

ZECC: Zero Energy Cooling Chamber for Vegetables

Cut Post-Harvest Losses for Vegetables

The Zero Energy Cooling Chamber (ZECC) is a brick chamber that cools through evaporation. It has double walls with sand in between, and the walls are kept wet for cooling. This chamber can reach temperatures between 10 and 15°C with about 95% humidity, which helps extend the shelf life of perishable crops.



World Vegetable Center

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Commodities

Vegetable crop

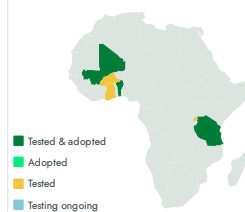
Sustainable Development Goals



Categories

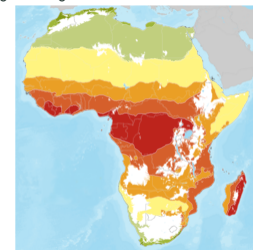
Prevention & storage, Equipment,
Conservation and Storage System

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Sellers



This technology is **pre-validated**.

9-8



Scaling readiness: idea maturity
9/9; level of use 8/9

Gender assessment

4

Climate impact

4

1

Problem

- **High Post-Harvest Losses:** Up to 50% of fruits and vegetables spoil before reaching consumers, causing food waste and income loss for farmers.
- **Reduced Availability of Nutrient-Dense Foods:** Post-harvest losses mean fewer fruits and vegetables for consumers, impacting their health and nutrition.
- **Limited Access to Cooling Technologies:** Many rural areas lack electricity and affordable cooling methods, making food preservation challenging.

Solution

- **Extends Shelf Life:** ZECC significantly extends the shelf life of vegetables (e.g., up to 8 more days for tomatoes, 11 days for peppers, 5 days for amaranth).
- **Environmentally Friendly:** ZECC is an eco-friendly storage solution that operates without electricity.
- **Low-Cost and Accessible:** ZECC offers an affordable and accessible cooling method, ideal for farmers in rural areas.

Key points to design your project

ZECC empowers women by boosting income and reducing labor, is climate-friendly by operating without electricity, and supports SDGs through improved food security, gender equality, and sustainable agriculture.

- **Initial Assessment:** Assess post-harvest practices and identify ZECC sites through field visits and farmer engagement. Requires transportation, survey tools, materials, and local experts.
- **Awareness and Training:** Conduct workshops and training on ZECC benefits and usage, distribute informational materials, and provide hands-on training. Needs training venues, materials, trainers, facilitators, and demo models.
- **Construction of ZECC:** Source local materials (bricks, sand, jute cloth, plastic crates), mobilize skilled labor, and involve farmers in construction. Requires materials, labor, and tools.
- **Monitoring and Evaluation:** Regularly visit to monitor ZECC use, collect data, and provide technical support. Needs monitoring tools, data forms, and transportation.
- **Scaling Up:** Expand ZECC to more farmers, facilitate knowledge sharing, and partner with cooperatives and NGOs. Requires additional materials, funds, and communication channels.
- **Reporting and Feedback:** Compile reports, gather farmer feedback, and plan for future improvements. Needs reporting templates, feedback tools, and a final review meeting.

Cost: \$\$\$ **400 USD**

a 2 cubic meter ZECC

10 – 15 degree celsius

temperature inside ZECC

95 %

humidity inside ZECC



Open source / open access



ZECC

<https://taat.africa/ncn>

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