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Less hunger, better health and more wealth: the benefits of knowledge sharing in Malawi's Orange-Fleshed Sweet Potato project

Agricultural researchers, NGOs and farmers in Malawi have pooled their knowledge and resources to develop and distribute new vitamin-enriched and drought-resistant sweet potato varieties, and to devise and promote new commercial activities that will help its spread.

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Overview

Hunger and malnutrition are common in Malawi, and the challenges are compounded by a changing climate that hampers agricultural production, in turn aggravating health and socioeconomic problems. In 2009, vitamin A deficiency affected nearly a quarter of infants aged 6 to 36 months. Vitamin A deficiency restricts growth, weakens immunity and eyesight and contributes to high childhood mortality. High though Malawi's 2009 figure was, it had fallen substantially from 60 per cent in 2001, partly due to government interventions to subsidise fertilisers for crops and to distribute vitamin supplements through health facilities.

But although these interventions have had some success, they depend on continued inputs and sustained government strategies. By contrast, promoting the vitamin A-rich orange-fleshed sweet potato (OFSP) offers a route that both taps and supplements an existing resource: local knowledge.

Growing sweet potato requires few inputs compared with other crops and relatively little labour, and it is traditionally a woman's crop. As women are the main care givers for young children, and together with those children are also the group most vulnerable to vitamin A deficiency, OFSP is a particularly appropriate intervention.

The project, which is funded by Irish Aid, is run by the International Potato Centre (CIP) in partnership with Malawi's national sweet potato programme and three NGOs – Concern Universal (in Dedza, Phalombe and Mulanje districts), the Millennium Villages Project (in Zomba district) and the Catholic Development Commission (CADECOM - Chikwawa district).

By 2012, the UN Food and Agriculture Organization (FAO), the Farmers Union of Malawi, Malawi's Wellness and Agriculture for Life Advancement (WALA) programme, and farmers' clubs in Salima District were all expressing interest in formally joining the OFSP project, taking the project's coverage to 15 districts in northern, central and southern Malawi.

Interventions and impacts

Sweet potato is already widely grown in Malawi. It is the third-most common food crop after maize and cassava, and it can produce more calories per unit of land than either of those, giving it great potential to tackle hunger. The whole sweet potato plant can be eaten, including the leaves, which for a green vegetable provide a useful source of protein (four per cent) during the 'lean months'. In short, nothing is thrown away.

But while all sweet potatoes are a good source of energy and vitamins C, E, K (and several B vitamins),

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most of the white-fleshed varieties, and even the commonly grown yellow-fleshed 'Kenya' variety, have no significant levels of vitamin A.

To redress this lack, the International Potato Centre has been working with the Malawi Ministry of Agriculture and Food Security (MoAFS), the Department of Agriculture Research Services (DARS), the Department of Agriculture Extension Services, NGOs and local communities to develop, cultivate and distribute new vitamin A-rich and climate-appropriate sweet potato varieties. These varieties are drought-resistant and can be grown throughout the year, meaning two harvests are often possible.

The ultimate aim is to cut hunger and improve nutrition, especially by increasing vitamin A intake among mothers and young children. Just 100g of OFSP a day meets the vitamin A needs of young children. The project aims to reach at least 70,000 rural households with young children.

Planting material. The project's start point is a variety named Zondeni, developed in 2008, and the initial phase was to multiply this and closely related varieties, often identified in collaboration with farmers who report what performs best in on-farm conditions. Thus CIP's expertise is combining with local knowledge to develop high-quality, disease-free planting material.

The project has so far released five new varieties of OFSP. Each initial stock is created at the Department of Agriculture Research Services' Bvumbwe Research Station (with support from CIP). Then knowledge on

how to propagate the variety is itself propagated out via secondary 'vine multiplication sites'. The project's NGO partners and government agricultural extension workers recruit lead farmers from farmers clubs. Once trained in planting techniques and improved production of the OFSP at the secondary sites, the farmers then cascade the information to further 'tertiary' vine multiplication sites.

Overall, more than 4,000 agricultural extension workers and lead farmers have been trained on vine multiplication, production, pest and disease management, and drip irrigation. The training has also widely shared other local knowledge, for example traditional techniques such as covering roots with sand to control sprouting and keeping tubers in the dark to extend storage times.

Building demand. A second and linked knowledge strand has been to build awareness of, and demand for, OFSP's benefits and uses. For example, the project supported a series of nine radio programmes promoting OFSP. The programmes went out over a nine-week period and were timed for broadcast when many women would be home and listening to the radio. OFSP has also been promoted in a song sung by village women at field and demonstration days and through dramas.

And the programme has shared knowledge on preparation techniques, for example drying OFSP or turning it into flour that can be sold. To complement this aspect, project partners worked with Universal Industries in developing a biscuit – and hence

Box 1. Fighting malnutrition and hunger: Martha's story

Martha Shaganti lives in Biyasoni, a village in Chikwawa district, where malnutrition is prevalent, especially among the under-fives, pregnant women and lactating mothers.

In the 2011-12 planting season Martha, who was pregnant at the time, received a voucher for 4kg of micronutrient-rich orange-fleshed sweet potato (OFSP) vines, distributed by the International Potato Centre and CADECOM. CADECOM also organised training to help women turn OFSP into nutritious and saleable products like juice, doughnuts and flour.

That year, despite losing part of her field to floods, Martha's family managed to harvest 6 bags of roots, selling 1.5 bags and sharing the rest with relatives and friends in the village.

Martha says, "My one year old son was underweight at first and got sick often. I clearly saw a big improvement in health when I started feeding him the products prepared from OFSP. His health card at the clinic testified such an improvement. Every mother in our community has observed that the products are appetising to children.

"OFSP also gives us adults adequate energy compared to other food stuffs. I had no problems with carrying it to the market as other members of the village bought from me right from my home. We have increased our land this year and we will even rent more land to increase products because of its multiple benefits."

Young children, pregnant women and breastfeeding mothers have the most to gain from the vitamin A in orange-fleshed sweet potato



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a commercial demand for smallholders' surplus OFSP products. Farmers can now sell all their excess and around 20 per cent of households who grow OFSPs are expected to earn at least US\$100 per year from OFSP sales.

Promoting health. Further, the project has worked with government and NGO health workers, training 'master trainers' who then pass their training on to many more field-level health workers. The training promoted the value of OFSP and provided health advisors with communication aids like seasonal recipe ideas and targeted messages that will help women get the best nutrition for their children from OFSP – for example by mixing it with other foods.

Local knowledge on food preservation. Sweet

potato farmers in some parts of Malawi store their harvested roots in a pit, covering them layer by layer with ash or dry sand, to keep them for the dry season when food is scarce. Stored OFSP roots from the Zonden cultivar can be kept for up to seven months this way and researchers have confirmed that they keep their vitamin value too. So this local knowledge has been promoted more widely through the project's training activities.

Reaching women. To ensure access to planting material, and partly to help ensure women can choose OFSP without needing control over household finances, the project has issued vouchers to smallholders. These are traded for planting materials from vine multiplication sites, and the smallholders running the sites redeem vouchers for

Box 2. Women and the OFSP project

Gender roles are quite strictly defined in Malawi, although there are significant differences between matriarchal and patriarchal communities in different parts of the country. Men generally dominate household decision making, and control household assets and the profits from produce sales. For example, women farmers in Chikwawa report that 'men get the lion's share' of income generated through sales of vines and OFSP products, even though sweet potato is seen as a 'women's crop'.

These culturally defined roles have made it hard to involve women in the OFSP project, despite the fact that they are the main intended beneficiaries: pregnant women, lactating mothers, and young children (who are cared for and fed primarily by women) are most at risk of vitamin A deficiency. For example, at a recent CADECOM training event only one out of 20 farmers was a woman. Disproportionally high illiteracy rates among women in Malawi add a further challenge, particularly when it comes to involvement in formal schemes. However, the project has aimed to recruit both men and women head of households from the very start. This focus, and strategies such as using vouchers rather than cash to subsidise planting material, has paid off. In 2011-12, 63 per cent of the 24,000 farmers supported through the voucher scheme were women. And overall, of the more than 4,000 agricultural extension workers and lead farmers trained by the project, 43 per cent are women.

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cash from the project. After four years, the project hopes to have given vouchers to 70,000 farming households.

The recruitment strategy for trainers also aims to involve both men and women head of households from the start. In some cases OFSP has helped women's economic empowerment in other ways, as women start to sell the food products themselves, including juice, scones, cakes, fritters and chips.

Main achievements and challenges

This project has become an integral part of Malawi's Agricultural Sector Wide Approach Programme, which is seeking to reduce smallholder farmers' vulnerability to climate change by diversifying and intensifying crop production and improving land and water management. It has encouraged smallholder farmers to use OFSP alongside maize, beans, pigeon pea, cotton, sorghum, cassava and Irish potato; sometimes intercropping to reduce pest infestations and because the roots and leaves can help reduce soil erosion and also conserve soil water.

The project has contributed to Malawi's nutrition action plans and has been widely adopted within the Scaling Up Nutrition (SUN) 1,000 Special Days Initiative (which concentrates on nutrition during the first 1,000 days of life, from conception to age two).

During its first year, the project produced 196,000kg of OFSP vines, but by 2011 that had risen to 650,000kg. In some areas yields have increased from 6 to 18 tonnes per hectare.

A recent assessment confirmed that OFSP varieties have become popular among households, bringing improved food availability and extending food supplies further into the 'lean' months. Households are now also more articulate on the nutrition benefits and presence of vitamin A, B and C in OFSP.

The biggest challenge has been how to set up and manage a system for multiplying and distributing the improved sweet potato vines, particularly given that

the propagated material is perishable. Establishing secondary and tertiary vine multiplication sites away from the Bvumbwe Research Station and closer to farming communities has helped.

Other challenges have included how best to 'spread the word' about OFSP given high levels of illiteracy among Malawians, particularly women, but this has been partially tackled with diverse and creative outreach activities and the 'train a trainer' approach taken to knowledge sharing.

Lessons

Strong partnerships can share knowledge 'vertically', feeding research and farmers' local knowledge into national strategies. Here, scientific research complemented by local experience and partnerships with NGOs successfully demonstrated a role for OFSP as a strong component of Malawi's food security strategies. And OFSP's influence is reaching even higher as the project's outcomes are shared at a global level through CIP and the CGIAR consortium.

But support is also needed to spread knowledge 'laterally' - between farmers, health workers and whole communities. Developing good OFSP varieties was not enough on its own. Success depended on 'spreading the news' through creative channels including radio, drama and recipes; and by providing commercial opportunities that appealed to smallholders.

The partnership approach has been a crucial catalyst for success. In Malawi the CIP, the MoAFS, NGOs and community groups have addressed and started to solve one of the key challenges for expanding OFSP production: how to develop and manage a vine multiplication system. These partners report that ongoing consultation and sharing skills with each other and with communities has been a rewarding experience. Project partnerships have also scaled up interventions from five to eight districts, and have drawn in many stakeholders from NGOs, government (especially the Department of Nutrition, HIV and Aids, which is a 'focal point' for coordinating nutrition projects in Malawi) and the private sector.

Further reading

Find more information about the project at the sweet potato knowledge portal www.sweetpotatoknowledge.org, including interim reports on the Rooting out Hunger in Malawi with Nutritious Orange-Fleshed Sweet Potato project (<http://sweetpotatoknowledge.org/projects-initiatives/sweetpotato-for-profit-and-health-initiative-sphi/rooting-out-hunger-in-malawi-with-ofsp>)



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