

# General Introduction to Agriculture

Agriculture is the science and art of cultivation of crops and keeping of livestock. As a science, it involves experimentation and application of scientific knowledge in such areas as soil analysis, pests and diseases of plants and animals, farm machinery and structural materials, animal and plant breeding. As an art, it involves the use of learned skills in tilling the land, construction, measuring, harvesting of crops, feeding and handling of livestock and marketing.

Major areas of Agriculture include crop husbandry, animal husbandry, agricultural engineering and agricultural economics.

Agriculture is related to other subjects; namely Biology, Chemistry, Physics and Geography in the following ways:

- (a) Biology - Growing of crops and keeping of animals require knowledge of botany, zoology and ecology.
- (b) Chemistry - Soil fertility, fertilisers and agro-chemicals.
- (c) Physics - Farm structures, machinery and tools.
- (d) Geography - Climate and soils.

## *The Importance of Agriculture to the Economy of Kenya*

- (i) Provides food to the people.
- (ii) Provides employment:
  - direct employment; rearing of ani-

### **Appendix**

*Crops* are cultivated plants. They are useful to man.

*Livestock* are domesticated animals.

*Poultry* are domesticated birds.

mals and selling their produce to get income.

indirect employment; working in agriculture based industries e.g. machinery, transportation and chemical factories.

- (iii) Source of raw materials for industries e.g.
  - Grains - Kenya Breweries.
  - Meat - Kenya Meat Commission and Farmers Choice.
  - Milk - KCC factories.
  - Hides and skins - Leather production factories.
  - Raw cotton - textile industries e.g. Raymonds.
- (iv) Provides foreign exchange. Agricultural products e.g. coffee, tea, pyrethrum, etc. are exported to earn foreign exchange. This can be used to purchase imported materials such as machinery and petroleum products.
- (v) Provides market for industrial goods e.g. pangas, jembes, sprayers, tractors and agricultural chemicals.
- (vi) Source of capital for national development. Money obtained is used for the construction of roads, schools, hospitals and other social amenities.
- (vii) Helps to correct balance of trade deficit.

## *Systems of Farming*

A farming system is the arrangement in which farming enterprises are organised.

**(a) Shifting Cultivation**

This is the practice of cultivating a piece of land until the soil is exhausted and crop yields decline. The land is abandoned and a fresh one opened for cultivation.

*Advantages*

- (i) Land is allowed to rest, to regain its fertility and structure.
- (ii) Build up of pests and diseases does not occur because of the shifting to other areas.
- (iii) Soil structure is not destroyed completely.
- (iv) Crops benefit from readily available minerals from burnt vegetation.
- (v) The land becomes useful after vegetation regenerates.

*Disadvantages*

- (i) The soil cover is burnt hence the soil is liable to erosion.
- (ii) Poor development of the land.
- (iii) Cumbersome method (due to constant movement).
- (iv) Impracticable in densely populated areas.
- (v) It includes burning which destroys vegetation and may destroy houses and other organisms.
- (vi) Farm planning and acquisition of loans for development is not possible.

**(b) Pastoralism**

This is a system which involves keeping of livestock and moving with them from one place to another in search of better pasture and water.

*Types of Pastoralism*

- (i) Nomadism - moving with animals along certain routes.
- (ii) Transhumance - moving for one part of the year and settling for the rest of the year in one place.
- (iii) Sedentary - keeping animals near their permanent homesteads during the night and allowing them to graze in the field during the day.

*Characteristics of Pastoral Farming*

- (i) Practised by people with low level of education.
- (ii) Pastoral people believe in the number of livestock rather than their quality.
- (iii) Erratic rainfall .
- (iv) Poor soils.

*Disadvantages of Pastoralism*

- (i) It encourages the spread of livestock pests and diseases.
- (ii) Poor quality of livestock.
- (iii) Uncontrolled breeding.
- (iv) Low production of milk, hides and skins etc.
- (v) There is a tendency to overstock and overgraze.

Pastoralism is gradually changing to ranching where there is:

- (i) provision of extension staff;
- (ii) improved pasture species;
- (iii) control of tsetse flies;
- (iv) improved services e.g. water cattle dips, and animal health services.

**(c) Arable Farming**

It refers to the growing of crops for subsistence, export or both. Commonly done on high potential areas. The type of crops grown are determined by the ecological conditions.

Examples of arable farming practices are inter-cropping, mixed cropping and mono-cropping.

*Inter-cropping*

Is the growing of two or three crops in association e.g. maize, beans, and sisal. All crops are grown in the same garden at the same time.

*Advantages*

- (i) Higher yields per unit area of land.
- (ii) Provides soil cover hence erosion is reduced.

- (iii) No total loss in case of outbreak of pests and diseases.
- (iv) Supplementation of the nutrients in the soil when legumes are included.

*Disadvantages*

- (i) Weed control becomes difficult e.g. use of machines in weeding and spraying.
- (ii) Wastage of fertilisers i.e it will not benefit all crops.
- (iii) Harvesting is cumbersome.

**(d) Mixed cropping**

Is the planting of different crops in different plots on the same farm e.g. annuals and perennials. All other aspects are similar to those of inter-cropping.

**(e) Mono-cropping**

Is the establishment of a pure stand of one crop in a field, e.g. maize, tea and coffee.

*Advantages*

- (i) Weeding is easy.
- (ii) Control of pests and diseases is easy.
- (iii) Proper utilisation of fertilisers/manures.
- (iv) Easy to harvest.

*Disadvantages*

- (i) Lack of soil cover.
- (ii) In case of disease/pest outbreak the entire crop will be wiped out, resulting in total loss.
- (iii) Requires constant application of fertilisers.
- (iv) Earnings are unpredictable due to market fluctuations.

**(f) Mixed Farming**

Is the practice of growing crops and rearing livestock on the same farm. Common in high potential areas e.g. Central and Western provinces of Kenya.

*Advantages*

- (i) Animals benefit from crop residues while crops benefit from animal wastes e.g. dung.
- (ii) Sustains income throughout the year.

- (iii) Ensures proper utilisation of labour and land throughout the year.
- (iv) The practice maintains soil fertility when legumes are included.
- (v) In case one enterprise fails, the farmer would depend on the other enterprises.

*Disadvantages*

- (i) High initial capital outlay is required.
- (ii) Lack of specialisation.
- (iii) Impracticable in unsuitable topography e.g. swampy areas.
- (iv) Limited land area for each enterprise.
- (v) Inadequate technical know-how and labour to run the enterprises.

**(g) Small-Scale Farming**

Refers to the farming practice done on a small area of land.

*Features of Small-Scale Farming*

- (i) Crops are grown mainly for subsistence.
- (ii) Land area is less than five hectares.
- (iii) Mixed farming e.g. poultry, vegetable, beekeeping.
- (iv) No mechanisation because it entails use of manual or simple tools.
- (v) Contributes to development in rural areas.

*Limitations*

- (i) Uneconomical to mechanise.
- (ii) Low production.
- (iii) Provides limited employment.
- (iv) Difficult to specialise.

**(h) Large-Scale Farming**

Refers to the farming practice on a large area of land, mainly for local and export market.

*Features*

- (i) Requires large tracts of land.
- (ii) Heavy capital investment.
- (iii) Most of the work is mechanised.
- (iv) Provides more employment.
- (v) Requires skilled and qualified manpower.

**Examples**

- (i) Ranching (large-scale animal rearing) e.g. large dairy farms, ADC farms and poultry farms.
- (ii) Plantation farming is the large-scale growing of one major crop e.g. tea plantations in Kericho, coffee plantations in Kiambu and Muranga, and sugar-cane plantations in Nyanza and Coast provinces.

**Environmental Factors Influencing Agriculture****(a) Rainfall****Features of Rainfall**

- (i) The total amount.
- (ii) Distribution.
- (iii) Reliability.

The three features determine types, distribution and performance of crops and animals in a given area.

**(b) Temperature**

Every crop has its optimal range of temperature. Temperature influences:

- (i) Germination of seeds.
- (ii) Quality of plant products.
- (iii) Rate of photosynthesis.
- (iv) Rate of growth of plants.
- (v) Distribution and performance of livestock.

**(c) Light****Features**

- (i) Light intensity.
- (ii) Light duration.

Light influences:

- (i) Rate of photosynthesis in green plants.
- (ii) Flowering of plants.
- (iii) Performance of livestock e.g. growth rate and laying percentage in poultry.

**(d) Wind**

Influences:

- (i) Increases the rate of evapo-transpiration.
- (ii) Strong winds cause destruction of

crops by lodging and breaking of branches.

- (iii) Strong winds cause soil erosion.
- (iv) Winds bring rains.

**(e) Soils**

Influences:

- (i) Provides nutrients and water to crops.
- (ii) Provides anchorage to crops.
- (iii) Influences distribution of crops and animals.

**(f) Relief**

Influences:

- (i) Rainfall pattern.
- (ii) Limits mechanisation.
- (iii) Types of soil and vegetation.
- (iv) Human activities.
- (v) Distribution of crops and animals.

**(g) Humidity**

Influences:

- (i) Rate of evapo-transpiration.
- (ii) Temperature of a given area.

**WORK TO DO**

1. Explain the term "Agriculture".
2. Briefly explain the relationship between Agriculture and other subjects like Mathematics, Sociology and Economics.
3. What is agricultural economics?
4. What is animal husbandry?
5. How does agriculture contribute to the economy of Kenya?
6. State various ways in which the Government is trying to improve agricultural production in Kenya.
7. (a) Draw a map of Kenya and show areas where pastoralism is practised.  
(b) Give reasons why it is practised in the areas you have shown.
8. Explain how tsetse-fly infestation affects distribution of livestock in Kenya?
9. What factors would be suitable for dairy farming in Kenya?
10. How would the relief of a place affect mechanisation?