralism

Constant wandering of men and their herds.

There is overstocking as they emphasize quantity.

It is basically for subsistence farming i.e. provision of milk for home consumption by the pastoral nomads.

Land is owned communally in nomadic lands.

Indigenous breeds of cattle are kept.
Nomadic pastoralists don't have permanent settlements.
Grazing is done communally and purely traditional.
They shun anything to-do with scientific methods.
Animals depend on natural pasture.
Burning of grass is practiced always at the end of the dry season.

CAUSES OF NOMADISM AMONG PASTORALISTS IN AFRICA

- Scarcity of pastures which forces herdsmen to move in search of pastures.
- Shortage of water for the cattle which leads to the seasonal movement.
- Communal land tenure system which allows the free movement of the herds.
- overstocking which results into overgrazing and pasture shortages leads to the nomadism.
- Aridity of the range land means that water holes dry up easily hence the movements.
- Prevalence of pests and diseases in the cattle areas causes the seasonal movements.
- Sparse population of less than 10 people per km² leaves vast areas of land free for movements.
- Conservative nature of the pastoral communities keeps them to the primitive method of cattle grazing and shun modern methods of settled farming.
- Unreliability of rainfall also makes nomadism an alternative way of life since they cannot grow any crops.

PROBLEMS FACED BY THE PASTORAL NOMADS

- Overstocking have caused overgrazing leading to de-vegetation
- Every year they have to travel long distances in search for pasture and water.
- Poverty e.g. lack of capital.
- The problem of land tenure i.e. land is owned by the whole community.
- The pasture tend to be innutritious leading to poor quality ANIMALS.
- Herds suffers from numerous diseases like Nagana, foot and mouth diseases, anthrax etc.
- Constant cattle rustling among the pastoral communities.
- The breeds are poor. Their fat content is low and beef output is also low.
- Bush burning has compounded the problem of un nutritious pasture.
- The harsh physical conditions like climate.
- Drought is a common phenomenon in these areas resulting into loss of substantial number of herds.
- Remoteness meaning poor transport and communication.

SOLUTIONS TO THE PROBLEMS ABOVE

Governments have come in to address the herd situations and make life of the nomads uplifted. The following solutions have been offered.

- Improvement of breeds through research and cross breeding.
- Diseases and pests control through dipping and spraying.
- Providing loans to solve the problems of capital.
- Improve transport through construction of roads.
- Land tenure should be changed to legislation, from communal to co-operative or individual.
- Improve marketing by creating markets.
- Introduce demonstration farms to teach better methods of animal raising.
- Sinking of bore holes and valley dams to serve as water sources.
- Provision of veterinary services.
- Encourage pastoralists to reduce on overstocking and emphasize quality rather than quantity.
- Where possible nutritious pastures be provided and planted.

THE FULANI OF THE SAHEL

The word Sahel means edge and in this case the edge of the Sahara desert.

The Fulani of West Africa are spread throughout the Sahel and savannah zones of West Africa in countries such as Senegal, Mauritania, Niger, Nigeria, Chad, Cameroon etc. They are nomads (transhumant) and mostly concentrated in northern Nigeria. They occupy a region of alternating weather i.e. the dry season which comes between December and March. In this period their area is quite dusty due to the movement of the north east winds south wards.

When the sun is in the north i.e. (April and September) it is a wet season and they receive rainfall of about 508-762mm of rainfall.

In the dry season, the grass withers, pools and streams dry up therefore the Fulani move south wards close to water and pasture. However, they cannot move up to the coast due to the presence of tsetse flies and rainfall is too much, but also there are hyenas in the forest zone.

They practice transhumance and therefore they are transhumant. They move around Bamenda, Jos plateau, Adamawa (Cameroon) and futa- Jalon.

They make use of high lands/ plateaus during the wet season as they avoid tsetse flies and water logged valleys which may cause foot and mouth diseases.

They have permanent settlement and during the dry seasons they run short of food thus a few animals are sold for food.

The problems faced by the Fulani pastoralists.

- Low and unreliable rainfall leading to shortage of water and pasture.
- Long periods of drought leads to death of cattle.
- Constant movement of animals in search of water and pasture leads to low quality of the products.
- Overstocking leads to overgrazing
- Overstocking also leads to spread of diseases to the livestock.
- Attacks from wild animals like hyenas reduces numbers.
- They look after traditional or local breeds which yield low milk and beef.
- Limited market for their products due to remoteness of their areas.
- Poor quality of pasture due to the practice of bush burning.
- Periodic invasion of locusts which cause wide spread destruction of vegetation leaving land bare for agents of erosion.
- Constant cattle rustling leads to insecurity and loss of animals.
- Poor transport and communication leads to remoteness.
- Limited extension services also lead to death of herds and the nomads.

The rapid growing market for meat and dairy products in west Africa has caused changes in traditional economies, traditional pastoralism enclosure.

Demand for meat is due to increasing population, rising living standards.

The serious problem faced by the Fulani is the expanding desert due to overstocking. Therefore there is need to address the desertification of the Sahel by;

- Reducing the number of cattle.
- Set up permanent ranches to avoid mouth.
- Afforestation to reduce expansion of the desert.
- Irrigation scheme to involve the Fulani in crop production.
- Extend education programs to educate the Fulani about the environment protection.
- Construct permanent water points
- Provide extension workers like veterinary officers to control pests.
- Cross breed animals to improve the breeds for better products.
- Construct main and feeder roads to improve marketing of products.
- Change land tenure system from communal to encourage settled farming.
- Disarm pastoralists to control cattle rustling.
- Establish milk collecting centres to provide market for their milk.
- Diversify their economy such that they also grow crops like millet, sorghum to solve food scarcity.

MAP SHOWING THE FULANI LANDS OF WEST AFRICA

(LEAVE SPACE FOR MAP)

IMPROVEMENT OF PASTORALISM IN AFRICA FROM NOMADISM TO RANCHING

CASE STUDY: (BOTSWANA AND NIGERIA)

Botswana is located in the southern part of Africa, with an area of 712,000km². It lies on the higher plateau of Africa with a very low population.

CLIMATE

The country is divided by the top of Capricorn, with the north having a tropical climate and south a sub-tropical type. Rainfall almost is 440mm a year. The figure represents quite low and unreliable rainfall.

The country faces persistent drought due to the nearby Kalahari Desert, which was worse in 1964 which caused a lot of heads of cattle to die.

Generally there is lack of surface water, therefore people of Botswana face harder conditions than those in north Nigeria as far as cattle keeping is concerned.

DEMONSTRATION FARMS/ RANCHES

Demonstration farms or ranches were set up after the 1962 drought and

Improved cattle keeping is being carried out on about 1600-2800 hectares. All this is paddocked and supplied with water.

AIMS OF THE RANCHES

1. To demonstrate modern beef management using government owned herds.
2. To let interested farmers participate with their own cattle and carry out the same techniques.
3. Here each interested farmer asked to bring 4-6 cows to the ranch to be fattened. They are taught animal management and other associated dealings. Ranches are paddocked so that farmers also learn to control grazing area.

CHARACTERISTICS OF DEMO FARMS IN BOTSWANA

- They are large in size
- They are fenced and divided into paddocks.
- Beef cattle are mainly reared.
- Cattle are rotationally grazed.
- Farms have well established supply of water.
- Animals are scientifically managed e.g. dipping and artificial insemination.
- Animals are fed on natural pastures

The farmers have benefited by learning that;

- ❖ Some grass should be preserved for the dry season.
- ❖ Animals are fed day and night
- ❖ They have learnt de-horning and castration as ways of improving on beef quality.
- ❖ They have learnt how to control diseases.
- ❖ They have learnt to gauge the carrying capacity of an area.
- ❖ They feed their animals on salt and food stuff for increased milk and beef production.

The government ranches supply all items which the farmers need e.g.

Water supply, Veterinary services.

The farmers benefit from;

Increased beef production / animal protein thus improving diet.

The increased incomes from the fattened animals

They also benefit from the lessons they have learnt

They learn how to dehorn and castrate etc.

Today majority of the farmers still graze their cattle on enclosed bush lands.

Soon it is hoped that the commonly owned land will gradually be fenced so that individuals can develop modern ranches.

Meat canning centers have been put up hence improved marketing. Around 85,000 animals are sold every year and beef projections reveal unincreased exports at a higher rate.

The major processing plants are at Lobatse from where meat is packed, frozen and exported.

Employment has been created on farms thus improving living standards.

National economy has been diversified thus preventing over dependence.

They are sources of revenue through taxes paid by farmers which benefits the locals in terms of social services delivery.

PROBLEMS FACED BY DEMONSTRATION FARMS IN BOTSWANA

- Drought which leads to pasture shortages and death of cattle.
- Water shortages also leads to death of cattle or reduces beef quality.
- Competition for market with other countries thus price fluctuation.
- Limited capital which affects supply of inputs.
- Soil erosion due to over grazing leading to growth of poor quality pasture.
- Pests and diseases like ticks and nagana which reduce quality of beef.

BOTSWANA AND RANCHING

CATTLE IN NIGERIA

- In Nigeria the Fulani rear cattle on subsistence scale in the Sahel and Savannah belts of northern Nigeria. They move in search for water and pastures.
- Increases demand for dairy products led to improved methods of animal raising. This was due to raising standards of the southerners. They demand a lot of beef and dairy products and high incomes.
- Ranches have been built first at Katsina near the border with Niger, in Sokoto, Kano, and Zari with permanent watering, cross breeding and improved pastures.
- Land carrying capacity with paddocking is being practiced. Cattle are fed on fodder crops processed from groundnuts leaves and cotton seed waste.
- Meat processing plants with refrigerators have been set up where fattened cattle are being slaughtered.
- Livestock trade routes (roads and railways) have been connected to link pastoral areas to market centers.