

Farm Water Supply

Water is necessary both for livestock and man. Importance of water in the farm include the following:

- (i) Cleaning equipment in the farm.
- (ii) Irrigation of dry areas.
- (iii) Used in industrial purposes e.g. tea industry.
- (iv) Generation of hydro-electric power e.g. Turkwell Gorge and Seven Forks.
- (v) Used in water mills to grind grain crops.
- (vi) Drinking by livestock and man.
- (vii) Mixing chemicals e.g. acaricide, fungicides, herbicides, etc.

Problems brought about by Water

- (i) Carrying away nutrients in the soil by leaching and erosion.
- (ii) Pollution of water bodies with agro-chemicals.
- (iii) Too much water to plants cause water-logging.
- (iv) Flooding of rivers and streams cause damage to man, livestock and crops.
- (v) Carriers of disease-causing organisms, e.g. diarrhoea, dysentery and typhoid.
- (vi) They form good breeding places for parasites, e.g. mosquitoes and bilharzia worms.

Sources of Water

Hydrological cycle (water cycle) is the circulation of water from the surface of the earth into the atmosphere and back to the earth. Sources of water are:

- Surface water e.g. rivers, streams,

dams, etc.

- Ground water e.g. springs, wells and boreholes.
- Rain water e.g. tapped from the roof tops and stored in tank, etc.

Storage of Water

Water is stored for future use, e.g. use during dry season.

Dams

Structures constructed to store water during rainy seasons for use during drought seasons. They are constructed across rivers and run-off channels.

Weirs

Structures constructed across a river to create small bondage for the intake structure. They are smaller than the dams and temporary.

Water Tanks

Rainwater, groundwater and run-off water can be stored in tanks.

The water storage structures include concrete tanks, corrugated iron tanks, steel tanks, plastic tanks, etc.

Pumping and Piping of Water

Types of Water Pumps

- (i) Hydram.
- (ii) Semi-rotary pumps.
- (iii) Centrifugal pumps.
- (iv) Piston pumps.
- (v) Jet pumps.
- (vi) Diaphragm pumps.

Types of water pipes

- (i) Hose pipes.
- (ii) Plastic pipes.
- (iii) Metal pipes.

Water Treatment

Water contains impurities e.g. dissolved, suspensions and floating. The impurities in water are grouped into three classes:

1. **Physical impurities:** Dissolved impurities detected by colour, taste and smell.
2. **Chemical impurities:** Dissolved impurities, detected by use of chemical analysis.
3. **Biological impurities:** Micro-organisms in water e.g. bacteria, viruses and algae.

Methods of Treating Water

- (a) **Aeration:** Removal of smell and odour from water by fine spraying or bubbling of air.
- (b) **Sedimentation:** Putting water in large basins to remove solid particles e.g. sand, metal, etc. to settle at the bottom by gravity.
- (c) **Filtration:** Passing water through fine granular materials to remove solid materials and biological substances.

- (d) **Coagulation:** Addition of chemicals which precipitate impurities and help in softening of hard water.
- (e) **Sterilisation:** Chlorination to destroy disease-causing germs.

WORK TO DO

1. Give the importance of water in the farm.
2. State the main problems of using surface water for domestic purposes.
3. State four different types of water pumps used in the farm.
4. State the factors to be considered when constructing concrete water tank.
5. State the factors to be considered when constructing a dam.
6. Name two water-borne diseases.
7. Explain how a water mill can be used to grind cereal crops e.g. maize.
8. With the help of an illustration, describe hydrological cycle.
9. Give the advantages and disadvantages of the following pipes in conveying water:
 - (a) Hose pipes.
 - (b) Plastic pipes.
 - (c) Metal pipes.
10. Explain how water from a borehole can be made available for irrigation in the farm.

Irrigation

Irrigation is the artificial application of water to crops in dry areas or where water is not enough.

Factors to consider in identifying and assessing the potential for Irrigation development include:

- (i) Relief of the land; its soil type.
- (ii) Type of crops to be grown.
- (iii) Human factor e.g level of education, social and economic aspects.

To increase the quantity and quality of crops production in an irrigation scheme the following aspects must be considered:

- (i) Selection of suitable varieties of crops.
- (ii) Application of appropriate type of fertiliser.
- (iii) Control of salinity.
- (iv) Proper management of irrigation water.
- (v) Provision of extension services to the farmers.

Types of Irrigation

1. **Surface irrigation:** This includes flood irrigation, furrow irrigation and basin irrigation. This is used in flat areas. The problem with this method is wastage and salinity.
2. **Sub-surface irrigation:** Use of porous pipes or perforated pipes. It is used in slopy areas and where water is inadequate.
3. **Overhead or sprinkler irrigation:** Used

in any area which is not steep.

4. **Drip/trickle irrigation:** Used where water is little and in slopy and flat areas:

WORK TO DO

1. State objectives in irrigation in dry areas.
2. Name areas in Kenya where irrigation is being carried out and give the major crop grown in each of these areas.
3. State the factor that determines the type of irrigation that can be used in any given area.
4.
 - (a) State the major problems facing irrigation schemes in Kenya.
 - (b) How are these problems being overcome to increase quality and quantity of farm products?
5. Discuss the advantages and disadvantages of the following types of surface irrigation.
 - (a) Furrow irrigation.
 - (b) Flood irrigation.
 - (c) Basin irrigation.
6. Give the conditions under which farmers can use the following type of irrigation.
 - (a) Drip/trickle irrigation.
 - (b) Overhead/sprinkler irrigation.
7. Around Lake Elmenteita is semi-desert. Explain, giving reasons, why this lake has not been used to increase agricultural production by irrigation.