

A RESILIENT APPROACH

Weathering the storm with climate-smart agri-finance

INTERVIEW

Debisi Araba discusses the potential of mechanisation in agricultural value chains

FOOD SAFETY

Aligning Africa's regulations with global markets

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TRENDS

4 | Weathering the storm with climate-smart agri-finance

ENTREPRENEURSHIP

8 | Escaping poverty through rice production

9 | Using drones to improve efficiency

SMART-TECH & INNOVATION

10 | Connecting farmers with investors

11 | Soilless solutions boost smart production

CLIMATE-SMART AGRICULTURE

12 | Boosting resilience with climate risk management

13 | Helping farmers win their battle against climate change

INTERVIEWS

14 | Debisi Araba: sustainable mechanisation for African farming

16 | Simon Winter: we need a wider array of technologies

17 | Dossier

Scaling: a high priority for agriculture

29 | Agribusiness

MARKET OPPORTUNITIES

30 | Brewing up new market opportunities

31 | Curing the Caribbean – one teacup at a time

AGRI-FOOD SYSTEMS

32 | Kenya's growing aromatic market

33 | Adding nutritional value to Kenyan crops

34 | FINANCE & INSURANCE

Closing the agri-finance gap for women

36 | TRADE & MARKETING

Reinforcing Africa's food safety

38 | BUSINESS LEADERS

Fayelle Ouane: our priority is to empower women in the value chain

40 | PUBLICATIONS

44 | OPINION

EDITORIAL

Tracking food safety and agricultural trade in Africa

Michael Hailu, director – CTA



Across the developing world, unsafe food remains a threat to food and nutrition security and public health. Each year, 91 million people in Africa fall ill due to foodborne diseases; of these 137,000 will die, including children and the elderly, according to WHO.

Food safety has also become an important precondition for access to global food markets and, increasingly, for high-value domestic markets in developing countries. No studies have been conducted into specific impacts on national economies, but evidence indicates that poor food safety places a heavy burden on trade and health, amounting to billions of euros. A single food safety hazard – aflatoxin contamination – is estimated to cause annual losses of over €600 million in lost export trade from Africa. Food safety is also particularly acute in informal markets where many smallholders operate and where most Africans buy their food.

In 2018, CTA has been involved in some key initiatives to help improve food safety and enhance regional trade in Africa. At the African Green Revolution Forum in Kigali, Rwanda, CTA and the International Food Policy Research Institute (IFPRI) launched the *Africa Agriculture Trade Monitor 2018*, which provides evidence and analysis of trends in intra-regional, intra-African and global trade in agricultural products. This joint publication provides critical key findings and policy implications, such as the need for African governments to further invest in infrastructure.

Together with the African Union (AU), CTA has also recently launched a project to develop the African Food Safety Index (AFSI) at a high level event in Dakar, which was attended by the Chairperson of the African Union Commission and the Prime Minister of Senegal. Funded by the EU, the AFSI will be an additional indicator in the Biennial Review Report of the Implementation of the Malabo Declaration. The initiative will include capacity building in food safety tracking across all AU member states, and the creation of an electronic platform so that countries can report and track food safety.

In our pursuit of higher, more sustainable and nutritious food production in Africa, we must not lose sight of the importance of food safety – and not just for reasons of health. If smallholder farmers cannot connect to expanded market opportunities, both regional and global, they will not be able to escape the cycle of poverty, which is why this important topic was also the subject of our most recent Brussels Briefing, which we review in this edition of *Spore*.

CLIMATE-SMART AGRI-FINANCE

A more resilient approach

As climate change poses fresh challenges to farmers across ACP countries, donors, development banks and private lenders are developing innovative blended finance and risk-sharing solutions.

Helen Castell

Climate change is having a profound impact on agricultural value chains across ACP countries, with smallholder farmers feeling the worst of the pain. Changing weather patterns pose a new threat to already precarious livelihoods and are rendering many traditional agricultural practices ineffective. But while climate-smart finance has become a fashionable topic, only a tiny proportion of funding is directed towards agriculture. Without more investment, feeding the world will become ever harder, warns Margarita Astralaga, director of Environment, Climate Division at the International Fund for Agricultural Development (IFAD).

While no corner of the world is immune to climate change, regions in most need of smart solutions include Africa's Sahel, where more frequent and longer droughts are disrupting the planting calendar. "Farmers don't know when to plant corn, when to plant cassava, because they cannot predict what is going to happen next," notes Astralaga. Farmers on small Pacific islands – many of which are already isolated in terms of external markets or supply chains – face

shrinking fresh water resources while rising sea levels threaten to consume arable land.

Blended finance

In a recent CTA discussion paper, *A Business Case for Engaging the Private Sector in Climate-smart Solutions for Smallholder Farmers*, the authors emphasise the need to harness financial, technological and intellectual capital in the private sector to complement public sector-driven climate actions, as a new dimension in the delivery of sustainable climate-smart solutions at scale. "Climate finance through a blend of grant, commercial and quasi-commercial financing instruments has the potential to unlock resources from the private sector towards promoting climate-smart agriculture (CSA) at scale," says Oluyede Ajayi, CTA's Senior Agriculture and Climate Change Programme Coordinator.

Blended finance – where public and private funds are combined in a common investment scheme or deal – has proven one of the most successful ways of funding CSA, states Astralaga. Many blended finance schemes include a grant component from a government body,

development or philanthropic organisation which, when mixed with funds from a commercial lender, reduces the interest that borrowers have to pay. Some blended schemes include a guarantee that lenders will receive back a proportion of the loan funds should the borrower fail to repay. This reduces the risk that financial institutions take, encouraging them to offer more or bigger loans to borrowers or sectors that they perceive as high risk, or to offer them more favourable terms such as interest-free periods or favourable repayment schedules.

The grant component of many blended finance schemes can persuade governments, organisations or firms in countries that are not directly responsible for climate change – and are therefore loath to pay for its consequences – that borrowing to alleviate its effects might still be in their best interest. Once they experience the benefits of climate-smart investments in agriculture or other sectors, they tend to be more open to borrowing in the future, via blended finance schemes or even pure commercial loans, says Astralaga. Others are resigned to having to make



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Climate-smart initiatives are gaining traction thanks to blended finance models that combine public and private investment

climate-smart investments but simply cannot afford a loan unless interest rates are reduced. “In many countries, the only way they would take a loan is if we have a grant component. That’s a fact,” she affirms.

In 2012, IFAD launched its flagship Adaptation for Smallholder Agriculture Programme (ASAP). The programme, which channels climate and environmental finance to smallholder farmers, helped persuade reluctant ministries of agriculture – many of whom initially argued that environmental issues were outside their remit – that the potential losses if they failed to invest in climate-change adaptation were greater than the costs of borrowing, Astralaga explains. Investments funded so far through ASAP include everything from improved meteorological data and early warning systems to solar energy, biogas and making rural roads that are essential for getting crops to market less vulnerable to flooding.

Six years later, “the change is just incredible,” with many governments now seeking second loans. IFAD’s first

Pomeroon

Agricultural projects that demonstrate resilience to climate change – either from the outset or following targeted adaptation – can represent a better financial risk to private-sector lenders, while helping development banks, donors and an increasing number of private investors achieve their sustainability goals.

Climate resilience was a key consideration – from both a financial risk and sustainability perspective – for investors who participated in a €2.6 million fundraiser by Pomeroon Trading for a major rehabilitation of the 280 ha Stoll Estate in Guyana, says co-founder Duncan Turnbull.

The company has developed a seedling nursery at Stoll where it conducts extensive testing of seed nuts from across Guyana, to ensure the ones planted on the estate are of the best genetic stock and grow into trees with a better yield than typically seen across the country. As well as planting 50,000 trees that could sequester as much as 24,000 t of carbon equivalent, Pomeroon has developed a sophisticated water management system and is piloting inter-cropping with the aim of introducing cash crops such as nuts, citrus fruits or ‘superfoods’ like moringa that are new to Guyana.

While sustainability was not the top criterion for the institutional investors who provided around 25% of the funds, it was a big concern for the high-net worth private investors that contributed about 40% and was a core mandate for the development fund institutions that provided the remainder.

ASAP project in Nicaragua, for example, included a large grant, but it is now taking a second full loan to fund climate-adaptation activities, she says. In Bolivia, a number of indigenous communities are applying for loans after they saw the benefits enjoyed by other indigenous communities that have

implemented IFAD-facilitated climate resilience projects.

Development banks reduce the risk

Using blended structures to provide a first-loss or subordinated tranche to “take away the first pain” in any climate-smart financing can be “very

› effective,” says Hans Bogaard, manager at the Dutch Development Bank (FMO). Once this is in place, commercial banks or lenders like FMO are often willing to provide regular funding on top. For example, MASSIF and the Infrastructure Development Fund – blended funds that FMO manages on behalf of the Dutch government and which are partly used to support projects supporting smallholders and climate resilience – allow FMO “to take a bit more risk,” says Bogaard.

FMO is also supporting a partnership, led by commercial lender Rabobank and the UN Environment Programme, which is looking to scale up forest-friendly sustainable agriculture using blended finance. FMO has agreed to share its knowledge in sustainable agriculture and forestry with the partnership – which in October 2017 launched an €867 million facility – and to mobilise its own blended finance resources where possible, states Bogaard. The facility aims to provide grants, de-risking instruments and credits to clients involved in sustainable agricultural production, processing or soft commodities trading who commit to forest protection, restoration and the involvement of smallholders, but has not yet disbursed any funds.

The Development Bank of Jamaica (DBJ) supports climate projects under the framework of Jamaica’s Pilot Programme for Climate Resilience, which was developed by the government in collaboration with the Inter-American Development Bank and the World Bank to invest in climate adaptation across priority sectors, such as agriculture. The programme supports CSA with grants and partial loan guarantees for lenders, from its own funds and via a Caribbean Development Bank line, says general manager Edison Galbraith. For example, for small loans of up to €38,750, DBJ can provide a guarantee of up to 80% of the loan amount on a *pari passu* – or shared loss – basis.

One initiative that DBJ plans to support with guarantees is a programme run by international humanitarian organisation INMED Partnerships for Children, which aims to help smallholder farmers launch climate-smart aquaponics businesses in Jamaica. INMED is currently working with Jamaican commercial banks and credit unions to create financial packages

Incentives

Lenders are increasingly offering staggered incentives such as better terms or reduced interest rates to agribusiness borrowers as they achieve climate-related milestones, such as implementing more resilient irrigation systems. However, it is difficult to accurately measure the impact of climate-smart interventions and even harder for commercial banks to assess the extent to which such actions will reduce the financial risk that lenders are exposed to, and improve a borrower’s ability to repay a loan. The sustainability of such financing structures is therefore uncertain, argues Bogaard. FMO prefers instead to support clients with capacity development, for example by paying 50% of the cost of consultants hired to help farmers and project developers improve their climate resilience.

under which lenders would offer lower interest rates and better terms, such as reduced collateral requirements and a longer initial repayment holiday, to help entrepreneurs buy modular aquaponics systems. Loan sizes will vary depending on the system required, which can cost up to €17,340 for a good-sized commercial system, but could be as simple as one module, two grow beds and a single fish tank. INMED expects first loans to be disbursed before the end of 2018 and aims to reach 150 farmers over the next few years.

DBJ is also funnelling money through local lender Jamaica National, which is offering subsidised loans to support activities such as rainwater harvesting, says Galbraith. Jamaica National’s climate change loan programme provides entrepreneurs with loans of between €1,295 and €32,360 to finance climate-change adaptation activities and energy-efficiency projects in the agriculture and tourism sectors. Loans feature an annual interest rate of 4% and up to 48-month repayment schedules, including a moratorium period of up to six months.

A balancing act

Satisfying the needs of smallholders and lenders in any climate-smart investment is a delicate balancing act, notes Bogaard. It can be challenging for development banks to invest in CSA projects that focus on adaptation, such as improving the climate-robustness of an individual farm. If, however, interventions are scalable – for example involving the introduction of drip irrigation at a plantation in a project that then integrates an outgrower scheme – they become more bankable, Bogaard says. Being able to leverage climate-smart

investments for bigger projects to benefit smallholders surrounding it is the “silver bullet” that every development bank strives for, he adds.

“Climate finance through a blend of grant, commercial and quasi-commercial financing instruments has the potential to unlock resources from the private sector towards promoting CSA at scale”

One recent project in which FMO has participated saw Africa Improved Foods (AIF) – a Rwandan producer of nutritious complementary foods to combat malnutrition (see *Spore* article, *Rwandan Farmers Reduce losses with Nutritious Grains*: <https://tinyurl.com/ybjncjhm>) – set up rural maize collection centres in 2017. It did this in an effort to combat the growing problem of farmers’ crops being rejected by buyers because they contained aflatoxin-producing fungi – a problem that is expected to become a growing challenge globally as temperatures rise. AIF states that rejection rates for maize due to the presence of aflatoxin fell by 52% in the second harvest of 2017 – after the collection points had been established – compared with the first harvest, and were down to zero by the third harvest.

Another way development banks can contribute to climate-smart adaptation is by issuing green bonds or green loans that can be used for climate-smart applications, via financial institution

clients, Bogaard adds. Typically, however, development banks focus on climate mitigation investments, for example forestry projects that will sequester carbon. For projects with long ramp-up periods – such as agro-forestry, where it can take 5 years for production and revenue to start – banks must be prepared to forgo interest payments initially, perhaps in return for profit-sharing later on, states Bogaard. Development bank provision of long-term or mezzanine finance – a mix of debt and equity financing that gives the lender the right to take an equity stake in a borrower if it defaults – can be vital here.

Innovation

There remains a need for more innovative financing solutions for CSA. To

Initiatives demonstrating climate resilience represent a lower-risk investment to private lenders

this end, IFAD has started exploring opportunities for crowd-sourcing as an alternative to traditional finance, as well as ways in which it could facilitate access to climate and commodity hedging, and help microfinance institutions measure and price climate risks.

Risk remains a key concern for both governments and financial institutions, with microfinance organisations in particular often uncertain about what interest rates they should charge when lending to smallholders to reflect climate-related risks and the extent to which they are reduced by any adaptation or mitigation initiatives. Lenders “need feedback so that they can design their own products based on the information we can provide them on climate risks,” Astralaga says. IFAD hopes to be able to launch a product or service related to this in early 2019.

Risk is also front of mind for DBJ, which is keen to support the scaling up

of weather-related crop insurance in Jamaica. So far, Jamaica International Insurance Co (JIIC) has experimented with weather-related insurance, but has struggled to offer premiums that are considered affordable, Galbraith notes. In 2013, JIIC teamed up with the Caribbean Catastrophe Risk Insurance Facility, which sells storm and earthquake coverage to governments, to pilot a livelihood protection policy to protect individuals’ income following severe wind or rain events (see *Spore* article, *Innovative Insurance for Minimising Climate Risk*: <https://tinyurl.com/y8qd5sbw>).

Innovations like this in risk management will encourage financial institutions to offer more agri-finance, adds Galbraith. And as the financing tools available for climate-smart agriculture projects in general become more sophisticated, investments in sustainable agriculture should finally gain pace. ■





In northern Uganda, a social enterprise has trained over 11,000 poor rural women in rice production to help them earn a living

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SOCIAL BUSINESS

Ugandan women escape poverty through rice production

Agnes Atim Apea’s social enterprise, the Hope Development Initiative (HDI), is helping poor smallholder women farmers achieve financial independence by providing inputs, technical farming services and a guaranteed market for rice.

Busani Bafana

In 2012, Agnes ‘Mama Rice’ Apea took a trip home to her district of Amolatar in northern Uganda and was struck by the deep poverty among local women in the region. Many had experienced conflict and displacement and seemed powerless to improve their livelihoods. To help these women earn an income, Apea made the innovative move to introduce rice growing in the district.

At first, 20 women were organised to grow upland rice and, as a result, Apea’s social enterprise HDI was born in 2012. Since then, more than 11,000 farmers across five districts in northern Uganda have been supported to grow, process and sell rice under the ‘Mama Rice’ brand. “Rice has a market and is nutritious and easy to prepare, making it an ideal crop for women,” says Apea.



11,000

farmers grow, process and sell rice under the ‘Mama Rice’ brand

Through its cooperative model, members pay an annual subscription fee of €1.11 and HDI provides inputs, credit facilities and mechanisation services to the women, and trains them in how to grow rice using best agronomic practices. At the end of the season, HDI buys the rice from farmers at market price. The women farmers produce up to 1,000 kg of rice per season and earn

€0.79/kg. The rice is then milled, packaged and sold to wholesalers in Uganda – or exported to Kenya and South Sudan – at €0.89/kg.

“In the last 6 months, we’ve given out 500 t of seeds on credit and we’ve opened over 2,000 ha of land for rice cultivation,” says Apea. She explains that farmers are also producing their own rice seed in HDI’s 100 ha farm instead of relying on seed purchased from elsewhere. As a result, the farmers are expecting to grow 2,000 t of rice in 2018, up from 1,500 t in 2017.

After the women began producing rice in 2013, HDI established a milling factory in Amolatar, which has the capacity to mill 3 t of rice per day. The mill has helped to bring development to the area, with electricity and transport services

being provided by the government in 2014 and 2015. Due to local women now earning a steady and guaranteed income, the POST Bank also opened its first branch in the district in 2015.

Agnes Adio, 32, says that being a member of HDI has helped her financially. From her 1.2 ha piece of land in Amolatar, she grows 4,500 kg of paddy rice. She sold her milled rice in June 2018 for €1,141 and has used these earnings to build a new brick house and to pay for her children's school fees. "I am excited about moving from a grass thatched house to my new permanent house," she says. "Rice farming is profitable and has helped me look after my family."

Apea has been recognised by the Government of Uganda, the business community and Rotary International for championing social justice and equity for women, and was named one of the 100 most influential and innovative women in the world by the BBC in 2017. "The biggest impact of our initiative is the empowerment of women," emphasises Apea. "From earning nothing to earning an average of €851 per season is life changing. To me, that is empowerment, and it is thanks to the rice enterprise."

In addition to offering a source of income, and as a means of enabling beneficiaries to purchase land and set up their own agribusinesses, HDI has set up a €340,000 loan scheme for women who struggle to obtain credit due to lack of collateral. Women have accessed average loans of €225, payable over a year. "[Through the loan] many women have bought farming equipment, houses, land and have put their children through school and university. They are working for a food- and financially-secure future," says Apea.

In January 2019, HDI plans to improve links with suppliers and traders by recruiting another 100 women to set up their own shops across Uganda and become direct distributors of Mama Rice. This will help to cut out the middlemen who transport rice to buyers, and thus increase the margins for women vendors. ■

★ For more information on Agnes Apea and HDI see Spore blog, *How Can We Better Support Women Entrepreneurs in Agriculture?* <https://tinyurl.com/y958qxet>

SMART AGRICULTURE

Using drones to improve efficiency

An agri-tech start up in Côte d'Ivoire is using drones to help farmers increase production by intelligently managing their plots.

Inoussa Maïga

Aboubacar Karim, a 23-year-old from Côte d'Ivoire, has made it his mission to put an end to agricultural losses as a result of poor crop management. "We can't carry on farming in the same way our grandparents did, using the same hoes and machetes that people have been using for 300 years," he says. Karim's field mapping company, Investiv, launched its first drone service in May 2017. The firm's six drones – each equipped with multispectral imaging cameras and operated by internally-trained pilots – produce agricultural land-use maps to pinpoint areas of crop disease, poor soil fertility or under-hydration. The company then analyses the data so that farmers can take appropriate action, for instance by fine-tuning fertiliser and disease control product dosages or using water and inputs more efficiently. Customers can also log into Investiv's land management platform to view the latest data on their farms. "To date, we've mapped more than 5,000 ha of farmland," says Karim.

In 2017, Investiv received support worth US\$10,000 (€8,500) from the Tony Elumelu Foundation – consisting of 12 weeks of training and access to a network of entrepreneurs – to kick-start the business. "That was my first experience of entrepreneurship and business training," admits Karim. "Like lots of tech start-ups, I had big ideas but hadn't really considered how they'd benefit farmers." The training, coupled with mentor guidance and an opportunity to test its solutions in the field, enabled Investiv to refine its services and tailor them to specific contexts and crops (mainly bananas, rice and cotton). "We want to help increase the income of those farmers who are poor," he explains in an interview with *Marcopolis*. "We want to show young people that agriculture can be attractive." ■

Investiv uses drones to map farmers' land and help them manage resources more efficiently



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SPONSORING AGRICULTURE

Bridging the gap between farmers and investors

To increase agricultural investment in Nigeria, an agri-tech start-up company is pooling funds from numerous city-based investors and providing support to farmers via a digital platform.

Oluyinka Alawode

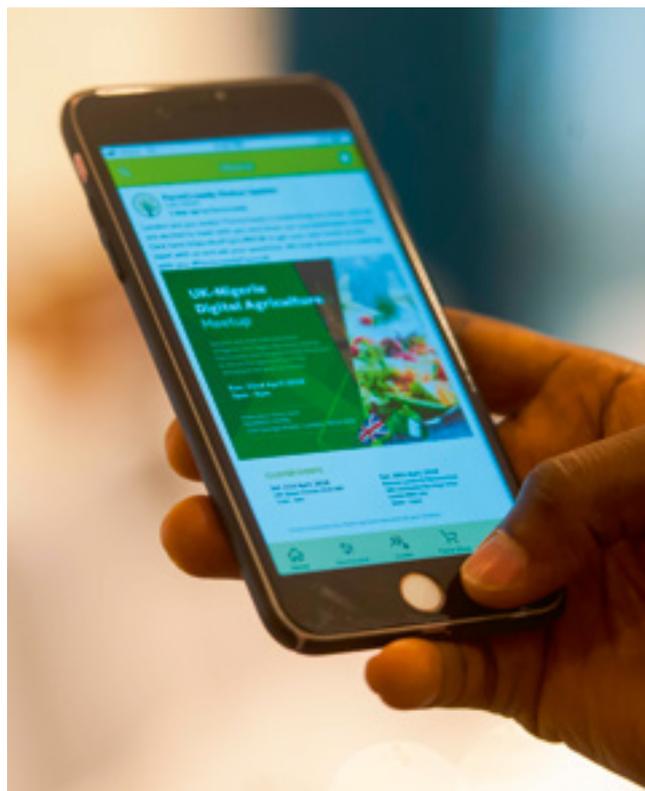
A digital platform, which is connecting farmers in rural areas with young professionals in cities, aims to increase food production in Nigeria, while also promoting youth participation in agriculture. Through the digital start-up, Farmcrowdy, smallholders are linked with investors who are willing to sponsor agricultural activities, which enables farmers to improve their production and expand their farming operations. The company's mobile app sends a notification to potential investors when farms are open for sponsorship, and investors then select the smallholdings they are interested in supporting. At the end of the farm cycle, farmers, sponsors and Farmcrowdy share the profit from the harvest sales.

In Nigeria, convincing commercial banks to invest in small agribusinesses is challenging, with lenders usually shying away from farming because of the associated risks. Farmcrowdy aims to address this issue by pooling funds from numerous investors and spreading the risk among a large population of middle-class Nigerians, most of whom invest about ₦100,000 (€245) per farming cycle. Investors receive between 6% and 25% as returns on the funds they provide – usually within a year – in addition to the capital they invest, and are able to monitor their investments from their homes or offices through the text, picture and video updates they receive via the app.

"I have always wanted to invest in agriculture without getting my hands dirty and Farmcrowdy has given me the opportunity to do so," says Julcit Bali, a sponsor based in Nigeria's capital, Abuja. Another sponsor, Chigozie Egbunefu, based in Port Harcourt in the south of Nigeria says, "[Farmcrowdy] is unique because of the coordination of its activities and regular updates to sponsors. It took away the burden of supervision and monitoring and I would certainly recommend Farmcrowdy to others."

7,000

farmers have benefited from 13,683 sponsorships



© FARMCROWDY

In Nigeria, a mobile app developed by agri-tech company Farmcrowdy is helping to link rural smallholders with inner-city agricultural investors

Farmcrowdy provide information on the availability of farm produce – usually cassava, soya beans, and rice – through their website and app, which helps farmers to secure potential buyers. "What makes Farmcrowdy different from other platforms is that it turns a complex problem into a digital marketplace," says Farmcrowdy CEO, Onyeka Akumah. The company is also connected with agri-based companies that use raw agricultural materials in their production processes, creating a ready market for farmers. In addition, Farmcrowdy uses the sponsorship funds to provide agricultural inputs and services, such as seeds, fertilisers and farm equipment to ensure good yields, as well as to pay for insurance cover for both the farmers and sponsors in the event of a poor harvest.

In less than 2 years, over 7,000 farmers have benefited from 13,683 sponsorships and the platform has amassed over 64,000 followers. "Before Farmcrowdy, I used to cultivate one or two plots, but now I have expanded to cultivate 15 to 16 plots, which is about 1 ha of land," says Blessing Jacob, a 24-year-old cassava farmer from Akwa Ibom state. Through Farmcrowdy's technical support and agricultural advice, which is provided by the company's field agents, Jacob has also been able to boost her yields, "Farmcrowdy taught [members of her cooperative] how to plant stems in a bed and space them correctly, and the yield of cassava we get now are bigger and healthier," she says. Victor Akpan, another young farmer says, "I have learnt so much about farming through Farmcrowdy and I am making much more money. With the money I have received, I can now pay to continue my education." ■

GREEN-TECH

Caribbean soilless solutions boost smart production

To overcome production challenges associated with climate variability in Barbados and St Lucia, young entrepreneurs are using hydro- and aquaponic technology to control the cropping environment.

Sophie Reeve and Natalie Dookie

Creative technological solutions are being developed to transform traditional methods of crop production and help to achieve food security in the Caribbean. In Barbados, hydroponic farm Ino-Gro Inc, for example, is using a 12 m shipping container with vertical towers to grow leafy green vegetables. Through a fully automated, online system, the growing environment can be monitored and controlled (i.e. temperature, humidity, CO₂ levels and lighting) using a smartphone app.

Hydroponics is a method of growing plants indoors, using nutrient solutions instead of soil. Energy-efficient LEDs provide optimum light and the closed loop irrigation system uses 85% less water than traditional outdoor systems. “Technology has been the main driver of change in most industries, and agriculture is no different,” says 23-year-old Warren Kellman, one of the Ino-Gro Inc managing directors.

The towers can grow around 2,500 plants at any given time, allowing high-density farming in a relatively small area. According to Kellman, the container is equivalent to nearly 0.5 ha of farmland and produces around 40 kg of produce a week, including three different types of lettuce, mint, basil and edible flowers. Demand is high and the produce sells out every week. “When we started, we wanted to find a way to make money but also do something good. We import too much. The population of the Caribbean is only going to grow and we need to find more sustainable ways to produce enough food,” Kellman explains.

In St Lucia, a local aquaponics facility is being touted by agricultural ministers in Antigua and Barbuda as a model for the rest of region to replicate, due to its highly efficient use of space for economic food production. Green Haven Fresh Farm – an organic farm which specialises in integrated vegetable, tilapia and shrimp cultivation – has 10 vertical vegetable beds and four fish tanks built above each other, and is supported by an 80,000 gallon solar-powered rainwater harvesting system. Lights on automatic timers and circulatory fans are also used to control the growing area and maximise production. The organic aquaponic system, which was established in 2016, produces 1.8 t of lettuce each month and 7.25 t of tilapia annually. ■



© GREEN HAVEN FRESH FARM

Using aquaponics, Green Haven Fresh Farm produces 1.8 t of lettuce every month

Crop robotics

Field trials in Samoa

A LOW-COST ROBOT known as the Digital Farmhand has been developed to help reduce manual labour and enhance crop data collection for small-scale horticultural farmers. Developed by engineers from the University of Sydney, the robot can perform simple tasks like pesticide spraying, seeding and weeding, and can be quickly dismantled and reassembled on site. A mobile mount also enables data – such as individual plant weights – to be recorded and stored directly on a smartphone, providing farmers with detailed crop analytics. The Pacific Island Farmers Organisation Network has signed a contract with the university, to assist in a number of robotics field trials to be carried out on commercial vegetable farms in Samoa.

Interactive farming

Safeguarding pigs in Uganda

AN INTERACTIVE voice response (IVR) service is providing smallholders with information for the prevention and control of diseases in pigs in Uganda. Launched in May 2018 by the International Livestock Research Institute, the IVR system offers 4-minute lessons delivered in the local language, to raise awareness of diseases like African swine fever among pig farmers. The messages can be updated and tailored to provide context-specific information. The system can also track which lessons the farmer has listened to and ask questions to gauge whether the information has been retained. The free IVR service is being piloted among 230 smallholder farmers in Masaka district, and farmers can access the service on their mobile phones regardless of model or network provider.

WEATHER SERVICES

Boosting rural resilience with climate risk management

In Rwanda, training farmers to use climate information services is helping to spread best farming practices, while enhancing farmers' capacity to plan for future climate shocks.

Sam Price

Without access to accurate and up-to-date weather data, ACP smallholders have traditionally relied on indigenous knowledge to inform their decisions, but such predictions are becoming increasingly difficult. To foster greater climate resilience among farming communities, in 2016 the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) launched the 4-year Rwanda Climate Services for Agriculture (RCSA) programme. Supported by USAID, RCSA aims to improve the supply, communication and use of climate-related services across Rwanda.

RCSA is building on an existing initiative through which Rwanda's National Meteorological Agency combines data from local, ground-based weather stations from across the country, with rainfall and temperature satellite data. The satellite data, which extends 30-50 years into the past, also provides a historical source of information that allows stakeholders to better understand long-term climate trends. This information is then compiled into 'Maproom' – a freely accessible database of climate data,

providing information on trends in temperature and rainfall across time, and at national, regional and district scales.

To improve the dissemination of climate information, and enhance farmers' ability to utilise the data themselves, RCSA has adopted the Participatory Integrated Climate Services for Agriculture (PICSA) approach that focuses on supporting small-scale farmers in their planning and decision-making. PICSA begins with an initial workshop, where farmers evaluate their current farming strategies with reference to the risks identified using Maproom data. Trainers and extension staff then work with farmers to choose the crop and livestock options best suited to the individual's circumstances. Just before the growing season starts, trainers and extension staff use a seasonal forecast to update the risks identified during the first evaluation, and guide farmers to decide on any adjustments for the coming season.

Farmers' participation in PICSA helps to identify and support differing needs across Rwanda's diverse agro-ecology. But the approach has also proven effective at scale, with an estimated

75,000 farmers across the country having received training in PICSA, as of April 2018. The project has also developed a network of trained farmers who are able to pass on their knowledge in the use of climate information to other farmers within their local community.

A recent project assessment revealed that the vast majority of farmers that have received PICSA training found it useful – with seasonal forecasts considered the most useful element of the training, and 93% of respondents having made changes to their farming operations. Anathase Mudenge, a farmer based in Bugesera District, dedicated a small portion of his farm to methods learned through PICSA training – including planting based on weather forecasting and the use of certified seeds – and witnessed a three-fold yield increase. "I now adhere to the planting time once I get the seasonal forecast, and I always look for improved seeds," Mudenge explains.

In recognition of its accomplishments, RCSA was awarded the first Climate Smart Agriculture Project of the Year Award, at the recent Africa Climate Smart Agriculture Summit in Kenya. Reflecting on the award, Jim Hansen, leader of the CCAFS Climate Services and Safety Nets Flagship Program said, "Innovative solutions such as ... PICSA have made it possible to make things previously only demonstrated at pilot scale work for farmers on a national scale." ■

Extension workers have reached 75,000 Rwandan farmers with training in the use of climate information services



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Automated irrigation

Water saving sensors

A **PROTOTYPE** irrigation system that prevents the over watering of crops has been developed in Kenya. The automated Irrigation Manager system, created by scientists at Jomo Kenyatta University of Agriculture and Technology (JKUAT), can decrease a farm's water usage by more than 25%. The technology uses 6 cm sensors to read soil water levels and can be calibrated to adjust the water supply according to the moisture requirements of different crops. Pumps linked to the sensors feed water into the ground when moisture levels drop below that needed by the plant. According to Wycliffe Obwoye, a JKUAT agronomist, the method also allows for the precise and economic application of liquid fertilisers and pesticides, and can boost crop yields by more than 50%.

Cereals centre

Youth preventing drought

A **RESEARCH HUB** in Senegal is supporting young entrepreneurs to develop climate-smart technologies into businesses. The Center for the Improvement of the Adaptation to Drought (CERAAS) has helped youths to develop climate-resilient seeds, grain processing machines and weed fighting technologies. Recently classified as a Regional Center of Excellence by the Economic Community of West African States, CERAAS has also sponsored 250 postgraduate students to study dry cereal plant breeding and crop management to help strengthen research across West and Central Africa. New drought-resistant varieties of bean and sorghum and a high-yielding variety of cassava have also been produced by the centre and released to local farmers.

WEATHER FORECASTS

Helping farmers win their battle against climate change

Real-time weather updates are cushioning small-scale farmers in Burkina Faso and Zambia from the impacts of prolonged dry spells, greater flooding and erratic rainfall.

Olivia Frost and Dieudonné Edouard Sango

Agro-meteorological services are helping nearly 1 million farmers in Zambia become more climate-resilient. The Climate Information and Early Warning Systems Project, supported by the United Nations Development Programme, is providing regular weather forecasts and agricultural advice to farming communities to help them adjust the varieties of crops they grow to suit the weather and boost agricultural production. More than 68 automated weather stations and 40 manual stations have already been installed. This enables the project to notify farmers before planting whether the season will be dry, and if so, advises them to substitute their regular crops with varieties that require less water. "Our regular weather updates give farmers up to 10 days lead time to plan during the rainy season," says Edson Nkonde, acting director of the Zambia Meteorological Department.

Weather updates are sent by text message in English to lead farmers who relay the information to fellow farmers in local languages. The project also partners with the Zambia National Broadcasting Corporation – which allows the project to transmit meteorological information to about 6 million small-scale farmers across the country – and community radio stations in pilot districts. "Indigenous knowledge of predictions have become more like tossing a coin," farmer Sililo Musepei explains. "With climate updates I know that if it



Farmers in Zambia are being sent weather forecasts via the radio and their mobile phones

rains tomorrow I can save my fertiliser for another day." By having a better idea of when, how and what to plant, farmers are getting higher yields and increasing their income. "The use of weather and climate information assisted me to plant in good time," explains farmer Roida Zulu. "I have increased maize production from less than 1 t/ha to 5 t/ha."

In Burkina Faso, a weekly radio programme initiated by FAO in collaboration with the National Meteorological Agency, is also providing weather forecasting and agronomic advice to more than 200,000 agro-pastoralists to increase their resilience to climate change. Topics covered have included natural resource management, soil fertility and pesticide use, as well as prevention and eradication of animal diseases. "Radio Climat allowed me to diversify my crops," states Moussa Sékou. "Before, I only produced maize, but as the show gave me an idea of when it would rain every week, I also produced rice in the wetter periods." ■

Debisi Araba

“Agriculture is a business; we can’t have unsustainable mechanisation”

Africa Director of the International Center for Tropical Agriculture (CIAT) and Malabo Montpellier (MaMo) Panel member, Debisi Araba, discusses mechanisation’s potential in Africa’s agricultural value chains.

Stephanie Lynch

MaMo has recently launched its latest report, *Mechanized: Transforming Africa’s Agriculture Value Chains*. Why did the panel decide to focus on mechanisation?

The MaMo Panel is focused on getting precise evidence to key stakeholders to inform decision-making across Africa and ensure that the continent’s agriculture sector is sustainable, competitive, productive and transformative. Currently, the sector has very low levels of mechanisation, making it globally uncompetitive, with poor productivity levels. You will find that a lot of African economies, especially those that are focused heavily around agriculture, export largely unprocessed or semi-processed commodities, whilst importing highly-processed, higher value goods. In a global economy, African countries need to be doing much more to produce and trade in processed and higher value agricultural goods to increase productivity, create jobs and improve food security; this is where mechanisation comes in.

Looking across different agricultural value chains in Africa, the report finds

that mechanisation offers opportunities to significantly increase productivity, competitiveness, sustainability and even create jobs. The low level of mechanisation not only limits processing of value-added agricultural products, but also contributes to a lot of food waste throughout the value chain. Africa’s contribution to global food waste is around 36%, and about 30% of that is due to poor post-harvest handling of food products. Implementing technologies to improve post-harvest handling, and reduce post-harvest losses, will ensure that we have improved food production in Africa.

The report examines a number of case studies from across Africa. Which countries particularly stand out in terms of progress towards scaling out mechanisation services in agriculture?

I would like to emphasise the important progress that Ethiopia, Morocco and Nigeria have made to foster an ecosystem that supports agricultural mechanisation by providing access to finance and training, and developing a pool of service

providers which can produce and maintain equipment. Beginning with Morocco, the Department of Agronomy set up an agricultural mechanisation training centre, which acts as a meeting space for researchers and the private sector to develop new technologies. Through this centre dairy farmers have been connected with large processors like Nestlé and milk production has increased significantly due to the introduction and adoption of mechanisation tools.

Ethiopia has done something similar, whereby they have trained farmers how to use and maintain different mechanisation tools and equipment. They launched an academy to train around 30 young people each year, which is helping to create an ecosystem to support mechanisation. This is important because across Africa you will often see tractors that have been abandoned due to a lack of knowledge and understanding of how to maintain or fix them. Agriculture is a business; we can’t have unsustainable mechanisation.

Finally, in Nigeria there has been promising progress to address post-harvest



Debisi Araba discusses how to transform African agriculture into a highly productive, competitive and sustainable sector

losses. A start-up called Cold Hubs has focused on improving efficiency in the cold supply chain through off-grid refrigeration systems (see Spore article, *Cold Chains: Strengthening the Weak Link*: <https://tinyurl.com/y7zo6ocw>). The company has set up solar powered refrigeration units in markets and on farms, which allow farmers, wholesalers and retailers to preserve, store and transport their products more easily.

The focus of this year's African Green Revolution Forum (AGRF) was on enabling new pathways to turn smallholders into sustainable agribusinesses. What topics were you glad to see the event pick up on?

The sub-theme for this year's AGRF was focused on showcasing how to 'Lead, Measure and Grow' agricultural transformation. What does a transformed agricultural sector look like? It will be highly competitive, highly productive sustainable, and able to create high-income opportunities, as well as deliver healthy and nutritious food. Getting people to identify the opportunities in agriculture that exist beyond the farm is important. We need to create more opportunities and pathways for people to move higher up the value

chain. This will come with increased mechanisation. But beyond mechanisation, it was good to hear updates and ideas about access to innovative finance mechanisms at all scales, for example blended finance; as well as conversations about data governance and implementing artificial intelligence, and other cutting-edge technologies, to improve productivity.

Women and young people have a central role to play in the transformation of Africa's agriculture. What more needs to be done to support them to participate and thrive in the sector?

The question of youth cuts across all economic sectors in Africa because we have a very young population on the continent. All African governments, and the private sector, need to look at incentives to attract young people to agriculture and invest in creating or widening entry points for them to join the sector. We need to move people up the value chain. One way to do this is through mechanisation. Introducing on and off-field processing technologies, irrigation, off-grid power technologies, and a sustainable and affordable service sector around these technologies,

will create job opportunities for young people.

Not enough has been done for women in agriculture and we need to be particular about how we target interventions to support women into agriculture. Access to affordable finance, land and property rights and the ability to transfer assets in their own names, are some of the most important battles that we need to fight. Women are currently disenfranchised across the entire economy, but they are particularly marginalised in agriculture because they have few land rights. Tying finance to assets other than the land would help more women to develop agribusinesses and giving women access to mechanisation tools, specific to their needs, would reduce the daily drudgery that they face in agriculture.

CIAT has been at the forefront of developing climate-smart agriculture solutions. How can public-private partnerships support such innovations?

Over the last 51 years, CIAT has been at the forefront of deploying cutting-edge agricultural innovations around the world. In climate-smart agriculture, we collaborate with a wide array of partners across multiple sectors on research for development and continue to explore new partnerships to ensure that we have a steady and growing conduit to disseminate innovations to those who need them. For example, in Nigeria we have a partnership with the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending, which we are helping to design and develop climate risk profiles. These profiles will inform the financial sector's decision-making and investment planning for agriculture. The credit industry and the insurance sector will also use the profiles to design tools for their clients – small, medium and large-scale agribusinesses alike – with a clearer understanding of where the climate risks are. It is really exciting to see these technologies move agribusiness to more productive, sustainable and profitable levels and we are proud to be partners on this journey of agriculture transformation in Africa. ■

Simon Winter

“We need a much wider array of technologies”

Executive Director of the Syngenta Foundation, Simon Winter, emphasises the need for localised solutions and the benefits of both public and private sector actors for agricultural growth and development.

Stephanie Lynch

Why is the private sector often viewed as having a critical role in boosting productivity and food security?

Within the market system we have different types of private sector actors who can provide assistance. We have the farmers themselves, who are of course part of the private sector, or can become part of it if they have the right tools, technologies and business models. We have the businesses that supply those farmers with the technologies and the inputs that they need to improve their yields. Then, we have bigger private sector organisations, such as downstream food processors, which supply consumers in urban areas.

We can mobilise more investment through bigger agribusinesses, whether they are input suppliers or downstream food manufacturers. The hard part is improving access to finance for small and medium-sized enterprises (SMEs), which work directly with smallholders, as well as financing the smallholders themselves. There is also a role for financial institutions to provide the necessary financial support to farmers and SMEs to enable them to develop and grow.

Which technologies is the Syngenta Foundation investing in to promote the mechanisation of agricultural value chains?

One of the things that I liked about the recent Malabo Montpellier Panel report, *Mechanized: Transforming Africa's Agriculture Value Chains*, is that it takes a very broad range of technologies and classes them all as mechanisation. Commonly, we

think about tractors, but actually we need a much wider array of technologies. The technologies that the Syngenta Foundation is focusing on include tractors and harvesters but also the tools and implements that do the planting and ploughing for instance, as well as associated technologies like laser levelling, which ensures that irrigated areas of land are flat enough to facilitate water flow. We are also supporting the supply chain for spare parts and building a network of trained maintenance experts.

How can engaging with stakeholders at the policy level help to provide smallholders with sustained access to mechanisation services?

Infrastructure, which is typically provided by the public sector, needs to be financed and well managed to support the transportation of large machines. We are working with CTA on introducing mechanisation in a set of rice irrigation schemes, so public sector backing, through public-private partnerships, is a very important part of our policy framework. Secondly, the public sector needs to provide incentives for the adoption of quality machines. For instance, subsidies for importing specific equipment can be put in place. In China, subsidies have stood at around 50–70% of the capital value of the equipment and mechanisation spread rapidly. Incentives behind ‘Uber-like’ hiring services are also needed. Cooperatives have begun to purchase machines that can be shared between their member farmers, and entrepreneurs are buying machines

Since Simon Winter joined the Syngenta Foundation in 2017 he has promoted partnerships to improve farmers' access to essential technologies and services



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and providing hiring services to farmers. The right combination of smart-subsidies will encourage the growth of these services.

Since you joined the Syngenta Foundation a year ago, which areas have seen the most progress and what remains to be done?

We are strengthening the capacity of our country teams to better integrate solutions and pull together local partners for replication and scale-up. We have also been doing a lot of work with young people, getting them to become agripreneurs who can provide inputs and training, as well as aggregation opportunities, to farmers. In India, we have developed a rapidly growing network of agripreneurs, supported by a common digital platform, which allows the agripreneurs to offer tailored solutions to their communities. Currently, there are 600 agripreneurs serving 120,000 farmers. We want to bring this approach to Africa, because we are not seeing the necessary support at sufficient scale for local, adaptable business solutions or community-level agripreneurs who can be supported to become change agents in Africa. ■

SPORE

Dossier

**SCALING:
A HIGH PRIORITY
FOR AGRICULTURE**

Agricultural innovations must have a more substantial impact to meet the United Nation's Sustainable Development Goals (SDGs) by 2030 – which call for a concerted effort from the public and private sectors, as well as farmers and processors.

TRANSFORMATION

Strategies for scaling agricultural innovations

To meet the SDGs, impacts at all levels of the agricultural value chain will need to be increased, with the involvement of all stakeholders in the sector.

Vincent Defait

Big problems need big solutions. In response to the significant challenges posed by climate change, population growth and environmental degradation in many ACP countries, increasing numbers of agricultural experts are stressing the importance of ‘scaling’ in order to meet the SDGs and create a better world.

Scaling in a nutshell

Scaling means maximising the impact of agricultural interventions through horizontal or vertical approaches. Horizontal strategies often reach more project beneficiaries by, for example, increasing the size of farms or implementing a service or technological innovation over a wider geographical area. Vertical approaches are focused on national agricultural policies or funding mechanisms in collaboration with national authorities, to create conditions that will be conducive to large-scale

acceptance of a change in practices or use of an innovation. A balance must be struck between horizontal and vertical scaling to ensure that the impacts will be sustainable.

In practice, key elements of successful scaling strategies can vary markedly: a commercial business case, development of a value chain, collaboration with the public sector, promoting the adoption of new techniques or technologies, etc. Despite many possible entry points, the goal of scaling is to increase the impact of an innovation by drawing on the influence of key stakeholders. In Ethiopia, for example, the government formed an army of development volunteers to implement its ‘1-to-5’ strategy where farmers trained in good agricultural, nutritional and hygiene practices are each responsible for training five other farmers, who in turn will train five others, and so on. Ideally, a ‘tipping point’ will be reached whereby scaling



Cooperation between agricultural value chain actors is necessary if locally successful innovations are to succeed at scale

of a technological, social or economic innovation will generate a critical mass of users, thus guaranteeing widespread adoption of the innovation, which then becomes the new ‘standard’.

In Madagascar, between 2006 and 2018, the International Fund for Agricultural Development (IFAD) funded several projects geared towards the promotion and scaling of the System of Rice Intensification (SRI). It focused on encouraging changes in farming practices by setting up farmer field schools to train farmers on using improved seed, fertiliser and crop protection products, as well as innovative tools such as biodegradable germinators. Agricultural technicians provided training and follow-up supervision.

One of IFAD’s projects was conducted in the Menabe and Melaky



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Scaling food security in West Africa

In Benin and Nigeria, a project entitled ‘Scaling Up Fertilizer Micro-Dosing and Indigenous Vegetable Production and Utilization in West Africa’, has been working to improve nutrition and income security through the increased production and consumption of indigenous vegetables. To overcome problems associated with low vegetable yields, such as poor soil fertility, land degradation, and water scarcity, the project has developed farmer-friendly and affordable solutions, including fertiliser micro-dosing which involves the targeted application of small quantities of fertiliser onto or close to the seed.

When combined with organic manure, micro-dosing was found to produce enough macronutrients in the soil to sustainably produce vegetables and, as a result, production of indigenous vegetables doubled during the course of the project, which ran from 2015 to February 2018. Incomes from indigenous vegetable enterprises also increased – from about €600 per week to €1,800 during the peak (dry) season. “Using simple, affordable and practical solutions, we are turning underutilised vegetables into cash crops for local farmers,” says Pierre Akponikpe, principal investigator for the project.

To accelerate the large-scale adoption of such practical solutions, the project, which is supported by the Canadian International Food Security Research Fund, created a ‘MicroVeg Innovation Platform’ (IP) to facilitate coordination and cooperation between farmers, marketers, processors, input sellers, policymakers and financial institutions. Through the IP, concerns that mattered to farmers were addressed – such as low production during the dry season, a lack of high-quality seeds, and poor fertiliser supply. The project also implemented vegetable production demonstration trials for farmers and has provided training for seed producers on, for example, when to harvest their grains and best post-harvest handling techniques.

Through these combined initiatives, information on improved vegetable production technologies and practices has reached nearly 340,000 farmers across both countries, and demonstrated that cooperation between value chain players is an effective way to scale-up agricultural solutions.

Sophie Reeve

regions of western Madagascar. While 16,000 households were initially targeted, 26,600 households benefited from the successful investments. Innovative tools and training in agricultural practices via 'school farms', as well as better hydro-agricultural management, resulted in substantial expansion of irrigated areas (3,393 ha of new irrigated rice fields, in addition to 2,195 ha where irrigation systems were improved). Average yields also more than doubled and the mean annual income of beneficiary households increased from Ar 1,308,700 (€325) to Ar 2,851,461 (€710), representing an overall increase of 118%.

The SRI approach – which has been implemented in Madagascar since the early 1980s – has been successfully replicated and adjusted to the Menabe and Melaky regions, where it has reached a large number of beneficiaries and improved their production. To successfully scale this project, IFAD has had to overcome many stumbling blocks, including poor water resource management, difficulties in adopting the new tools because it disrupted ancestral practices, and the need to tailor some techniques to local conditions (e.g. soil type, cropping calendar and spacing for transplanting). Project managers have had to build new irrigation infrastructure or rehabilitate old ones to meet these challenges, while sometimes also setting up microfinancing networks to provide access to funding and thus ensure the sustainability of the initiatives. The private sector has helped by supplying some harvest storage equipment, building small input supply shops, while training their owners and seed farmers.

Many challenges

“Scaling often calls for large changes which may have wide implications for society and the environment, both positive and negative,” warns Lennart Woltering, a scaling expert at the International Maize and Wheat Improvement Center (CIMMYT). “For example, while an irrigation project may benefit specific farmers, others in the community might suffer from lower water availability or higher pollution levels in the long term. One should not look for ‘maximum potential scale’ but for an ‘optimal or responsible scale’.”

The CGIAR Research Program on Climate Change, Agriculture and Food

Security (CCAFS) analysed 11 climate-smart agriculture (CSA) cases (<https://tinyurl.com/y8lav8qj>) in developing countries that exemplify three primary strategies to scale up CSA: value chain and private sector involvement, ICTs and advisory services, and policy engagement. The report also identified three major scaling challenges: the difficulty of estimating the costs and benefits of scaling activities to gauge the economic efficiency of different scaling activities; mainstreaming knowledge across local and national levels to move from small-scale projects to informing and implementing policies with a broad reach, while also ensuring that national interventions are appropriately contextualised and locally viable; and addressing equity considerations in scaling up CSA interventions to establish who is benefitting and whether disadvantaged groups are being excluded.

The goal of scaling is to increase the impact of an innovation by drawing on the influence of key stakeholders

“The tension between the context and specificities of smallholders with the need to reach very large numbers of them is a real challenge,” says Philip Thornton, a researcher at the International Livestock Research Institute and CCAFS. Thornton describes this tension using the example of radio broadcasts to inform farmers on weather conditions so as to help them make effective decisions. These radio messages, “have to be fairly generic [to reach a wide audience] and you can’t tailor them to the local farmers and their actual conditions ... You can reach tens of thousands of people but you can’t necessarily provide them with the message that will help them manage their crop.”

Scant technology adoption

In Africa, smallholder adoption of agricultural technologies is another problem that stalls scaling. “This is attributed to farmers not being aware of the benefits new technology can provide, the

technologies not being available at the time they are needed, or not being profitable due to land and labour allocation,” concludes the Partnership for Economic Policy’s study, *The Impact of Agricultural Technology Adoption on Farmer Welfare in Uganda and Tanzania*. Other reasons include a lack of market access, insufficient funds to purchase improved seed or pay for a mechanised service, insurance policies that are not tailored to farmers’ needs, or a preference for lower-yielding but better-tasting traditional seed.

Taking local particularities into account “is the massive *tremendum* [mystery] about scaling up,” adds Thornton. “We know that the farmers have different soil conditions, they have different objectives, they have different kinship networks that help them deal with life. How do you go from that sort of context and complexity to reaching the millions of smallholders that we need to reach?” Moreover, a successful project in one location will not necessarily have the same results elsewhere.

CIMMYT has opted to focus its scaling effort, particularly in Ethiopia and Zimbabwe, on developing a small tractor service for poor farmers who cannot afford to buy one. The Farm Mechanization and Conservation Agriculture for Sustainable Intensification project is coordinated differently depending on the specific features of the target country: in Ethiopia, where the state is omnipresent, marketing is overseen by the government since mechanisation is a key political priority; while in Zimbabwe, which has a more liberal economy, the private sector supports the project. “Once we have evidence that a particular piece of machinery can increase labour productivity (and land productivity in some cases) and can constitute a viable business for a rural service provider, we basically support the market system around this piece of machinery,” explains Frédéric Baudron, a Zimbabwe-based CIMMYT agronomist. This involves creating demand through demonstrations and start-up investment support, training value chain stakeholders, especially rural mechanised service providers and crafts people, providing market information and coordinating importers, processors, service providers and vocational training centres. Over a hundred service providers have so far been trained in Ethiopia and Zimbabwe since the project launch in 2014.

Scaling up in agriculture

The value of testing and evaluating new ideas to leverage resources and achieve sustainable impact at scale



SOURCE: IFAD, 2018

“If you manage to build a business case together with a company that can earn profits, they will continue investing in the business case or innovation, and even expand it”

Role of the private sector

The private sector is taking on an increasingly important role in scaling projects, but only as long as the market remains attractive. For instance, in CTA’s Scaling up climate-smart agricultural solutions for cereals and

livestock farmers in Southern Africa project, insurance companies and telephone operators have partnered to provide farmers in Malawi, Zambia and Zimbabwe with solutions to cope with the impacts of climate change. They all ask, “what are the business opportunities?” says Oluyede Ajayi, Senior Programme Coordinator of CTA’s Agriculture and Climate Change Programme. And the answer is, “Insurance companies want to have their market space. If they are part of a programme, the chance that their products designed for it are adopted is higher. It is also a way for them to reach out to customers for other products like life insurance,” Ajayi adds. Seed companies may have a fantastic variety and demand from farmers for it, but if the seed is only available to purchase in cities, it is out of farmers’ reach. “The idea is that this gap can be bridged if

the companies work with us through small agro-dealers in rural areas,” Ajayi explains. Telephone companies also benefit because, to get access to ICTs and weather-based services, farmers have to buy SIM cards and airtime.

“Private sector players are very important for efficiency and sustainability,” says Floortje Jacobs, public-private partnership adviser at SNV Netherlands Development Organisation. “NGOs often have project funding that is available for 3–4 years. When the funding ends, the project ends too, along with the impacts. If you manage to build a business case together with a company that can earn profits, they will continue investing in the business case or innovations, and even expand it. So the impact will keep scaling, even after the project funding ends,” she says. “But things are obviously more complicated in the field.”

› **Striking the right balance**

The cost of reaching farmers located in remote areas without infrastructure is often prohibitive, thus discouraging business investment. In the coffee and cocoa sector in Ghana, farmers located far from markets and business activity locations are being left behind, Thornton explains: “The private sector obviously has a major role to play but may not be able to reach everyone, particularly the poor in rural areas.”

To tackle this challenge, CTA’s programme has been built on a partnership between four pillars, Ajayi says: farmers’ organisations, “who could tell us when we do something wrong”; researchers and breeders who generate the technologies; private sector stakeholders who build the platforms or market seeds;

and policymakers who can change the laws and regulations. As a result, 4 years after the programme was launched in 2014, the profiles of 4,200 farmers have been digitised to ensure that they receive tailored weather information, 10,000 have purchased or learned about improved cereal varieties at seed fairs, 1,000 extension agents have been trained on agriculture-oriented insurance schemes, and 500 small agriculture product retailers have received training on the fundamentals of ‘supply and demand’ market dynamics.

To assess whether the conditions for sustainable and efficient scaling have been met, the PPP Lab initiative – in which SNV is involved – has developed the Scaling Scan tool, in collaboration with CIMMYT. Public-private partnerships

(PPPs) were questioned on their scaling ambitions and methods. “We found out that PPPs engage in 10 different types of activities,” explains Jacobs, “which we now call the 10 scaling ingredients”: technology/practice, awareness and demand, business case, value chain, finance, knowledge and skills, collaboration, evidence and learning, leadership and management, and public sector governance. The Scaling Scan tool is basically a self-assessment that helps PPPs reflect on the extent to which all of the ingredients are sufficiently addressed in their scaling strategies. The success of a scaling initiative, however, “still depends on the type of innovation, and the economic and political context, etc.” says Jacobs. “Unfortunately, there is not one recipe.” ■

Nine lessons for scaling up agriculture

Designed to guide decision-makers and prioritise limited investments for maximum impact at least cost, these lessons have already been used to scale successful practices to a wide set of beneficiaries



1
Formulate equitable agricultural policies



2
Design agricultural interventions to be gender inclusive



3
Assess whole-farm trade-offs and synergies for agriculture



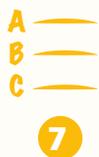
4
Support farmer-to-farmer and community-wide social learning



5
Know what drives the adoption of agricultural practices across different scales



6
Target the pathways to scale out agricultural technologies to farming communities



7
Prioritise agricultural options and benefits for greater impact



8
Invest in preserving and enriching the soil



9
Monitor agricultural interventions with a real-time participatory tool

SOURCE: CIAT, [HTTPS://TINYURL.COM/Y9ALNV7M](https://tinyurl.com/y9alnv7m)

INTERVIEW

Renaud De Plaen:

“There is no blueprint for development”

Alex Miller

Program leader for agriculture and food security at the International Development Research Centre (IDRC), Renaud De Plaen, describes some of the requisite factors to design scalable development interventions.

What lessons has IDRC learnt about the necessary factors to ensure interventions can be scaled up?

For IDRC, the importance of scaling up came from the desire to address problems associated with food security. Over the years, IDRC have developed a number of innovations, but one of the key challenges is helping those innovations make an impact at scale. IDRC looked at scaling up as a way to get successful innovations to a large number of people, replicating them, or even adapting them so that they can work in new contexts. However, there is no blueprint for development and interventions may not always be applicable to different social and environmental contexts.

For successful scaling up, we have identified five necessary factors. The interventions need to be specifically relevant to the local population that you are trying to help. Secondly, you need to identify the right strategy for scaling up your intervention, which may entail working with ICTs. The third factor is identifying the right partners, such as academia, civil society, the private sector, or policymakers to scale up your innovation; being in the right place, at the right time, with the right partners is also an important factor. And, finally, finding and supporting some local leadership for your strategy is necessary to maintain development in the local community.

Where have these factors been particularly effective in IDRC projects?

In India, IDRC has supported the development of double fortified salt production as a way to address anaemia in children and pregnant women. The innovation has been scaled through a partnership with policymakers. They subsidised the cost of double fortified salt for consumers in the states of Jharkhand, Madhya

and Uttar Pradesh, which has helped 50 million people access the salt. A scaling up strategy involving ICTs has also been particularly effective in Benin and Nigeria, where IDRC has reached over 18 million people through rural radio programmes. The broadcasts informed farmers about how to grow and consume indigenous vegetables. However, even with the best scaling up strategies, there are no guarantees of success.

Why is involvement of the private sector so critical to help scale interventions and create lasting impact?

Most of the literature on scaling up focuses primarily on market approaches to scaling. It assumes that if an innovation works at a local level and is economically viable, then the private sector will be able to pick it up and run with it. However, this is not always the case. For example, in the case of the double fortified salt, it would have been difficult for the private sector to scale up this intervention on its own and the implementation of policy related to double fortified salt in Jharkhand, Madhya and Uttar Pradesh states was critical to its successful deployment. The private sector is often one of many important actors, but its role varies according to the innovation that is being scaled up.

How can policymakers be encouraged to invest in agricultural development to help replicate and scale successful interventions?

African countries have already made tremendous progress when it comes to investing in agriculture. Although many are not there yet, 44 countries have committed to allocating at least 10% of their national budgets to agriculture and food security in the future. Most investments go towards access to inputs, infrastructure and finance, to support an increase in production. However, investment in education needs to become more of a priority, so that there will be more agricultural experts on the continent who can enhance African agricultural capacity and facilitate scaling up of successful innovations.



Renaud De Plaen of IDRC explains the critical role that both the public and private sector play in scaling innovations

BENIN

Stimulating production through public-private partnerships

By creating stronger value chains around ‘champions’ in agribusiness, the incubator programme, 2SCALE, is helping small-scale farmers enter local and regional markets and enabling an increase in the scale of production.

Aaron Akinochi and Claude Biao

In Benin, 61,000 farmers – including 20,000 women – are involved in public-private partnerships built around local small- and medium-sized enterprises (SMEs), thanks to support from the agribusiness incubator, 2SCALE. Present in nine sub-Saharan African countries, and financed by the Dutch government, 2SCALE is committed to creating networks around local ‘champions’ (producer organisations, traders, processors, suppliers of agricultural services, etc.) in order to help them produce, process and supply high-quality food produce for local and regional markets. The aim is to increase the scale of the entire value chain by responding to the needs and ambitions of the companies, whilst still involving local producers and other rural entrepreneurs, in addition to reaching low-income consumers.

“Our approach is focused on the market,” explains Éric Lakoussan, head of 2SCALE’s horticultural sector in Benin. “We work around the business idea of one company in order to develop an inclusive value chain, and we are using 2SCALE funds from the Dutch government to cement a partnership with this ‘champion’ and the other parties in the value chain.” In Benin, 2SCALE partners with just over 350 SMEs.

A fruitful approach

One of 2SCALE’s success stories is Promo Fruits. In 2013, 2SCALE helped the regional leader for fresh Pineapple juice to negotiate a loan of €697,000 from Oikocredit International to invest in new machinery and enable the 2,500 small producers who supplied the company to increase their productivity and access finance. The following year, Promo Fruits negotiated further loans



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By creating networks around local 'champions', agribusiness incubator 2SCALE has helped to involve over 60,000 Beninese farmers in public-private partnerships

in order to invest an additional €3 million in their factory in Allada, 56 km north of Cotonou.

In partnership with 2SCALE, the company co-financed a network of technicians who train and advise farmers on agricultural best-practices. This enabled an additional 12,000 farmers to join the Promo Fruits supply network, which increased the quantity of fruit supplied from 11,200–21,500 t/year and Promo Fruits doubled the volume of juice sold, from 5.2–11.5 million l/year. As a result of this increase in scale, the company was able to self-finance all of the costs of the technician network.

At the start of their partnership with pineapple growers in 2016, Promo Fruits also organised meetings with the farmers which enabled them to discuss specific challenges linked to transportation, and to find solutions. These included providing transport to producers, and organising initial processing *in situ*, before transportation to the factory. "It is important that all of the parties involved understand that working together creates improvements in productivity and competitiveness," concludes Lakoussan.

Success with soya

Another SME 2SCALE partners with is the soya cooperative, Coopérative de Transformation d'Approvisionnement et d'Écoulement de Soja (CTAE), which commits to purchasing minimum quantities from producers to supply its production units for oil and soybean *goussi* (a condiment). With 2SCALE support, CTAE has strengthened its supply chain and doubled the quantity of soya it processes from 6,000 t in 2016 to 12,000 t in 2018. To strengthen their partnerships with farmers, 2SCALE partners, including CTAE, are committing to developing services at the upper end of the supply chain – such as logistical support to transport the soya to the nearest factory in order to reduce post-harvest losses – to increase and improve their production capabilities, and the productivity of farmers.

The main challenge: access to credit

Bernard Dedjelenou, coordinator for the cooperative, Union régionale des producteurs de l'Atlantique et du Littoral (URP-AL), considers his top priority to be increasing soya production. This is why URP-AL, a 2SCALE partner, is training growers to enable them to produce high-quality foodstuffs and to store and transport them under optimal conditions. To achieve this, URP-AL requires finance to enable them to contribute to the travel costs of farmers attending training sessions. "To maintain this in the long-term, and to entrench the training process, it is important to have access to credit," explains Dedjelenou. "This remains our principal barrier."

This concern is shared by the farmers who benefit from 2SCALE's operations in Benin. Many believe that the solution is to find more businesses to commit to buying their produce, which would provide microfinance organisations with a guarantee to encourage them to extend credit to farmers. However, according to Dedjelenou, URP-AL has already lost partnerships with microfinance companies due to payment defaults by some farmers. Without this credit, upscaling operations are simply not possible.

One of the main challenges in establishing partnerships that can help in scaling up value chains is finding companies that wish to be both competitive in their markets and have a lasting social impact on the other members of their supply chain. "A lot of companies that operate in the agribusiness sector do not have a desire for inclusion," laments Lakoussan. "There are companies which simply wish to buy raw materials without any contact with the producers."

The importance of working together

The same logic holds for partners operating on a more modest scale. "The main advantage of 2SCALE is that we are now able to manage our production as a small company would," explains Bénédicte Ahouansou, a Beninese soya processor and member of a cooperative of 20 women, which sells cheese, milk, flour and pancakes in local markets. "Thanks to 2SCALE, we have managed to identify four farmers who produce high-quality grain. We purchase from them either in cash, or on credit, and produce cheese, milk, flour and pancakes." This strategy allows Ahouansou, and the other members of the cooperative, to earn around CFA 30,000 (€45) a month, compared to a little less than CFA 10,000 (€15) before they started their processing activities in 2017. ■



EL SALVADOR

Building a win-win agribusiness solution

An agribusiness in El Salvador is transforming the lives of local communities by providing jobs, training and access to formal markets for farmers and farm workers in the agricultural sector.

Stephanie Lynch



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Acceso's collection centres in El Salvador directly source more than 60 types of fruits, vegetables and seafood from over 1,000 smallholders



For small-scale farmers living in remote areas around the world, access to finance, inputs and markets present a major challenge, which often prevent them from achieving sustainable growth in productivity. These difficulties are as prevalent for farmers in El Salvador as they are for farmers in rural areas of sub-Saharan Africa. To provide a sustainable and scalable solution, the Clinton Giustra Enterprise Partnership (CGEP) has established a social enterprise, Acceso Oferta Local – Productos de El Salvador, that bridges the gap between rural farmers and large buyers, and helps smallholders increase the productivity and quality of their crops.

“Through years of testing various approaches, we learned that building agribusinesses that directly link marginalised farmers to buyers is a more sustainable, scalable, and replicable solution than traditional programmes,” explains Frank Giustra, who co-founded CGEP with former US President Bill Clinton in 2007. CGEP has established locally managed agribusinesses in the Caribbean, Latin America and Southeast Asia, which have generated over €16.4 million in farmer income and benefitted more than 10,000 farmers and farm workers. To ensure development interventions achieve impact at scale it is essential that they can become financially self-sufficient. CGEP’s goal is therefore to build profitable agribusinesses that satisfy the needs of market buyers and attract support from minority impact investors – private sector individuals or institutions who are aligned on financial and social goals.

Enhancing farmers’ capacities

In El Salvador, smallholder farmers not only have limited access to formal markets, but also have difficulty knowing which crops are in demand and the price they can achieve. Consequently, farmers often end up selling their produce to middlemen at prices that are much lower than the market value. However, since Acceso was established in 2013, the enterprise has become the country’s leading company for sourcing produce directly from smallholders, over 1,000 farmers supply Acceso with more than 60 types of fruits, vegetables and seafood. Acceso sells these products to national and international buyers, such as Super Selectos (the largest national supermarket, which has 96 stores across El Salvador) and Subway’s 84 restaurants in the country.

“Acceso ... plays an incredible role, not only in bringing the products to our stores on time, at excellent quality and good prices, but also in developing

Collection centres have improved the incomes of more than 3,200 farmers and farm workers and created 114 jobs

the capacity of farmers to grow and develop the value of their produce,” says Carlos Calleja, vice president of Grupo Calleja, which owns Super Selectos. To ensure farmers are able to meet the quantity and quality demands of large buyers, Acceso provides training in good agricultural practices (GAPs), such as the proper use and storage of fertiliser, and the best control mechanisms for pests and diseases. By

partnering with Asociación de Proveedores Agrícolas – an agrotechnology and food security organisation – and the agribusiness trade association, CropLife Latin America, the company is able to assign each farmer an agricultural technician and scale out GAP training to its entire network of farmers. “The goal is to

improve crop handling techniques so [farmers] can finally achieve higher yields,” explains Jaime Torres, Acceso’s lead agronomist.

Attracting private sector buy-in

In 2016, Acceso became the first business in Central America to pass a GAP audit of farmers’ plots by Yum! Brands. By ensuring that farmers are able to consistently produce crops according to strict quality standards, Acceso has been able to reliably supply agricultural products to large buyers on the scale that they require. This approach has helped the company to gain buyers’ trust and establish long-term partnerships, which is integral to allow the enterprise to grow and achieve impact on a large scale.

When Acceso approaches a new client, the enterprise’s local team of experts assesses the buyer’s crop specifications and volume demand to help identify gaps in local supply that their smallholders could fill. Andres Baiza, Acceso’s general manager, explains that the company identified that some of their clients “were importing certain products like broccoli and lettuce... from Guatemala.” Given that the conditions in El Salvador are also suitable for the production of these cash crops, the company trained their farmers to produce the vegetables locally.

By advising and training an association of 14 women to produce cash crops such as cucumbers, tomatoes and green peppers – which are in local demand – Acceso guaranteed these smallholders a profitable market. “The nice thing has been the experience of being competitive in a formal market,” says one of the women in the association. Before linking up with Acceso, the women were selling in informal markets where the prices varied substantially from week to week. They now receive a steady income for their produce, which – even

- › when sold for a premium due to its high quality – undercuts the price buyers would have to pay for imported goods.

Providing ease of access and jobs

Beyond meeting buyers' demands in terms of the variety, quality and quantity of crops they need, at a competitive price, Acceso also manages the aggregation, packaging and delivery of smallholder goods. "Our buyers can buy from our network of farmers through us. They don't need to go to each farmer and see what they're producing, we do that for them," boasts Baiza. The aggregation services not only ensure Acceso is able to source and distribute produce on the scale required by buyers, but also benefit the farmers, for whom "we are a single solution because we... classify their products to be delivered to formal markets," he says.

By ensuring that farmers are able to consistently produce crops according to strict quality standards, Acceso has been able to reliably supply agricultural products to large buyers on the scale that they require

Acceso operates four collection centres in Chalatenango and Huachapán, which conduct quality control and basic processing (washing and packaging) of 750,000 units of produce

per month. Around 300 producers supply the collection centre in Los Planes, Chalatenango, with about 58 different products. "Before, we spent more time delivering. It took us 5 hours to drop produce at the market and we weren't sure if they'd accept it or not. Today the advantage is that it's just a 5 minute drive [to the collection centre] and everything is organised. It's certain that they'll purchase everything," says one farmer.

The collection centres have not only improved the incomes of more than 3,200 farmers and farm workers in the surrounding communities, but also created 114 jobs for local collection and processing workers, as well as agricultural technicians. One woman who works at Los Planes collection centre says, "My life has changed. I come to work, I spend time with my co-workers, I learn new things... The important thing is that I have a salary; I have resources to support myself and get ahead."

Profit-driven value chain approach

The agribusiness solution that CGEP has developed benefits actors along the entire value chain, from the smallholder farmers whose productivity and incomes have significantly improved, to large buyers who save time and money with Acceso's reliable supply of quality produce. By ensuring all stakeholders have something to gain from its activities, Acceso was able to achieve profitability within 15 months and has ensured that its revenue continues to grow, reaching almost €5 million in 2017. Giustra explains, "We look to create a win-win situation for both farmers and buyers. It's not easy; however, with persistence it is possible to build viable businesses, and these types of investments are highly impactful in terms of social return on capital." In El Salvador, this approach has enabled CGEP to deliver successful, sustainable impact at scale. ■

Revitalising Haiti's groundnut sector

Despite the large number of farmers in Haiti who rely on groundnut farming for their livelihoods, exports to the US and Europe are limited due to poor price competitiveness and high rates of aflatoxin contamination. To revive the sector and enable smallholders to reach formal markets and scale up production, CGEP launched the Acceso Peanut Enterprise Corporation. With over 3,000 farmers, the social enterprise has one of the largest formalised networks of smallholders in Haiti. To avoid aflatoxin contamination and improve yields, the farmers are trained in good pre- and post-harvest practices. The company also provides farmers with access to inputs on credit, such as quality seeds and fertiliser, and the cost is simply deducted from the price that Acceso pays farmers for their crops at the end of each season. Sinous Chavre, a 78-year-old farmer, explains that before he joined Acceso's training programme he had difficulty securing seeds and credit. Now he not only has access to quality seeds and fertiliser, but has also received training in improved practices for land preparation and post-

harvest storage, enabling him to expand his production and increase his monthly income by 40%. "Being part of Acceso means that I do not need to work another job or find an alternative source of income to support my family," he says. Acceso aggregates, stores and conducts aflatoxin testing on the groundnuts that it receives from farmers like Chavre using a network of nine depots that it has established in Haiti's Central Plateau. In 2016, the company was able to begin scaling its operations to include additional crops, such as lime, mango, sisal, castor and moringa, which are sold in both local and export markets. To ensure its farmers receive the quality seeds they need, Acceso Haiti also operates a commercial nursery, which produces and distributes seedlings to farmers. So far, the nursery has produced more than 1 million seedlings. The company's business model, which provides farmers with access to everything they need to expand their production and sell to profitable buyers, generated over €1.2 million in revenues during 2017.

SPORE

Agribusiness

MARKET OPPORTUNITIES

*Brewing up
new market opportunities*

*Curing the Caribbean –
one teacup at a time*

30

AGRI-FOOD SYSTEMS

*Kenyan farmers profit from growing
aromatic market*

*Adding nutritional value
to Kenyan crops*

32

FINANCE & INSURANCE

*Closing the
agri-finance gap*

34

TRADE & MARKETING

*Aligning Africa's
regulations with
global markets*

36

BUSINESS LEADERS

*“Our priority is to
empower women in
the value chain”*

38

LOCALISED TRADE

Brewing up new market opportunities

Through a public-private sector initiative in Cameroon, farmers are being provided with improved seed to enhance their production and supply local industries.

Elias Ntungwe Ngalame

Through the establishment of partnerships between producer organisations and local food companies, subsistence production of cassava, maize and sorghum in Cameroon is being transformed into commercially-orientated and competitive value chains. As part of a public-private sector initiative, farmers are being supplied with improved seeds in order to increase production and provide quality raw materials to national bakeries and breweries. As a result, over 8,000 farmers are now accessing steady and reliable markets, while the local businesses have been able to significantly reduce their import bills for flour and raw products.

Established in 2014, the World Bank Agricultural Investment and Market Development Project (PIDMA) has developed a partnership agreement between

In Cameroon, public-private partnerships are helping smallholders to move from subsistence to commercial production

8,000

farmers are accessing steady and reliable markets

200

local bakeries use the flour within their bread

the Ministry of Agriculture and nine private companies within the brewing and bakery sectors. With funding of €76 million, PIDMA is also working with research partners from the International Institute of Tropical Agriculture on providing improved cassava varieties, and the Institute of Agricultural Research for Development in Cameroon, which is supplying high-yielding and disease-resistant maize and sorghum seeds.

As part of the partnership agreement, local agri-food companies use the raw

materials supplied by producer organisations for making cassava flour and starch. Over 200 local bakeries now use the flour within their bread, while the starch is used by Nestlé, for example, to make products such as Maggi bouillon cubes, as well as by Guinness Cameroon and Brasseries du Cameroon in the production of beer. As a result, the companies involved have seen their overall expenditure reduced by over 50% due to a significant decrease in importation costs. “Farmers of these staple crops are now successful because they have a steady market for their products,” says Christopher Ekungwe, regional delegate of agriculture and rural development for Cameroon’s south-west region.

Through the provision of quality seed and greater access to local markets, maize and sorghum farmers are also increasing their incomes. Alice Ngum, a maize farmer from south-west Cameroon says she now earns around FCFA 475,000 (€720) per season – triple the profit she made before the initiative. “In the past, we sold our products at a give-away price and we could not even negotiate with buyers who offered little because we were desperate,” she says.

According to the Ministry of Trade, each year brewing companies and bakeries are using an estimated 400,000 t, 300,000 t and 20,000 t of locally produced maize, sorghum and cassava, respectively. Officials at Brasseries du Cameroon say the project has created a win-win system for both farmers and companies, “The initiative to localise the market for maize and sorghum has been very profitable for all stakeholders, allowing for local supply to the companies and immediate sale of produce for the farmers,” says Julius Wysenyuy, regional director for sales at Brasseries south-west branch. ■



© ELIAS NTUNGWE NGALAME

TRINIDAD TEAS

Curing the Caribbean – one teacup at a time

A new line of organic loose-leaf teas launched in Trinidad and Tobago is building on the region's tradition of steeping flowers, leaves, herbs, roots and barks to provide a range of health benefits.

Natalie Dookie

In 2016, Sophia Stone, founder of Caribbean Cure, decided to leverage the curative properties of West Indian plants to create natural teas that build on the Caribbean's practice of using herbs to provide health benefits, making them more accessible to health-conscious consumers. "We use premium indigenous raw materials to craft our medicinal recipes, which then are blended for wellness and taste," says Stone. "Starting with one, the firm now produces five blends containing no added sugar, preservatives, flavourings or colouring and, with the exception of our cardamom-ginger white tea blend – which contains minimal caffeine – our teas are caffeine free." With zero calories, and 100% vegan and gluten-free, the teas also contain ingredients that have been shown to boost antioxidant and immune levels.

When first established, Caribbean Cure struggled to find a reliable supply of indigenous ingredients. However, of the 20 raw materials used today, about 75% are sourced regionally. "We oversee production of our teas from garden to table, including visiting fields, investigating farming techniques and testing the crops," Stone explains. Through these partnerships with a few small farmers, the company has been able to assure quality and consistency with its teas. Many ingredients (hibiscus flowers, sorrel, orange peel, lemongrass, ginger and turmeric) originate from Trinidad. But ingredients not produced locally or in sufficient quantities (black peppercorns, aniseed, cinnamon, cloves, cardamom pods and ginger) are imported, mainly from Grenada.



Caribbean Cure's teas contain no added sugar, preservatives, flavourings or colouring

In order to maximise nutrient retention and create various flavour profiles across the range of teas, Caribbean Cure has developed a proprietary slow-heating dehydration process, and their proprietary hand-blending process, which has been trademarked, was developed in-house with local experts to ensure nutritional integrity of the ingredients. Stacy Seeterram, executive director, also highlights the uniqueness of their packaging, "We are an eco-friendly firm and have reduced the use of packaging by doubling the amount of tea in our metal tins to 40 servings, and we further reduce waste by encouraging customers to recycle our tins."

Since coming on board in 2017, Seeterram has actively partnered

with business support organisations at all stages of product development and testing. Most recently, she spearheaded collaboration with exporTT on co-financing arrangements and learning how to become more export ready. With support, Caribbean Cure has seen its monthly production run increased from 50-100 tins in 2016 to 5,000 tins by August 2018. On future plans, Stone says they will be launching a tea bag line soon, making the loose-leaf experience even more accessible and at a lower price. Within the next 6 months, Caribbean Cure is finalising arrangements to sell its products on Etsy and Amazon, and is also in talks with distributors in the Caribbean Forum, Canada and Japan to export their first loose-leaf shipments by 2019. ■

© CARIBBEAN CURE

HERBAL HARVESTS

Kenyan farmers profit from growing aromatic market

Through the provision of quality, adapted seeds, greenhouses and training in good agricultural practices, farmers in Kenya are diversifying their production with the introduction of herbs.

Bob Koigi

In Kenya, more than 2,000 smallholder farmers are accessing international markets and increasing their incomes through herb farming. In order to meet growing global demand, seed and vegetable company, Premier Seed, has been providing farmers with training in herb production and in how to meet international food safety and quality standards.

The company aims to encourage farmers to move away from traditional cultivation of cereals and pulses, which continue to produce low yields as a result of incessant pest and disease attacks and poor farmgate prices. Herbs like basil and chives are perennial and mature after 45 days – unlike maize or beans which take a minimum of 3 months to mature – and can be harvested every 10 days, providing a frequent and reliable income. “We wanted to convince farmers of the benefits and transform their farming experiences,” says Eunice Wanjohi, Premier Seed’s lead agronomist.

The project was first piloted in 2012 with 50 farmers from Nakuru who were trained in the production of basil and chives. The project has now reached 2,000 farmers across key agricultural areas and introduced a variety of other herbs, including oregano, thyme, rosemary and tarragon. To ensure optimum yields are achieved, Premier Seed works with seed breeders from the Netherlands which produce varieties well adapted to the dry climate and alkaline soil conditions. “Seed is the foundation of every farming venture so we have to make sure we get it right from the start,” says Simon Andys, CEO and founder of Premier Seed.



Farmers in Kenya are diversifying their production by growing profitable and fast-maturing herbal crops

James Kuria who had been farming maize, beans and peas for 40 years is one of the project’s pioneering farmers and now runs four greenhouses in which he grows basil, dill and thyme. “I used to earn on average Ksh 23,503 [€200] per month before delving into herbs and I struggled to take care of my family. Now, from my herb farming alone, I earn Ksh 47,000 [€400] every month. My wife left her shop business to help me because the results from the farm are so impressive. We have introduced over 20 other farmers to this venture,” he says.

In addition to quality seeds, farmers are provided with training in good agricultural practices, such as the judicious use of chemicals and water, pest management and produce traceability – which they can enhance by allowing their location and planting and harvesting details to be accessed online. Premier Seed also constructs greenhouses for farmers as a result of partnerships established

2,000
smallholder farmers are accessing international markets and increasing their incomes

2,500
additional farmers are being trained, with the aim of reaching a further 7,000 by 2020

between the company and financial institutions. Banks extend credit facilities to the farmers and once they start earning from their exports, a pre-agreed upon proportion of their income is deducted to repay the loan amount.

Premier Seed initially targeted the European market, but has since identified new markets in the Middle East and US. The company is recruiting more farmers to meet the burgeoning demand and is currently training another 2,500 farmers, with the aim of reaching a further 7,000 by 2020. ■

Adding nutritional value to Kenyan crops

Farmers in Kenya are supplying a local agri-processing company with millet, groundnuts and honey to produce nutritious snacks and strengthen local value chains.

Justus Wanzala

Established in 2015 by Irene Ikarede Etyang, Akimaa Africa blends locally-produced ingredients together, resulting in highly-nutritious snacks. Its Tasty Millet Meal Bar is high in protein, as well as several key minerals, including calcium, iron, phosphorus and zinc. “Obesity is on the rise in Kenya, and Africa at large,” Etyang explains. “My Tasty Millet Bar is therefore a good replacement for the sweet foods people like because it is low-fat and highly nutritious. The bar is also gluten free and has no added sugar, making it good for diabetics.”

The firm currently contracts over 200 farmers to produce and supply millet. Another 10 farmers provide groundnuts and two youth groups supply the bulk of the honey. “In our team,

we have agronomists who have been instrumental in ensuring that we get the right raw materials as per our specifications,” states Etyang. She adds that the company has trained farmers on good agricultural practices and proper food handling. “Food quality and safety is key for us because we produce human food, and we are sure to adhere to food policies and legislations.”

The company has a small factory in Busia county and uses a milling machine to grind down the groundnuts and millet into flour and blend it together. “Our production capacity is 500 bars per day, retailing at Ksh 100 [€0.86] each,” Etyang says. The company’s customers are predominantly health-conscious urbanites, and demand is increasing. “The challenge we have is a lack of

processing equipment; most of our production is manual,” she adds. “We hope to automate the process as we scale up.” Etyang states that this would also enable the company to begin to provide a wider range of products, including confectionery.

Gladys Emojong is one of the farmers supplying millet to the company and observes that most farmers had previously abandoned millet cultivation due to poor prices and the crop’s intensive labour requirements, but the company’s production has resuscitated its cultivation. Tabitha Apurut, another millet supplier for Akimaa Africa, explains that before she was introduced to Akimaa Africa by a friend, income from the crop was low. “I used to sell 1 kg of millet for Ksh 25-35 [€0.21-0.30] – mostly to middlemen – but now Akimaa Africa buys it at Ksh 100 [€0.86]. This has motivated me to grow more,” says the mother of five. Apurut, who cultivates millet on 1 ha, says she intends to lease more land to plant the crop and, since 2015, has earned approximately €680 from the crop each year.

Apurut also lauds the knowledge of good agricultural practices (GAPs) acquired through Akimaa, which have enabled her to improve her production and post-harvest handling. All of the farmers contracted to deliver their produce to Akimaa Africa are offered training on millet husbandry and GAPs relating to the use of fertilisers, pest control methods and post-harvest handling of their produce. Training is provided through extension visits, open days and demonstrations on farms. ■



© VICTOR OCHAKALA

Akimaa Africa’s nutritious and profitable Tasty Millet Meal Bar provides a new source of income for over 200 farmers

ECONOMIC EMPOWERMENT

Closing the agri-finance gap

Improving rural women's access to finance represents an untapped business opportunity for financial service providers prepared to tailor products to meet their needs.

Helen Castell

In many ACP countries, barriers to formal finance prevent women from growing their businesses and investing in their community's future. Only 50% of women in the developing world own a bank account, according to the World Bank's Global Findex database. For agriculture, the challenges are more complex. For example, women clients represented just 28% of Opportunity International's agri-finance portfolio a year ago, compared with 85% for its total lending book, notes Timothy Strong, Opportunity's director of operations for agri-finance.

Improving women's access to agri-finance requires a holistic approach and a need to embed gender awareness, argues Strong. A recent change in its gender strategy saw Opportunity hire consultants to assess attitudes throughout its workforce and provide gender training. A vetting tool was also developed that measures whether partners' gender values align with its own. As a result, in part at least, Opportunity has increased women's representation in its African agriculture finance portfolio to 49%, against an initial target of 40%; while, in Mozambique, women's representation has almost doubled to 30% from 18%.

Sharing the risk

Despite numerous studies showing women to be an excellent credit risk

– with equal or better microfinance loan repayment rates than men – few lenders get to experience this without some initial risk-sharing support. “It's very hard to convince financial institutions to invest in a new client category unless there is some kind of mechanism behind it, like a credit guarantee scheme or subsidisation to encourage them to approach the client segment and see the profitability for themselves,” says Niclas Benni, FAO rural finance and investment specialist. To boost women's financial inclusion, CUMO – Malawi's biggest rural microfinance provider – received initial funding from the UK's Department for International Development (DFID) in the early 2000s. As of June 2018, it boasted a repayment rate of 99% from a lending portfolio that comprises 83% women.

Lack of collateral, such as titles to land or property, is a common barrier for smallholders seeking credit, but an even bigger one for women with most property held by men. One solution is to accept group collateral, including savings. With CUMO, for example, groups of 10 to 25 women save into a joint deposit account; when they have savings equal to 5% of the required loan, CUMO retains the money as collateral.

Regulatory change is also encouraging lenders in some countries to explore accepting movable property such as

furniture as collateral. A World Bank-supported online public database that allows business owners to use moveable assets to secure loans was launched in Malawi in February 2016. Mozambique's central bank is supporting a similar initiative.

Bridging the gap

Rural smallholders' physical distance from urban bank branches is also a challenge. Most women have less access to transport than men and they may face safety threats travelling alone, notes Maxi Ussar, director of JustImpact Consulting based in Malawi. In some cultures, women are expected to remain at home and may require permission to travel. Others see handling money as a man's job or lack the confidence to enter a bank. For many rural women, the dual responsibilities of farming and childcare also leave them with less time to travel.

CUMO's lending model requires that each group of borrowers opens a bank account at a nearby branch but, although some travelling is required, only one person has to make the journey. Reducing the need to travel to banks could be overcome by mobile technology. However, with mobile ownership rates lower among women globally, this will take time, emphasises



Financial service providers are beginning to tailor products and services to suit women's needs and priorities

Serving female smallholders

Benni, particularly as over 1.7 billion women in low- and middle-income countries do not own mobile phones.

Tailoring products

Financial inclusion interventions are not gender-neutral and uptake gaps would be reduced if products and services suited women's needs and priorities, Jemimah Njuki, senior program officer at Canada's International Development Research Centre, wrote recently in *Business Daily Africa* (<https://tinyurl.com/ycg2dnct>). After a DFID-funded gender study showed women prefer to engage with female loan officers, Opportunity is exploring ways to hire more female staff, who live in the communities, says senior programme manager Lydia Baffour Awuah. In addition, in many communities, it is men who control assets, resources and inputs, meaning it is important to engage with them to demonstrate why investing in women's businesses is good for everyone, says Baffour Awuah. "We can't address the issue about women and gender inequality without bringing the men on board."

Lenders should also identify the crops that women grow, which tend to be horticulture or food crops rather than the cash crops men focus on, and then

In order to reach more female smallholders, financial service providers must understand their aspirations, income patterns and product preferences and tailor products accordingly, a recent brief by CGAP concluded (<https://tinyurl.com/ycyaet54>). Drawing on data from detailed financial transaction and income flow diaries collected from smallholder households in Mozambique and Tanzania in 2014-15, the brief found that women farmers prioritise and have responsibility for household and family expenses like education and groceries. Products like commitment savings for education could therefore appeal.

Women also experience longer periods of illiquidity than men and enjoy fewer income peaks during the year, suggesting they could benefit from longer-term loan repayment schedules. Products could be tailored so that, for example, credit is offered during low-income periods and saving deposits are requested during income peaks – which often occur at different times to men. Granting women longer-term credit products, especially in periods of illiquidity, can allow them to gain some economic independence, says brief co-author Benni.

target them through farmer associations or input providers, says Baffour Awuah. As part of the Malawi Oilseed Sector Transformation project, which Ussar consulted on, as private sector companies started to see commercial opportunities for sesame, they were encouraged to sign contracts with the traditionally female growers rather than their husbands, as previously. This gave the women more financial autonomy and allowed them to benefit from ancillary training to improve yields and creditworthiness.

Smallholder income flow diaries collected by the Consultative Group to Assist the Poor (CGAP) also showed a preference among women for savings over credit, which questions the common practice of banks offering savings and loans in a bundle, which can force women to take a product they do not want, states Benni. A focus on savings can also be a double-edged sword for women, creating a culture of caution where female farmers are wary to spend or invest in their business, adds Ussar. ■

FOOD SAFETY

Aligning Africa's regulations with global markets

Poor food safety regulations limit Africa's ability to engage in international food markets. But harmonised regulations, tailored infrastructure and increased public and private sector investment have been identified as interventions that could bolster the continent's food safety capacity, and ignite its food export market.

Vincent Defait

Despite the economic importance of agriculture in Africa, food commodities account for only 4% of the continent's total exports – a predicament that is partly explained by its poor food safety record. To boost the competitive edge of agriculture in ACP countries, it is essential to align food quality standards with the rest of the

world, while improving the efficiency of value chains.

“In our pursuit of higher, more sustainable and nutritious food production in Africa, we must not lose sight of the importance of food safety and not just for health reasons,” warned Michael Hailu, CTA Director, at the launch of the new Africa Food Safety Index

(AFSI) on 2 October 2018 in Senegal. “If smallholder farmers cannot connect to expanded market opportunities, including exports, they will never be able to escape the cycle of poverty.” CTA has partnered with the African Union (AU), CGIAR, FAO and World Health Organization to launch the AFSI with the aim of providing the evidence necessary for African countries to prioritise food safety, reduce foodborne illnesses and improve trade and income.

President of the African Development Bank, Akinwumi Adesina, warned in 2017 that Africa's annual food import bill – already worth US\$35 billion (€30 billion) – was estimated to rise to US\$110 billion (€95 billion) by 2025. The cost is substantial considering that losses due to aflatoxin contamination alone currently amount to over €750 million per year, according to the Partnership for Aflatoxin Control in Africa. Moreover, the *Africa Agriculture Trade Monitor 2018* (see *Levelling Africa's Trade Imbalance* in this edition) recently reported that a lack of compliance with EU standards resulted in trade losses for sub-Saharan Africa worth €7.9 billion in 2012.

Harmonising and strengthening regulations

In this context, appropriate capacity to meet food safety standards is needed. The Global Food Safety Partnership have published a report entitled *Food Safety in Africa: Past Endeavors and Future Directions* presented at the most recent



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To connect African smallholders to international markets, food safety regulation must be improved across the entire value chain



Investments in appropriate infrastructure and technology are key factors in achieving both food safety and market expansion

CTA Brussels Briefing, which maps and analyses the institutions, initiatives and resources devoted to food safety capacity building in sub-Saharan Africa. The data is designed to provide a basis for countries and regional organisations to streamline and strengthen their food safety regulations and initiatives.

Isolina Boto, Manager of the CTA Brussels Office and Coordinator of the Brussels Briefings, outlined a number of key points on food safety that emerged from the Briefings meeting – highlighting in particular the need for research data to support policymaking, and the importance of partnerships between donors and other stakeholders for scaling good practices. Boto also insisted that the distinction between regional and international markets is not a crucial one, since many businesses serve both markets, and all consumers require access to healthy food.

All actors impacted

Food safety affects all actors across the value chain, including smallholder farmers who generally deal with informal markets – which are often lacking in health inspection equipment and

“While technology is very important, farmers will not adopt it if there are no incentives to produce safe food”

sufficient resources to boost awareness on good practices. “Smallholder farmers are not organised in any way, so what we have been doing is ensuring we aggregate these farmers into production and marketing units,” explains Elisabeth Nsimadala, president of the Eastern Africa Farmers’ Federation (EAFF). The e-Granary platform, which can be accessed via smartphones, is used by EAFF to organise farmers and provide them with up-to-date market information and agricultural advice. This enables EAFF to more readily disseminate technology and practices to help improve the safety of the food produced by over 100,000 members.

Kelley Cormier, division chief for USAID’s Bureau for Food Security, says

that while technology is very important, farmers will not adopt it if there are no incentives to produce safe food. She adds that the food system in Africa is marked by, “low levels of public and private sector investment,” as well as “a confusing and costly food safety system.” USAID is striving to overcome these challenges by facilitating collaboration between different food safety stakeholders, promoting market expansion for safe products, encouraging formal sector leadership and capacity building, while facilitating the adoption of good food safety practices in the informal sector.

Africa’s regional economic communities must also be a driving force in the implementation of food safety standards, claims Chris Muyunda, chairman of the Governing Council of the CAADP Non-State Actors Coalition. To do so, states and their partners should “showcase farmers who comply with the standards (thus boosting awareness of good practices), conduct more food quality tests, promote local and regional certification, and support value chain actors with sufficient expertise to understand food quality and safety standards,” Muyunda states. ■

FAYELLE OUANE

“Our priority is to empower women in the value chain”

Fayelle Ouane – managing director of SUGUBA, which is working to boost entrepreneurship in Francophone West Africa – explains why her company aims to unleash the entrepreneurial talent of youth and women.

Cléophas Biyung Mosala

SUGUBA, meaning ‘big marketplace’ in Mande, aims to accelerate prosperity, job creation and social progress in the region by increasing the number of investible start-ups and providing a hands-on way to transform them into sustainable businesses. The platform, which was a partner of CTA’s Pitch AgriHack 2018 competition, also enables start-ups to network with each other to fuel regional expansion and regional trade and help them develop robust integrated value chains.

What key components are needed to support a developing company?

We customise each approach because all businesses are different. Some of them have very strong teams with a range of technical, managerial and financial expertise. But someone alone with a business idea, and without any knowledge on how to draw up a financial statement or raise funds is a very different case. That is why we start by assessing the entrepreneur’s skills, and development opportunities in terms of the team, financial strategy and capacity to raise the funds needed for the company’s growth. We then



© CADEL MUSALA

Fayelle Ouane, managing director of the SUGUBA platform which partnered CTA’s Pitch AgriHack Competition in 2018, has placed women at the heart of sustainable agribusiness

customise our approach based on this initial assessment to enable the entrepreneur to progress and improve the company’s performance. The entrepreneur also benefits from the advice and connections we facilitate with mentors, coaches and experts in different fields.

How relevant are programmes like CTA’s Pitch AgriHack competition for supporting young agripreneurs?

This programme is very precious to us. Two paramount features for Africa’s socio-economic development are combined in this competition, i.e. agriculture and agribusiness, along with new technology

“Women are under the spotlight at SUGUBA because we are truly convinced that they face much greater obstacles than male entrepreneurs in Africa”

and digital development. These aspects are highly relevant, especially for the countries we are currently covering – Mali, Senegal and also soon Côte d’Ivoire. During the competition, we developed and provided training on business planning and investment to the start-ups. We looked at available funding sources and the key components that start-ups need, such as robust corporate financial statements, to be able to pitch to investors and raise funds.

At Pitch AgriHack 2018, SUGUBA sponsored a prize for the best women-led company which was awarded to the Beninese start-up Fenou Packaging. Why did it win?

The winning entrepreneur was highly dynamic and motivated, and their business model was in line with SUGUBA’s vision – facilitating trade between Francophone countries instead of exporting raw materials and importing expensive finished products. Fenou Packaging is the type of company that will serve as a catalyst for intra-regional trade growth in West Africa while promoting the development of agribusiness industries.

Fenou Packaging produces top quality, completely biodegradable packaging that is environmentally-friendly and improves the quality of locally produced goods. We were also impressed by the fact that Fenou Packaging has tailored an artificial intelligence tool to help customers quickly select the right packaging for different products. In the region, increasing numbers of locally processed products are sold in supermarkets, but customers are turned off by the poor-quality packaging, thus prompting them to buy imported goods.



Sonita Tossou, promoter of the start-up Fenou Packaging, was awarded the prize of the best company in agribusiness led by a woman during the Pitch AgriHack competition



“Fenou Packaging produces top quality, completely biodegradable packaging that is environmentally-friendly and improves the quality of locally produced goods”

How is SUGUBA supporting intra-regional trade in West Africa?

First, we are trying to connect entrepreneurs from different countries. For instance, we could put a Malian mango producer in contact with a jam factory in Senegal since most mangoes produced in Mali are currently exported to the EU, where over half of the produce is dumped due to fruit quality issues. We hope that value will be generated and preserved in the region by connecting entrepreneurs.

The second initiative we are working on is the Made in West Africa conference scheduled for 2019. A major exhibition

will showcase the best local producers and enterprises. We aim to promote these industries by connecting them with investors. Alongside the exhibition, we plan to organise a summit with trade ministers from the sub-region and other key stakeholders (e.g. custom’s directors) to encourage our leaders to make substantive commitments to promote regional trade and implement the African Continental Free Trade Area agreement.

The next Africa Women Innovation and Entrepreneurship Forum in South Africa will focus on women’s technological role in agriculture. Why is SUGUBA involved in the development of agri-tech businesses spearheaded by women?

Women are under the spotlight at SUGUBA because we are truly convinced that they face much greater obstacles than male entrepreneurs in Africa. We are also aware of their huge potential, which has yet to be sufficiently tapped and developed. We are striving to identify the impediments they face and solutions we could provide, particularly through our network of coaches, experts and mentors. Everyone knows that women put in the most work in agriculture and agribusiness, but benefit the least. SUGUBA’s priority is to try to redress this imbalance and empower women in the value chain. ■

OUSMANE BADIANE

Levelling Africa's trade imbalance

Dr Ousmane Badiane, International Food Policy Research Institute (IFPRI) Director for Africa, highlights opportunities to boost Africa's intra-regional trade following the launch of the *Africa Agriculture Trade Monitor 2018*.

Alex Miller

How will an increase in intra-regional trade strengthen the economies of African states?

Across most of Africa the agricultural sector is primarily an export sector, including to regional cross-border markets but there is a demand gap of €39 billion. The more you integrate African markets, and the more you allow goods to move competitively and at reasonable cost across borders, the better you will position African smallholders to compete in these markets and to reap the benefits of the increasingly large demand gap. There are a lot of commodities being produced that are Africa-specific, like white maize, cassava and millet, and these are primarily regionally traded.

Intra-African trade is also important for the future of Africa and its agricultural sector, because a key factor in the current demand is the rising middle class in Africa's rapidly growing urban centres. There is evidence that, as incomes rise among the middle class, these urbanites are not importing more caviar, wine and cheese, but are demanding more traditional local staples. They want their staple foods to be processed so that they are easier to cook with better packaging and food safety standards. Stakeholders across all segments of these emerging value chains – from packaging and advertisement, distribution, processing, certification, to food safety service providers – would be primary beneficiaries of greater intra-African trade in agriculture.



© IFPRI

Can you explain some of the key constraints to agricultural trade in Africa?

Underinvestment in infrastructure and uncondusive regulations and policies inhibit the movement of commodities across borders, which in turn raises the cost of trading. This has to change; as long as these constraints exist, intra-regional trade cannot increase and smallholder farmers will continue to be penalised. Farmers need access to regional markets in order to raise their incomes. It needs to be understood that trading with neighbouring countries in times of shortfall is an opportunity for farmers to make more money. In Eastern and West Africa, we are seeing efforts to remove all policy and regulatory obstacles to commodity movement. We have not yet turned the corner, however, as many countries too often still resort to export bans and other

Dr Badiane explains how Africa's growing middle class is driving value chain development for the continent's staple foods

interferences in trade with their neighbours. Policymakers need to understand that markets – when they work – work for everybody and they work well. Governments have to accept the idea of regional common markets, where goods are allowed to move freely. Intra-regional markets are part of the solution and not part of the problem.

What are some of the key emerging trends in African trade and what implications do these have for the future of the agricultural sector?

Fruits and vegetables have become quite a dynamic sector, especially in West Africa. For example, Senegal's

Sustainable intensification

Putting farmers' experiences into practice



By examining the driving forces behind increased agricultural trade, at global and regional levels, the *Africa Agriculture Trade Monitor 2018* provides insight into the transformation of African economies. The success of intra-regional trade and improved global exports are studied against the backdrop of increasing African imports.

The report provides a clear narrative about trade developments that occurred primarily between 1998 and 2013, with particular attention paid to how and why Africa's trade balance became negative in the early 2000s.

The primary reasons – a growing urban population and

constraints to trade – are explored in the report.

This joint publication from CTA and the International Food Policy Research Institute is the second annual report of its kind (see *Spore* review of the *African Agricultural Trade Status Report 2017*, <https://tinyurl.com/y7jke6av>). Emphasis in this latest report is placed upon increased intra-regional trade of agricultural commodities and the benefits that this is having in Africa's regional economic areas. For example, a chapter on West Africa examines the potential for intra-regional trade to increase the region's market resilience.

Key findings and policy implications, such as the need for African governments to further invest in infrastructure, are also detailed in this report, which substantiates its claims with figures and graphs. This makes the publication an essential guide to the diversification and the competitiveness of trade across the continent.

Africa Agriculture Trade Monitor 2018

By O Badiane, S Pierre Odjo & J Collins

International Food Policy Research Institute (IFPRI), 2018; 153 pp.

ISBN 978-08-9629-349-6.



Downloadable as a PDF file from: <https://tinyurl.com/yc72fme3>
www.routledge.com

fruit and vegetable exports to the EU have grown by 50% per year between the early 2000s and a couple of years ago. Green beans, mango and cherry tomatoes are some of the main exports. Senegal is not alone – exports from Burkina Faso, Côte d'Ivoire and Mali are also increasing. Proximity to the European market and a growing urban demand have helped stimulate growth in this sector.

Another new trend is the rapid transformation of traditional staples value chains. For instance, in the early 1970s, millet was available for consumption only in places where millets were grown. Now I can get millet-based products, made in Mali or Senegal, in

several stores around Washington DC. Processed staples have entered the urban consumer market, which is a very exciting new development. The tens of thousands of new enterprises enabling this to happen need to have access to technology to spur product and process innovation, as well as access to capital to invest in growing their businesses. Finally, they need a regulatory environment that allows them to be competitive. There is a lot that needs to be done to make sure that enterprises can become larger, more profitable businesses, which can seize on the opportunities resulting from the rapid increase in food demand in urban and cross-border markets. ■

Economic development

Africa's vision



Narrowly focussed discussions about humanitarian crises and security concerns neglect broader developments in Africa's economies. *Africa*

Through an Economic Lens provides a broad vision for economic progress in Africa. The risks and opportunities that arise from new trends like urbanisation and population growth must be recognised as important parts of Africa's economic development. The benefits of African progress must be shared and, as the book points out, future development must be appropriately financed.

Africa Through an Economic Lens

By A Sy

Brookings Institution Press, 2018; 224 pp.

ISBN 978-08-1573-473-4

€35

www.brookings.edu

<https://tinyurl.com/y84wgtnr>

Commodity markets

Ending hunger



The latest edition of *The State of Agricultural Commodity Markets* looks at the relationship between agricultural trade, climate change and food security. Considering

these three factors, the report offers recommendations on how interventions to alleviate climate change can boost agricultural trade and help to achieve the Sustainable Development Goal to end hunger by 2030. As climate change continues to effect food producing regions around the world, agricultural commodity markets look set to play an increasingly important role in feeding the world's hungry.

The State of Agricultural Commodity Markets

By FAO

FAO, 2018; 92 pp.

ISBN 978-92-5130-565-2

Downloadable as a PDF file from:

<https://tinyurl.com/y71nmmp3>

STATUS UPDATE

Reports on the state of agriculture in Africa

Insights from the latest developments and investments into African agriculture are pivotal to learning lessons for increasing productivity and transforming continental nutrition and food security.

Alex Miller

Agriculture employs over half of Africa's population and yet low mechanisation levels, as well as climate change, are among the key factors constraining productivity levels. With a continental population that is expected to double by 2050, concerns around food security and nutrition also continue to grow.

In the recent *Africa Agriculture Status Report*, published by the Alliance for a Green Revolution in Africa, the authors state that, in order to increase African food production, African governments must go about solving production and investment issues. However, as they also emphasise, "It is not a question of what needs to be done, it is how." This critical report emphasises the need to foster political will to establish clear development strategies to drive agricultural transformation. For example, in Côte d'Ivoire, Ethiopia, Ghana, Kenya, Rwanda and Senegal, examples are provided of where governments are working to increase farmers' access to finance, land and markets through new legislation and ICTs. The lessons learned are key to informing other African countries also seeking to reform their agricultural sectors.

However, a critical lesson learned from previous development strategies in African agriculture is that improving food security and nutrition is also essential. *The State of Food Security and Nutrition in the World 2018* provides insights into how efforts to improve food security

are progressing but emphasises how the impacts of climate change and population growth will affect future agricultural development efforts. As with other key contemporary nutrition initiatives, this publication emphasises that not only do people require sufficient food, but they also need to be well nourished. The issue of malnutrition is becoming increasingly crucial; FAO estimates that the prevalence of undernourishment has increased over the last 2 years to 10.9% of the global population. One striking factor behind this trend is that the failure to reduce malnutrition is closely associated with increases in conflict in several parts of the world.

The need to implement reforms built upon previous successes is shared by the authors of *Agricultural Investment Funds for Development*. This FAO report highlights how, since 2010, investment funds have become an increasingly popular vehicle for development agencies to use in the agricultural sector. However, the authors argue that lessons learned must be used to further shape the way future agricultural investments are managed. For example, investment fund managers are becoming more willing to fund agricultural projects, so long as they increasingly benefit from their investments. If there is to be enough food to feed a global population of over 9 billion in 2050, it is estimated that, each year, investments of €71 billion must be made in the agricultural sector across developing countries. ■



Africa Agriculture Status Report: Catalyzing Government Capacity to Drive Agricultural Transformation

By the Alliance for a Green Revolution in Africa

AGRA, 2018; 218 pp.

Downloadable as a PDF file from:

<https://tinyurl.com/y9mzcvxv>



The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition

By R Vargas, E I Pankova, S A Balyuk et al.

FAO, 2018; 182 pp.

ISBN 978-92-5130-571-3

Downloadable as a PDF file from:

<https://tinyurl.com/y8xsebff>



Agricultural Investment Funds for Development: Descriptive Analysis and Lessons Learned from Fund Management, Performance and Private-Public Collaboration

Edited by C Miller, T Ono & M Petrujleskov

FAO, 2018; 142 pp.

ISBN 978-92-5130-061-9

Downloadable as a PDF file from:

<https://tinyurl.com/y8e4ar17>

Farmers' organisations

Capitalising on experiences in Eastern Africa



Since 2016, CTA has been supporting the implementation of experience capitalisation processes around the world; this is where an experience is identified, validated and documented, leading to learning and identification of good practices which can then be adapted, improved and adopted by others and scaled up. In Eastern Africa, CTA's Capitalization of Experiences for Greater Impact in Rural Development project has involved training

farmers' organisations, such as the Uganda National Farmer Federation, to undertake experience capitalisation processes. The aim was to not only discuss the concepts behind the capitalisation approach, but to also improve sharing and adoption of lessons learned and good practices. The ultimate goal was that each organisation would work with colleagues back home and complete the process within a few months to implement recommendations.

Experience Capitalization: Learning from Farmer Organisations is a collection of 13 case studies from Kenya, Tanzania and Uganda that highlight the challenges and successes of development projects aimed at farmer organisations. It explains where improvements to the initiatives can be made. Smallholder organisation, Mtandao wa Vikundi vya Wakulima Tanzania, detail their project to introduce improved land management practices and create awareness of how climate-smart approaches could be used to help mitigate the most serious effects

of climate change. One of the lessons they highlight was that more days need to be made available to train less capable farmers before trees can begin to be planted, which is done to rejuvenate water sources and to limit soil erosion. Another case study looks at the use of trade fairs by the Kenyan Livestock Producers Association to promote business linkages between farmers, manufacturers and suppliers. The recommendations from this experience capitalisation process included hosting the fairs in more central locations in Kenya and using television and radio broadcasts to attract new farmers and exhibitors.

The report is aimed at farmers' organisations that are looking to improve their development initiatives. CTA hopes the lessons shared and presented in this publication will be put into practice and adopted on a broader scale, and used to refine future initiatives. For Gian Nicolo Francesconi, CTA Senior Technical Advisor for Cooperative Agribusiness Development, "The experience capitalisation process will be complete when these stories are shared, and when the main recommendations are adopted or taken up by other organisations in East Africa, and in other regions." ■

Experience Capitalization: Learning from Farmer Organisations

By CTA & IFAD

CTA, IFAD, 2018; 76 pp.

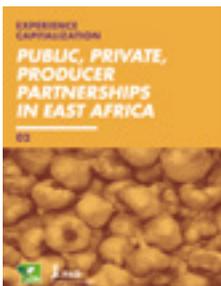


ISBN 978-92-9081-625-6

Downloadable as a PDF file from: <https://tinyurl.com/ycoot67l>

4P arrangements

Learning lessons from public-private-producer partnerships



Cooperative efforts, or partnerships, between the public sector, the private sector and producers are known as 4P arrangements. This refers to strong cooperation arrangements between a government, business agents and small-scale producers, who agree to work together while jointly assuming risks and responsibilities, and sharing benefits, resources and competencies.

Following the launch of its capitalisation project in early 2016, CTA received interest from a number of different partnerships across Eastern Africa, which wanted to look in greater detail at what their 4P partnerships had achieved. With the support of the International Fund for Agricultural Development, experience capitalisation processes were undertaken with the objective of gathering key insights and lessons that could be adapted and adopted to improve these and other partnerships in the future.

The publication is divided into 12 easy-to-read case studies which focus on different 4P arrangements across Rwanda, Tanzania and Uganda. Partnership examples include improving sunflower production practices in Tanzania, adding value to vegetables in Zanzibar, and reducing post-harvest losses for maize and bean farmers in Rwanda.

The lessons learned from these partnerships are already being adapted and adopted, and CTA hopes that this approach will help contribute to a continuous process of learning, improvement and scaling up. ■

Experience Capitalization: Public, Private, Producer Partnerships in East Africa

By CTA & IFAD

CTA, IFAD, 2018; 76 pp.



ISBN 978-92-9081-627-0

Downloadable as a PDF file from: <https://tinyurl.com/y7gk3fu>

Do farmers benefit from data sharing?

CHRIS ADDISON

Sharing data on their own terms benefits farmers



Chris Addison, Senior Programme Coordinator, Data4Ag, CTA

To start to consider the benefits of data sharing, it is best to consider the categories of data that we are talking about in farming. Benefits will depend on whether the data provides a competitive advantage to the individual farmer (a trade secret) or only becomes valuable if shared with others (e.g. location). CTA was involved in producing a review of the data sets most used by farmers' organisations in Africa to deliver services to their members (<https://tinyurl.com/yblg4l8a>). The study illustrated the variety of data being managed by these intermediaries on the farmers' behalf, together with the possible benefits of such data sharing.

The data services reviewed were categorised into four areas that benefited farmers: production-related data alerts on threats, such as pests and weather; data that could affect access to finance, including facilitating credit and insurance; data related to market access, such as data on market prices or to improve traceability; and registration data to improve organisation and logistics. Through further work with the PanAfrican Farmers Organization and Agricord in the Data4Ag project (<https://tinyurl.com/y76xtue5>), CTA discovered that smallholders needed to be convinced of the value of sharing data and reassured about how the data was being used.

Improved productivity and market access

Sharing crop data not only enables extension information to be better targeted to farmers but, with access to yield data, farmer associations and

agribusinesses can aggregate access to markets and better represent farmers' interests. For example, with their data service, e-granary, the Eastern Africa Farmers Federation has found buyers for their farmers' produce by securing a better supply based on better yield forecasts. They are working with local government on food security issues, using data shared by their members on yields. The company has also used farmers' data to provide insurance for their members.

CTA has also been working in Samoa with Women in Business Development Incorporated (WIBDI) (see *Spore* article, *Responding to Market Demand with Farmer Data*: <https://tinyurl.com/y84j8hx3>), where we have seen the value for farmers in sharing data to access new markets. Here the data allows WIBDI to organise a constant supply of organic produce to hotels and restaurants through their 'WIBDI Farm To Table' app. The farm registration data is used to ensure each farms' organic certification is kept up to date. This integrated approach to value chain management is why sharing data brings benefits.

Ensuring data ownership by farmers

But data does not need to be open to all and there is a need to consider what the Open Data Institute calls the 'data spectrum'. This means that different rights can be associated with different data sets and uses. CTA has worked together with the Global Open Data for Agriculture and Nutrition (GODAN) and, more recently, the Global Forum on Agricultural Research and Innovation to look at how the benefits of data sharing for farmers can be supported. In a GODAN paper

(<https://tinyurl.com/yabgxmam>), Jeremy de Beer explains a number of safeguards that are in place to preserve farmers' rights and, at the same time, examines different models to govern shared data, which range from international agreements to social certification.

Building farmers' trust

The opportunities created for farmers by sharing data are clearly wide ranging, but there is a need for trust centres to play a role in preserving their interests. At CTA, we have been looking at the ability of farmers' cooperatives and farmer-led businesses to play this role. New technologies can potentially play a role as well. We have recently featured a number of blockchain applications in agriculture (<https://tinyurl.com/y9bh4j6p>) which show how farmers could benefit from new tamper-proof records. There are also opportunities for consumers to capture farmers' data using trust systems in software to ensure traceability in the value chain. This can be used to ensure more inclusion of farmers in the value chain and prevent fraud; for example, farmers working with Moyee coffee (the first Ethio-Dutch fairchain coffee farming and roasting company) receive tips from consumers drinking their coffee through a blockchain app.

The take-home message is that there are a myriad of opportunities for farmers if they share data. These can provide access to finance, insurance, new markets and extension, but the data sharing should be on their terms and ensure rights protection. ■

JAMILA ABASS

Farmers must be involved in data solutions



Jamila Abass,
Country Manager,
Wefarm Kenya

Many governments and donor agencies, as well as the private sector work to solve the myriad of challenges smallholder farmers in Africa face every day, including, but not limited to, access to markets and agronomic support. More progress could be made, however, if the farmers themselves were invited to play a role in tackling their own problems – and mobile technology could be a way to make this happen.

The headache for ag-tech companies in emerging markets is the lack of primary farmer level data, such as exact geolocation, size of farm under production, production dates etc., which is essential to creating robust systems to get farmers in emerging markets closer to precision agriculture. Of course, concerns about data privacy and security do not make it easy for farmers to reach out for their gadgets and freely share information. However, the reward they get from confidentially sharing their data with ag-tech companies that are committed to transform the industry for the greater good outweighs these concerns.

Better planning and collective action

Farmers in most emerging markets rely on rain-fed agriculture, which forces everyone in the same region to plant around the same time and, in most cases, farmers from the same region plant the same thing. This therefore drives down prices during the harvest season due to oversupply of the same commodity in the same region. If farmers were to share what they are planting, how much they are planting and the specific date they are planting, the oversupply could be avoided as farmers could get production volume predictions for certain crops in their region.

Imagine a farmer texting I want to plant half a hectare of potatoes in Arusha

and within seconds receiving advice back: “1,000 farmers within a 30 km radius have planted potatoes this season. We predict the prices will be very low. However, only 100 farmers are planting tomatoes and we predict the prices to be high. Would you like to plant tomatoes instead or delay your planting date by a week?”

Efficient farm management

Farming is science and business combined and no matter how experienced a farmer might be, they don't always have all the answers. Technology can therefore enable farmers to tap into detailed data about how their farms operate, which particular area needs more fertilisation, which fields to irrigate and when, and which pests and diseases to look out for based on weather patterns. Access to such information allows farmers to lower their cost of production and gives them maximum yields while minimising their risks.

Recently, Wefarm and the Danish Refugee Council worked together to disseminate weather data to farmers in Turkana, a county in north-western Kenya, which has recently been plagued by drought and famine. The weather data these farmers received was generic county level information that had less impact on individual farms. If smallholder farmers share their exact geolocation, however, it will enable companies like Wefarm to create more customised services for individual farmers to better deal with climate shocks. Ag-tech companies should be prepared to not only come up with smart ways of encouraging farmers to share data, but also work hand in hand with them to come up with suitable data agreements between the farmers and the service providers. ■

Poll

Will Africa's new trade agreement (CFTA) boost agribusiness?

36%

By sharing crop data farmers can receive tailored extension services

36%

There are not sufficient safeguards to protect farmers' data rights

18%

Sharing farm data increases farmers' access to markets and finance

10%

Farmers' need more control over how their data is used

Other debates

Find *Spore's Opinion* pages and a third blog on this topic online. New debate topics are published each month on the *Spore* website:

<http://spore.cta.int/en/debates.html>

In the next issue

192 March - May 2019

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