19

Farm Layout and Structures

Introduction

Farm layout is how land is allocated to various farm enterprises and how these enterprises relate to each other. Farm layout is aimed at maximum utilisation of resources and ease of farm management.

Factors Considered in Planning Farm Layout

(i) Size of the farm.
(ii) Climatic factors e.g. direction of wind.
(iii) Type of soil.
(iv) Accessibility.
(v) Topography.
(vi) Security.
(vii) Government regulations.
(viii) Source of amenities such as water, power and communication.
(ix) Types of enterprises.
(x) Flexibility.

Surveying

Calculation of Land Size

Done by measuring and dividing the piece of land into units and calculating the area of each unit. The unit used may be a triangle, trapezium, square, rectangle, etc.

Method/equipment used in measuring distance when calculating land areas:

(i) Pacing method.
(ii) Tape measure (Surveyors tape) or chains.
(iii) Theodelite.

Farm Structure

These are physical constructions put on the farm to increase efficiency in production.

Types of Farm Structures

These are fences, poultry houses, dips, spray races, crushes, stores, rabbitries, beehives, compost pits, milking sheds, piggeries, fish ponds, drinking troughs, silos and farm buildings.

(a) Fences

Importance of Fences in a Farm

(i) Keep out unwanted intruders to the farm.
(ii) Define the boundary lines of the farm.
(iii) Paddocking of fields make rotational grazing possible.
(iv) Live fences serve as windbreaks.
(v) Fences are used in mixed farming to protect crops from damage by livestock.
(vi) Fences add aesthetic values to the farm.
(vii) It is easy to control breeding.
(viii) It is easy to isolate sick animals from the rest of the herd.

Types of Fences

1. Barbed wire fence.
2. Plain wire fence.
3. Electric fence.
4. Concrete fence.
5. Chicken wire fence (mesh wire fence).
6. Woven wire fence (chain link).

7. Wooden fence (slabs).
8. Live fences e.g. sisal, cypress, kai apple, lantana, euphorbia.

Fencing Practice

(a) Materials include wires, staples, nails, posts, droppers and concrete materials.
(b) Size of posts:
- General purpose 2.5 m by 25 cm in diameter.
- Strainer units and corner posts 3 m by 30 cm in diameter.

(c) Distance between the post.
- 3m between posts, 10mm if droppers are to be used.
- 200 m between strainer units.

(d) Depth of the holes.
- 60 cm.

Gate Posts, Gates and Strainer Units

1. Gates should be hunged on posts separate from the fence.
2. Mechanical implements e.g. tractors require 4.0-4.5 m width of gate.
3. Entrance of gates for pedestrians can be accommodated within the fence.

Steps in Fencing

(i) Locate the corners.
(ii) Clear the fencing area.
(iii) Mark gates, strainers, pass places and standards by pegging.
(iv) Dig holes to proper depths.
(v) Fix the standard posts.
(vi) Firm around posts or apply concrete.
(vii) Fix wires on posts.
(viii) Fix the droppers.

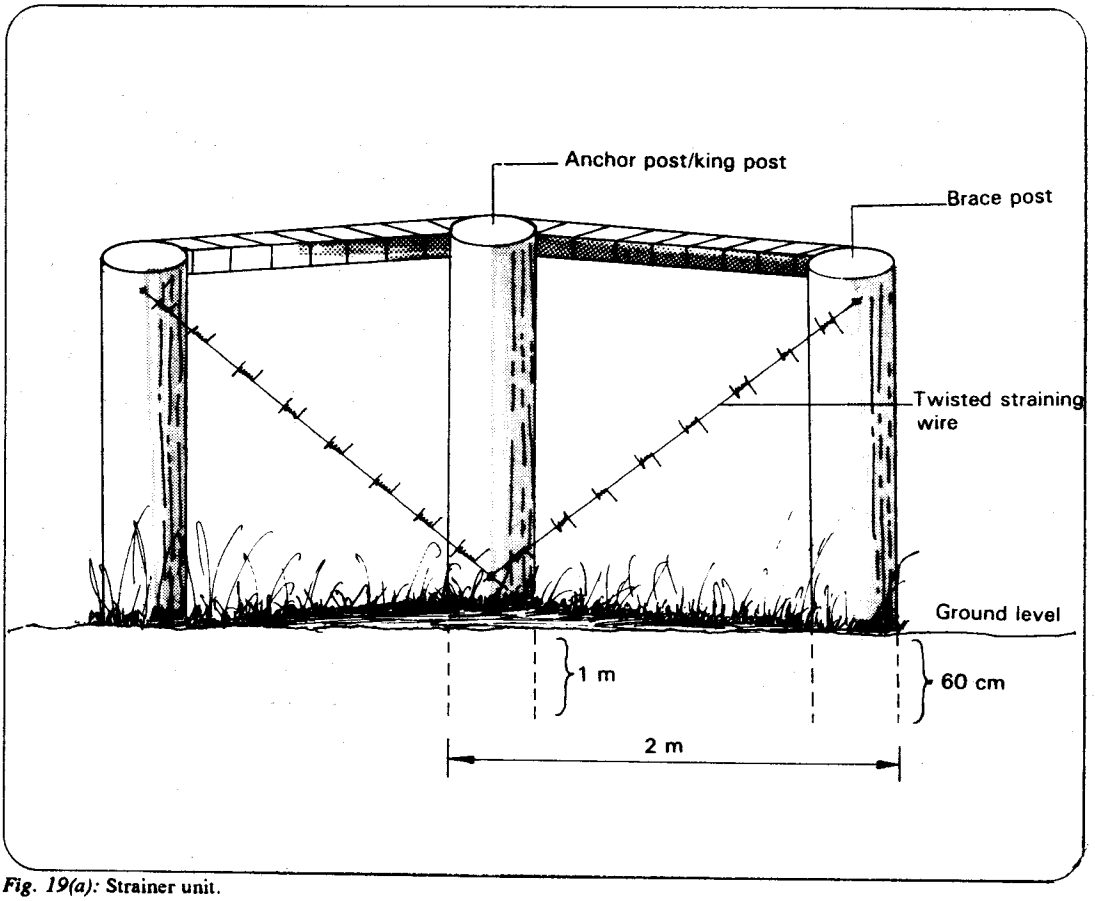

Fig. 19(a): Strainer unit.

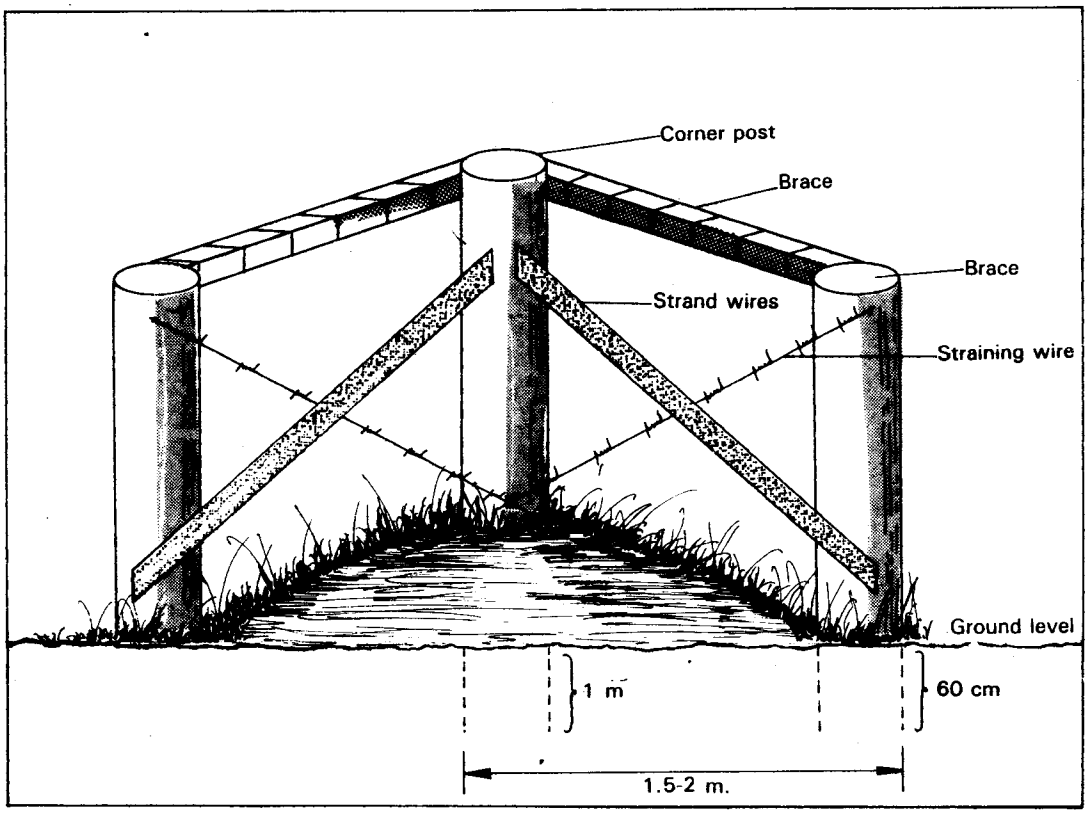

Fig. 19(b): Corner arrangement of a fence.

Structural Materials and Use

Factors which determine the type of materials to use are durability, strength, labour, availability, workability, serviceability, cost and sanitation.

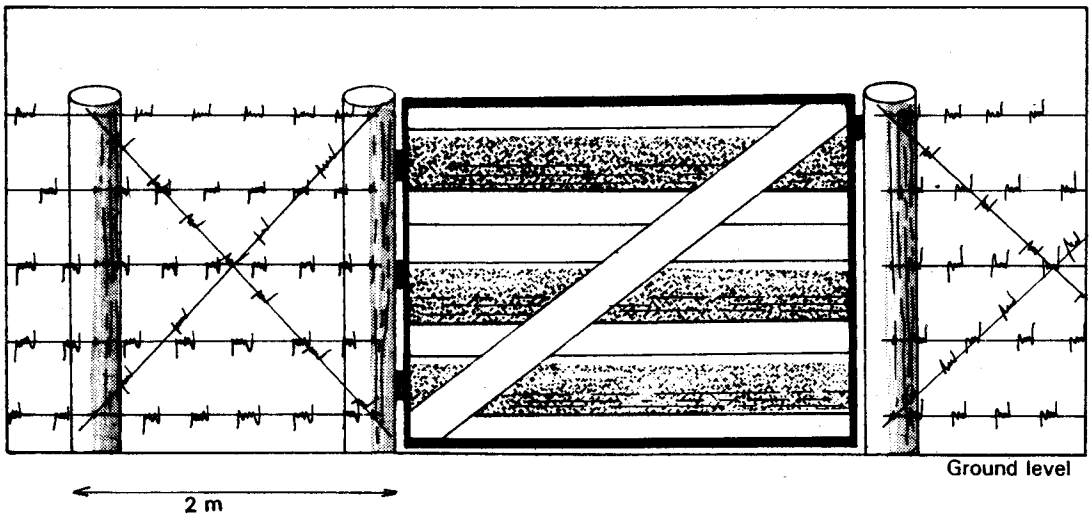

Fig. 19(c): Fencing a gate.

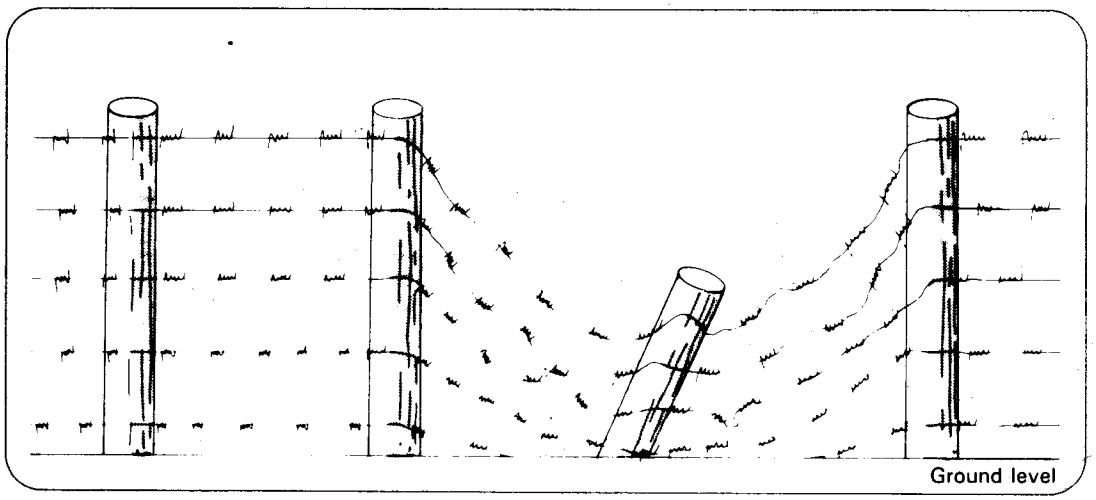

Fig. 19(d): Fencing a pass.

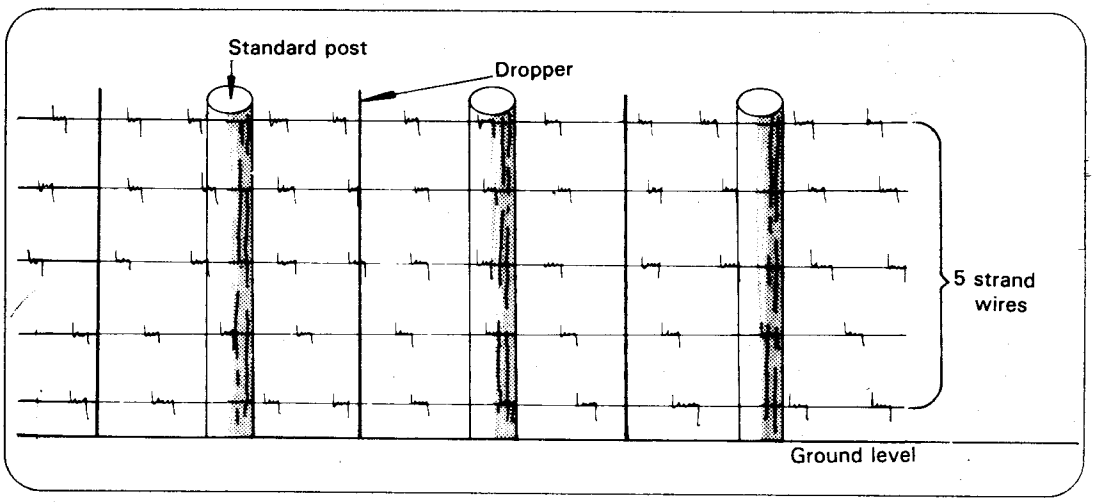

Fig. 19(e): Fencing standard posts and droppers.

1. *Stones and Bricks*

   Advantages

   Stones and bricks are durable, sanitary, resistant to weather and insects decay and are easily available.

   Disadvantages

   They are bulky and require skilled labour to make them.

2. *Plastic and Synthetic Materials*

   These include glass, asbestos and fibre.

   Advantages

   Light, cheap depending on quality, sanitary, can be moulded into any shape, are durable, cannot be destroyed by insects and fungus and are water-proof.

   Disadvantages

   Are easily destroyed, fragile, very expensive and require skilled labour.

3. *Wood (Timber)*

   Advantages

   They are workable, cheap, can be reused and are fairly strong.

Disadvantages
They can catch fire easily, decay if exposed to water and are affected by fungus and insects.

4. *Concrete*
Is a mixture of cement, sand, aggregate and water e.g. in making blocks the ratio is 1:2:3; one part cement, two parts sand and three parts of aggregate.

Uses
(i) Making posts for fencing.
(ii) Making walls and floors of buildings.
(iii) Making gabions and water channels to prevent erosion.
(iv) Making water and feed troughs.

Advantages
These materials are durable, workable, sanitary, cheap to maintain and fire resistant.

Disadvantages
These materials are expensive, require skilled labour, are bulky and cannot be re-used.

Animal Handling Structures

1. The crush: This is used when doing the following activities.
   (i) Spraying livestock to control ticks.
   (ii) Milking.
   (iii) Examination of sick animals.
   (iv) Artificial insemination.
   (v) Treating animals e.g. drenching, vaccinating etc.
   (vi) Doing routine jobs e.g. dehorning, putting identification marks.
2. The spray race: Used in control of ticks by spraying livestock with acaricides.
3. The dip: Machakos type, and Plunge dip. This is used in control of ticks by dipping livestock.

Farm Buildings

Factors to be considered in site selection are:
(i) Security.
(ii) Nearness to the source of water and power supply.
(iii) Topography.
(iv) Direction of the prevailing winds.
(v) Direction of the sun.
(vi) Personal whims.
(vii) Nearness to the means of communication.

Types of Farm Buildings
(i) House for farm animals.
(ii) Store for farm products.
(iii) Store for equipment, tools and supplies.
(iv) Building for growing crops e.g. green houses.
(v) Building for processing plant e.g. milkplant, etc.
(vi) Farmer's house.

Parts of a Farm Building
Kingpost, rafter, strut, tie beam, wall plate, lintel, window sill, wall and foundation.

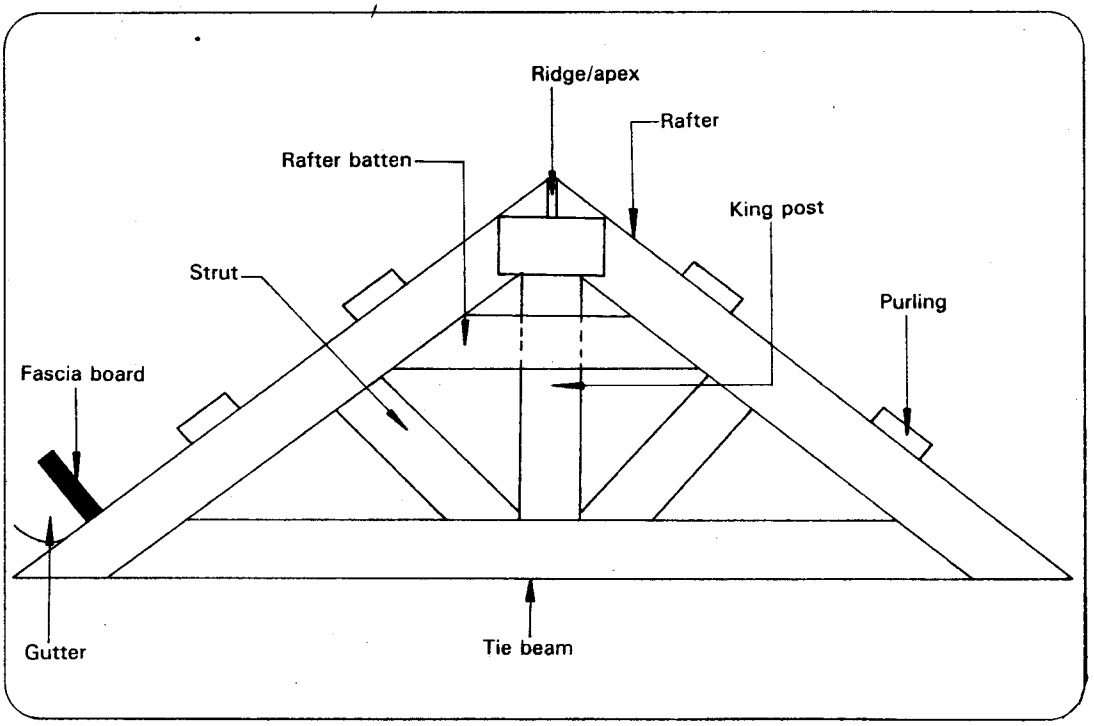

Fig. 19(f): Parts of a roof.

WORK TO DO

1. (a) What is farm layout?
   (b) State the steps followed in developing a farm layout.
   (c) State the factors to consider when planning a farm layout.
2. Give materials required in constructing wood fences.
3. Outline the steps followed in fencing a farm.
4. Mention the various materials used in the construction of farm buildings.
5. Outline the desirable features of a crop store in the farm.
6. State the importance of farm structures in the farm.
7. Write short notes on the following:
   (a) Pacing method in farm surveying.
   (b) The crush.
   (c) Mortar.
8. What are the points to be considered when designing a building for processing farm produce?.
9. State the disadvantages of the following materials in farm buildings:
   (a) Tiles.
   (b) Thatch.
   (c) Plastics.
10. Draw a well labelled diagram to show parts of a roof in farm buildings.