Topic 1: Introduction to Agriculture
Level: Form 1
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Note: Study each of the above systems under:
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Note: Learners should be reminded that any of the above methods can be subsistence or commercial
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• Food supply
• Source of employment
• Foreign exchange earner
• Source of raw materials for industries
• Provision of market for industrial goods
• Source of capital

Objectives

By the end of the topic, the learner should be able to:

a) Define agriculture

b) State the main branches of agriculture

c) Describe farming systems

d) Explain the role of agriculture in the economy and demonstrate an appreciation of its importance to the country

e) Demonstrate an appreciation for the wide and varied opportunities in agriculture.

Introduction to Agriculture

Definition of Agriculture

Agriculture is the science and art of cultivation of crops and rearing of livestock.

As a science, it involves experimentation and application of scientific knowledge in such areas as;

- ✓ Soil analysis,
- ✓ Control of pests and diseases,
- ✓ Farm machinery and structures,
- ✓ Crop and livestock breeding.

As an art, it involves the use of learned skills in;

- ✓ Tilling the land,
- ✓ Construction,
- ✓ Measurement,
- ✓ Harvesting of crops,
- ✓ Feeding and handling of livestock
- ✓ Marketing.

Branches of Agriculture

Crop Farming (Arable Farming)

The practice of growing crops on cultivated land.

It is subdivided into:

Field crops Cultivation:

Maize, beans, potatoes, coffee, tea, cotton to name but a few.

Horticulture:

It involves the growing of perishable crops which have high value.

It is further subdivided into:

- ✓ **Floriculture** - the growing of flowers.
- ✓ **Olericulture** - the growing of vegetables.
- ✓ **Pomoculture** - the growing of fruits.

Livestock Farming

This branch deals with the rearing of livestock for various products.

It is further subdivided into:

- ✓ **Pastoralism:** This is the rearing of mammalian livestock such as cattle, sheep, goats, rabbits, pigs and camels.
- ✓ **Fish Farming (Aquaculture):** This is the practice of rearing fish and other aquatic organisms, in ponds.
- ✓ **Bee Keeping (Apiculture):** This involves the rearing of bees in structures known as beehives.
- ✓ **Poultry Keeping:** This is the keeping of domesticated birds.

Agricultural Economics

It deals with the allocation of scarce resources (land, labour, capital and management) for agricultural production.

Agricultural Engineering

This branch of agriculture deals with the use and maintenance of farm tools, machinery and structures.

Farming Systems

A farming system is the organization of the various enterprises in a farm.

It is determined by the following factors:

- ✓ Resources available (land, labour, capital and management).
- ✓ Skills of the farmer.
- ✓ Environmental factors such as climate, soil type and topography.
- ✓ Government policy.

- ✓ Farmer's choice and preference.
- ✓ Enterprise requirement.
- ✓ Social-cultural factors.

The following are systems of farming:

Extensive System:
It is a system where a large piece of land with low investment of resources per unit area is carried out.

Advantages of extensive system

a) It is cheap.

b) Does not require high level of management.

c) Requires less labour.

Disadvantages of extensive system

a) Low profit per unit area.

b) Cannot be practiced where land is limited.

c) Low output per unit area.

d) The land is under-utilized.

Intensive Farming:
This system utilizes the factors of production to the maximum and involves high level of management.

Advantages of intensive farming

a) Maximum utilization of the resources.

b) Can be practiced even where land is a limiting factor.

c) Results in high yields.

Disadvantages of intensive farming

a) Labour intensive.

b) High capital investment is required.

c) Requires high level of management.

d) It can lead to high loses in case of poor management.

Large Scale Farming
Refers to the farming practice under large areas of land over 20 hectares.

It is used mainly for commercial purposes.

The system is highly mechanized.

Advantages of large scale farming

a) Results in high yields.

b) Due to economics of scale high profit is realized.

Disadvantages of large scale farming

a) Lack of diversification may lead to total failure in case of unfavorable conditions.

b) High level of management is required.

c) Heavy capital investment.

d) Requires skilled and qualified manpower.

Small Scale Farming
Refers to farming carried out on a small area of land less than 5 hectares.

Family or casual labour can be engaged during the peak periods.

Most of the Kenyan farmers are small scale due to unavailability of farmland.

Advantages of small scale farming

a) Requires low capital investment.

b) Possible where land is a limiting factor.

c) Does not require high management level unless under intensive system.

Disadvantages of small scale farming

a) Uneconomical to mechanize due to small size.

b) Low production.

c) Provides limited employment.

d) Labour intensive.

e) Difficult to specialize.

Methods of Farming

A method of farming is an established way of carrying out farming activities.

The following are the common methods of farming:

Mixed Farming

It is the practice of growing crops and keeping of livestock on the same land.

It's common in high potential areas.

Advantages of mixed farming

a) Mutual benefit between crops and livestock.

b) Crops supply feed for animals while animals supply manure for crops.

c) Acts as an insurance against total loss by the farmer.

d) The farmer is assured of an income throughout the year.

e) There is maximum utilization of the resources.

f) Animals can be used in the farm activities particularly draught animals.

g) Ensures proper utilization of labour and land throughout the year.

Disadvantages of mixed farming

a) High initial capital.

b) Lack of specialization.

c) Land can be a limiting factor if both enterprises are to be raised.

d) Requires high level of management for both enterprises.

Nomadic-Pastoralism

This is the practice of livestock rearing whereby animals are moved from one place to another in search of water and pastures.

It is practiced in the arid and semi-arid areas where in most cases beef animals are kept.

Nomadic pastoralism is gradually changing to ranching with the introduction of:

- ✓ Improved pasture species, improved livestock breeds and supplementary feeding.
- ✓ Efficient disease and parasite control measures.
- ✓ Improved infra-structure such as roads, water supply, cattle dipping facilities.
- ✓ Extension services.

Advantages of nomadic-pastoralism

a) Serves as the backbone of beef industry in Kenya.

b) Proper way of utilizing the arid and semi-arid areas.

c) Source of income to the pastoral communities.

Disadvantages of nomadic-pastoralism

a) It encourages the spread of livestock pests and diseases due to communal watering points, grazing and dipping facilities.

b) There is a tendency to increased soil erosion and land degradation.

c) Source of conflicts and ethnic tension among the nomadic communities for the control of good pastures and water.

d) Difficult to control breeding and breeding diseases.

e) High rate of inbreeding leading to poor quality livestock.

f) Low production of milk, meat, hides and skins due to wastage of energy in traveling from one place to another in search of pastures and water.

g) High death rates as a result of walking for long distances.

Shifting Cultivation

It is a traditional method of cultivating a piece of land until the soil is exhausted and crop yields decline.

The land is abandoned and the farmer shifts to a new field as the previous land is left fallow to regain its fertility.

Advantages of shift cultivation

a) Land is allowed to rest and regain its fertility.

b) No buildup of pests and diseases.

c) Soil structure is restored.

d) The cost of production is low since inorganic fertilizers and pesticides are not used.

e) Crop produce are chemical free.

Disadvantages of shift cultivation

a) Not practical where land is a limiting factor.

b) Farm planning and acquisition of credits for land development is 'not possible.

c) It is a cumbersome method due to constant movement.

d) Lack of soil conservation measures

e) Not possible to grow perennial crops.

f) Low output per unit area due to poor farming methods.

g) Where fire is used to clear the land organic matter is destroyed.

Organic Farming

It is a fanning method where crops are grown and livestock reared without the use of agrochemicals.

It is a method of farming which has been adopted to reduce the long term effect of the agro-chemicals on crops which may eventually end up in man and livestock.

Agro-chemicals are also expensive thus organic farming reduces the cost of production. Organically produced goods fetch high market prices.

Advantages of organic farming

a) Cheap and cost effective.

b) Make use of the locally available materials

c) Useful in improving the soil structures.

d) No side effects from the crops and livestock products.

e) No environmental pollution.

Disadvantages of organic farming

a) Not Nutrient Specific (not specific on nitrates, phosphorous, potassium).

b) Requires a lot of labour.

c) A lot of time is taken for the organic contents to decompose for consumption by plants.

Agro-Forestry

This is the practice of integrating trees and crops on the same piece of land.

With land resources becoming scarcer, agroforestry is becoming more important.

Examples of common agroforestry trees and shrubs include:

- ✓ Cajanus cajan
- ✓ Grevillea robusta
- ✓ Sesbania sesban
- ✓ Calliandra calothyrsus
- ✓ Casuarina equisetifolia
- ✓ Leucaena leucocephala

Trees selected for agroforestry should have the following characteristics:

- ✓ Able to grow fast.
- ✓ Deep roots to minimize competition for nutrients.
- ✓ Should be preferably leguminous.

Advantages of Agro-Forestry

a) Trees reduce soil erosion in a given area.

b) Leguminous trees add nitrates into the soil thus improving the soil fertility.

c) Some trees can be used as livestock fodder to provide a high level of proteins.

d) They are important sources of wood fuel and timber.

e) There is maximum utilization of land.

Disadvantages of Agro-Forestry

a) Use of farm machineries is difficult

b) Reduced yields due to the competition of sunlight, water and nutrients between crops and trees

c) Makes planning and management of land difficult as compared to monoculture farms and straight forestry operations.

d) It takes a lot of time to see the benefits.

Importance of Agriculture to the Economy of Kenya

a) Provides food to the population to meet nutritional requirements and to enable man to engage in other activities of farming.

b) Provides employment. This for example can be *direct* as a labour in the farm, tea plucking or *indirect* for example, working in agricultural based industries.

c) Source of raw materials for industries for example cotton lint for textile industry.

d) Provides foreign exchange - through exporting agricultural produce.

e) Provides market for industrial goods agriculture is a consumer of the finished goods from agro-based industries.

f) Source of income - farmers as well as the government get revenue from the sale of agricultural produce and tax payment.