CHAPTER 5

OBJECTIVES

At the end of this chapter, students should be able to:
â—† state the meaning of farm survey.
â—† recognise common simple survey equipment.
â—† carry out simple maintenance practices on survey equipment..

5.1 Introduction

In agriculture, survey is usually associated with the collection and documentation of baseline data on the environment such as the farmland or any other agricultural project. Before embarking on any agricultural project, there is usually the need to carry out survey in order to locate the farmland, delineate its boundaries, determine its total size and locate various farm buildings and structures. Survey is an essential component of farming activities.

5.2 Meaning of Farm Surveying

Farm surveying is simply the process by which farmlands are measured and mapped out, especially at the beginning of farming operations. It is the measuring and mapping out of the position, boundaries and entire size of a farmland area. It also concerns the setting out of positions and heights for new farm sites. Such measurements by tablets, plans or layout are done for specific purposes.

5.3 Soil Survey

This is the scientific examination or assessment, systematic classification and description of soil in an area. Soil survey maps are products of a good soil survey. Soils are classified based on the type and intensity of field examinations. Soil survey reports are of different types and include the following:
(a) Exploratory soil survey report
(b) Low intensity soil survey report
(c) Synthesis soil survey report
(d) Medium intensity soil survey report
(e) High intensity soil survey report
(f) Very high intensity soil survey report

5.3.1 Importance of soil survey maps

(a) They usually form the basis for scientific experimental research as well as other associated

activities.
(b) It is needed for siting experimental trials.
(c) It is important for road construction.
(d) It is important for siting farm houses and structures.
(e) It is used for urban and regional planning activities.
(f) It is important for selecting appropriate crop to plant

5.4 Common Survey Equipment

Some common survey equipment are as follows:
1. Ranging pole
2. Measuring tape
3. Theodolite
4. Offset staff
5. Gunterâ€™s chain
6. Prismatic compass
7. Arrows or pins
8. Beacons or pillars
9. Record book and writing materials.

5.4.1 Ranging pole

This is made of wood or metal. The length varies from 1.8 m to 3 m long and is about 2.5 cm thick. It is usually long, round or

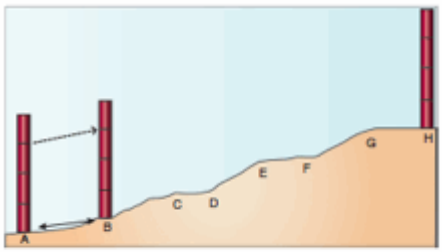

Figure 5.1 A ranging pole

hexagonal in cross-section with a pointed end. It is marked with alternate red and white bands to enable it to be seen from a distance.

5.4.1.1 Uses

It is used for marking stations or spots.
It is used for making straight lines.

5.4.2 Measuring Tape

It is usually made of linen or fine steel sheet.
It is marked or calibrated in metric units and imperial units. It is usually wound up in a reel or rolled up in loops.

5.4.2.1 Uses

It is used for measuring distances, that is, taking measurement of length, breadth and height.

5.4.3 Theodolite

It consists of a tripod stand, a sighting telescope and two graduated circles for vertical and horizontal angles. It has a spirit level

Figure 5.2 A measuring tape

which is used to define horizontal plane against which angles of elevation or depression are measured.

5.4.3.1 Uses

It is used to measure horizontal or vertical angles or planes. It is also used to measure horizontal and vertical distance.

Figure 5.3 A theodolite

5.4.4 Offset staff

It is a graduated rod about 3 m long. A hook may be fitted at the top for the purpose of pulling a chain through a hedge.

5.4.5 Uses

It is used for taking short offset measurement.

5.4.6 Prismatic compass

It has a prism and a compass card marked in degree, half degrees, minutes and seconds in a clockwise direction.

5.4.6.1 Uses

It is used in taking bearings. It is also used in measuring angular distances.
It is also used in measuring angular distances.

Figure 5.4 Offset staff

5.4.5 Gunterâ€™s chain

It consists of a series of dumbbell-shaped links of steel wires joined together. One Gunterâ€™s

chain measures about 20 m long. It has brass handles at either side.

5.4.5.1 Uses

It is used in taking short or detailed measurement of length and breadth

FIGURE 5.5 Gunter's chain

5.4.6 Prismatic compass

It has a prism and a compass card marked in degree, half degrees, minutes and seconds in a clockwise direction.

5.4.6.1 Uses

It is used in taking bearings.

It is also used in measuring angular distances.

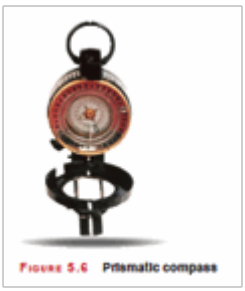

FIGURE 5.6 Prismatic compass

5.4.7 Arrows or pins

They are thin pointed steel wires of about 30 cm long with one end curved into a ring.

A red cloth is normally attached to the ring so that it can be seen from afar.

5.4.7.1 Uses

It is used during chaining for marking of chain lengths. It can also be used for marking stations.

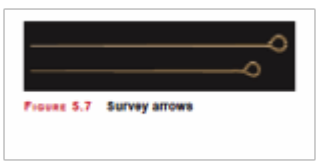

FIGURE 5.7 Survey arrows

5.4.8 Beacon or pillar

This is made up of a rectangular block usually in concrete form. On top of the block marks are usually inscribed. Beacons are buried in the ground with the head raised a little above the ground.

5.4.8.1 Uses

It is used for marking of points measured.

It is used for the recognition of measured or surveyed area.

FIGURE 5.8 A beacon

5.5 Maintenance of Farm Survey Equipment

To increase the shelf life of survey equipment and their effectiveness, adequate care must be given after use. The following are some of the general maintenance techniques of surveying equipment:

1. Competent surveyor or personnel should be allowed to handle and use the instrument for intended purposes.

2. Keep instruments away from heat and rain to prevent damage and rusting respectively.

3. Wash and dry equipment like ranging pole and clean it after use.

4. Replace worn out parts.

5. Metal parts should be oiled or greased or painted before they are stored for long time to avoid rusting.

6. Equipment like theodolite and prismatic compass should be kept in dry and cool places.

7. All bolts, nuts and screws should be tightened before and after use and stored in a tool box.

5.6 Importance of Farm Surveying

1. Farm surveying helps to determine the hectarage of land, giving an estimate of how large the farmland is.

2. It enables farmers to make the best use of available resources in order to achieve maximum profits.

3. Farm surveying and planning can be used as a basis of feasibility studies.

4. It gives the owner of the land security since he knows his entire land boundaries.

5. It is very important because through farm survey farmer can make decision on locations of various farm buildings and structures.

6. It exposes the gradient of the land, and land can be used accordingly.

7. It is very important in the production of a soil map of the farmland.

8. Farm survey does not allow for wastage of land.

5.7 Meaning of Farmstead

Farmstead can be defined as a farm house and all its production and structures. It is a limited area within the farm occupied by buildings, enclosures for cattle, fences and gates.

A farmstead is both a home and a production centre. Planning of a farmstead is based on the system of farming and on the needs and comforts of the farmerâ€™s family. The best location for the farmstead is near the centre of the farm.

5.8 Factors to Consider in Planning a Farmstead

The following factors should be considered in planning a farmstead, in order to ensure efficiency:

1. Drainage: Adequate drainage will ensure good access to and from the farmstead for vehicles and other farm machinery. It will also allow for easy disposal of wastes. It is also important to avoid water logging.
2. Water supply: Adequate water supply is needed for both human and animal consumption. Water should be available for irrigation purposes.
3. Topography: The place should allow free drainage. Farm buildings or living quarters are usually located on high elevations for proper viewing of the farm. The topography of the farm should also minimise erosion hazards.
4. Nearness to market: This reduces distribution or transport cost.
5. Accessibility: The farm should be easily accessible to ensure regular supply of farm inputs and evacuation of farm produce. It also makes marketing of produce possible.
6. Waste management: The ability to handle waste materials especially livestock wastes and their proper disposal and utilisation should be considered.
7. Climate: The climate of the area should also be considered.
8. Soil type: This determines the site for crops and farm structures.

5.9 Classes of Farmstead
1. Barns
2. Dwellings of different kinds
3. House for swine
4. House for cattle
5. House for poultry
6. House for crop storage
7. Orchards
8. Vegetable garden plots
9. Service building such as equipment maintenance yard, warehouses
10. Processing centres
11. Fish ponds
12. Water reservoir
13. Drainage canal
14. Farm gate house

5.10 Principles of Farmstead Planning
1. Livestock building should be located on the soil that is poor for crop production within the farm.
2. Buildings should be located in easily accessible areas.
3. Farm buildings should not be located on slopes to avoid erosion.
4. Crops should be planted on the best soil within the farm.
5. Residential and office buildings should be located far away from livestock building to avoid noise and unpleasant odour from farm animalsâ€™ wastes and dung.


FIGURE 5.3 A farmland layout

5.11 Importance of Farmstead Planning

1. It makes coordination and control of farm operation easier.
2. It encourages efficiency of farm activities.
3. It allows for proper utilisation of resources without wastage.
4. It makes the farmer to be more responsive to market demand.

Activity
Visit a nearby farm and identify the different types of buildings and structures on the farm. Pay attention to the locations of the different structures and comment on the distance of each one to another.

SUMMARY
Survey is needed to locate the farmland, delineate its boundaries, determine its total size and locate various farm buildings and structures before embarking on any agricultural project.
â—† Farm surveying is the process by which farmlands are measured and mapped out, especially at the beginning of farming operations.
â—† Examples of common survey equipment are ranging pole, measuring tape, theodolite, offset staff, Gunterâ€™s chain, prismatic compass, arrows or pins and beacons or pillars.
â—† Farm survey equipment are maintained in order to increase their shelf life and effectiveness.
â—† Farm surveying is important for the following reasons:
âœ§ It helps to determine the hectarage of land.
âœ§ It enables farmers to make the best use of available resources.
âœ§ It can be used as a basis of feasibility studies.
âœ§ It gives the owner of the land security.
âœ§ It makes decisions possible on locations of various farm buildings and structures.
âœ§ It exposes the gradient of the land.
âœ§ It is very important in the production of a soil map.
âœ§ It allows for efficient utilisation of land.
â—† Farmstead is a farm house and all its production and structures
â—† The factors to consider in planning a farmstead include drainage, water supply, topography of the place, nearness to market, accessibility, waste management, and climate of the area.
â—† Farmstead planning makes coordination and control of farm operation easier, encourages efficiency of farm activities, allows for proper utilisation of resources without wastage and makes the farmer to be more responsive to market demand.

REVISION QUESTIONS
Essay Questions
1. List six common survey equipment and describe one use to which the equipment is known for.
2. Enumerate five importance of farm surveying.
3. What is a farmstead?
4. Describe five factors to consider in planning a farmstead.
5. State four advantages of farmstead planning.

Objective Questions
1. The process by which farmlands are measured and mapped out especially at the beginning of farming operations is called
(a) soil mapping.

(b) land clearing.
(c) farm surveying.
(d) farm routine.

2. A survey is required for the following reasons before embarking on any agricultural project except
(a) uproot trees and clear the land.
(b) delineate its boundaries.
(c) determine its total farm size.
(d) locate various farm buildings and structures.

3. The following are survey equipment except
(a) prismatic compass.
(b) walking stick.
(c) theodolite.
(d) gunterâ€™s chain.

4. Farm survey equipment are maintained in order to
(a) increase their shelf life and effectiveness.
(b) to be marketable.
(c) easy to carry.
(d) beautiful and decorated.

5. Farm surveying is important for the following except
(a) it helps to determine the hectarage of land.
(b) it can be used as a basis of feasibility studies.
(c) it exposes the gradient of the land.
(d) it does not enable farmers to make the best use of available resources and creates conflict.

Answers Objective Questions

1. c 2. a 3. b 4. a 5. d