

Providing Affordable Storage Solutions

HIGHLIGHTS

- Annual post-harvest food losses are as high as 30 percent of the total produce in Sub-Saharan Africa.
- Enterprises provide affordable post-harvest storage solutions, both on-farm and near transportation hubs.
- Innovations include centralized management information systems to help track real-time information on the multi-location holdings of customers and solar power in cold-storage solutions to save electricity and diesel costs.



Salahaldeen Nadir / World Bank

Development Challenge

In developing countries, significant post-harvest losses from farm to depot are caused due to financial and structural limitations in harvesting, storage, packing, and transportation. Further, challenges in institutional and regulatory frameworks, market mechanisms, and climatic conditions also contribute to food spoilage. A major drawback in agriculture supply chains in developing nations is limited access to a formalized cold-storage network, especially for smallholder farmers. Post-harvest losses have dire economic implications on farmers. When a kilogram of produce is wasted, losses accrue through the production process, including the cost of inputs such as land, seeds, fertilizers and pesticides as well as the effort the farmer puts into production. Lack of storage and warehousing facilities also impacts farmers' incomes as they are often compelled to sell their produce at very low prices to avoid losses due to spoilage.

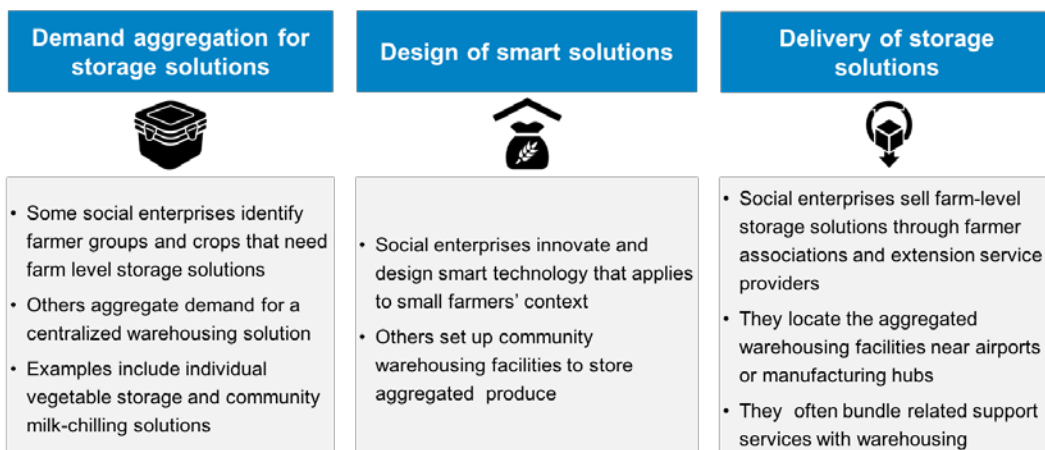
Business Model

Enterprises that reduce post-harvest losses offer storage solutions that are general as well as sector-specific. General storage solutions can be used for different types of agricultural produce, and comprise large facilities that farmers can lease as well as local storage that farmers can purchase and own. Specific solutions cater largely to the dairy sector for milk chilling. Enterprises providing storage solutions often cut through several levels of middlemen by procuring agricultural products directly from farmers on behalf of processors, traders and government bodies, thereby ensuring better prices to smallholder farmers. Some of them also provide extension services in the pre-harvest phase and/or market linkage and collateral management services in the post-harvest phase.

A number of these storage and warehousing solutions are powered by clean energy to cater to farmers in areas with limited or no grid connectivity. Enterprises innovate and develop renewable energy operated storage solutions. For instance, Wakati's storage solution can protect up to 200 kg of fresh produce without cooling, using a small solar panel.

Commercial and large-scale warehousing facilities either have a logistics wing that functions as a procurement agent, and collects fresh farm produce from agriculturists or have an aggregation center within the village cluster where farmers bring their produce. They are sold through retail distribution models as stand-alone products directly to farmers, and involve inventive use of technology to ensure the product is easy to use. Greenpath uses Coolbot, a cold storage product that enables small farmers to build their own cold storage using an air conditioner, as opposed to purchasing a refrigeration system.

Features of Storage Solutions Business Models



Implementation: Delivering Value to the Poor

Awareness

Enterprises adopt several mechanisms to spread awareness about the significance and long-term benefits of storing agricultural produce. Ergos and Tessol conduct outreach programs such as exhibitions, demonstrations, and roadshows to showcase their solutions. They also establish partnerships with educational institutions, government, and civil society organization for awareness building activities. Tessol works in association with ASHRAY and Ministry of Food Processing to spread awareness regarding cold chain application.

Acceptance

Storage enterprises have to break old habits of farmers and help them understand that modern storage solutions provide them an opportunity to reduce wastage and get better prices for their agricultural produce. For this, the enterprises bank on their local knowledge and contacts to build trust, and engage with smallholder farmers. To ensure adequate marketing and acceptance of its warehousing solutions, Ergos utilizes its local knowledge of the agricultural setting, and farmers' attitude. Similarly, to ensure effective business engagement and development of its on-farm cold storage solutions, Inspira Farms engages marketing executives who have local knowledge and understanding.

Accessibility

Enterprises such as Wakati and Promethean Power Systems engage with local farmer leaders and dealers for distribution. Ecozen reaches its customers through in-bound calls and face-to-face meetings, exhibitions, events, seminars and workshops; newspaper articles, and blogs. The enterprise is also in discussion with Farmer Producer Organizations, Farmer Producer Groups, micro-finance institutions, NGOs, and Energy Saving Companies to build the market and increase access to its storage solutions.

Affordability

Storage solution enterprises offer significant cost benefits to smallholder farmers, and price their services and products at nearly 35-50 percent lower rates, in comparison to mainstream competitors. A few enterprises have their own research and development teams that continuously innovate to make their storage solutions more affordable to the farmers. Ecozen is in discussion with several financial institutions and Corporate Social Responsibility departments of corporate firms to help facilitate loans to customers. Some enterprises leverage renewable energy technologies to provide affordable post-harvest storage solutions to smallholder farmers.

Post-harvest value addition companies, such as processors, packagers, and exporters, hesitate to deal directly with smallholder farmers. Instead, they establish contracts with the warehouse companies, who provide them the required agricultural output in the desired quality. The warehouses are often centrally located from a cluster of areas that lack local storage facilities, often close to transportation hubs. On-farm storage solution providers reach the customers mainly through village leaders or farmer co-operatives.

The primary sources of revenue for post-harvest storage solution providers include rental fees from warehousing services and sale of cold storage products and equipment. However, enterprises have innovative means of collecting their fees, in order to make it affordable for their customers. Enterprises such as Tessol include fees obtained from renting out cold storage products such as portable cold storage and walk-in cold rooms.

Enterprises depend on strategic partnerships to increase awareness, acceptance, accessibility and affordability of their products and services, thereby creating maximum impact on smallholder farmers. They partner with federal and state governments, financial institutions such as micro-finance institutions and banks, industry associations, and development finance institutions' programs such as JEEViKA by the World Bank that supports the Bihar Rural Livelihoods Project.

Results and Effectiveness

Although not many enterprises have conducted social and environmental impact assessment, most of them aim to reduce post-harvest losses by at least 20-25 percent. Ecozen's solution, for instance, provides direct benefits by preserving the quality of fruits and vegetables until market prices are attractive. It also offers indirect benefits such as savings on electricity bills and diesel costs, as it operates on solar energy.

Availability and reliability of solar cold storage increases the average incomes of agricultural enterprises such as exporters of fruits and vegetables, farmers' associations and large-scale farmers. Cold storage also stabilizes prices for fruits and vegetables across seasons. Inspira Farms creates at least 28-30 jobs in each of the rural agricultural communities, further increasing their avenues of income. As the direct customers of the enterprise include rural businesses and co-operatives such as dairies, horticulture companies and agri-export companies, it focuses is on the jobs created by these clients.

The larger enterprises, particularly those that have scaled significantly, focus on technological innovation to increase customer experience and improve operational efficiency. SLCM established a centralized management information system that provides real-time information on the multi-location holdings of customers. It has also devised its own Standard Operating Practices (SOP) that brings down wastage during storage.