Challenge

Post-harvest food losses
Global food production has reached a record high in recent years. Yet over one-third of all food produced for human consumption is lost or wasted, equivalent to 1.3 billion tons. Post-harvest food loss is a leading cause of food insecurity for millions of families across the world.

Achieving zero hunger by 2030 will require that no more food is lost or wasted. By preventing post-harvest losses in food systems, we can increase the availability of food worldwide without requiring additional resources or placing additional burden on the environment.

These losses are most significant in developing countries. Post-harvest losses have a significant nutritional, health, and financial impact for both consumers and farmers. They are disproportionately affecting women, who are largely responsible for managing post-harvest drying, cleaning, and storage. For rural families, many of whom already live on the edge of hunger, lost food means lost land, water, fertilizer and income.

Challenges of preventing food losses
As part of its efforts to support smallholder farmers and agricultural markets, the United Nations World Food Programme (WFP) is supporting developing countries’ efforts to reduce food losses throughout the value chain. Simple and affordable steps such as improving storage infrastructure, and sharing storage best practices can drastically reduce food losses and increase the availability of food on local and regional markets. This also means improved food security and increased resilience to shocks for smallholder farmers.

Solution

Through WFP’s five-year Purchase for Progress (P4P) pilot programme, WFP and partners began working on post-harvest loss reduction at the community level with over 166,000 smallholder farmers and traders across 20 countries, 43 percent of whom are women. This experience clearly identified post-harvest losses as one of the biggest challenges to food security for smallholder farmers and their families.
In response, in 2014 WFP launched an initiative in Uganda called “Zero Food Loss”, combining training & airtight storage to tackle one of Africa’s greatest challenges: high-levels of post-harvest loss caused by pests, diseases, poor handling, and ineffective storage.

As a result, post-harvest loss was reduced from 40 percent to less than 2 percent among participating farmers. By the end of 2016, over 115,000 households chose to participate in trainings and then purchase airtight storage, and the numbers continue to grow. Even more potential was shown when WFP’s Refugee and Safety Net Programmes leveraged the same technology and training, with tens of thousands of the most vulnerable also choosing to participate to reduce their post-harvest losses.

Under the “Zero Food Loss” initiative, this effective, scalable, and replicable model tested in Uganda continues to create demand from other countries. In response, WFP has set up its Global Post Harvest Knowledge & Operations Centre (KNOC) in Uganda, which is facilitating South-South knowledge sharing and exchange on post-harvest loss management.

18 developing countries have already visited Uganda to learn about the “Uganda Model”, with nine beginning their own rollouts of post-harvest loss national programmes.

Stakeholders and Partners

The major stakeholders of the initiative are smallholder farmers in all regions of Uganda, private sector manufacturers and distributors of airtight storage, and increasingly, the Government of Uganda. The Government seeks to expand the initiative to 2.5 million farming families by 2025.

Key supporting partners include USAID (funding); Massachusetts Institute of Technology (MIT) and Makerere University of Uganda (design, monitoring and evaluation); multiple NGO implementing partners, and, next to WFP, also FAO and IFAD as part of a Rome-based Agencies joint project on food loss.

Methodology

The Zero Food Loss Initiative builds on four stages:

- **Stage 1: Capacity development (farmer education).** One-day participatory training programmes are held in different regions throughout the country. Farmers receive training in post-harvest handling (harvesting, drying, threshing, on-farm storage).

- **Stage 2: New technology for farming equipment.** With heavy involvement of the private sector, a range of tested hermetic (airtight) storage equipment are made available for purchase, with over 90% of farmers choosing to purchase at the training workshops. The new equipment eliminates the need for chemical fumigants and enables storage until the next harvest (or beyond). Farmers pay for their storage, with subsidies used to bring initial price-points low enough to include all farmers – including refugees and farmers in WFP’s Safety Net programmes. Farmers choose to participate as consumers – they are not beneficiaries.

- **Stage 3: Field support (refresher training).** Refresher sessions are scheduled in sub-districts and villages of all the selected farming regions. Farmers with the same type of equipment gather to participate in on-farm demonstrations to ensure they

- **Stage 4: Evaluation and feedback.** Regular monitoring and evaluation of the initiative’s impact are conducted to ensure that it remains effective and relevant to farmers’ needs.

**Value chain approach:** eliminating post-harvest losses is not a technical problem – it is a supply chain challenge, and cannot be effectively addressed in isolation;

**Focus on scaling of proven technologies:** good answers to one of the biggest food security challenges already exist – but have not been scaled. Private sector involvement at earliest stage, with clear profit incentives has been a key success driver;

**Partnership and collaboration** with government, NGOs, UN agencies and the private sector;

**Capacity development of farmers:** through one-day training workshops.

**Innovation**

This is a very innovative initiative due to the combination of several success factors:

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- **Focus on scaling of proven technologies:** good answers to one of the biggest food security challenges already exist – but have not been scaled. Private sector involvement at earliest stage, with clear profit incentives has been a key success driver;

- **Partnership and collaboration** with government, NGOs, UN agencies and the private sector;

- **Capacity development of farmers:** through one-day training workshops.
have memorized the new techniques for post-harvest handling.

- **Stage 4: Monitoring and evaluation.** Surveys are carried out, with evaluation metrics developed in collaboration with MIT and Makerere University. The evaluation measures qualitative and quantitative post-harvest losses (outputs); however, the emphasis is on the outcomes and impacts on the smallholder farmer: food availability in the lean season, increase in income, and health and nutrition of the family. A key element of the evaluation is communication – not just to the donors or governments, but specifically to and for the smallholder farmer communities that will be next to participate.

### Effectiveness/Validation

**MIT’s comprehensive independent assessment** on Ugandan farmers participating in WFP’s Zero Food Loss initiative reported a significant improvement in income, food security, and socio-economic well-being (e.g., household health, daughters’ and sons’ education, women’s workload, women’s status in the community).

The evaluation identified the following achievements:

- **Post-harvest losses are reduced to less than 2%,** from as high as 40% prior to implementation (using traditional storage methods);
- **Increased food availability** at household level through a lean season – farmers are fully in control;
- **Increased income** of most farmers, who are able to pay off their investments within one harvest, and on average triple their incomes. The ability to store grain gives farmers the possibility to sell months after the harvest, when prices rise. One of the additional benefits: parents have money for school fees;
- **Improved health and nutrition** due to the prevention of aflatoxin contamination at harvest. Airtight storage also drastically decreases storage contamination;
- **Sustainability** of the programme through the inclusion of the private sector from the onset. Private companies play a major role in future, market-led, demand-driven expansion;
- **Protection of the environment** by introducing environmentally-friendly solutions that reduce the use of chemicals and promote the conservation of water.
- **Women empowerment** by reducing the time that women spend on finding food for their families. As a result, women have more time to pursue other income-generating activities.

### South-South Cooperation

The “Zero Food Loss Initiative” seeks to scale this effective, scalable, and replicable model across frontier markets in Africa, Asia and Latin America.

To meet the growing demand for post-harvest expertise, and with encouragement from the Ugandan Government, WFP set up its Global Post Harvest Knowledge & Operations Centre (KNOC) in Kampala, which is already facilitating South-South knowledge sharing and exchange.

Its activities are conducive to the South-South efforts of Uganda’s private sector to transfer innovative technology on silo management to other countries in the region (e.g. Zambia, Tanzania).

18 developing countries have already visited Uganda to learn about the “Uganda Model”. This includes field visits that involve meetings with participating farmers, sessions with Ugandan officials, training-of-trainers sessions, and knowledge sharing with hermetic silo manufacturers. Delegations
include government officials, WFP implementing staff, and metal artisans who bring back skills to their own countries. The next major visit in Kampala will be organized in Q4 2017.

Sustainability

- **Key areas**: creating non-dependency on price subsidization, engagement of governments, early involvement of the private sector, focus on female farmers, ongoing capacity development of farmers, design and operational effectiveness of the new equipment.
- **Markets** that recognize and reward improved grain quality will need to be continually developed and explored, including WFP and private sector buyers.
- **Private sector inclusion**: development of a hermetic storage supply chain, including local, high quality manufacture at scale, and rural distribution networks.

Replicability

Lessons learned in Uganda from the Zero Food Loss Initiative form the base for the expansion of the programme, which is already rolling out in Rwanda, Burundi, Tanzania, Zambia, Mozambique, Mali, Burkina Faso, Sudan and Jordan, with several other countries in Asia and Africa preparing to launch.

Uganda’s private sector manufacturers are also already exporting hermetic storage units to several countries. **Engagement of the local private sector** (manufacturers and distributors) in each country is key to the long term sustainability and of mainstreaming the approach, because they are a critical link in the supply chain to support the development of affordable and accessible technologies which respond directly to the farmers’ – and the market - needs.

Resources

To learn more about the Zero Food Loss Initiative and operations of the Uganda KNOC Centre, please refer to the following resources:

- The implementation report of WFP’s Zero Food Loss Initiative in Uganda.
- A video about Post-Harvest Loss produced by the ADM Institute for the Prevention of Postharvest Loss.
- A video on the MIT independent impact assessment on the Zero Food Loss initiative.
- A podcast on the Zero Food Loss Initiative and KNOC Centre.

Contact Person

For further information, please contact Brett Rierson (Head, WFP Global Post-Harvest Knowledge & Operations Centre, Uganda).

References

1 WFP, 2015. **ZERO LOSS FOR ZERO HUNGER: WFP’s Work to Prevent Post-Harvest Food Losses**