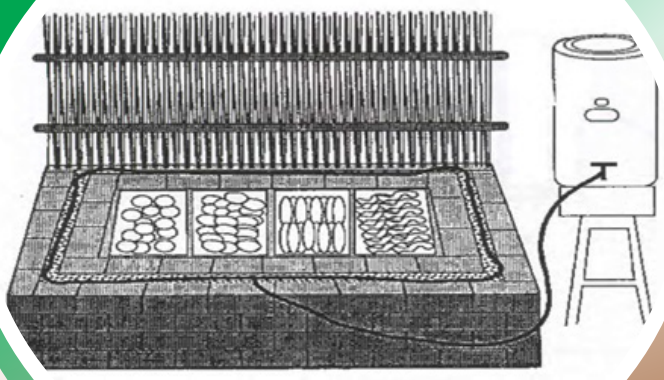
KALRO/NAVCDP Programme Factsheet No..../2024

Zero Energy Brick Cooler (ZEBC)

Technology: It is a low cost postharvest temperature management that improves the shelf-life of banana using less power. Its evaporative cooler works on the principle of cooling resulting from evaporation of water from the surface of porous materials such as sand or bricks. Hot dry air is drawn over the porous material. The water evaporates into the air using latent heat of evaporation, raising its humidity and at the same time reducing the temperature of the air within the chamber compared to the ambient (environment) temperature.



Materials for making a Zero Energy Brick Cooler

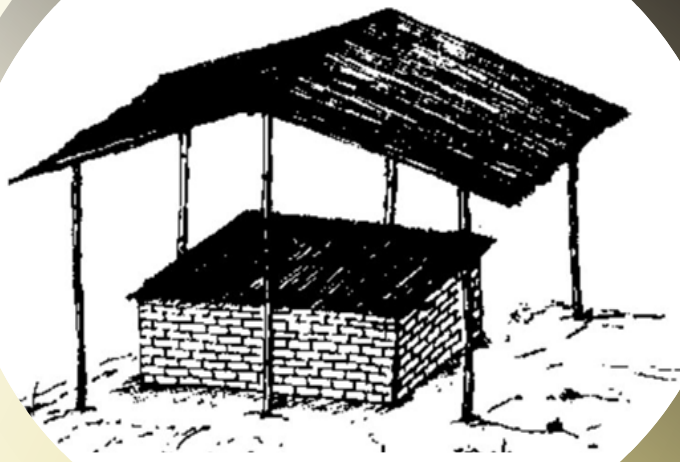
- Bricks and sand only (no cement required)
- Measuring tape
- Straw or grass
- Watering can
- Wooden frame (2m by 1.5m)
- Rope

Step by step procedure for making a Zero Energy brick cooler

Site preparation needs to be done before building a ZEBC. It important to make a ZEBC on a flat surface near a water source and preferably under a shade

1. Add a layer of sand and use a rake to level the sand.
2. Using a tape measure measure and mark the ground 2 m by 1.5 m. The size and capacity of the ZEBC depends do individual's demand for storage space.
3. Layout brick to make the chamber foundation on the measured area.

4. Erect a one meter double wall by overlapping the bricks. Start by building the inner wall which should have a gap of 8cm between the inner and outer wall.
5. Use a watering can to wet the wall of structure.
6. Fill the space between the inner and outer wall with wet sand
7. To make a simple cover top, make a wooden frame 2m by 1.5m and cover the frame with dry straws or grass. Use a rope to secure the straws in place. The cover goes ontop to keep the air inside the ZEBC cool.
8. Store your bananas in plastic crates or baskets and arrange the crates on top of each other.
9. Cover the top using a clear a plastic sheet or polythene paper. This helps extend the shelf-life of bananas.
10. In case the ZEBC is not built under a shade, then construct a shade to protect it from direct sunlight as shown in the figure below
11. Water the chamber twice daily in order to achieve the desired temperature.



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