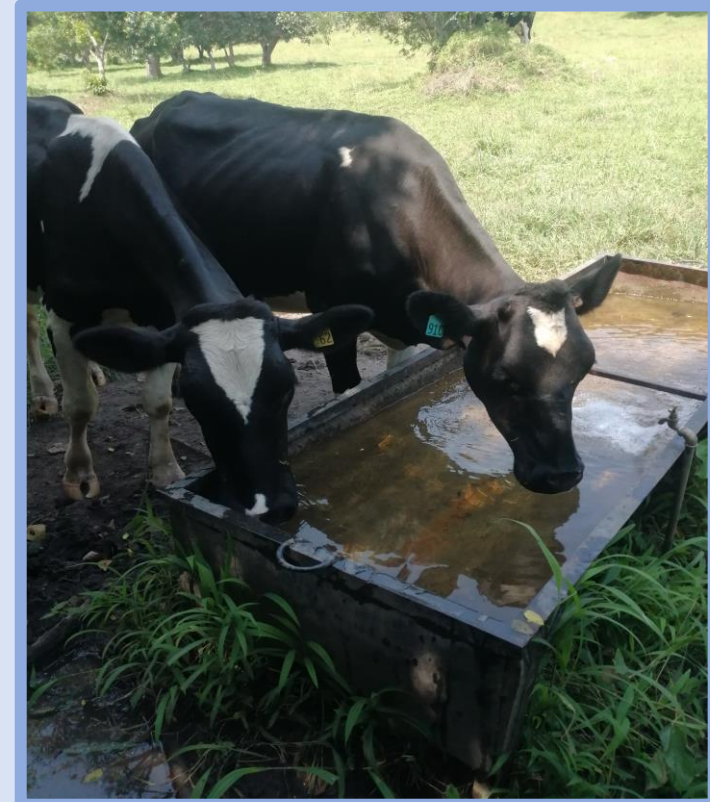


Theme 4: Water management and supply

WATER SOURCES, DISTRIBUTION, STORAGE AND REQUIREMENTS (Level 2)

Topic	Training & information Content
4.1	Water sources, distribution, storage and requirements



1. You will learn about (learning objectives):

- Identify appropriate sources of clean water for cows
- Importance of water to the cow
- Qualities of good water
- Water distribution
- Water storage



2. Uses of water by a cow

- Water is a very important nutrient requirement for cows and should be given free access
- Water is needed for:
 - production of milk (milk is 87% water)
 - transportation of absorbed nutrients in the body
 - aids chemical reactions within the body
 - maintain normal body temperature
 - excretion of waste from the body



3. Qualities of good water

- Water qualities aspects include:
 - Clean
 - Good smell
 - Good colour
 - Free of impurities i.e. chemicals or toxins
 - Have naturally occurring minerals in right quantities
 - Have balanced pH



4. Sources of water

- Common water sources
 - Streams
 - Rivers and lakes
 - Wells
 - Boreholes
 - Springs
 - Water harvesting i.e. rainwater harvesting
 - Municipality water
 - Dams
 - Reservoirs



5. Surface water (streams, rivers, lakes and reservoirs)

- Water from streams, rivers and lakes are popularly used especially by farmers in the rural areas
- Water from these sources however are prone to contamination
- The herd is limited to drinking between 1-2 times only a day due to distance to watering points
- Most of municipality water is distributed from surface water



6. Underground water (springs, wells and boreholes)

- Refers to water found beneath earth's surface in fractures of rocks or soil pore spaces.
 - Springs are naturally occurring and not commonly used as drinking points for cows
 - Wells are shallow in depth compared to boreholes and can be dug manually
 - Boreholes are dug by drilling machines due to the huge depth that has to be achieved



6.1 Underground water (springs, wells and boreholes) Cont'd...

- Underground water sources are used as a supplement source of water especially during dry seasons

Note: harvested water (rainfall) is not categorized as either surface or underground water sources



7. Water distribution

- Water distribution to cows can be done through various means:
 - Fetch and carry (rope and bucket)
 - Pumping water
 - Piping systems
- Water distribution systems should be carefully chosen to ease feeding of cows



7.1 Water distribution Cont'd...

- Distribution systems should be well maintained (cleaned)
- Adequate water access encourages even distribution of manure and even grazing on pastures



8. Manual water distribution

Rope and bucket

- Commonly used by farms within their households and during season of water scarcity (access of boreholes and wells)

Manual water pumping

- This is a cheap and reliable means of pumping water from water sources



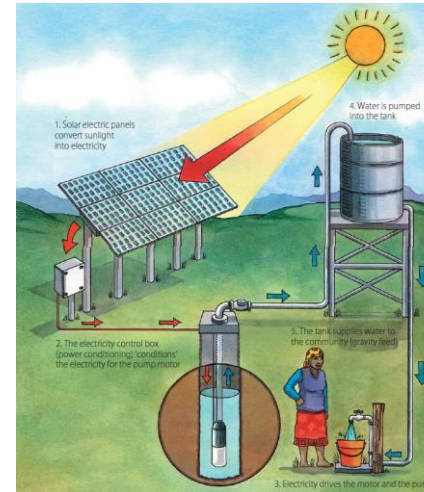
9. Mechanical water distribution

Mechanical water pumping (including solar driven)

- Pumping lifts water above ground level from the source and re-directs it to troughs or bowls

Piped systems

- Mostly used by peri-urban farmers who have access to water from the municipality water supply



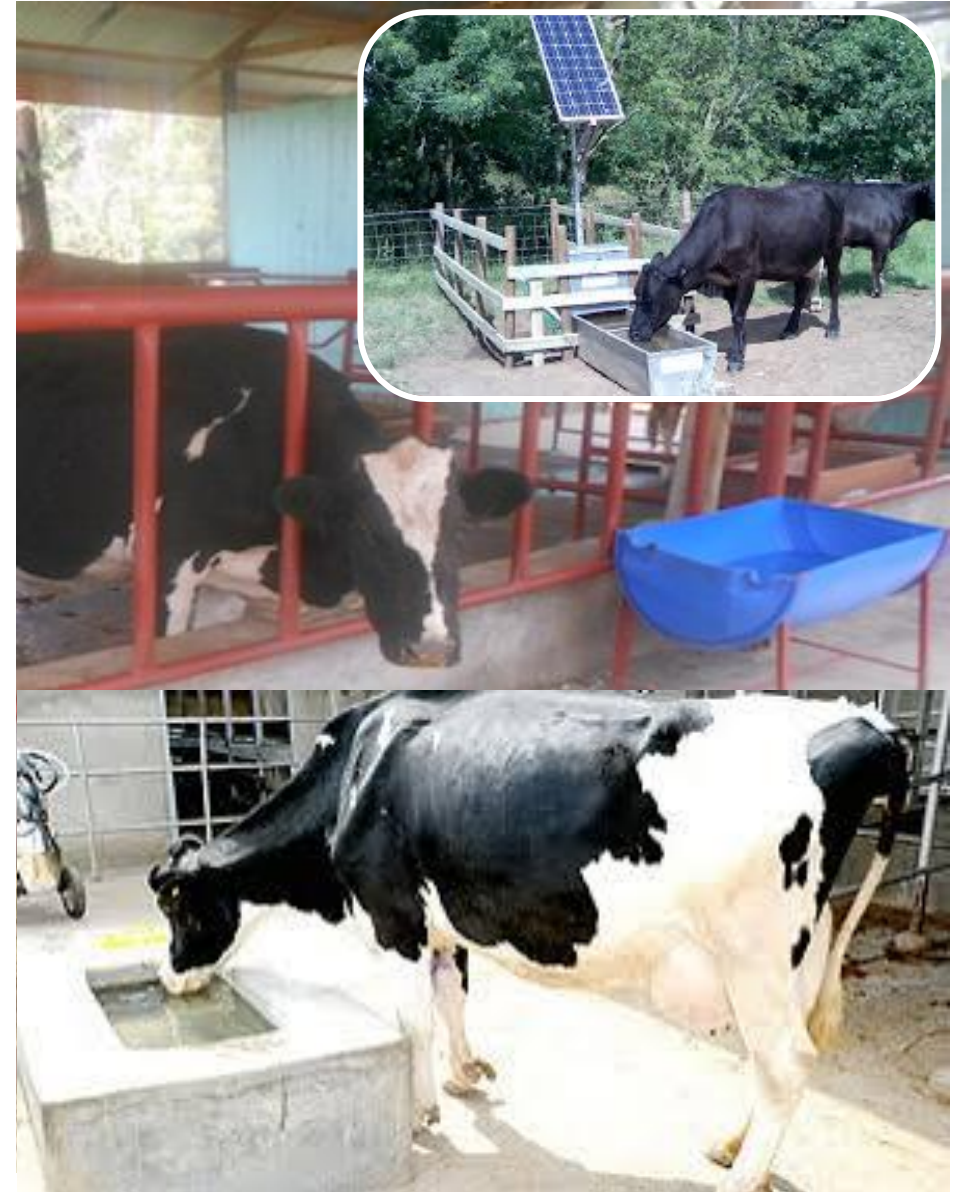
Mechanical water pumping



Piped water

10. Water distribution to the herd

- Avail water close to the feeding area of the herd either in the zero grazing unit, grazing area or both
- Cows should not walk long distance to get to watering points
- Water troughs should be strategically located
- Locate troughs in shaded area



11. Do's in water distribution to cows

- Water in troughs should be removed and cleaned frequently (e.g., weekly)
- Test for bacterial or chemical contamination
- Remove manure build up near the trough
- Water troughs should be accessible for cleaning
- The area around the trough should be firm and dry



Dirty water troughs should be cleaned



Trough after cleaning and refilled with clean water

12. Water intake/requirements for a cow

- Cows take in more water than the amount of feed they take
- Cows tends to drink a lot during periods of great feed intake and after milking
- Adequate quality water is key in meeting the welfare of the cows as well as maximizing milk production
- Watering points should be placed in well drained areas
- Low water uptake result in reduced feed intake



13. Treating/purifying and Supply of oxygen to water

- Liver flukes can be found in wetlands or waterlogged areas
- When water is harvested in a water pan, do not allow the animals to walk into the water pan to drink water. Instead, pump the water into an overhead water tank then to water troughs



Water pumped to overhead tank

Photo courtesy: Wilda Farm, KE

13.1 Treating/purifying and Supply of oxygen to water

Supply of oxygen

- Supply of oxygen to water can be realized in the water if allowed to flow and more effectively if a small water fall can be created



14. Water storage



Water storage also determines quality of water, if it is maintained or deteriorated.



Farms that harvest water or store water from other sources should have a good choice of storage facility.



Frequent cleaning of storage facilities should be done.



Water should not stay for long in an enclosed storage since it may cause water to have a bad odour.



Mending of holes should be to avoid water losses.



Farms should plan to have sufficient storage for dry seasons.



Excavated dam



Elevated plastic tanks



Tyres used for storage