

Maize Matters – the Story of YieldWise in Tanzania



Tanzania

In late 2014 and early 2015, farmers in Tanzania experienced the joy of a bumper maize harvest. Everywhere across the vast country, granaries were full. The bounty was welcome, but with so much produce came an unfortunate aftermath: farmers struggled to find market for their grain, and in turn to store what they could not sell. Limited markets and inefficient preservation techniques meant that a huge percentage of the bountiful production ended up spoilt.

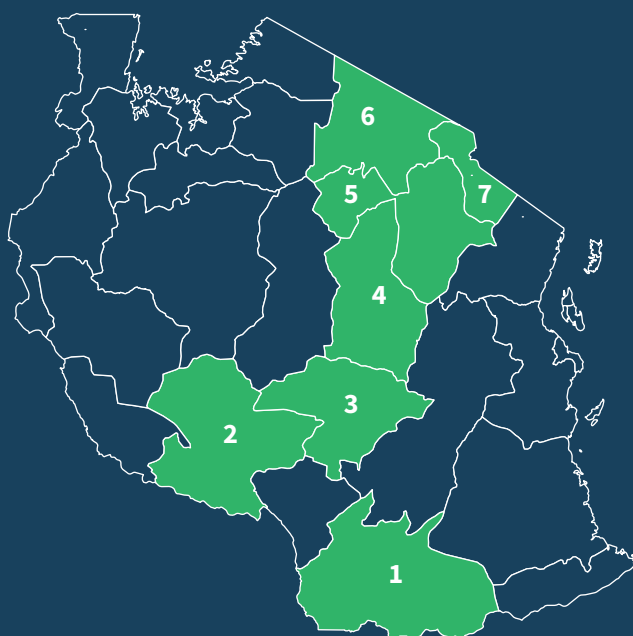
The following year – 2016 – Rockefeller Foundation launched its YieldWise Initiative to address post-harvest loss in Africa. Targeting four value chains – mango, cassava, tomato and maize – in Kenya, Nigeria and Tanzania, the initiative sought to find ways to reduce loss of fruits, vegetables and staple crops, and to increase incomes of small-holder farmers on the continent. The initiative was to run until December 2019.

Food loss impacts food security and food production across the world, with 30 per cent of all food produced for human consumption being lost before it reaches consumers, and 40 per cent of that which does reach them going to waste. In Africa and other developing regions, more than 40 per cent of fruits and vegetables

spoil before they can be consumed, reducing the incomes of small-holder farmers by 15 per cent. In the case of maize, it is estimated that 30% of produce is lost between farm and table.

Based on Tanzania's experience following its bumper harvest, Rockefeller partnered with the Alliance for a Green Revolution in Africa (AGRA) with the aim of reducing post-harvest loss of maize by at least 50% and increasing incomes of small-holder farmers by 25% in the country. The initiative focused on the Ruvuma, Mbeya and Iringa regions in the Southern Zone; Dodoma in Central; and Manyara, Arusha and Kilimanjaro in the North.

AGRA was already working along the maize value chain and had, in fact, been partially responsible, together with other players, for the increased productivity that had led to the bumper yield. Under the Partnership for Inclusive Agricultural Transformation in Africa (PIATA), AGRA was working with other partners in 11 countries on the continent to increase incomes and improve food security for farm households. The partnership had a market component managed by AGRA, and to this the YieldWise Initiative added the mitigation of post-harvest loss of maize.



Rockefeller Foundation - Alliance for a Green Revolution in Africa (AGRA) targeted 7 regions in Tanzania.

1. Ruvuma
2. Mbeya
3. Iringa
4. Dodoma
5. Manyara
6. Arusha
7. Kilimanjaro



The goal of the partnership is to reduce post-harvest loss of maize by at least 50% and increase incomes of small-holder farmers by 25% in the country.

The YieldWise model had five components: building market demand and linkages; farmer aggregation and training; increasing access to finance; increasing access to post-harvest loss technologies and practices; and prioritization of loss prevention and knowledge management. This was to be achieved through training 100,000 farmers on new technologies and good agricultural practices in an effort to increase production

of quality maize and reduce loss; linking these farmers to reliable markets; and facilitating access to formal and informal financing.

To streamline management of the multiple players implementing the program in Tanzania, AGRA signed an agreement with the Center for Sustainable Development Initiatives (CSDI) as lead partner to coordinate activities of

Goals



50% of those trained to be women and youth

Yieldwise Model



Building market demand and linkages



Farmer aggregation and training



Increasing access to finance



Increasing access to post-harvest loss technologies and practices



Prioritization of loss prevention and knowledge management

Under Center for Sustainable Development Initiatives (CSDI) RUDI (Rural Urban Development Initiatives) and Briten (Building Rural Incomes Through Entrepreneurship) trained farmers

Results



Close to 200,000 farmers were trained



50% reduction in post-harvest loss



Joseph Moshi tends his maize crop in Shirimgungani village, Moshi.

two other grassroots organisations – RUDI (Rural Urban Development Initiatives) and Briten (Building Rural Incomes Through Entrepreneurship). CSDI was responsible for the market access component – working with small- and medium-scale enterprises to invest in buying maize from small-holder farmers, working with technology manufacturers and agro-dealers, and facilitating linkages with financial institutions.

“YieldWise reached 200,000 farmers with training on modern production and preservation methods.”

RUDI and Briten were charged with outreach activities in the north and south of the country respectively, including training of farmers in good agricultural practices and post-harvest loss management, aggregation of farmers, and linking them to markets for produce that was not absorbed by the contract buyers. The goal was to have at least 50% of those they worked with be women and youth. The training component was expanded in 2018 to include 3,000 Village-Based Advisors, who were lead farmers trained to pass on knowledge and skills to others in quality maize production and effective post-harvest techniques to prevent loss. **In the end, close to 200,000 farmers were trained.** In addition, 214 farmer

organizations received digital weighing scales, tarpaulins and moisture meters. Buyers were also trained to demonstrate to farmers the use of post-harvest loss technologies when buying maize from them at aggregation centers.

In 2015, AGRA partnered with the World Food Programme, Syngenta, Yara, Bayer and Rabobank in a coalition called the Farm-to-Market Alliance that was committed to making markets work for farmers in Tanzania. The Alliance helped farmers to access bank loans to purchase quality farm inputs on the strength of Forward Delivery Contracts signed with buyers before the maize season began, with the former committing to buy the latter's crop once harvested. The bank would deduct the loan amount once the buyer deposited the payment in the farmer's account.

The programme had mixed outcomes. In 2017, it was a great success, and the Alliance was able to facilitate loans of over US\$1.3 million, with a 99% repayment rate. But things did not go so well in 2018, when maize prices fell as a result of a combination of factors – a glut the year before, low production per hectare, influx of cheaper high-quality imports from Zambia, and competition from Uganda for Tanzania's regional export market. Although buyers had already signed off-taker agreements with the farmers to purchase maize at a set minimum price per kilo, many off-takers refused to honour the

predetermined prices, which were twice as much or more than those prevailing in the market. So, while the contract price was about Tsh45,000 (US\$19.4) per kilogram, the market was paying Tsh18,000 (US\$7.8). On the other hand, with loans to repay, the farmers would not accept the lower prices and held on to their produce in the hope of getting better prices.

Eventually, out of 16,000 metric tons that they had committed to absorb, off-takers bought half the amount with support from AGRA, which gave a 20% top-up on market price to help bail the farmers out. But there were losses all around: farmers harvested just five to six bags per hectare compared with the usual 20-25 bags and to make matters worse, were unable to get premium prices for what they harvested. As a result, many farmers were not able to repay their loans, putting the banks in a precarious position as they could not pay the input companies that had supplied products on credit. The program had been implemented with the two biggest banks in Tanzania, National Microfinance Bank and CRDB Bank, but the experience caused the financial institutions to develop cold feet, and the following season (2019), they were no longer willing to give loans to the farmers.

The YieldWise Initiative built on AGRA's investment and learnings, especially in the Farm-to-Market Alliance. AGRA used this experience to inform the design and execution of YieldWise in Tanzania. An important lesson drawn from AGRA's previous experience was that, when structuring contracts between farmers and anchor buyers, the possibility of prices favouring either the farmer or the

buyer should be factored in. It was therefore essential that the buyers and farmers enter into flexible contracts that allowed for negotiations in such contexts.

Recognizing that prices could move either way, AGRA revised the agreements in conjunction with the Tanzania Agricultural Development Bank (TADB), committing the farmers to producing and selling more volumes so that they could service their loans even if prices were low. With this arrangement in place, 2,000 farmers in Ruvuma, a leading region in maize production, received loans worth US\$30 million in 2019.

While the loans served their purpose – to boost the capacity of farmers to procure inputs for high quality maize production anchored on the security of a ready market – there were still some gaps. Buyers, too, required financial support to purchase maize and links to expanded markets for the larger volumes. They pointed out that the success of the agreements was largely dependent on them as they were the link between the farmers and the consumers, and they had the burden of buying, cleaning, weighing and sorting the maize before selling it. Consequently, YieldWise widened its focus and support to include private sector players, including off-takers, many of whom were also processors. And in order for SMEs to buy more maize, YieldWise designed a product with the TADB to support purchase of large volumes of maize, milling machines that could process 30 metric tons daily, and storage silos for up to 500 metric tons.



Lucy Yona, left, plans to process up to 30 tons of maize daily at her mill in Njombe once her new mill, above, is fully installed.

One of the beneficiaries of this package was Lucy Yoni Kitavite, the Managing Director of Mama Seki Group, a medium-sized milling operation based in Iringa. Lucy set up the plant in 2005, after having been in the maize farming and trading business for 15 years. She began by husking maize, and then went into milling in a rented space with a borrowed piece of equipment. In 2012, she bought a piece of land in the Njombe area, where her factory now stands, and gradually increased her milling capacity to seven metric tons a day.

In 2018, AGRA linked Lucy up with TADB, and she was able to get a loan to boost her working capital and to install a larger processing plant with a capacity of 30 metric tons daily. From working with 65 farmers before the loan, Lucy was able to increase the number of farmers supplying her plant to 265, to whom she paid Tsh 344.25 million (US\$148,742) in 2019. The supply volumes and incomes of the farmers are expected to rise substantially once the new plant is in place. There was a hurdle in the installation as it took longer than expected due to delayed importation of parts, forcing the bank to revise the loan payment plan. Nevertheless, it was expected that once the plant was fully operational, it would enable Lucy to repay her loan as she expanded her business.

The loan facility operates on a 30% matching grant model, where the borrower pays back 70% while the rest is paid by Yieldwise. By February 2020, only Lucy and one other processor had applied for the facility.

With the injection of working capital, Lucy was able to increase the volume of maize she bought from area farmers. She signed contracts with 53 farmers' groups, and to ensure that they keep producing high-quality grain, she educates them on good crop husbandry, how to prevent aflatoxin contamination and how best to store their maize. She supplies them with fertilizer and seed on credit, and recovers the cost once they deliver maize to her. Lucy has also built two godowns where the farmers can store their maize safely if they do not have the capacity to do so on their farms.

While Lucy was excited about the new, bigger mill, she was anxious about how and where she would market her increased production. The Mama Seki brand has outlets in five towns in Tanzania and Lucy had been working hard to get more. She was concerned about storage, too. She used to buy 2,000 metric tons of maize but would now need to buy up to 10,000 to keep her mill running at a profitable capacity. To accommodate the increasing volumes of maize, she had to store it in temporary wooden shelters that were not optimal for preservation of the grain. The challenge in accommodating the increasing volumes of maize presents an opportunity for provision by other players in increasing capacity and types of modern storage.

As part of the YieldWise Initiative, AGRA facilitated loans through the TADB to farmer organizations for acquisition of items to prevent post-harvest loss, including tarpaulins



New technology: Joseph Moshi and his wife pour maize into a hermetic bag for storage after drying the grain on a tarpaulin that he hired from Shirimbungani Cooperative Society.



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for threshing and drying and hermetic bags for storing maize to ensure it is protected from pests and moisture. Through the bank, technical assistance was also provided to guide the farmers on the capacity of storage they needed.

One of the assumptions made by the YieldWise Initiative was that making hermetic bags and silos accessible to farmers through a bank credit facility would encourage their uptake. Yet, while farmers were trained on the benefits of these technologies and encouraged to use them, many found the silos unaffordable. Nevertheless, 150,000 hermetic bags were sold, mainly for domestic use, and tarpaulins for drying the grain was widely adopted as farmer organizations purchased the sheets and rented them to members for a small fee. Citing the seemingly high cost of the hermetic bags but also aware of their benefits, farmers bought a few bags for domestic use, while grain destined for the market was preserved using pesticides. Thus, while rural households are benefiting from pesticide-free maize, their consumers are not.

AGRA further placed money in Equity Bank and Tanzania Postal Bank (TPB) for a revolving fund through which agro-dealers could access loans for buying and stocking tarpaulins, hermetic bags and silos in a bid to make them easily accessible to farmers. YieldWise connected over

400 agro-dealers to the two banks. **The total value of finance accessed from the three partner banks was US\$766,202.**

YieldWise promoted the use of tarpaulins, hermetic bags and silos made by several companies. The outlets worked with RUDI to provide extension services by training farmers and publicizing the products at the grassroots. Hermetic bags are made to protect the grain that is stored in them for up to two years, keeping it free of pests and moisture. They have a special plastic lining that is impenetrable to insects or disease-carrying germ and keeps the contents dry. Julius Nyabicha, marketing manager of A-Z, a 50-year-old manufacturer based in Arusha, is aware that farmers consider the cost of the hermetic technology to be high, but he points out that, compared with ordinary bags, which cost Tsh2,000 (US\$0.86), the hermetic ones, retailing at Tsh5,000 (US\$2.16), are in the end a lot cheaper. This is because the hermetic bags are reusable for three seasons, while the ordinary ones can only be used once; no pesticides are needed with the hermetic bags, resulting in overall savings; and there are enormous health benefits of using them as no pesticides are used on the grain. Once farmers understood this, shares Julius, they are more open to buying the bags, but sales also depend on how well the crop has done in a particular year. If poorly, then sales are low, and vice-versa.



In the bag: Maize is one of the most important crops for food security in Tanzania.

A-Z and AGRA have also been trying to get the Government of Tanzania to rescind VAT on the hermetic bags, which would make them much more affordable. As part of its advocacy activities, in 2019 AGRA commissioned an economic study to assess the impact of removal of the 18% VAT charged on hermetic storage materials and found out that it would have far-reaching effects on the economy and the incomes of farmers. The gains accrued to farmers from using hermetic bags outweigh the cost of the bags and the extra costs associated with adoption of the bags. Removal of tax would increase demand for the bags by one-and-a-half times and would increase the total net benefit to the society by US\$10.9 million (Tsh25.6 Billion) per season. AGRA presented the results to 25 Members of Parliament in June 2019 and again in March 2020. Key recommendations from the study were made to the fiscal committee in April 2020 and will hopefully be factored into the national budget.

Another policy issue is that of counterfeits, which are now flooding the market at cheaper prices than the real ones, and yet are not as effective. A-Z is pushing for harmonization of standards across East Africa, which will help to get rid of counterfeits in the region and protect farmers from being taken advantage of by unscrupulous dealers.

While the business partnership between A-Z and YieldWise has been mostly successful, A-Z suggest that,

for better outcomes in private-public partnerships, commercial partners be consulted on project design and involved in regular strategic meetings so that initiatives such as this can benefit fully from what they and other stakeholders have to offer regarding real-time market dynamics.

Indeed, stakeholder involvement and partnerships have been critical to development of agriculture in Tanzania in general.

“Agriculture is the backbone of Tanzania’s economy. Maize matters, because it is the most important crop in ensuring food security.” observes Mr. David Lekei, the Agricultural, Irrigation and Co-operative Officer in Hai District, Kilimanjaro Region.

While this is so, competing priorities mean that the government has not been able to support agriculture extension services. A positive, unexpected outcome of YieldWise, therefore, was the strengthening of extension services in areas where the initiative was implemented.



Inset. David Lekei

Mr. Lekei adds: “Government agricultural officers and extension workers received extensive training from YieldWise, gaining knowledge and skills on new ways of growing, harvesting, drying and storing maize to increase production and reduce loss. The training empowered them to continue training farmers and equipped them with reference material that they will continue to use beyond the lifespan and implementation areas of YieldWise.”

Partnership with government is critical to the sustainability of the work initiated by YieldWise. In 2019, the Initiative supported the Agricultural Non-State Actors Forum, the Economic and Social Research Foundation and other industry stakeholders to develop an implementation plan for Tanzania’s Post-Harvest Management Strategy. The support included printing of 2,000 copies of the Implementation Plan, 2,000 copies of an English version and 10,000 copies of a simplified popular Swahili version. YieldWise team members participated in the official launch of the Strategy, officiated by Vice-President Hon. Samia Suluhu Hassan in August 2019.

Although YieldWise has ended, AGRA has mainstreamed the model into its Partnership for Inclusive Agricultural Transformation in Africa (PIATA) portfolio, enabling the

approach and design to reach farmers in 11 countries in Africa with the lessons gained through YieldWise. AGRA is planning to scale the model to other African countries where it works.



Rockefeller Foundation YieldWise initiative was launched in 2016 with the goal of reducing post-harvest loss in select countries and value chains by up to 50 percent. More than 40 percent of fruits and vegetables in developing regions spoil before they can be consumed.

Using a multi-pronged strategy, YieldWise sought to improve millions of rural lives by increasing incomes, increasing the availability of food and protecting finite environmental resources.

The initiative targeted tomato and cassava production in Nigeria, mangoes in Kenya and maize in Tanzania.

YieldWise Initiative in the maize value chain in Tanzania was coordinated by the Alliance for a Green Revolution in Africa (AGRA).