

Fighting food insecurity in southern Africa

Kirsty Tuxford highlights the innovations that are helping farmers adapt to the threats from climate and pests in the SADC region



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Farmers Radio has been an effective way to assist farmers in sub-Saharan Africa and to educate people with nutritional messages

In 2016, a lack of rain in southern Africa delayed the planting season by two months. Planted areas shrunk, crops wilted and food production in the region was down 25 percent, according to a report by the World Food Programme.

By 2050, the world will be home to an estimated 9.1 billion people, and the UN's Food and Agriculture Organisation says that the agricultural sector will need to grow by 70 percent to satisfy global demand.

This is a particularly grim challenge for Africa, where 95 percent of farming is rain-fed, and crops depend on the weather, yet millions of farmers are not informed about how climate change is affecting their crops, which leaves them unable to adapt their farming practices to be sustainable for the long term. This has created a need for technologies, which can provide a leap forward to not only sustain communities and livelihoods but to alleviate poverty despite the threats from climate change.

Plant clinics

The Centre for Agriculture and Biosciences International (CABI)

launched its Plantwise initiative six years ago and builds on existing agricultural extension or advisory services, where a 'plant doctor', usually employed by the ministry of agriculture, is responsible for giving help and advice to up to 3,000 or more farmers through plant clinics where farmers bring their suffering specimens.

In the SADC region, clinics are held in Malawi, Mozambique, Tanzania and Zambia, but Plantwise also operates across Africa and globally. Plantwise has enabled the 'plant doctors' to be more effective by providing training and computer tablets with access to a huge shared database of information—the Plantwise Knowledge Base. And now, it's not even necessary for the tablet to be online, as relevant information can be downloaded prior to the plant clinic, which may be held in a remote area.

"In developing countries, because of literacy issues and lack of access to technology for farmers, we make sure it's the plant doctors who are the multipliers, because with one plant doctor you can potentially reach more than 2,000 farmers," says

Dr Washington Otieno, executive director of the Plantwise Programme Executive at CABI. "They are our primary target because we know that they are trained and they are literate. They access information for the farmers and at the same time they also collect information about the farmers. The benefits happen on two levels: individual farmers get information on how to reduce their crop losses, and we are also collecting data on a macro level – about all the farmers in the region, and what that allows us to do is track outbreaks of pests."

The previous system used pen and paper, so data collection took so long – around 100 days – that the data was stale by the time it was processed, but the new app developed by Plantwise allows data to be gathered and uploaded on the spot—which means that farmers have the chance to treat problems and anticipate threats much more quickly.

The Plantwise model functions thanks to partnerships, donor money and a sustainable strategy.

"You can solve whatever you want by throwing money at it but that's not sustainable," says Dr Otieno. "There will be change, but the second the money stops, usually the activities, benefits and impacts stop. We think about sustainability, we build a partnership model where we work very closely with stakeholders in what we call a plant health system—everyone who works in agriculture—the ministry of agriculture, private sector, academia, farmer representations etc. If we were to pull out tomorrow, there are a number of countries where the activities would continue—they are completely self-sustaining.

CABI initially went in and trained the plant doctors itself but now has moved to a model where it only trains the trainers so it can



Growing movement to share data

Global Open Data for Agriculture and Nutrition (GODAN) is a rapidly growing group, currently with over 568 partners from national governments, non-governmental, international and private sector organisations that support the sharing of open data to make information about agriculture and nutrition available, accessible and usable to deal with the urgent challenge of ensuring world food security. The GODAN Secretariat has an estimated five-year budget of approximately US\$8.5 million. There is no fee to join and the organisation is supported by several donors. GODAN hosts e-forum discussions on topics such as ICTs and Open Data in Agriculture and Nutrition, and also hosts webinars and e-learning programmes. "Our partners have stressed the importance of access to reliable nutrition data, which is now seen as an integral part of the global food security agenda," writes GODAN Executive Director, André Laperriere, in GODAN's *Success Stories Issue 2* report.

Another knowledge-sharing platform, e-Agriculture, is a global Community of Practice, where 12,000 members from 170 countries exchange information, ideas, and resources related to the use of information and communication technologies (ICT) for sustainable agriculture and rural development.



Digital Green has helped farmers learn new techniques leading to an increase in yields by using local farmers to make community videos for others to benefit from

build capacity and make the model sustainable.

The set-up costs for the Knowledge Bank were around £1 million a year, and have since been reduced to around £600,000 a year. The budget for Plantwise operations specifically in Africa is not available, but the overall annual operating budget for the Plantwise project is around £8 million.

‘In-kind’ contributions from partners play a hugely important role, with more than 200 partners contributing in a variety of ways including paying the salaries of the 6,000 plant doctors. Dow Agri-science is also helping to fund the tablets.

So far, the Plantwise initiative has reached 7.4 million farmers in Africa and having just announced

its merger with the research content platform SciDev.Net, CABI believes it can greatly extend its reach and improve the way research is shared.

Sound and vision

Innovations to assist farmers don’t have to rely on the latest mobile phone technology. Canadian non-profit organisation, Farm Radio International, utilises what rural Africans are all very familiar with—the radio—to broadcast messages about best farming practices. Illiterate farmers can benefit, and there’s no need for any mobile phones, tablets or apps. Working with more than 650 radio partners in 40 sub-Saharan African countries to fight poverty and food insecurity through radio programmes, they help small-scale African farmers help

themselves by providing localised and relevant information.

“One of our most successful projects in the SADC region was ‘Mobilising Radio and ICTs to Fight Vitamin A Deficiency by Scaling up the Production and Consumption of Orange-Fleshed Sweet Potato,’ or—put more simply—the OFSP project,” says Bart Sullivan, Head of Radio and ICT Innovation.

An initiative of the Bill & Melinda Gates Foundation, Helen Keller International, the International Potato Center, Sweet Potato Action for Security and Health in Africa (SASHA), and Farm Radio International, this three-year project involved a radio campaign focused on increasing the production and consumption of vitamin A-rich sweet potato in four

countries: Tanzania, Burkina Faso, Ghana, and Uganda.

An estimated 3.5 million households tuned into the programmes, with 430,000 growing OFSP and 650,000 consuming OFSP as a result. In Tanzania, there were more than 800,000 estimated listeners, with more than 380,000 going on to grow it after the programmes aired.

“The campaign significantly increased knowledge of nutrition, vitamin A deficiency, and the health benefits of OFSP,” says Sullivan. “And demonstrated that, when used effectively, radio is a valuable tool to educate listeners about nutritional

development, learn about new solutions, evaluate the relevance of these technologies to their own needs and circumstances, introduce and adapt the solutions to their needs. Without these platforms in place, shelves are quickly lined with unused new technologies.”

Digital Green is a non-profit organisation that helps farmers to learn new farming techniques, by using short educational videos in local languages. Operating in Asia as well as Sub-Saharan African communities (including the SADC countries of Malawi, Mozambique and Tanzania), Digital Green began as a research project at Microsoft

One of their many projects which ran from 2013-2015 in Ethiopia, Ghana, Tanzania and Mozambique, was funded by the Alliance for a Green Revolution in Africa (AGRA), and used community videos to promote integrated soil fertility management (ISFM) practices.

Digital Green trained video production teams and extension agents from the Ministry of Agriculture (in Ethiopia) and Faida Market Link (in Tanzania), who reached farmers in 30 villages across the two countries. In Ghana and Mozambique, the team trained front line workers from agricultural institutes, extension-centric universities and development agencies on the Digital Green video production and dissemination approach.

“Our approach was found to be effective in all four countries,” says Kumar. “In Ethiopia and Tanzania, where we worked with extension agents and lead farmers who were directly engaging community members, the number of farmer groups and villages reached was more than double the initial targets—and approximately 40 percent of farmers who viewed the videos adopted at least one of the new practices promoted. This rapid spread was attributed to community and extension agent interest in using the Community Videos approach. In Ghana and Mozambique, where our engagement focused more on the extension educators and trainers, participants also showed a high level of interest in using the approach in their work.”

Digital Green also combines video dissemination with market access facilitation that makes use of mobile smartphone applications, IVR (Interactive Voice Response) and mobile phone text messages enabling farmers to have improved access to information about yields, →

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Broadcasters are given scripts about farming techniques that they can adapt to a local context, and they are also trained both face-to-face and through online courses, mentors and ‘how-to’ broadcast guides. Often, the skills they learn enable them to progress in their radio careers.

While Farm Radio is an asset to agribusiness development, there is still a need for more funding to finance technology for farmers in Africa, believes Sullivan. “The needs and opportunities are greater than the financing presently available,” he says. “That said, inadequate funding is just one of the challenges; there is also a need for investment in communication platforms that help farmers contribute to technology

and became its first non-profit spin-off in 2008. The Bill & Melinda Gates Foundation awarded a grant of US\$2,861,910 to the Digital Green project in 2009, for work in Africa and India.

In a controlled evaluation, the Digital Green approach was found to be 10 times more cost-effective, and uptake of new practices seven times higher, compared to traditional extension services, which farmers find difficult to relate to.

“The videos are of the farmers, by the farmers and for the farmers,” says Vinay Kumar, Regional Director: Asia & Global Initiatives, Digital Green. “It reduces the social distances between the teacher and the taught and creates local capacity to create and share knowledge on locally relevant practices through peer-to-peer learning.”

fertilisers and farming education, data-tracking facilities, as well as better knowledge of market prices and competitors.

“Digital Green has encouraged farmers to adopt better agronomic practices on their farms, which has led to higher yields, in turn helping farmers feed their families and increase their incomes,” explains Christian Merz, senior programme officer digital solutions at the Bill & Melinda Gates Foundation. “On average adoption of promoted agricultural practices are 42 percent, which led to increased farmer productivity.”

“Since the approach costs 10 times less than existing extension approaches, there’s actually less expenditure, thus what is required [in Africa to help farmers] is reallocation of existing funds earmarked for agriculture and health extensions,” says Kumar.

Challenges

Despite the arrival of technology to help rural African farmers, there’s a lack of data to aid decision-making and action plans for agricultural growth in sub-Saharan Africa, said experts at the ministerial conference on agriculture and nutrition data and 4th Agritec Africa International Exhibition in Kenya earlier this year. The meeting was organised by GODAN.

Conclusions drawn were that farmers need more information on drought forecasts, rainfall distribution and pest outbreaks—or at least more education on where to access such information.

Even if pest outbreaks can be tracked, new planting techniques learned, and information accessed about how to treat crop diseases, there’s still the issue of a lack of water and frequently, fertiliser.

African agriculture generally, still lacks funding. In 2003, African



Christian Merz, senior programme officer, digital solutions, Bill & Melinda Gates Foundation

governments signed the Maputo Declaration, committing 10 percent of spending to agriculture. However, only 13 countries have ever met the target in any one year, and it’s the small-scale producers who miss out.

Jamila Abass, the CEO and founder of m-Farm and a 2015 Aspen New Voices Fellow and Quartz Africa Innovator, has argued that farmers should be supported in procuring basic rainwater harvesting systems and assisted with proper soil testing. She also believes that governments are not prioritising crucial infrastructure. Farmers who live in remote areas with only a donkey for transport are limited when it comes to selling their produce. Likewise, farmers who have no fridges to store produce, are forced to sell immediately at a lower price. The development of transport, cold storage, and other crucial infrastructure should be a key priority for governments, says Abass.

Special emphasis needs to be placed on ensuring that female African farmers have increased access to technology and mobile phones. “While women are vital drivers of food systems for

their families and communities, they often lack equal access to agricultural information and decision-making power leading to a huge productivity gap in many countries,” says Christian Merz, senior program officer digital solutions at the Bill & Melinda Gates Foundation. “Technology helps us empower women farmers by giving them greater access to resources and opportunities.” Indeed, the Foundation strives to ensure that all agricultural projects it funds understand the importance of empowering women.

A new report *Fast-forward progress: Leveraging tech to achieve the global goals*, brings attention to an important point—that “people—not technologies—should remain at the centre of our attention,” says Gilbert Hounbo, President of the International Fund for Agricultural Development (IFAD). “The better ICTs respond to the demands of people, groups, and communities, and the better their design (according to local circumstances and conditions), the bigger the contribution of ICTs to the achievement of the SDGs.” ■