

WEATHER AND CLIMATE OF EAST AFRICA

Weather is the state of the atmosphere of a particular given place and time. It is the state of the atmosphere of a place for a short period of time.

Climate is the average weather conditions of a given place measured and recorded after along period of time usually 30 – 35 years.

These elements of weather include the following

Element	Instrument
Pressure	Barometer
Humidity	Hygrometer
Rainfall	Rain gauge
Sunshine	Sunshine recorder or Campbell stokes
Temperature	Maximum and Minimum thermometer or six's thermometer
Cloud Cover	Observation
Wind speed	Anemometer
Wind direction	Wind Vane or Weather cock
Visibility	Observation

The measurement and recording elements of weather are done in a weather station. A weather station therefore is a place where all elements of weather are measured and recorded.

NB: Atmospheric pressure is the force exerted on the Earth surface by the weight of the atmosphere.

1. Temperature Inversion is the increase, in temperature with increase in altitude.
2. Temperature inversion is the higher you go the cooler/warm it becomes.
3. Environmental lapse rate – this the decrease in temperature with increase in altitude.

CLIMATE TYPES AND REGIONS OF EAST AFRICA

Broadly speaking the climate of East Africa can be categorized into 3 major types

1. Equatorial climate
2. Tropical climate or Savannah

EQUATORIAL CLIMATE

The equatorial climate, in East Africa has been modified due to altitude water bodies etc. to increase the following types.

- a) Equatorial lake shore type (True Equatorial Climate)
This type of climate is around L. Victoria region
- b) Modified Equatorial types
This is found around the plateau and highlands
- c) Coastal Tropical Type, which is along the East Africa coast
Equatorial climate region therefore extends from Lamu in Kenya to Tanga area south of R. Pangani in Tanzania, along L. Victoria basin (Buganda), Nyanza province – Bukoba, etc.

Characteristics of Equatorial Climate

1. Heavy rainfall of between 1500 – 2000 mm well distributed throughout the year.
2. High/Hot temperatures between 21 – 27°C
3. High humidity throughout the year of 80%
4. High cloud cover

5. Double maxima (peaks) or rainfall
6. Small annual range of temperature of between 2 – 5°C
7. Rainfall is mainly correctional
8. No district dry season is experienced in this climate

Bukoba in Tanzania

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp ° c	21	21	21	21	21	21	20	21	21	21	21	21
Rainfall mm	151	159	247	360	330	85	160	49	80	107	164	90

Draw a graph to represent the above data.

TROPICAL CLIMATE (SAVANNAH)

This type of climate is divided into 2

- a) Tropical Northern i.e. Northern Uganda and Central Tanzania
- b) Tropical Southern i.e. Southern Highlands of Tanzania

This type of climate in East Africa is extensive covering North, Eastern and Western Uganda. Most of Tanzania especially the southern parts and South West Kenya

Characteristics

- High/Hot temperatures throughout the year between 25 – 30°C
- It experiences one maximum peak of rainfall (Unimodal)
- Modal rate rainfall of 750 – 1000 mm per annum.
- Moderate temperature range going up to 10°C (5-10°C)
- Mean annual temperature is high i.e. 21oC
- Wet season alternates with dry season

Gulu in Uganda

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp o c	24	24	23	22	22	21	19	21	22	23	24	25
Rainfall mm	155	109	145	48	5	0	0	0	3	5	31	97

Draw a graph to represent the above data

NB: The economic activities carried out in this climatic region include:

Bee keeping, charcoal burning, wild life conservation, fruit gathering, growth of annual crops like millet, sorghum, maize, etc.

SEMI DESERT AND DESERT CLIMATE

This region stretches to North Eastern Tanzania, Eastern and Northern Kenya to North Eastern Uganda (Karamoja), Ankole Masaka corridor etc.

Characteristics of this climate:

1. High temperatures of about 30oC/Hot temperatures
2. Very little rainfall ranging from 325-620mm per annum.
3. Rainfall is unreliable
4. Daily/Diurnal range of temperature is very large.
5. Low humidity

6. Mean annual temperature is high

NB: The common type of vegetation include scrub, thicket and thorny bushes, Cacti, Euphobia, etc.

MONTANE / SUB TROPICAL CLIMATE (Cool High Climate)

This type of climate is limited to the highland areas of East Africa e.g. Kenya highlands, Rwenzori, Elgon, Kilimanjaro etc.]

Characteristics

1. Heavy rainfall of over 2000mm
2. Receives orographic / relief rainfall
3. Low temperature due to high altitude
4. Low humidity due to low temperatures.
5. Dense cloud cover due to the high condensation resulting from low temperatures.

SKETCH MAP OF EAST AFRICA SHOWING THE CLIMATIC TYPES /RAINFALL PATTERN (space for the map)

FACTORS INFLUENCING THE CLIMATE OF EAST AFRICA

1. Relief / altitude
2. Latitude / Distance from the Equator
3. Influence of winds like the North Eastern and South Eastern trade winds
4. Distance from water bodies
5. Vegetation cover
6. Cloud cover
7. Man's activities e.g. industrialization, deforestation
8. Influence of the ITCZ (Inter Tropical Convergence Zone)
9. Ocean currents / sea and land breezes
10. Influence of aspect i.e. direction in which the land faces the sun.

RAINFALL DISTRIBUTION IN EAST AFRICA

Rainfall is water vapour but it takes the form of tiny drops of water

For rainfall to form, the following conditions must be met;

- a) Air must be saturated
- b) Air must be cool
- c) Air must contain small particles like dust to act as nuclei for rainfall formation.
- d) Rainfall in East Africa is uneven distributed, some areas receive heavy rainfall while others receive low or moderate rainfall.

In East Africa there are 3 types of rainfall.

1. Convictional rainfall e.g. Entebbe, Kampala, Mwanza, Bukoba,
2. Orographic/relief rain fall e.g Elgon, Rwenzori, Kilimanjaro, Kenya etc
3. Cyclonic/ frontal rain fall eg around the equator (not common)(look at the Imation and characterists in S.1 Book Geogragpy)

Climatic calculations

1. Mean daily temperature (MDI) = $\frac{MAX + MIN}{2}$
2. Daily rainge of temperature = $Mxax - Min$
3. Mean monthly temperature = $\frac{Sumcimean\ daily\ temperature\ of\ 1\ month}{Numbers\ of\ days\ in\ that\ month}$

4. Mean Annual temperature = $\frac{\text{Sum of mean monthly temperature for 1 year}}{12}$
5. Mean Annual Rain fall = $\frac{\text{Sum of mean monthly Rain fall for 1 year}}{1}$

THE FOLLOWING FACTORS AFFECT OR INFLUENCE RAIN FALL UNIT AND DISTRIBUTION.

1. Relief /Altitude

High land areas receive more rain fall than low lands of lower plateau e.g Kigezi Highlands, Kenyan Highlands, Elgon, Kilimanjaro, Meru.

NB: Most Highland of East Africa Receive rain fall on the South east Slopes (effect of Aspect)

2. Winds

The North East westlines and the south east trade winds mostly affect rain fall distribution in East Africa

3. Nearness to water bodies :

Areas near water bodies receive heavy rain fall than those far away from water bodies.

4. Man activities like Deforestation and forestation, industrialization,

5. Vegetation

Areas with dense forests receive heavy rain fall while areas with skunty vegetation receive / low rain fall.

NB: 1. Humidity is the amount of water vapour in the atmosphere

2. Relative humidity is the ration of the actual amount of water vapour present in a given volume of air at a given temperature and atmospheric pressure, measured in percentage.

3. Absolute humidity is the total amount of water vapour that is actually present in a given volume of air at a given temperature and atmospheric pressure.

Lines on maps showing equal places with;

1. Temperature – Isotherms
2. Pressure – isobars
3. Rainfall – isohyets
4. Sunshine – isohels
5. Cloud cover – isonephs
6. Sea bed with equal depth – isobaths
7. Ocean with equal salinity – isohaline
8. Equal intensity of earthquake shokes – isoseismal.
9. Altitude – contours.

VEGETATION OF EAST AFRICA

Vegetation refers to all plant life which it includes trees, pastures, shrubs herbs e.t.c. Vegetation can either be natural or artificial.

NB: East Africa is mostly covered by grass lands compared to forests

MAJOR VEGETATION TYPES IN EAST AFRICA

East Africa has the following major vegetation types

1. Equatorial forests (Tropical rain forests/Selva)
2. Savannah vegetation
3. Desert /Semi desert vegetation
4. Montane / Highland vegetation
5. Mangrove forests

SKETCH MAP OF EAST AFRICA SHOWING MAJOR VEGETATION TYPES IN EAST AFRICA (space for the map)

EQUATORIAL FORESTS

These forests are categorized into two i.e. lowland forests and highland or Montane forests.

a) Lowland forests

These forests are found in the lowland areas of East Africa e.g Mabira, Bwindi Impenetrable, Kibale, Ssesse forests, Budongo forests, Maramagambo, Kisii, Bugoma, Bukoba forests e.t.c.

Their existence has been favored by the following factors.

1. High humidity
2. Heavy rainfall of more than 1500mm per annum
3. High temperatures of over of 27°C
4. Low altitude of between 1000 – 1500mm above sea level
5. Presence of deep fertile and well drained soils

Characteristics of Equatorial Lowland Forests

1. The trees are ever green throughout the year i.e. trees shed their leaves at different intervals.
2. The trees are not in pure stands i.e. they have many different tree species.
3. The trees take long to mature (50-80yrs)
4. The trees have broad leaves.
5. Trees have little or no undergrowth.
6. The forests have little or no undergrowth.
7. The trees are of hardwood species e.g. mahogany, red wood, green heart, red heart, rose wood, ebony, iron wood e.t.c.
8. The trees have thick canopies (layers) which are divided into three.
9. Trees have buttress roots with numerous climbing plants.

b) Montane or Highland Forests

They are found on highlands of East Africa e.g. Rwenzori, Elgon, Kilimanjaro, Meru, Kenya e.t.c.

The major tree species e.g. cedar, podo carp, Bamboo, Camphor e.t.c.

Montane forests are favoured by the following factors;-

1. Heavy rainfall of over 1500mm per annum.
2. Cool temperatures modified by altitude.
3. Well drained fertile soils.
4. Limited man's interference.
5. Relatively high altitude of between 2500m above sea level.

Characteristics

1. The trees are ever green.
2. They appear in pure stands.
3. Trees have small leaves.
4. Their characterized by a single canopy.
5. Trees are mainly of soft wood species.
6. The forests have thick cover of moss and tree ferns.

Economic Importance of Equatorial Forests

1. Equatorial forests modify climate of the surrounding areas through evapotranspiration which leads to the formation of convectional rainfall.
2. Equatorial forests attract tourists because they harbor a number of wild animals of tourist's interest.
3. They are alternative sources of foreign exchange.
4. They provide employment opportunities to a number of people e.g. Lumber jacks, Forest rangers, researchers.
5. Equatorial forests help in controlling soil erosion.
6. They provide raw materials for industries such as saw mills, pulp and paper industries.
7. They provide constructional materials like timber.
8. They provide grounds for research and scientific study.
9. They are sources of energy inform of fire wood, charcoal e.t.c.
10. They provide man with a variety of fruits which are wild. (Wild fruits) and herbs.
11. They promote re-creation i.e. They provide grounds for picnics.
12. Provides good scenery.

SAVANNAH VEGETATION

It covers more than ½ of East Africa. This type of vegetation is categorized into three;-

a) Savannah woodlands (Mombo)

They are found towards the equatorial forests in the following areas;- Murchison falls National Park, Ntungano, Mubende, some parts of N. Ug, Central Tanzania, Rakai.

Savannah woodlands are favoured by the following conditions

1. High temperatures of between 27-30°C
2. Moderate rainfall between 760-1000mm per annum.
3. Fairly fertile and well drained soils.

NB: The main economic activity is bee keeping

Characteristics

1. The trees are umbrella shaped.
2. Trees are deciduous and are thorny.
3. They have long top roots.
4. The trees form the continuous cover i.e. shot and scattered.
5. They store water in their trunks.
6. The trees are drought and fire resistant.
7. They are thick barks with small leaves to control transpiration. E.g. baobab, Acacia e.t.c.

b) Savannah Grasslands.

They are found in areas with 750-1000mm rainfall in the following areas, Nyika, Tsavo National Park, Bukoba, Central Tz, E.Uganda e.t.c.

They are favoured by the following;-

1. Moderate to heavy rainfall (750-1000)
2. Fairly high relative humidity
3. High temperatures of between 28-30°C
4. Fairly fertile soils
5. Low lying gentle relief
6. Alternating wet and dry seasons

Characteristics

1. They are composed of mainly grass with scattered trees. Major activities, animal conservation, nomadic pastoralism.
2. The trees are short, scattered and are umbrella shaped.
3. The trees are also deciduous in nature.
4. The trees are resistant to drought.

The major species of grass include elephant grass, specially grass, tussock grass e.t.c.

Dry Bush Savannah

They are found in areas which receive rainfall of between 250-500mm. majorly occupied by nomadic pastoralists e.g. N.E.Uganda, Ankole masaka corridor, N.Tz and Kenya as well as the flow of the W.Rift valley.

Factors which favoured it include;-

1. High temperatures.
2. Low rainfall of between 250-500mm.
3. Low humidity.
4. Fairly fertile soils.

Characteristics scanty

1. Vegetation and scattered, some areas have bare ground.
2. The trees are thorny with few leaves.
3. They have long tap roots.
4. The leaves and stems are waxy.

Importance of Savannah Vegetation

1. It promotes Agriculture especially cattle rearing because of abundant pastures.
2. The woodlands resources of timber and other building materials.
3. Grounds for settlement because of the flat nature of the land scape.
4. The vegetation also controls soil erosion.
5. The vegetation promotes research and scientific study.
6. The savannah vegetation promotes bee keeping and hunting.
7. Used for wild life conservation which promotes tourism.

ALPINE /MONTANE VEGETATION

This type of vegetation is found on the highlands of East Africa like Mt. Kenya, Elgon, Rwenzori, Kilimanjaro.

Semi Desert and Desert Vegetation

This vegetation is found in the dry semi desert areas of East Africa like North East of Uganda (Moroto and Katido), Turkana land (N.Kenya), Parts of Central Tanzania.

The following conditions favour their existence

1. Poor sandy soils.
2. Hot temperature of over 35oC.
3. Very little and unreliable rainfall of about 250mm.S
4. Low humidity.

Characteristics

1. Trees are drought resistant.
2. They shed off their leaves during dry season.
3. They have woody stems.
4. Trees store water in their trunks.
5. Trees are very shot and scattered.
6. The leaves are small and stems are thorny.

Desert vegetation promotes the following;-

1. Wild life conservation (game parks)
2. Pastoralism
3. Hunting

Swampy Vegetation and Mangrove Forests

Swampy vegetation occur in areas with permanent swamps like L.Victoria, Kyoga and along some rivers.

The Mangrove forests concentrate long the coastal area of East Africa because of the following factors.

1. Heavy rainfall.
2. High temperatures and humidity.
3. Low attitude.
4. Deep fertile soils.
5. Salty and muddy water.

Characteristics

1. The trees are short drunks with broad leaves.
2. They are ever green because of too much H₂O.
3. Some trees have twisted trunks.
4. They have aerial roots.
5. The trees are very close together and are of hard wood spears.

Factors Influencing Vegetation Distribution in East Africa

1. Climate

Abundant rainfall which is well distributed throughout the year and high temperatures give rise to equatorial forests. Moderate rainfall and throughout the year give rise to savannah vegetation. white areas with low and unreliable rainfall influence the growth of semi desert vegetation.

2. Relief /Topography /Altitude

On steep slopes soils are thin and water drainage is rapid giving rise to stunted vegetation areas which are gently sloping and flat, soils tend to accumulate favouring the development of forests while in valleys soils are water logged leading to swamp vegetation.

3. Eolaphic Factors (Soils)

Deep and fertile soils support dense equatorial forests, soils with moderate fertility support savannah. Thin, immature and infertile soils support stunted vegetation while dump coastal soils influence the growth of mangrove forests.

4. Biotic Factors

Pests such as locusts, wood peckers lead to destruction of grass and trees respectively. Wild animals also lead to the destruction of vegetation cover.

5. Latitude

Areas near the equator have tropical rain forests because of heavy rainfall and then high temperatures.

6. Drainage

When drained areas are characterized by vegetation ranging from savannah to equatorial forests while poorly drained areas favour swamp vegetation.

7. Anthropic Factors (Man)

In many parts of East Africa man has destroyed vegetation through his activities like deforestation, mining, agriculture, industrialization, road construction e.t.c. changing thick forests into savannah, semi desert and then shrub.

However, man in some areas has tried to develop vegetation through afforestation, re-afforestation, gazetted more forest reserves, restricting encroachers, educating the masses a lot the importance of forests e.t.c.

FORESTRY INDUSTRY IN EAST AFRICA

Forestry is the sciences of managing forest resources for human benefit like maintain adequate supply of timber, wood production e.t.c.

In East Africa the following are the types of forests:-

1. Tropical rain forests /Equatorial rain forests

These occur in the low land areas of East Africa e.g. Mabira, Budong, Bwindi impenetrable, Ssesse forests e.t.c.

2. Montane Forests

These occur on slopes of mountains like Elgon, Kilimanjaro, Kenya, Rwenzori e.t.c.

3. River in the Forests

These occur along major rivers of East Africa e.g. R.Nile, Tana, Pangani e.t.c.

4. Planted or Artificial forests

These forests are planted by man and are majorly soft wood e.g. eucalyptus, fir e.t.c.

Factors favouring the growth of forests or Development of the forestry Industry in East Africa.

1. Availability of heavy and reliable rainfall throughout the year favour the growth of equatorial forests.
2. Presence of high temperatures throughout the year favouring the grow of forests.
3. Availability of fertile soils to sustain the growth of forest.
4. Presence of a variety of trees species of commercial e.g. Mahogany, Iron wood, Muvule, Green heart.
5. Presence of low population leading to vast land permitting the growth and development of forests.
6. Favourable government policies of forestry e.g. policies on afforestation and re-afforestation, restricting encroachers, gazetted more forest reserves e.t.c.
7. Availability of advanced and appropriate technology in forest exploitation. E.g. power driven saws, tractors.
8. Presence of adequate and cheap labour both skilled and un skilled from within East Africa abroad.
9. Availability of large market for forest related products especially timber.
10. Presence of advanced researched in forest development.

THE CONTRIBUTION OF THE FORESTRY INDUSTRY IN EAST AFRICA

1. The forestry industry in East Africa provides the people with timber for construction and furniture making.
2. The industry generates employment opportunities to the people of East Africa e.g. forest rangers, lumber jacks, drivers, charcoal burners.
3. Forests in East Africa modify climate through evapotranspiration leading to rainfall formation.
4. The forestry industry provides raw materials for industrial development (saw mills)

5. The forestry industry generates revenue for the government through taxation of the people employed, companies e.t.c.
6. It diversifies the economy of East Africa and thus widening the tax base.
7. It has promoted tourism in East Africa thus source of foreign exchange since act as habitats for wild animals.
8. It promotes research and scientific study.
9. Promotes the development of infrastructure like roads, skills, hospitals e.t.c.
10. Forestry is also a source of income to the local people which has helped in the improving of the standards of living of the people.
11. The forestry industry is a source of fuel inform of fire wood and charcoal.
12. It has led to development of towns and urban centres.
13. Forests also provides man with food inform of fruits, herbs and wild animals.
14. Source of foreign exchange through exportation of forest products to countries like USA, France e.t.c.
15. The forestry industry has promoted trade and international relations.

Problems Facing People Living Around forests

1. Pests and disease, e.g. mosquitoes, tsetse flies.
2. Wild animals.
3. Difficulty in cleaning the forest for settlement, agriculture, construction of transport routes.
4. The humid conditions interfere with man's activities.

FACTORS LIMITING /HINDERING THE EXPLOITATION OF FORESTS IN EAST AFRICA.

1. The trees do not grow in pure stands i.e. they are scattered and therefore locating and exploitation become hard.
2. Tropical forests have buttress roots making them very difficult to cut.
3. Trees are enlunghed with climbing plants making it difficult.
4. Presence of pests and diseases e.g. tsetse flies.
5. Forests are dark, dump and impenetrable.
6. The trees take long to mature.
7. The rate of tree cutting exceed replacements leading deforestation.
8. Wild animals e.g. lions, tigers e.t.c.
9. Presence of poor and inappropriate technology.
10. Lack of sufficient capital to set up saw mills.
11. Absence of reliable transport to deliver timber.

Problems Facing the Forestry Industry in East Africa.

1. The valuable species are scattered all over the forest making their exploitation very costly.
2. Presence of wild animals like lions, leopards, snake e.t.c. scare away the workers.
3. Remoteness of the forested areas. i.e. poor accessibility of poor impassible roads.
4. Inadequate machinery like cahin saws, traders leads to the use of crude materials like pangas used, axes e.t.c.
5. Insufficient capital to modernize the forestry industry.

6. Competition with other land uses especially agriculture for labour.
7. Pests and diseases which attack the trees reducing the quality and value.
8. Competition for market with other producing countries like DRC, Swaziland.
9. Political instability in the forested areas. Forests in East Africa
10. Unfavourable government policies e.g. putting much emphasis on agriculture, industrialization e.t.c. other than forestry.
11. Fire outbreaks during dry seasons also lead to the destruction of the forested land.
12. Illegal cutting down of trees by encroachers.

NB: In East Africa the forest cover is declining because of the following:-

1. Population increase.
2. Need for firewood and charcoal.
3. Need for timber for construction.
4. Clearing of trees for infrastructural development.
5. Industrial expansion
6. Encroachment for agriculture.
7. Increase in the number of wild animals.
8. Need for land for settlement.
9. Fire outbreaks.
10. Cutting down of trees to control tsetse flies.

Effects of Deforestation on the Environment of East Africa

- Loss of valuable wood.
- Decrease in wood fuel.
- Reduction in the water table.
- Increased global warming due to removal of trees that absorb carbon dioxide.
- Accelerated landslides due to removal of protective soil cover and removal of soil binding roots.
- Deforestation interferes with the water cycle i.e. micro-climate, changes/reduction of rainfall.
- Filtration of river basins leading to floods/pollution of water/drying up of streams.
- Destruction of wildlife habitat leading to unbalanced ecosystem.
- Creation of Bad Lands i.e. gullied lands which are useless for any activity.
- Destruction of valuable tree species/extinction of valuable plants e.g. medical plants.
- Destruction of the natural beauty of the environment through forest clearance.

CONSERVATION AND MANAGEMENT OF FORESTS

- The East Africa governments are doing the following to improve upon the forestry industry.
 1. Carrying out afforestation and re-afforestation programmes.
 2. Controlling excessive lumbering by banning timber exports.
 3. Encouraging family planning to control population growth and thus reduce pressure on forests.
 4. Encouraging the use of alternative energy sources like solar, Bio gas e.t.c.
 5. Carrying out research in forest management.

6. Educating people about the importance of forests through the mass media.
7. Training and deployment of forest rangers to guard and protect the forest.
8. Planting of exotic trees which mature faster e.g. eucalyptus.
9. Establishing or gazetted more forest reserves.
10. Introducing of energy saving stores.
11. Introducing strict legislation on deforestation.
12. Licensing of tree cutters to reduce on it legal cutting down of trees.

FORESTRY IN TANZANIA

The main catchment forest in Tanzania are on the slopes of Mt. Kilimanjaro, Usambara, Meru, Uluguru, Tukuyu forests also exist in iringa and Tanga regions. The main objectives for the development of forests in Tanzania include;-

1. To protect the water catchment areas.
2. To provide forest products sufficient to meet the country's requirements.

FORESTRY IN KENYA

Forests form one of Kenya's important resources and in Kenya there are both indigenous and exotic soft woods.

Examples of forest reserves include;-

1. Western province on Mt.Elgon and Kakamega.

Rift Valley Province (Manu ranges, Nandi Ranges, Mathew ranges, Loronghi)

Aberdane

Eastern slopes of Kenya E. Slopes of Mt Kenya, Marsabit, at the coast, Shimba hills, Ara buku, Sikoke.

The conservation of forests in Kenya has the following major objectives

- 1- To maintain and improve the climatic and physical conditions of the country
- 2- To conserve and then regulate water supplies by protecting the catchment areas.
- 3- Conserve the soil through prevention of desertification and soil erosion.
- 4- To control and maintain the country's supply of timber and in other forest products.

The paper manufacturing industry in Kenya is at Webuye (W. Kenya).

FORESTRY IN UGANDA

The major forests include, Mabiron, Budongo, Semiliki; Maramigambo, Kibale, Bugoma, Bwindi Impenetrable, Ssesse forests, Mt. Elgon. Edunya, Lenda, "Ngahinga, Zoka, Itwara etc.

Plantation forests in Uganda make up 22%, these plantations are based on pines and the eucalyptus e.g Lendu (W.Nile), Abera (Gulu) Mafuga (Kabale) Kateera (Kiboga) , agwatta (Lira) , Mutai (Jinja)

The more to establish forest plantations was due to the Industrial wood, wood fuel, poles for building and construction on well ass for power distribution (electricity)

Major True species

Indigenous Species

East Africa (color) Softwood	East Africa Comphor
Pods	Sandal wood
Muvule	Mukinduri
Muhgu	Muringa
Cape chest nut	
Elgon Olive	

Soft wood
Eucalyptus
Kei appl.

SKETCH MAP OF E. AFRICA SHOWING FOREST DISTRIBUTION.

(space for the map)

Distribution of forests in Uganda

Distribution of forests in Kenya and Tanzania

A- Lendu	F- Semiliki	K- Maramagambo	P- Ssese
B- Zoka	G- Rwenzori	L- Bwindi	Q- Mabira
C- Budongo	H- Kosyahia Kitomi	M - Kibale	R - Elgon
D- Bugoma	I - Mafuga	N - Mgahinga	
E-	J -	O-	

AGRICULTURE /FARMING IN E. AFRICA

Agriculture is the growing of crops and rearing of animals. In E. Africa Agriculture is important in the following ways;

1. It is a source of food to the people of E. Africa e.g. bananas, millet, potatoes, meat, milk, egg. Etc.
2. It has led to the provision of employment opportunities to the people of E. Africa
3. It has provided /source of income to the farmers which has helped in the raising of standards of living.
4. It has diversified the economy of E. Africa and thus widening the tax base.
5. It is a main source of raw materials for the Agro based industries in E. Africa examples of raw materials include, skins, cotton, coffee etc.
6. It has led to the generation of government revenue through taxation of the farmers, Industries and companies.
7. It has led to the development of important infrastructure like hospitals roads, skulls, banks etc.
8. It has promoted trade and international cooperation, Uganda and U.K Kenya, Tanzania etc.
9. It has promoted research and scientific study in E. Africa.
10. It has led to the industrial development e.g. Posho mills, breweries, bakeries, Meat Packers, Tanneries.
11. It has led to the generation of foreign exchange through the exportation of products to other countries like France, U. K Japan.
12. It has promoted tourism in E. African
13. Development of towns and ports
14. It has led to the provision of market to other industries e.g. those that manufacture fertilizers, chemicals, Agric machinery.

TYPES OF AGRIC IN E. AFRICA.

- 1- Subsistence farming
- 2- Planting farming
- 3- Irrigation farming
- 4- Mixed Farming
- 5- Horticulture is growing of flowers, vegetables and fruits for urban areas.

SKETCH MAP OF E.AFRICA SHOWING THE MAJOR POSTORAL AREAS

(space for the map)

Characteristics of Nomadic Pastoralism

- 1- The nomads move from one place to another in search for water and pastures
- 2- The animals kept are normally under weight
- 3- The animals kept are for subsistence purposes
- 4- Nomads graze their animals communally
- 5- The animals are resistant to pests, diseases drought and long distances.
- 6- They are confined to dry areas of E.Africa
- 7- Animals are kept for prestige
- 8- They overstock and overgraze
- 9- Nomads have no permanent settlement
- 10- They burn grass as they move with their animals.
- 11- Nomads keep large herds of local poor breeds e.g Zebu, Ankole cattle, Sangai

The Nomads of E.Africa keep large herds of cattle for the following reasons.

- 1- For paying bride price
- 2- For prestige
- 3- Source of food
- 4- Source of Income (Wealth)
- 5- Culture and Tradition
- 6- For Insurance purposes
- 7- Animals are sources of labour and transport
- 8- Animals provide energy in form of cowdung

Factors favouring Nomadic Pastoralism (Why nomadic Pastoralism is practiced)

- 1- Presence of extensive land which permits the Nomads to move freely with their animals.
- 2- Presence of sparse population in these areas giving more land.
- 3- High temperatures and low rainfall, it has favoured Nomadic Pastoralism this leads to a shortage of water and pastures forcing the Nomads to move.
- 4- The Nomads move from place to place in search of water and pastures.
- 5- It is also favoured by their culture or tradition of keeping large herds of animals
- 6- Presence of infertile soils in these areas which do not support crop growing but livestock rearing.
- 7- High incidence of animal pests and diseases e.g. tsetse flies, ticks etc e.g. Malaria, East Coast Fever, foot and mouth diseases etc.
- 8- Remoteness of pastoral areas has led to persistence of Nomadic Pastoralism.
- 9- Negligence by government
- 10- Flatness of the area which enables the animals to move easily. Change from livestock rearing because they are illiterates
- 11- Nomads depend on their animals for their livelihood.
- 12- Presence of extensive pastures (Savanna grasslands)

13- Presence of local breed which are resistant to pests, diseases and long distances.

THE MASAAL/ MASAI OF KENYA AND TANZANIA

These are Nomadic postaralists found in Kenya and Tanzania and they practice transhumance ie. Movement with their animals in relation to seasons. They keep goats, sheep, cattle and donkey for transport they keep animals purposely for meat, milk, prestige and wealth. Their major areas is Narok and between L. Natron and Manyara. These areas experience high temperature of 27⁰C and R./F OF 500MM PER annum. The vegetation is mainly savannah grasslands with scattered trees. The warriors are known as Maran, their settlement is called Manyatta or Kraal. (Enkang) They have simple temporally house made of mud and sticks and the animals and people are protected by thorny bushes.

PROBLEMS FACED BY NOMADS IN E. AFRICA.

Physical /Environmental /problems (not by their own making)

- 1- Prolonged droughts which leads to shortage of water and pastures leading to death of animals.
- 2- Pests and diseases e.g. Rinder pest, foot and mouth, anthorax Nagana, ticks, tsetsefiles. These affect the quality of the animals.
- 3- Wild animals which attach both the animals and nomads e.g. Hyenas , loins and Snakes etc.
- 4- Poor breeds of animals which lead to production of poor quality products.

Man made problems (Problems of own making)

- 5- Overstocking which leads to overgrazing and soil erosion
- 6- Constant famine because the Nomads don't grow crops
- 7- Cattle rustling which leads to loss of lives and property.
- 8- Lack of veterinary services because of government negligence
- 9- Insecurity in these areas
- 10- Long distances moved by animals in search of water and pastures
- 11- Inadequate transport network (remoteness) that the nomads can't transport their products to markets.
- 12- Lack of market for their products because of the poor quality products
- 13- Lack of capital to improve on their animals husbandry because the animals kept are for home consumption.
- 14- Communal grazing by the Nomads leads to easy spread animal diseases.
- 15- Burning of pastures as they move which leads to growth of hard and unpalatable pastures.
- 16- Ignorance (illiteracy) among nomads that they prefer quantity than quality

Measures being taken to Solve the problems faced by Nomads

- 1- The government is educating the nomads to improve on their livestock
- 2- Cross-breeding is being encouraged between the local and exist breeds to improve on the quality of the animals.
- 3- Planting of better pastures for the animals
- 4- The government is improving on security of the neighbouring areas especially Karamoja and disarming the Nomads.
- 5- Spraying with pesticides to control the pests and diseases
- 6- They are encouraged to grow some crops to control famine especially Sorghum, maize etc.
- 7- The government has also extended veterinary services to the pastoral areas.
- 8- Water supply has also been improved by constructing boreholes, valley dams, water holes etc.
- 9- Feeder roads have been constructed to help the nomads to transport their products to markets.
- 10- Loans have also been extended to the Nomads to help them improve on their animal husbandry.
- 11- In some parts like Mbarara the government has established industries to provide markets to their products as well as processing their products.
- 12- The Nomads have also been advised to reduce on the number of the animals in order to improve quality and to control overstocking and overgrazing.
- 13- The government has also imposed quarantine measures to control spread of diseases.
- 14- Local markets have been improved so that the nomads may sell off some of their animals.
- 15- Nomads are also being encouraged to establish ranches where modern farming methods can be carried out e.g. paddocking artificial insemination etc.

EFFECTS OF NOMADIC PASTORALISM IN THE ENVIRONMENT

Negative effects.

- 1- soil texture is destroyed leading to soil erosion
- 2- vegetation is also destroyed during dry seasons when there is extensive fires
- 3- Nomadism accelerates the extension of desert lands.
- 4- Grass is also destroyed.
- 5- The eco-systems is also destroyed by nomadism.
- 6- It also leads to soil exhaustion as a result of erosion
- 7- Pollution of environment through the dust as the animals move and flies

Positive Effects

- 1- vegetable burning improves on soil fertility (ash)

RANCHING IN E. AFRICA

This is the keeping of livestock purposely of meat e.g. of ranches in E.Africa include with effect.

Uganda - Ankole Masaka Ranching Scheme

- Aswa Ranching Scheme
- Buruli Ranching Scheme
- Kisozi Ranching Scheme

Kenya - Kaputei Ranching Scheme - Kenya highlands

- Karuma Ranching Scheme
- Ol-Kalour Ranching Scheme

Tanzania - Kongwa Ranching Scheme

- Mt. Kilimanjaro
- Southern Highlands.

Characteristics of Ranching

- 1- Animals are kept for commercial purposes
- 2- They specialize on the rearing of one type of animal
- 3- They employ scientific methods of animal rearing like cross breads, artificial insemination, use of machines etc.
- 4- Animals on ranches are grazed on natural pastures
- 5- Ranches are confined in dry areas of E. Africa as well as areas of sparse populations.
- 6- The movement of the animal is restricted by fencing and paddocking
- 7- They have permanent water source and well developed transport network

Factors which have favoured the establishment in E. Africa.

Physical factors include;

- 1- Presence of vast land for the establishment of ranches
- 2- Availability of natural pastures for the animals to feed on
- 3- Presence of sparse population favouring the establishment of large ranches as well as permitting free movement of animals.
- 4- Presence of good breeds of animals such as Hereford, Boran, Aberdeen Angus.
- 5- Presence of infertile soils which don't permit/allow crop growth and thus encouraging ranching.
- 6- Availability of permanent water sources for the animals e.g. a river, lake dam etc.

Human Factors

- 1- presence of advanced technology and research
- 2- favourable government policy of promoting livestock rearing
- 3- Presence of large market for meat both in E. Africa and abroad.
- 4- Availability of a large capital based provided by the government financial institutions etc.

- 5- Presence of reliable means of transport enabling the transportation of meat to markets and processing centres.
- 6- Availability of large supply of labour both skilled and unskilled.
- 7- Political stability

Ankole Masaka Ranching Scheme.

The scheme is located at the border of Masaka and Mbarara district.

The area was originally occupied by the Bahima but later they abandoned because of rinder pest and then Nagana.

Problems facing Ankole Masaka Ranching Scheme.

- 1- Pests like tsetseflies and diseases like Nagana
- 2- Poor breeds of animals
- 3- Infertile soils leading to the growth of poor pastures
- 4- Political instability within the area.
- 5- Overgrazing promotes soil erosion and exhaustion
- 6- Harsh climatic conditions leading to scarcity of water and pastures.
- 7- Low carrying capacity of the land promoting overgrazing
- 8- Growing of poor quality pastures which are not palatable to the animals

Importance of the Scheme.

- 1- It has promoted research into better animal rearing methods.
- 2- Livestock rearing skills have been taught to the people like crossbreeding, fencing, spraying, dipping etc.
- 3- A market has developed at Sanga and this has promoted trade in the area.
- 4- Tsetseflies have been wiped out and ticks have also been reduced.
- 5- The scheme has led to generation of employment opportunities to surrounding people.
- 6- It has led to generation of revenue to government through taxation of scheme, employees etc.
- 7- A major source of income to the local farmers enabling them to improve on their standards of living.

THE ANKOLE/MASAKA RANCHING SCHEME.

Importance of Livestock rearing in E. Africa.

- 1- The livestock industry provides man with food in form of meat, milk, blood etc.
- 2- It has led to the generation of employment opportunities to the people of E. Africa
- 3- It is a source of income to the people, enabling them to improve on their standards of living.
- 4- It has led to the generation of revenue to the government through taxation of the farmers.

- 5- It has lead diversified the economy of E. Africa, leading to widening the government tax base.
- 6- It has also leads to urbanization e.g. Mbarara, Tororo, Eldoret, Mandera.
- 7- It has promoted research in E. Africa
- 8- It has created market for industries like animal feeds.
- 9- Development of industries like creameries, Meat packers, leather horning industries.
- 10- Development of infrastructure like roads, hospitals, xub research centres.
- 11- Promoted tourism and thus earn alternative source of foreign exchange.
- 12- Animals provide man with products like hides, skins, bones etc.
- 13- Source of prestige and labour.

PLANTATION AGRICULTURE/ ESTATES FARMING IN E.A

Plantation Agriculture is the growing of one or two cash crops on a large scale using scientific methods. In E. Africa pest crops include the effect, tea, sisal, pyrethrum, coffee, pineapples, rice, cotton and cloves, sugarcane. Most of these crops are perennial.

Characteristics of PIANTATION AGRICULTURE .

- 1- Farming is done on a large scale i.e. over 100 hectares
- 2- Farming is highly mechanized involving use of machines like tractors.
- 3- Plantations in E. Africa are owned by foreigners especially Indians, Americans and Europeans.
- 4- The crops grown are fore commercial purposes.
- 5- Processing of the crop is done within the population
- 6- They specialize on the production of either 1 or 2 crops
- 7- Plantation Agriculture involves high output because of increased mechanism.
- 8- Farming is scientifically managed involving record keeping, use of fertilizers, research etc.
- 9- Plantations have well developed infrastructure like roads, include hospitals, banks etc.
- 10- Plantations employ large number of people

Factors which have favoured the establishment of plantations.

- 1- Favourable climatic conditions i.e. heavy rainfall etc.
- 2- High/low temperature depending on the crop, high humidity
- 3- Availability of extensive land for the establishment of large farms
- 4- Presence of fertile well drained soils.
- 5- Presence of a flat, gentle or undulating landscape for easy mechanization and establishment of transport network
- 6- Availability of large capital base provided by foreigners and even the government.

- 7- Presence of abundant labour supply i.e. skilled labour provided by foreigners and unskilled labour people provided by the local people.
- 8- Presence of a reliable and ready transport network for the transportation of the products to market. E.g. roads, railways etc.
- 9- The favourable government policies of attracting investors, leasing of land to the investors, maintaining political stability etc.
- 10- Presence of a wide market for the products both in E. Africa and abroad
- 11- Presence of sparse population to permit large scale farming.
- 12- Presence of abundant power for processing the crop
- 13- Advanced and appropriate technology in form of machines like tractors, water sprinklers for irrigation etc.

ADVANTAGES OF PLANTATION FARMING.

- 1- Plantation Farming provides employment to a number of people in E. Africa e.g. drivers, cultivators, machine operators.
- 2- Plantations have led to the generation of government revenue through
- 3- Plantations are sources of raw materials to industries which process their crops e.g. tea processing, industries, sugar refineries.
- 4- It has led to the generation of foreign exchange through the exportation of the crop to USA, France, India etc.
- 5- Plantations have also led to the development of infrastructure like roads, xuls, hospitals, housing estates.
- 6- Plantations in E. Africa have also led to the development of towns e.g. Kisumu, Lugazi, Jinja, Kericho.
- 7- Plantation has diversified the economy thus widening the government tax base.
- 8- Plantations have promoted tourism and thus another alternative source of forex
- 9- Plantations have promoted research and scientific study leading to high quality and output.
- 10- Plantations are sources of income to the pole employed, thereby helping them to improve on their standards of living.
- 11- Plantation has promoted trade and international relations with the trading partners.
- 12- Plantations have provided market for industrial products.
- 13- Plantations provides people with products e.g. sugar, coffee etc.
- 14- It has promoted industrial development in E. Africa e.g. sugar refineries in Kakira etc
- 15- The people employed on plantation acquire skills, related to Plantation
- 16- People in E. Africa have encouraged in out growers scheme. Out growers the farmers who grow the same crop as that on plantation.
- 17- People process their products before exports thus increasing the products value.

Disadvantage of Plantation.

- 1- It is expensive to maintain and establish because of the high investment involved.
- 2- People practice monoculture which lead to soil erosion and exhaustion
- 3- Repatriation of profits because they are owned by foreigners.
- 4- People associated with over productions which leads to price fluctuations.
- 5- Plantation displace a number of people in E. Africa calling for expensive resettlement.
- 6- There is easy spread of diseases because the growing the same crop.
- 7- Incase of any natural disaster like drought, pest invasion heavy loses are incurred.
- 8- Plantation leads to decline in food production which may lead to famine.
- 9- Plantation require a lot of labour
- 10- The crops take long to mature leading to redundancy on the farm.
- 11- Plantations are associated with strikes because of low wages and poor working end...

Examples of Plantations in E. Africa include;

- 1- Kilombero Sugar Plantation (Tanzania)
- 2- Kakira Sugar Works (Uganda)
- 3- Lugazi Sugar Corporation (Uganda)
- 4- Mumias Sugar Plantation (Kenya)
- 5- Kinyara Sugar Plantation (Uganda)
- 6- Kirecho and Limuru Tea Plantation (Kenya)
- 7- Sisal Plantation (Tanga, Tanzania)

SUGARCANE GROWING IN E.AFRICA.

The crops is grown in the following areas of E. Africa

Uganda. - In the shores of L. Victoria (Kakira and Lugazi)

- Kinyara (Masindi)
- Sango – Bay (Rakai)

Kenya - Coastal Province

- Nyanza (Kisumu and Kano Plains)

Tanzania - Moshi

- Kilombero Valley
- Bukoba
- Mwanza
- Morogoro

Conditions for Growth

- 1- High rainfall of over 1500mm or irrigation water
- 2- Temperature of about 20⁰c
- 3- Fertile alluvial soils
- 4- Attitude of 1500m above sea level
- 5- Flat or undulating low lands for easy mechanization
- 6- Presence of a dry and warm season for ripening and harvesting
- 7- Reliable and quick means of transport and large market.
- 8- Presence of cheap labour supply for cutting/harvesting
- 9- Large capital stock.

CULTIVATION

The areas cleared using machinery like tractors, canes for planting are selected, chopped into 40mm long, the pieces are then dipped into fungicide solutions. After treatment, they are planted in 1.5m apart. While growing, weeding and spraying are very important. Harvesting begins after 1 or 1 ½ years and it is done using pangas.

It is then loaded on lorries, tractors or small wagons to factories.

Processing

At the factory, the cane is weighed, chopped and crushed after which the juice is treated with lime, and sulphur then heated and clarified, boiled and the crystals are separated from the molasses.

N.B MoLas is dark brown using for making alcohol (Waragi) and the residue is used as animal feeds.

The sugar crystals are then dried, graded, sorted and then transported to the consumers.

Use of Sugar

- 1- Making of alcohol
- 2- Used as food
- 3- For sweetening medicines
- 4- Making paper boards, chemicals, animal feeds etc.

KILOMBERO SUGAR PLANTATION.

K.C.P is located in central Tanzania between rivers great Ruaha and Kilombero. It is owned by S.U.D.E Co (sugar development Cooperation) water for irrigation is provided by the Great Ruaha and the method for irrigation is overhead sprinkler.

AIMS FOR EAST OF K.S.P

- 1- To provide sugar for home, consumption and exports.
- 2- To open up the remote area of Kilemboro for development.
- 3- To provide employment to the local people.

MAP OF KILOMBERO VALLEY IRRIGATION SCHEME.

(space for the map)

FACTORS WHICH HAVE FAVOURED THE EAST OF KILOMBERO SUGAR PLANTATION.

- 1- Availability of large supplies of water for irrigation provided by the great Ruaha River.
- 2- Presence of a gently sloping land permitting free movement of Water for irrigation, use of machinery and easy construction of transport network.
- 3- Availability of fertile. Alluvial soils in the valley favouring the growth of sugarcane.
- 4- Presence of heavy rainfall of over 1500mm and high temperatures of over 20⁰c which also favour the growth of high quality sugarcane
- 5- Presence of sparse population in the region giving room the establishment of the population.
- 6- Availability of a reliable and ready transport for the transportation of the sugarcane processing centres and to markets e.g. the raods, railways (Tazara railways)
- 7- Presence of wide market for sugar both in Tanzania and abroad.
- 8- Favourable government policy of developing this area of Tanzania as well as financing the plantation.
- 9- Presence of a large capital base provided by the government purchasing machinery and payment of employees.
- 10- Presence of vast lands with lowlands for the establishment of a large plantation.
- 11- Availability of large supply of labour both skilled and unskilled
- 12- Presence of advanced technology used in clearing the land as well as processing the crop.
- 13- Advanced research.

KAKIRA SUGAR WORKS, (UGANDA)

It is located at the shores of Lake Victoria along Jinja Iganga high way. It is owned by the Madhvani family, water, Irrigation is obtained from L. Victoria and the method for irrigation is overhead sprinkler.

N.B. Factors for development are the same as those of Kilombero Sugar Plantation.

Problems facing sugarcane growers in E. Africa

- 1- Pests of grasshopper, man etc. and then diseases like yellow wit)
- 2- Shortage of labour for cutting the cane.
- 3- Soil erosion and exhaustion due to monoculture.
- 4- Price fluctuation on the wild market.
- 5- Fire out breaks
- 6- Inadequate capita 2 purchaser machinery and to pay the workers or expensive machinery.
- 7- Competition from other sugar producing countries e.g Cuba, Brazil, Malaysia.
- 8- Competition from sugar beet.

SISAL GROWING IN E. AFRICA

Sisal is grown for its sharp leaves which crushed yield a coarse fibre. It is a cheap commercial crop in E. Africa.

In Tanzania, it is grown around Usambara mountains, Morogoro, Kilosa, Lindi, Arusha, Mtwara. The loading area is Tanga.

N.B. However due to price fluctuations sisal and dates have been turned into horticulture, dairy farms, cattle ranches.

In Kenya is grown in Muranga, coastal areas and fringes of the Kenya highlands.

In Uganda, sisal has never been an important commercial crops because of climate.

Conditions of Growth.

- 1- It requires a wide range of soil conditions
- 2- High temperatures of between 25- 30⁰C.
- 3- Rainfall of about 750mm per annum.
- 4- Plenty of sunshine
- 5- Gentle and flat land
- 6- Attitude of between 0 – 180m above sea level.
- 7- Quick and cheap transport network.
- 8- Large manual labour.

CULTIVATION

- 1- The bulbils/suckers are planted in nurseries and after 9 months
- 2- They are transplanted into fields. Weeding and harvesting are done by knives.

PROCESSING

After harvesting the leaves are taken to factories where the fibre is exposed by stripping using a machine called Decorticator. The fibre is washed, dried, bleached in the sun, brushed graded and bared and export.

Uses of Sisal.

- 1- For making sacks, mats, carpets, fibres, strings, drugs (cortisone, (a pain killer)
- 2- The new use for making pulp and paper and its factory is a Tanga.

Problems facing sisal farmers.

- 1- Shortage of labour
- 2- High costs of machinery
- 3- Price fluctuation on the world market.
- 4- Pests and diseases.

- 5- Soil erosion and exhaustion due to monoculture
- 6- Competition from artificial fibres like silk, nylon etc.

CLOVE GROWING IN E.A

Cloves in E. Africa are grown in Zanzibar (the largest producer in the World). Pemba islands. In Zanzibar and Pemba, the crop is grown the Western parts of fertile soils and heavy rainfall.

Clove growing areas of Zanzibar and Pemba.

Conditions for growth.

- 1- Heavy rainfall of between 1500 – 2000mm per annum
- 2- High temperatures of 27⁰c .
- 3- Flat and gentle land
- 4- Deep, fertile and well drained soils.
- 5- High humidity
- 6- Dry picking season.
- 7- Availability of abundant labour for harvesting
- 8- Shelter from dry winds.

Problems Facing the Clove Growers.

- 1- Soil exhaustion due to monoculture
- 2- Insufficient labour for harvesting
- 3- Price fluctuation on the world market.
- 4- Competition from other producing countries especially Madagascar
- 5- Pests and diseases.

However some of these problems are controlled by digging up of disease trees and replacing them with new ones

Diversification of Agriculture by into other crops and economic activities

Uses of cloves

- 1- For spicing food and cigarettes
- 2- For making cooking oil, soap, perfumes, flavouring medicines, cosmetics, chocolates, and sweets.

PYRETHRUM GROWING IN E. AFRICAN

Pyrethrum is a white flowering plant which contains a chemical substance used for making insecticides.

It is a commercial crop grown around the Kenyan highlands, Mt. Meru, Mbeya, Arusha in Tanzania.

Conditions for the Growth.

- 1- Low temperatures of below 15°C at bud formation time.
- 2- Altitude of over 2000m
- 3- Heavy and well distributed rainfall of between 1000 – 1250mm.
- 4- Rich, well drained volcanic soils.
- 5- Abundant labour for picking
- 6- A fairly cool and moist conditions.

Cultivation and processing

The seeds are planted in nurseries after which transplanted in major fields in rows, weeded and mature in one year. It is picked every 2 – 3 weeks in the flowering season for up to four years. Pyrethrum is grown on small farms and then some large farms.

Flowers are dried in the sun over burners, bagged in sacks and sent to factories for extraction of pyrethrums for use in insecticide. N.B. The Biggest factory is in Nakuru. It is exported to U.S.A and Britain.

Problems.

- 1- Soil Exhaustion because of monoculture
- 2- Shortage of labour
- 3- Pests and diseases.
- 4- Competition from synthetic insecticides

However the above problems are solved by application of fertilizers, spraying, limited production of pyrethrum, banning of synthetic/chemical insecticide

Uses of Pyrethrum

- 1- Making of insecticides, perfumes, herbs, proteins, for animals.

TEA GROWING IN E. AFRICA

Tea is a major plantation crop in E.Africa obtained by plucking, drying and curing.

In Uganda, it is grown in the forest areas; Lugazi (Kasaku and Luwala), Mityana, Kabarole, Bushenyi, Mubende, Luwero, Masaka, Kigezi, Buhweju.

In Kenya, it is grown in Kericho, Limuru, Kisii, Nyeri, Kakamega, Nandi hills, Embu, Meru, Kiambu, and Muranga.

In Tanzania it is grown in Bukoba, Rungwe, Iringa, Tanga i.e. (S. & W. of Usambara Mounts), Mbeya, slopes of Mt. Kilimanjor. South highlands (Tukuyu, Njombe and Mufundi).

Conditions for growth.

- 1- Low temperatures of 13°C.
- 2- Gentle sloping land/undulating land
- 3- Altitude of between 1000 – 2000m above sea level.
- 4- Heavy rainfall of between 1000 – 2000mm
- 5- Acidic, deep, well drained soils.
- 6- Abundant labour for weeding and harvesting
- 7- Constant pruning, weeding and application of fertilizers.
- 8- Constant spraying against pests and diseases.
- 9- Quick and reliable means of transport and ready market
- 10- Machinery for processing the leaves.

N.B. Tea pluckers normally used sticks leaves while plucking to keep the activity at one level

Cultivation

There are four methods of growing;

- 1- Leaf cuttings and planted in Nurseries after which transplanted into rows.
- 2- Seeds are planted in nurseries and after two years transplanted into the main estate in rows.
- 3- Once on estates, constant weeding and pruning are done because the more branches, the more the shoot and thus high production.
- 4- During harvesting, to leaves and a bud are plucked and taken to the factory.

Processing

The plucked leaves and the buds are carried to the factories on heads, bicycles, pickups, tractors and lorries. Tea must be processed with the first 24hours.

On reaching the factory, it is weighed and passed through withering lofts where hot air is blown to remove moisture and making the leaves soft.

The leaves are put on rollers where they are cut into small pieces, allowed to ferment for 2 hours where it turns brown to acquire the taste/flavour of tea.

Tea is then graded, weighed, packed and sealed for sale/ exports.

N.B. Forests/trees are normally planted near tea estates to perform the following

- 1- Control soil erosion
- 2- They are wind brakes
- 3- They provide shade
- 4- Rainfall formation
- 5- Source of energy firewood for drying the tea.

Tea growing in Kericho. (Tagabi Tea Estates.)

Kericho is the main tea growing area in Kenya and E. Africa as a whole. The main growing areas are the gentle slopes of Mau Escarpments.

At Kericho tea is grown under 3 main categories.

- 1- Large scale estates owned by rich companies like Brooke Band Tea Company.
- 2- Small scale growing but with assistance from the Kenya Tea Development.
- 3- Production on cooperative basis owned by the cooperatives

Tea growing in Kericho was encouraged by the following factors.

- 1- Heavy rainfall of over 200mm p.a.
- 2- Altitude of 1800m above the sea level
- 3- Presence of fertile and slightly acidic soils.
- 4- Availability of extensive land for the establishment of estates.
- 5- Presence of abundant labour from the Nyanza province.
- 6- Large supply of water for processing the tea i.e. from R. Kilho.
- 7- Availability of machinery like tractors.
- 8- Transport
- 9- Market
- 10- Government policy.

Tea from Kericho is exported to the middle East Netherlands, Canada, Germany, US.A, Britain etc.

N.B. The major problem facing tea growers in Kericho is severe hailstorms. This is the only place in the world where hail falls at all seasons.

Problems facing Tea Growers.

- 1- Competition from other producing countries like Sri-Lonka

- 2- Pests and diseases
- 3- Rain during the picking season
- 4- Competition from other beverages like coffee.
- 5- Soil exhaustion due to monoculture
- 6- Over production leading to price fluctuation in the world market
- 7- Inefficient labour for packing
- 8- Inadequate transport facilities

Solutions

- 1- For soil exhaustion: application of fertilizers
- 2- Competition: improving on the quality
- 3- Pests of diseases: spraying using chemicals
- 4- Shortage: of labour mechanization
- 5- Weeds: Constant pruning
- 6- Hailstorms, use of aircrafts to spray silver/iodide and hail suppression scheme.

Uses of Tea.

- 1- Beverage
- 2- It is used as a drug.

TOBACCO GROWING

It is grown on small scale (Small holders because it is done by peasants. In Kenya, it is grown in Kipei, Kisii and Embu.

In Uganda, it is grown in W. Nile (Arua), Kitgum, Kabarole, Bushenyi, Gulu, Bunyoro, N. Kigezi.

There are two varieties of tobacco grown in Uganda ie.

- a) Fire cured, which require fire for drying. Mostly grown in Arua.
- b) Flue cured which require wind for drying. Mostly grown in Kabarole

Conditions for Growth

- High temps of about 22°C.
- Well drained soils
- Rainfall of about 500 – 600mm during the growing season.
- Altitude of between 1000 – 1200m above sea level.
- Abundant labour for weeding and harvesting
- Constant attention

N.B. Tobacco is an annual crop and it is grown in rotation in other crops because it exhausts the soil quickly.

Cultivation

Tabacco is planted in nurseries and after 2 months transported in 2 fields, where weeding and addition of fertilizers are necessary.

The curing plants of tobacco are called burns.

Processing/Curing

There are to types of curing namely;

- (a) Flue curing: leaves are hanging in an enclosed or heated room to limit the dangers of moisture which can make the leaves go bad.
- (b) Five curing: This involves hanging with leaves on fire until the leaves turn yellow/brown.

Problems facing Tabacco Growers.

- 1- Pests and disease
- 2- Shortage of labour for needling and harvesting
- 3- Drought and low rainfall and high temperature
- 4- Price fluctuations in the world market.
- 5- Soil erosion and exhaustion because of monoculture
- 6- Accidents especially in the burns.
- 7- Limited fire wood for processing
- 8- Competition from other brewing countries e.g. Cuba, Sri Lonka
- 9- Reptiles especially snakes
- 10- Poor transport network
- 11- Shortage of capital
- 12- Processing is time consuming

Users

- 1- For making cigarettes, stuff
 - 2- Medicine
- B.A.T limited is the soul buyer of tobacco in E. Africa

RICE GROWING IN E.AFRICA.

Rice requires fertile soils with plenty of water. It is an annual crop. In Kenya it is grown in Mwea Lebere and Ahero Irrigation Scheme. In Uganda, it is grown in Kibimba, Palisa, Dolo the shores of L. Victoria, Kyoga and Olweny Irrigation Scheme in Lira.

In Tanzania its grown in Mkomozzi Rufigi, Usangu and shores of L. Malawi

WATTLE GROWING IN E. AFRICA.

Wattle trees are grown from their bark which yield an extract used in tanning leather. It's a commercial crop and Kenya is the chief producer. It is mainly transported to India.

Wattle requires a fairly dry condition and the most producing areas are Kikuyu land and Trans-zoia.

WHEAT GROWING IN E. AFRICA

Mainly grown in Uasin Gishu.

They require a fairly fertile and heavy soil, light to moderate rainfall and a warm and sunny ripening period.

Wheat growing areas in Kenya include; Kenya highlands, Eldoret, Nakuru, Londrani and the living producer is to UASIN GISHU.

In Tanzania it is grown in Arusha and mainly exported to Britain.

COTTON GROWING IN E. AFRICA.

Cotton is a small holding crop and the chief growing areas are the shores at L. Victoria i.e. S.E. Mwanza, Nyanza Province in Kisumu and in Uganda its grown around.

Others growing areas include; Lira, Gulu, Soroti, Kumi, Tororo, and Busoga, It is also grown along the E. African, coast and the Ruligi delta and R.Tan

Conditions for Growth

- 1- Labour
- 2- Capital
- 3- Requires dry seasons for picking
- 4- High temperature of not less than 25°C.
- 5- Rainfall of about 750mm
- 6- Altitude of 1400mm above sea level
- 7- Fertile and well drained soils
- 8- Abundant labour supply for picking

Cultivation and Processing

The land is ploughed and seed are planted in rows of about 1 m apart. After germination, thinning, weeding and spraying are done.

Harvesting is done by hand. Sorting is then done to remove the unwanted fibres. Cotton is then packed and taken to the stores and finally ginneries where the seeds and fibres are separated.

Problems Facing Cotton Growers.

- Pests e.g. boll weevils
- Diseases e.g. bacterial blight.
- Unreliable rainfall during the growing seasons.
- Inadequate labour for picking and sorting
- Competition in other cash crops like coffee
- Poor storage facilities
- Price fluctuations in the world market
- Soil exhaustion due to monoculture
- Heavy rainfall during picking season
- Uses of cotton – competition from synthetic fibres like nylon, silk.
- Poor transport in rural areas.

Uses of Cotton

- Making of cotton
- Cotton fibre
- Cattle feeds
- Cotton textiles
- Making cooking oil
- Stuffing mattresses and pillows
- Cotton wool used in hospitals.

COFFEE GROWING IN E. AFRICA.

In E. A there are 3 varieties of coffee

- a) Arabica Coffee. Grown in highland areas e.g. Mt. Elgon, Rwenzori, Kirimanjaro, Meru, Kenyan Highlands, Usambara.
- b) Robusta Coffee, this makes the best instant coffee and it does well around L. Victoria shores (Mwanza, Kisumu, Bukoba, and central Uganda)
- c) Clonal Coffee

Conditions for Growth

- 1- Deep fertile and well drained soils as well as volcanic soils.
- 2- Moderate rainfall of 1000 – 1500mm
- 3- Temperature of between 20 – 26°C for Robusta 19- 23 for Arabica Coffee.
- 4- Altitude of 1000- 1200m for Arabica , 1000 – 1500 Robusta Coffee
- 5- Labour for picking
- 6- Capital, market etc.
- 7- Protection from winds
- 8- Transport

Cultivation

Coffee is grown from seeds in nursery beds which also must be protected from the sun. Its transplanted after one year followed by weeding, spraying and addition of fertility. Coffee is ready for picking after the 3 years and it is done by hand.

Processing

There are two methods of processing i.e.

- 1- Wet processing (Cherry wet processing)/coffee is put in a tank of water for it to ferment for easy removal of pulp. The beans are sun dried, roasted, graded and packed. This mainly for Arabica Coffee.
- 2- Dry processing (cherry dry processing). The beans are sun dried then sent to hulleries for removal of pulp. It's then roasted, graded and packed.

Problems

- 1- Price fluctuations in the world markets.
- 2- Soil erosion and exhaustion due to monoculture.
- 3- Competition from other beverages like tea, cocoa
- 4- Inadequate labour for picking
- 5- Difficulty in carrying out mechanization
- 6- Poor transport in the rural areas.
- 7- Limited/poor storage facilities
- 8- Competition from other countries like Brazil, Ethiopia
- 9- Pests e.g. Coffee berry borer and diseases e.g. leaf root diseases.

CONTRIBUTION OF IMPORTANCE OF CASH CROP GROWING TO ECONOMIC DEVELOPMENT

- 1- Sources of foreign exchange after exploitation e.g. coffee, tea,
- 2- Cash crops have led to development of infrastructure like roads, schools, hospitals.
- 3- They have promoted international trade e.g. cooperation
- 4- They have provided employment to many people.
- 5- They have led to urbanization e.g. Kericho.
- 6- They have led to research.
- 7- Sources of food e.g. coffee, tea.
- 8- Provide raw materials for industrial development e.g. jaggery for sugarcane, jaggery for cotton.
- 9- Sources of government revenue through taxation.
- 10- Sources of income to the peasants which lead to the improving of the standard of living.
- 11- Diversified the economy

Problems Facing Agriculture in E. Africa

- 1- Pests and Diseases
- 2- Competition from the development countries
- 3- Poor breeds of crops and animals
- 4- Price fluctuation in the world products.
- 5- Lack of market because of poor products.
- 6- Political instability especially in Northern Uganda
- 7- Poor soils like clay and sand.
- 8- Poor technology i.e. many farmers still use traditional tools like pangas, hand hoes.
- 9- Climate problems like high temperature, low rainfall, floods,
- 10- Shortage of labour for harvesting
- 11- Poor storage facilities
- 12- Poor transport network from the growing areas to markets.
- 13- Population increased which leads to shortage of land, land fragmentation and land disputes.
- 14- Poor relief which hinders mechanization of Agriculture
- 15- Illiteracy among farmers.
- 16- Limited research in the agricultural sector

IRRIGATION AND RESETTLEMENT SCHEMES IN EAST AFRICA.

Irrigation is the artificial supply of water to growing crops. Irrigation schemes in E. A were mainly established for resettlement purposes. However other aims include;

- 1- To provide extra water to meet the rainfall shortages
- 2- To improve on the soil conditions.
- 3- To control flood and increase production
- 4- To ensure full production throughout the year.

Factors favouring the establishment of Irrigation Schemes in E. Africa.

- 1- Presence of flat land for easy mechanisation as well as movement of water under the influence of gravity.
- 2- Presence of fertile alluvial soils
- 3- Availability of extensive land for establishment of large irrigation schemes
- 4- Presence of a permanent water source in form of rivers, lakes etc.
- 5- Presence of a large capital base for purchasing machinery as well as payment of workers.
- 6- Favourable government policies of maintaining political stability and attracting foreign investors.
- 7- Availability of ready and efficient transport network in form of roads, railways etc.
- 8- Presence of large supply of labour both skilled and unskilled.
- 9- Availability of ready and wide market.
- 10- Low and unreliable rainfall favouring irrigation farming

Examples of Irrigation Schemes in E.Africa.

Scheme	District	Source of Water	Crop
Uganda:			
Olwny Irrigation Scheme	Lira	Lake Kwania	Rice
Mubuku Irrigatio scheme	Kasese Sebwe	River Sebweli Mubuku	Rice and vegetables
Sango Bay irrigation scheme	Rakai	L. Victoria	Sugarcane
Kibimba irrigation Scheme	Bugiri	L. Kibimba & R. Mpologoma	Rice
Alera Irrigation Scheme	Apac	L.Kyoga	Rice and vegetables
Doho Irrigation Scheme	Buteleja	R. Manalwa	Rice
Ongom Irrigation Scheme	Lira	R. Owemeri	Citrus fruits
Kiige Irrigation Scheme	Kamuli	R. Nabigaga	Citrus Fruits
Ahero Pilot Irrigation Scheme	Kisumu	R. Nyondo	Rice
Mwea Tebere Irrigation Scheme	Kirnyaga	R. Ihiba and Nyamindi	Rice
Bunyala Pilot Irrigation Scheme	Busia	R. Nzoi	Rice
Galole/Hola Irrigation Scheme	Tana River	R. Tana	Cotton
Kibirigwi Irrigation Scheme	Kirnyaga	R. Sagana	Onions, Tomatoes, vegetables
Katiru Irrigation Scheme	Turkana	R. Turkwell	Maize
Taveta Irrigation Scheme	Taita- Tovela	Njoro Springs	Vegetables
Kibwezi Irrigation Scheme	Makuweri	r. Kiboko	Rice
Lari Irrigation Scheme	Tana River	River Tana	Vegetables
Pakere Irrigation Scheme	Morogoro	Great Ruaha	Sugarcane
Kilombero Irrigation Scheme			
Usangu Irrigation Scheme			
Rungwa Irrigation Scheme			

AHERO PILOT IRRIGATION SCHEME.

The scheme is found in W. Kenya on R. Nyando in Kisumu. The major crop is rice and water for irrigation is from R. Nyando and R. Miriu drains the water from the scheme. The method for irrigation is furrow and the aim for the establishment was to taste the success of large scale irrigation.

Factors for development include the following;

- 1- Presence of suitable fertile soils for the growing of rice.
- 2- Availability of large supplies of water for irrigation from R. Nyando.
- 3- Presence of large supplies of cheap labour both unskilled and skilled.

- 4- Presence of a flat land between R. Nyando and Miriu which allowed free flow of water under the influence of gravity and easy use of machines.

The Ahero Rice Scheme. (space for the map)

MWEA TEBERE IRRIGATION SCHEME.

The scheme is located on R. Tana. N. E of Nairobi near the fat hills of Mt. Kenya. The major crop is rice and water for irrigation is obtained from the following areas; R. Thiba, Nyamindi, and Murubara.

The aims for establishments.

- 1- To make use of arid land
- 2- To resettle and employ the detainees (from Mau Mau rebellion...)
- 3- To increase rice production in the country for self reliance.

Conditions which have favoured the location of the project.

- 1- Presence of permanent water sources such as Rivers Tana, Thiba and Nyamindi
- 2- The gently sloping landscape - Predominant plain on the lower slopes of Mt. Kenya allowing irrigation by gravity flow.
- 3- Presence of fertile block cotton volcanic soils, red clay loams which support rice growing.
- 4- Low average unreliable rainfall of less than 750mm per annum.
- 5- Large/extensive tracts of land was sparsely populated thus for the project.
- 6- Favourable government policy of promoting irrigation projects in remote or marginal lands.
- 7- Proximity to communications lines e.g. the Nairobi – Nyeri Railway.
- 8- Availability of landless people who could be recruited
- 9- Availability of capital
- 10- Ready market for the crops etc.

Explain the benefits of the Irrigation Project to the people of Kenya

- 1- Source of vital food ie. Rice.
- 2- Provision of employment to people
- 3- Source of income to farmers
- 4- Resettlement of the population which was formerly landless
- 5- Improvement in infrastructure i.e. roads, towns, schools,
- 6- Improvements in research
- 7- Source of government revenue
- 8- Establishment of processing industries

- 9- Effective utilization and marginal lands
- 10- Development of towns.
- 11- Farmers acquired modern farming techniques

Outline the problems faced by farmers on the irrigation project

- 1- Poor yields of rice
- 2- Reduction in soil fertility
- 3- Pests which destroy the crops
- 4- The Problem of Weather conditions i.e. cool temperatures, storms etc.
- 5- Price fluctuations leading to unstable farmer's income.
- 6- Sitting of canals
- 7- Limited capital
- 8- Soil Exhaustion
- 9- Soil Salination

MWEA –TEBERE IRRIGATION PROJECT (space for the map)

AGRICULTURE IN E. AFRICA CHIEF COMMERCIAL CROPS IN E.A

- | | |
|-----------|--------------------|
| Coffee | |
| Tabbacco | Rice |
| Sisal | Irrigation Project |
| Sugarcane | Pyrethrum |
| Tea | Cotton |
| River | |
| Coconuts. | |

Measures/Solutions to the problems.

- 1- Regular spraying to control pests diseases
- 2- Application of fertilizers and farm manure to improve on soil fertility
- 3- Regular dredging of canals to get rid of silt
- 4- Building of embodiments along the rivers to control flooding
- 5- Encourage the farmers to form cooperatives to get more money.

N.B.

- 1- Gable/Hola is located on R. Tana East of Nairobi, Major crop is cotton and water for irrigation is from R. Tana. Other crops grown include g. nuts and sugarcane. The aim was to act as a model scheme by which an arid area could be developed.

- 2- The Kano plains pilot irrigation scheme (Kenya is located on the Kavirondo gulf out the shores of L. Victoria near Kisumu. The major crop is sugarcane and others include rice. The flood plains of the following, rivers provide water for irrigation e.g. Nzoia, Yalla, Nyando and Sondu. The aim was to improve the farming system which was substance and to improve food production to Famine.
 - 3- **Lari Irrigation Scheme:** - This is a multipurpose irrigation scheme located on the Kenyan Highlands N. W. of Nairobi town. The major aim was to resettle the Kikuyu Farmers to grow pyrethrum and to rear dairy cattle.
 - 4- **Yalla and Bunyala.** These schemes are found on the shores of L. Victoria on R. Yalla Major crops include sugar cane and rice. The aim was to reduce population pressure on the Kano plains as well as to eliminate Malaria and Bilharzia.
 - 5- **Mobuku Irrigation Schemes:-** This is a multipurpose irrigation scheme located on the slope of Mt. Rwenzori. The major crop is onions others include cotton, groundnuts, maize, vegetables etc and irrigation water is from R. Sesebe.
- The aim (major was to resettle people from over populated areas especially Akonjo, Bakiga, Bwamba.
- 6- Doho Irrigation Scheme – Major crop is rice and it is found in Bulaleja Water for Irrigation is from R. Manalwa.
 - 7- Kibimba irrigation Scheme:- its located in Bujiri district, major crop is rice and irrigation water is from R. Mpologoma and L. Kibimba

Contribution of Irrigation Schemes in E. Africa

- 1- Schemes provide employment opportunities to many people in E. Africa.
- 2- Source of food to man. E.g. Rice maize, onions, vegetables
- 3- Sources of raw materials to industries
- 4- Sources of Income to the local people thus helping them to raise their standards of living.
- 5- The schemes promote research and scientific study in E. Africa .
- 6- They promote the development of infrastructure like roads, railways,
- 7- Development of towns like Embu.
- 8- Schemes in E. Africa are sources of government revenue through taxation of the people as well as the schemes themselves.
- 9- The employed people acquire skills on modern farming techniques.
- 10- Attract tourists leading to the development of tourist industry.

- 11- Promote industrial development in E.Africa.
- 12- Resettlement of the population which was formally landless.
- 13- Generation of foreign exchange through the exportation of the crop
- 14- Diversification of the economy thus widening the government tax base.
- 15- Have promoted international trade and relations.
- 16- Have led to the effective utilization of marginal lands. E.g. dry lands, swamp

Problems facing Irrigation Schemes in E.Africa.

- 1- Pests and diseases
- 2- Monoculture which leads to soil exhaustion
- 3- Over production leading to fluctuations on international markets
- 4- Break down of machinery
- 5- Inadequate labour force
- 6- Limited land for expansion
- 7- Shortage of water for irrigation because of drought conditions
- 8- The schemes are expensive to establish and maintain/inadequate capital
- 9- Limited market for the crop.
- 10- Pollution of the environment by industries and tractors.
- 11- High evaporation rates leading to salinity of the soils.
- 12- Silting or blocking of canals etc.

SKETCH MAP OF E.A. SHOWING IRRIGATION SCHEMES. (space for the map)