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SPORE N°193

EDITORIAL

A digital revolution for smallholder agriculture

Michael Hailu, director - CTA

From drones to Internet-of-Things, blockchain and AI, the proliferation of accessible digital technologies are opening tremendous opportunities to transform smallholder agriculture into profitable, sustainable and inclusive businesses.

Africa's growing youth workforce also presents enormous potential for agricultural transformation but, to capitalise on this promising resource, the sector must become a more attractive employment option for the continent's young people. There is a pressing need to build the capacity of Africa's youth, not just in terms of modern farming skills, but critically in digital skills and business acumen in order to foster agricultural prosperity and economic growth.

The speed at which digitalisation for agriculture (D4Ag) is developing, particularly in Africa, provides exciting opportunities. In 2013, when CTA organised the first international conference on 'ICT4Ag' in Rwanda, there had been little previous activity in the sector. But, in the last 5-6 years, there has been a huge increase in new digital solutions coming into the market, as well as interest from major donors and governments to leverage digitalisation to transform smallholder agriculture. CTA has been a pioneer in this area, and it is pleasing to see big players coming into the space.

A key event for CTA this year is the publication of a landmark report, in collaboration with Dalberg Global Development Advisors. The report will highlight the current state of digitalisation solutions for improving farmer productivity and incomes, as those may present the most attractive business cases and impact potential. We hope that the report will inspire investors by identifying opportunities in the sector.

The report is also a first in mapping the D4Ag landscape and making projections for Africa in order to provide a baseline on which to build upon, and track changes and developments in the future. We are looking forward to sharing this report in Rome at the FAO Ministerial Conference in June 2019 and at other key events, including the forthcoming African Green Revolution Forum, to be held in in Accra, Ghana, with the theme 'Grow digital: Leveraging digital transformation to drive sustainable food systems in Africa.'

Across the continent, evidence exists of farmers embracing smart farming by applying digital technologies. The digital era offers many new innovations that will help us to more efficiently and sustainably unlock the full potential of smallholder farmers and agribusinesses. Digitalisation can be a real game changer in transforming smallholder agriculture, but it now has to be given due importance in terms of policy and investment.

BLENDED FINANCE

New investment funds impact African agriculture

Impact investment funds are fast becoming the vehicle of choice for governments and donors looking to invest in African agriculture and encourage private sector investors to do the same.

Helen Castell

Investments in African agriculture are rising faster than ever before, with a new wave of blended finance impact investment funds leading the way. But, while these are helping to harness private sector capital – including from African commercial banks and corporates – the bulk of initial donor and government money comes from overseas. Still, the impact of such funds on the lives of smallholder farmers is increasingly well documented and demonstrates that investing in African agriculture can be profitable for private sector players, as long as the right projects are financed and risk is well managed.

Development agencies and private sector investors are seeking to plug a stubborn agrifinance gap in Africa by investing in agricultural investment funds, whose number and size have grown rapidly since the start of the decade, according to a 2018 FAO report, *Agricultural Investment Funds for Development*. Food shortages and rising food prices have simultaneously pushed agricultural investment up governments' and development agencies' priorities and made the sector a more profitable proposition for private sector investors.

Many funds use a blended finance structure. This can be a catalytic tool for encouraging more capital into agriculture, explains Jerry Parkes, managing principal at Injaro Investments, an Africa-focused investment manager

How impact investment funds work

Blended finance impact investment funds combine public and private sector money to achieve a specific social or environmental impact, as well as a financial return. The idea is that public investors shoulder more of the fund's total risk for no or low returns so private investors are encouraged to fund an area where high risks mean they would usually have to be rewarded with high profits.

Funds can be divided into two or more 'tranches' or portions. One tranche – sometimes referred to as 'catalytic capital' because it helps the fund pull in other investments – is filled with money that is either donated or invested as long-term equity by philanthropic organisations, governments or development banks. This can play a 'first loss' role, meaning that if the value of the overall fund falls, an initial proportion of any losses will be absorbed by this pile of money, before other investors take a loss on their investments. It can also be used to pay for technical assistance which, in agriculture, could involve training farmers to improve yields to reduce the risk that beneficiaries will not repay debt or prove a profitable investment.

Money from private sector investors is typically put into a separate tranche, often referred to as 'senior capital', which earns a higher interest rate or equity return. However, the reduced risk – due to the technical assistance or 'first loss' tranche – means that investors are happy to accept lower interest rates than they would usually demand.

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Incofin Investment Management supports smallholder farmers and agribusinesses with finance and technical assistance

launched in 2009. With its €43.8 million closed-ended equity investment fund, Injaro Agricultural Capital Holdings Ltd (IACHL) has so far deployed €30.4 million – providing capital, business advice and capacity building to small and medium-sized enterprises (SMEs) in West Africa, Parkes says.

Impact investment funds' expertise in targeting and measuring impact directly raises the likelihood that capital will reach intended beneficiaries and higher-risk agricultural value chains, emphasises Parkes. IACHL is on track to meet and possibly exceed its impact target to reach 1.125 million beneficiaries by 2023, having so far benefited around 900,000 smallholder farmers and people on low incomes. For example, Injaro funding helped Ghanaian animal feed brand, Agricare, implement a pilot outgrower scheme in 2016 to increase the proportion of maize it sourced from local smallholders. From 210 farmers with 250 ha under cultivation at its launch, by the end of 2017 the scheme had scaled up more than tenfold, directly benefiting around 1,200 smallholders with over 2,580 ha.

The missing middle

Impact investment funds are ideal for targeting the 'missing middle' – agribusinesses that are too big for microfinance, but need capital injections of €20,000 to €1 million. Achieving the 8-12% financial returns private sector investors typically seek – while factoring in credit, foreign currency and other risks associated with agriculture – would require regular funds to lend at interest rates as high as 50%, notes Florian Kemmerich, managing partner of Bamboo Capital Partners. However, by protecting private sector investments with money from donors that prioritise capital preservation over financial returns, private sector players are prepared to take a lower financial return because their risks are reduced.

Together with Injaro, Bamboo is manager of the International Fund for Agricultural Development (IFAD) Agri-Business Capital (ABC) Fund, which launched in February 2019 to provide loans and eventually equity investments for rural SMEs, farmer organisations, agricultural entrepreneurs and rural financial institutions globally. The open-ended fund, also supported by the Alliance for a Green Revolution in Africa, the EU, the ACP Group of States, and Luxembourg's government, will seek to attract €200 million from investors over the next 10 years. It so far has €50 million committed in the 'first loss' tranche, and aims within the next 3-6 months to secure another €50 million, before reaching out to private investors, states Kemmerich. The involvement of IFAD – which has historically only made grants but, in February 2019, voted in a new resolution permitting it to make private sector investments – reflects a shift in the kind of investors becoming attracted to blended finance impact funds, says Parkes.

The EU-funded AgriFI facility also announced its long-awaited debut investment in April 2019, agreeing to inject up to €5 million of long-term equity in Incofin Investment Management's Fairtrade Access Fund (FAF), which supports smallholder farmers, agri-SMEs and agri-focused financial institutions with finance and technical assistance. Since its 2012 inception, FAF has disbursed over €164.5 million, impacting the lives ›

› of over 254,000 African and Latin American smallholder farmers. FAF's technical assistance facility, which uses grant funding to improve productivity, disease control and market access for farmer organisations, has reached over 54,000 smallholders in 10 countries.

Mixed financial performance

Impact investment funds that blend private sector capital with state or donor money must marry impact with offering investors an attractive financial return. This has proved challenging. Crises such as the coffee rust epidemic that has affected Latin America since the 2011/2012 season have dented the performance of some funds exposed to the region or reminded would-be investors that African agriculture faces equivalent risks, says Calvin Miller, former head of agribusiness and finance at FAO and co-author of the 2018 agricultural investment fund report.

It took 3 years to stabilise Incofin's FAF and bring it to a profit, according to founder and managing partner Loïc De Cannière. This was partly due to teething issues as the fund established its risk management and due diligence procedures for producer organisations, but also because of external events, including Latin America's coffee rust disease. Because FAF is exposed to underlying price volatility in commodities, as well as credit risk and governance challenges in farmer organisations, investors must absorb more risks than with many traditional microfinance or impact funds, he acknowledges.

FAF is now generating a 2-3% return on equity, helping attract new investors, such as Swiss wealth manager Lombard Odier in 2018. The recent AgriFI injection is also providing more comfort to new investors, with several contacting the fund since AgriFI's investment was announced, De Cannière says. The very tangible nature of agriculture – with investors able to visualise the goods they are financing and appreciate the impact on producers' lives – also makes them more committed to the fund's overall goals, he adds.

Harnessing African capital

Still, local value chains, where investors are exposed to currency risk, remain under-served by impact funds in Africa. Finding a way to plug this gap will be challenging, but could present a good opportunity for the employment of African capital, De Cannière says. Like many funds, FAF focuses on export value chains, in which produce is priced in hard currencies like the US dollar or Euro.

Domestic investment is an important source of capital for agriculture, with African donors, lenders and corporates helping African money flow along agricultural value chains. But, while impact investment funds say funding of local banks for on-lending to agribusinesses will improve such lenders' understanding of agriculture and encourage them to lend more in the long term, the vast majority of money pumped into such funds still comes from outside the continent.

Low financial inclusion, with many rural Africans having no bank account, means a relatively small portion of money passing through African economies reaches banks, notes Carlijn Nouwen, partner at Dalberg Global Development Advisors. Banks are therefore under-capitalised compared with European or North American institutions, leaving less money available for lending to agriculture.

"It's not one lever that changes agriculture – it's a whole range of things and you need to lean on all of them."

Local commercial banks also face external hurdles in lending more to agriculture. While farmers often complain about unrealistic collateral requirements, these are imposed on banks by regulators charged with maintaining financial system stability, Nouwen notes. The high interest rates charged for agricultural loans also reflect banks' own high operating costs, while agriculture must compete for bank capital with lower-risk, higher-return sectors.

Small agribusinesses across Africa therefore remain mostly informally funded, either from entrepreneurs' own pockets or through loans from friends and family, she says. Larger corporates and wealthy individuals in Africa also invest in agriculture, either as joint ventures with the entrepreneur or through equity investments, but transactions are not always publicised so are harder to track, notes Miller.

There are signs of progress though. Uganda's aBI Finance, a funding vehicle that offers local lenders government- and donor-backed guarantees for 50% of their agricultural portfolio, has been instrumental in encouraging banks and microfinance institutions (MFIs) to lend more to the sector, says De Cannière. aBI's guarantees have, for example, helped the country's Finance Trust Bank build a credit portfolio that is nearly 30% comprised of agricultural loans. This is funded by nearly €35.8 million of deposits from local Ugandan savers.

Joined at the hip

A common characteristic of solutions that are successful at getting both African and overseas money flowing to agriculture is that the funder and borrower are 'joined at the hip', with closely aligned interests, says Nouwen. Input providers, for example, increasingly provide credit to farmers by not requiring payment for fertiliser or seed until they have sold their harvest. Although not a formal flow, she explains that it is a vital source of 'funding in kind' that farmers have come to rely on. While agriculture has to compete with other sectors for bank capital, such input providers are reliant on farmers for custom so have no option but to continue providing 'credit' to farmers even following defaults and disaster years.

Similarly, the success of Nigeria's Babban Gona – an investor-owned social enterprise that says it has disbursed 16,000 profitable loans so far among its membership of over 1 million farmers – is inextricably intertwined with that of its members. Babban Gona works closely with farmers to design and implement a package of inputs, training, offtake agreements, marketing services and incentives that benefit them and the company, Nouwen notes. "It's not one lever that changes agriculture – it's a whole range of things

and you need to lean on all of them," she says. Governments and donors should direct more of their resources towards initiatives like these, which will continue lending to agriculture once funding and guarantees expire, she advises. Indeed, in March 2019, AgriFI approved a planned €5 million investment in Babban Gona.

MFIs and microfinance banks also tend to be well aligned with farmers' needs while their licenses often allow them to be flexible with collateral. However, many are barred from taking deposits, leaving them under-capitalised and prone to collapse, Nouwen notes. For the sake of financial system stability, she cautions that central banks must ensure that agriculture does not become overly reliant on non-bank lenders like MFIs, input providers or other corporates.

Sustainability is key

There are promising signs that African governments are starting to see the potential of impact funds. For instance, in March 2019 the government of Togo decided to provide seed funding to Bamboo's blended finance BLOC Fund, which invests in companies using technology to solve social and environmental challenges, says Kemmerich. At a time when technological advances like blockchain and renewable energy are creating opportunities for African SMEs to build businesses and connect to markets, governments are keen to play a catalytic role in reducing poverty by attracting private capital to sectors like agriculture, he says.

Impact funds are a welcome addition to the limited array of funding vehicles available for agriculture, acknowledges Nouwen. But, while 'first loss' tranches and subsidised money have a good track record of attracting private sector investors to the table and encouraging local banks and MFIs to lend, such funders too often withdraw from riskier value chains once incentives are removed. This, she argues, must be front of mind for donors and governments before they make any investment. Only through the funding of crops and projects that can earn sustainable profits for private sector players will 'catalytic capital' truly live up to its name, she concludes. ■

Over 254,000 smallholders have benefitted from the distribution of €164.5 million under Incofin's Fairtrade Access Fund

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Entrepreneur Anastasha Elliot is processing food and cosmetic products using locally-produced plants, fruits and herbs

PLANT-BASED PRODUCTS

Health conscious consumption in the Caribbean

Agri-processing companies in the Caribbean are making the most of indigenous fruits and plants to access a home-grown market for food, beverage and cosmetic products.

James Karuga

Food and cosmetic products derived from plants, herbs and fruits found in Saint Kitts and Nevis are all made by Sugar Town Organics, an agri-processing company founded by Anastasha Elliot in 2010. She decided to focus on the use of locally grown, botanical plants and fruits after learning of certain healing properties from her grandparents. Guava fruit, for instance, which is used in Elliot's salad dressing has anti-inflammatory and anti-bacterial properties, and the passion fruit used in her hot sauce, contains vitamins A and C.

Before establishing the business, Elliot undertook a diploma and advanced diploma in organic hair and skin care formulation to supplement her knowledge, as well as a degree in culinary arts to learn how to formulate food-based products. Sugar Town now processes 30 products in its food portfolio, including jams, dips, wines and liqueurs, under the brand name Flauriel. The company's cosmetic range, called Yaphene, processes 63 products including soaps, toothpastes, aftershaves, shampoos, skin care creams, and hair and spa products. All products are made from organically produced indigenous herbs, fruits and plants, including anise, fennel, jasmine, orchids, pink roses, soursop and tarragon.

90 kg

of indigenous plants, herbs and fruits are processed by Sugar Town Organics each month

Product prices range from €1.8 to €33.79 and, as demand spiked from 2017 to 2018, Sugar Town's sales increased by 150%. "Many spas are directly searching for more locally-produced goods to offer to their clientele," says Elliot, explaining that this helps to cut down on the costs of importing similar products. The Tourism and Foreign Affairs Department, Park Hyatt and Marriott hotels, and other local gifting agencies, also buy Sugar Town's products, stocking them as gifts to those visiting Saint Kitts and Nevis. Depending on the time of the year and the number of events, through these markets alone, the company generates monthly revenues of between €880 and €2,200.

The company purchases up to 90 kg of raw produce each month from about 20 farmers, and uses small machines, like dehydrators and commercial blenders, to process the products. In the immediate future, Elliot plans on building a factory to increase production and create employment opportunities beyond her staff of four. "We plan to increase our social impact by targeting skilled youth who are released from jail and face social stigma," she explains. In the next 5 years, Elliot aims to increase the reach of Sugar Town's products within the Caribbean, and to target the European market.

Botanical beverages

Also selling predominantly plant-based products in the Caribbean is Tanisha Thompson, who started Natural Fusion Partners (NFP) in 2015. With an initial capital of €10,500, raised from personal savings, Thompson created NFP to promote the consumption of healthy, low sugar and calorie beverages in Jamaica. NFP works with four local farmers to source the produce for her guava iced tea and aloe vera-flavoured water, targeting diabetics and health-conscious consumers.

Since its inception, NFP has sold over 850,000 l of the two beverages to local supermarkets, pharmacies and at trade fairs. The drinks are sold in 340 ml bottles for J$2 (€1.78) per bottle. Annually, NFP generates nearly €21,000 and employs five local youths between 18 and 30-years-old, who are involved in processing, marketing and promotion of the beverages.

Venturing into new markets has been a challenge for Thompson as the brand is currently only sold in two Jamaican parishes and is relatively unknown. However, participation at agricultural exhibitions, accreditation of product safety by the Bureau of Standards in Jamaica and validation by the Ministry of Health, are helping to increase company awareness and consumer confidence in NFP products.

"Agropreneurship can be challenging in Jamaica when you have scarce financing to fund various aspects of your business. As a result of the challenges, I am now more patient and persistent. I have received a lot of 'no's' but I have learnt that this doesn't have to be the final answer," says Thompson. ■

SUPPLYING SPICE

Chilli exports challenge Rwanda's losses

Young entrepreneur Diego Dieudonné Twahirwa is supplying global markets with his dry chilli and chilli oil products, whilst providing a ready market for local farmers.

Aimable Twahirwa and Sophie Reeve

In Rwanda, more than 1,500 chilli farmers are supplying unsold produce to local agribusiness, Gashora Farms, for processing into chilli oil, helping to address the challenge of post-harvest losses in the country. The company, which was established by 30-year-old entrepreneur Diego Dieudonné Twahirwa in 2014, exports fresh and dry chilli pepper to European countries and the chilli oil (branded Didi's Chilli Oil) to Switzerland, the UK and US.

Twahirwa graduated as an agronomist in 2012 and initially worked for a refined pyrethrum producer. In 2014, he left the company to venture into farming. "I decided to take this difficult decision to quit my job since working with the company helped me learn about agricultural practices, and I found my new passion – being on the farm," he says.

© AIMABLE TWAHIRWA

Diego Twahirwa's chilli agriprocessing company, Gashora Farms, provides a ready market for local chilli producers

After trying his hand at tomato production, Twahirwa experienced significant losses without a ready market and decided the crop was too perishable. During his transition to chilli, he also experienced post-harvest problems and resorted to drying the produce to increase its shelf life. "Dry chilli can last for up to 6 months," he explains. "Encouraging local farmers to grow chilli as a unique crop – with both local and global markets – was key to boosting quantity and quality along the value chain." The company now harvests about 10 t of dried chilli every 6 months with each kilo being sold for €1.8, generating €18,000 per ha.

Twahirwa is also looking to expand his value-added product line with the production of pulp and chilli powder, and was a finalist for the Young Entrepreneur Awards at the 2018 World Forum for Export Development. "My plan is to take chilli farming to another level. I have already teamed up with a British agronomist and I plan to introduce other modern scientific breeds of chilli into the market," he concludes. ■

ECO-FRIENDLY CHOCOLATE

Cycling for organic cocoa in Côte d'Ivoire

Innovative technologies in West Africa are reducing the environmental impacts of cocoa processing, and increasing farmer resilience to climate change.

Sophie Reeve and Cléophas Mosala

© CYRILLE BAH

In Côte d'Ivoire, a raw chocolate factory is processing cocoa beans into chocolate using a human-powered bicycle

In Abidjan, Côte d'Ivoire, cocoa beans are being processed using a 'grinding bicycle' to produce about 400 kg of chocolate each month. At Mon Choco, a raw chocolate factory, carefully sorted cocoa beans are poured through a funnel fixed to the bike, and transformed into a paste by a grinder activated through human-powered pedalling. After 2–3 days of grinding, a sleek chocolate paste is formed, which is then chilled in moulds.

Mon Choco produces organic and environmentally-friendly chocolate bars, which is a rarity for Côte d'Ivoire where very little finished chocolate is produced. "We are the first cocoa-producing country in the world and we do not produce chocolate," says Dana Mroueh, owner of the factory. "I wanted Ivorians to discover Côte d'Ivoire chocolate with local products such as chilli, ginger and cashew nuts. It was also a way for me to value the work of planters who are often forgotten," Mroueh continues.

Unlike normal chocolate, there is also no cooking of the raw cocoa beans at Mon Choco, resulting in a much richer, almost fruity taste. "We are artisanal chocolatiers, so our process is manual, from the cocoa pods to the final process of packaging the chocolate tablets. One of our trademarks is that we do not roast the cocoa pods, we use raw chocolate. This enables the cocoa pods to retain its flavours and nutritional values. It's also richer in protein, it's richer in anti-oxidants, and the taste is really different," says Mroueh, who buys the cocoa beans straight from the farmer and then dries them on the roof of her factory in Abidjan, or in her tumble dryer. "We really want to have a minimal impact on the environment by using as little electricity as possible... We use recycled paper when we can, glass jars rather than plastic jars, and we use a bike that allows us to save electrical energy," she explains.

Organic cocoa beans are difficult to find in Côte d'Ivoire, where the overwhelming majority of farmers use chemicals and insecticides. As a result, the organic bars are expensive to produce, and with premium prices of around €2.30 per bar the factory caters primarily to the European market. "A craft product like ours is more expensive on average than an industrial product... but we try to have a product that can be accessible to the majority of people," says Mroueh. "In the future, we aim to export our products to other African countries, as well as to Europe and Asia."

Climate-smart cocoa

In order to help strengthen cocoa productivity and enhance climate resilience in Côte d'Ivoire and Ghana, a data platform known as 'CocoaCloud' is being scaled-up. The platform generates, translates and disseminates critical information – such as weather forecasts and location-specific agricultural advice – that facilitates 'climate-smart' decisions for agriculture. CocoaCloud is already supporting 7,500 cocoa farmers, extension advisors and community members in the West African region with training and localised weather forecasting services, and aims to reach 1 million cocoa farmers in Côte d'Ivoire and Ghana by 2024.

Partners behind the platform – the World Business Council for Sustainable Development (WBCSD) and Opus Insights B.V. – called upon the private sector and donors to support the agri-tech initiative at the UN Africa Climate Week in Accra, Ghana, in March 2019. "CocoaCloud demonstrates our commitment to transforming food systems in key regions using innovative, climate-smart solutions. We now call for many other organisations to join and benefit from CocoaCloud," said Peter Bakker, WBCSD's president and CEO. ■

STRATEGIC STORAGE

Renewable technology confronts food waste

Mobile solar-powered refrigerated units are allowing farmers to preserve their produce at a convenient time and place.

Justus Wanzala

Solar-powered cold storage units are being used by over 2,000 fruit and vegetable farmers in eastern Kenya to reduce post-harvest losses and gain better access to local markets. Set up in 2016, agri-tech company Solar Freeze has established easily accessible, mobile cold rooms, located in rural areas for farmers to store their produce before being transported to market. Farmers are thus able to harvest their crops at a convenient time, and seek suitable markets, whilst their produce is preserved. According to company director, Dysmus Kisilu, the green energy innovation has seen a 40–60% reduction in post-harvest losses among its users.

2,000
farmers in Kenya use solar-powered cold storage units to preserve their produce

Farmers pay KSh 10–30 (€0.09–0.26) per crate stored in the cold units, depending of the type of produce delivered, which tends to include avocado, carrot, garlic, mango, onion, passion fruit, peas, pepper, potato and spinach. The company tries to ensure as many farmers as possible can access the units when required, with each being able to store up to 4 t of produce. Solar Freeze uses a platform to inform farmers of any available space in the units and how the unit is functioning. "It works by using a sensor installed in the cold rooms. The information includes updates about the temperature level of a particular cold room," says Kisilu. Using this system, Solar Freeze is also able to calculate when and how much farmers need to pay.

© SOLAR FREEZE

Solar Freeze mobile cold storage units are reducing post-harvest loses among users by 40–60%

Working with local mobile phone companies Safaricom and Airtel, Solar Freeze has created a free app for farmers to connect with buyers, transport services and agricultural extension experts. Buyers and transporters, for instance, receive details on the quantity of produce that is available in the cold units and ready for delivery to markets. In addition, farmers can access an 'Uber'-style pick-up service to deliver their goods – either from the units or directly from their farms – to markets. Farmers enter their name and location into the Solar Freeze app and, depending on the produce amount, the service costs between €0.45 and €1.8 per transfer.

According to Kisilu, farmers using the refrigerated units are moving away from diesel-powered generators for cold storage, hence reducing environmental impacts. "Food waste is an economic issue as well as an issue for climate change, as it is a big contributor to greenhouse gas emissions globally, which we're mitigating through utilising solar," he says. ■

Online tool

Scaling biofortified staples

A NEW ONLINE INTERACTIVE TOOL is helping to identify where and for which staple crops biofortification can make the greatest impact on micronutrient deficiencies. The Biofortification Priority Index (BPI) was developed by HarvestPlus to guide strategic decisions for investment, policy, and practice, pertaining to the introduction and scaling of biofortified staples. The BPI ranks 128 countries in Africa, Asia, the Caribbean and Latin America according to their potential for biofortification in eight crop-micronutrient combinations, such as 'zinc rice' and 'iron beans'. Niger, for example, is the top country for development and delivery of iron pearl millet – the first variety of which was released in 2018.

Multi-crop thresher

Saving time for smallholders

A PORTABLE, mechanised, multi-crop thresher (MCT) that works 90 times faster than manual methods is being used by more than 2.5 million cereal crop producers in Tanzania. Imara Tech is the agricultural equipment manufacturer that produces the MCT and also provides hire purchase and training in its use. Tanzanian farmers spend 1.35 billion hours threshing each year, which the MCT can cut by days, or weeks, allowing farmers to spend more time running other businesses or taking care of their homes. In addition, the MCT can be used by entrepreneurs to sell threshing services to other smallholder farmers and increase their incomes to over €12 an hour. Use of the thresher provides grain uncontaminated by rocks and dirt, and has been found to cut post-harvest losses to 2%.

CLIMATE-SMART INCENTIVES

Reaping the economic rewards of conservation

To overcome the issues of drought and extreme poverty in Zambia, smallholders are being rewarded for taking up climate-smart, conservation practices to increase productivity and protect their environment.

Doreen Chilumbu

Smallholders in Zambia are receiving training in climate-smart production practices and technologies to achieve food security and access to guaranteed markets, while conserving natural resources. Through a Community Markets for Conservation (COMACO) model for rural development, 179,000 farmers across eastern Zambia – 52% of whom are women – have benefited from access to affordable farming inputs and formal training in low-tillage farming, mulching and composting.

COMACO's premise is that with the right training and incentives, smallholders will favour sustainable agriculture practices over more destructive methods, such as monoculture and deforestation, and move away from elephant and rhino poaching. The scheme offers above-market prices for goods that are produced in compliance with conservation agriculture practices, and access to inputs when using these methods.

Before the programme was introduced in 2003, farmers in the area were earning around €17 per harvest; this has since risen by at least €170. "Most families in the Luangwa Valley experience 3–5 months of chronic food insecurity. With few options available to support their families, residents may turn to logging, illegal hunting, and slash-and-burn agriculture. But, since these incentives were introduced to the area, these trends have reduced and farmers involved in the programme have enough food," says chief Nsefu, a traditional leader in the area.

The promoted practices also include beekeeping, gardening in the dry season and poultry husbandry. Diversified production has enhanced productivity for smallholders and reduced the need for inorganic fertilisers, thereby decreasing nitrous oxide emissions. "Teaching how to compost may not be appreciated [by farmers] the first time but, as time has gone by, we have come to value the training. Our soils are looking healthier and even the crop yield has improved. We have enough food in our homes and income in our pockets," says Zitandala Sakala, a smallholder farmer in Luangwa Valley in eastern Zambia.

© DOREEN CHILUMBU

In eastern Zambia, smallholder Nelly Zimba picks grass to use for mulching to improve her soil fertility

The uptake of beekeeping has also dissuaded farmers from cutting down their trees. "It has been hard work, but now hundreds of farmers are realising the value of keeping and protecting trees. I have felt such pride in the producers for the way they have changed their practices and it makes me so happy to see them make a better living from conservation," says Julius Kamanga, a beekeeper from Mfuwe.

Mulching has also become an integral practice among farmers in the area as a result of the project training. Smallholder Nelly Zimba feels the technique is a necessary ingredient to successful farming and provides the key to long-term maintenance of strong, biologically active soils. "If you see my field today, it is full of maize stalks; I have reserved this for mulching at an opportune time," she says. "We raise over 35 different types of fruits and vegetables with about 2 ha under production. We have 4 ha suitable for vegetable production, so we rotate the other 2 with cover crops."

Zambia faces frequent flooding and drought, and Luangwa Valley is one of the most affected areas in the country. To help mitigate the impacts of drought, the programme has facilitated the planting of over 10 million cassava cuttings to serve as a drought-resistant food reserve. Cassava crops can also help increase water storage in the soil profile and reduce the risk of rainfall run-off. "[The farmers] have learned the importance of diversification and now grow cassava. Before COMACO, a lot of farmers just grew maize and the yields have always been depressing," says Nsefu. ■

Climate-smart cropping

Sustainable yam system

GHANAIAN SMALLHOLDERS have been introduced to a pigeonpea-yam cropping system to help overcome the challenge of finding fertile soil to produce high yields. The planting system, which is being implemented by the Crops Research Institute of the Council for Scientific and Industrial Research from 2018 to 2020, has been identified by the Institute as sustainable in the face of climate change and depleting soil fertility. With the technology, yams are planted between ridges of pigeonpeas, which are cut and used as stakes. The pigeonpeas conserve moisture and fix atmospheric nitrogen, increasing sustainability, efficiency and yields. The leaves, which are cut and spread before land preparation, also add to soil carbon and nutrient levels for sustaining soil fertility.

Innovative insurance

Localised crop and livestock protection

IN EASTERN AFRICA, a combination of mobile and satellite systems are being used to track smallholder crop and livestock production, and offer tailored insurance products to protect against unpredictable weather conditions. Developed by the Agriculture and Climate Risk Enterprise (ACRE) Africa, which works in Kenya, Rwanda and Tanzania, the insurance products are index-based, which means automatic payouts are determined by comparisons to historical, regional rainfall patterns. By 2018, more than 1,700,000 smallholders were insured for over €160 million against various weather risks. ACRE's latest insurance scheme in Kenya, Bima Pima, can be purchased from agrovet and agridealer shops – a first for smallholders in the country.

CANOPY COFFEE

Enhancing water management in Kenya's drylands

While Burundi's agriculture is threatened by changing climatic patterns, a sustainable coffee project is helping farmers to restore landscapes and manage their own assets.

Georgina Smith

In Burundi, 9,600 households – nearly half of them female-headed – have started cultivating shade-grown coffee. The climate-smart approach mixes coffee with various trees and plants, such as banana, beans and maize, which protect the coffee from harsh sunlight or strong wind, and provide alternative sources of income. Beans fix nitrogen in the soil, improving soil fertility, while bananas are capable of remaining hydrated under drought stress, reducing water competition during drought.

As part of a Sustainable Coffee Landscapes Project, which is financed by the Global Environment Facility and implemented by Burundi's Ministry of Environment, Agriculture and Livestock, avocado, mandarin, orange and Japanese plum trees have also been planted, diversifying incomes in the Bubanza, Bururi and Muyinga provinces. Since 2013, these agroforestry practices have been adopted by more than 18,700 farmers, boosting the productivity of 2 million existing coffee trees across 4,400 ha.

Burundi's coffee industry is vital for local communities, supporting half of local livelihoods and accounting for 90% of the country's foreign exchange. But severe land degradation costs the country 4% of its GDP annually. Agencies working on coffee certification, park management, and regulation in the sector have come together through the project to improve training opportunities for farmers.

A manual and booklet for cultivating profitable shade-grown coffee has been translated into French and the local Kirundi language, and community-based agritourism in the Bururi Forest Reserve in Southern Burundi has enabled the local Batwa people to purchase their own land for the first time. Batwa community member Odette Nkurikiye, says, "We were enemies of the forest reserve of Bururi, but now, we are its best protectors. We now have jobs and have even bought land. We want to tap into the opportunities offered by our restored landscapes and stay out of poverty."

Building on this success, a World Bank €26.6 million Landscape Restoration and Resilience project, starting in early 2019, is expected to restore a further 90,000 ha of land, supporting sustainable management of the Bururi Forest Reserve and the Kibira and Ruvubu National Parks. The project is expected to benefit 80,000 households, increasing land productivity in targeted landscapes by 20%. ■

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Through a Sustainable Coffee Landscapes Project in Burundi, agroforestry practices have been adopted across 4,400 ha of land

MICHAEL HAILU

"Digitalisation: a game changer for smallholder agriculture"

As CTA launch a landmark report on digitalisation in agriculture in Africa, Michael Hailu, Director of CTA, highlights his hopes that the report will inform other actors and inspire investors by identifying impact opportunities in this critical sector.

Susanna Cartmell-Thorp

Digitalisation is a key part of CTA's strategy. How is CTA supporting the development and dissemination of effective digital technologies in particular?

CTA has been active in this space for many years as one of the forefront organisations working to mainstream digitalisation, especially for smallholder agriculture. One area is to identify exciting digital innovations that are emerging and test them, pilot them and see how they can be integrated into smallholder agricultural value chains. Take drones, for example – which are fairly new within the agricultural sector. We have been working with suppliers of drone technologies and young entrepreneurs in ACP regions to see how this technology can help provide real-time information for farmers to improve productivity and, at the same time, create opportunities for young people. Another example is blockchain; we have recently launched a project supporting young entrepreneurs to develop the application of blockchain to address specific value chain challenges, for example, improve traceability of agricultural products to fetch higher prices for farmers.

We have also been supporting young innovators with coaching and mentoring having identified the most promising ones through 'Pitch AgriHack' competitions, which we run across the ACP. Many of the winners and runners-up already have a start-up business, so we try to help them develop the businesses further; and some are just starting, so we try to help them conceptualise their business model. Through this programme, CTA has reached out to more than 800 young innovators across the ACP and many of them have become successful, running effective businesses and reaching tens of thousands of smallholder producers through their services.

Digitalisation is a big space, where a lot of innovation is happening, which is also involving young people. This is all encouraging, but what excites you most about it?

What is most exciting is the speed at which digitalisation in agriculture is developing, particularly in Africa. In 2013, when CTA organised a big international conference on 'ICT4Ag' in Rwanda, there was really very little activity happening. But in the last 5 to 6 years, as you will see in our digitalisation report, there has been a huge increase in new digital solutions coming into the market, as well as interest from major donors and governments to really leverage digitalisation to transform smallholder agriculture. So, we feel that CTA has been a pioneer in this area and now big players are coming together and mainstreaming digitalisation into the agricultural sector.

Even though you have been working in this area for some time, CTA is still a relatively small organisation compared to many of the big players. What role do you feel that CTA plays compared to other actors in the sector?

Although CTA is small, it is playing a key catalytic role as a knowledge hub, facilitating exchange of lessons and

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Michael Hailu highlights the catalytic role of CTA in raising awareness of digital technologies, sharing lessons, publishing information around these innovations, and supporting young entrepreneurs

experiences and thereby making these innovations more accessible to entrepreneurs and farmers. We do a lot of work identifying emerging technologies, sharing lessons, publishing information around these innovations, and we have also supported many young entrepreneurs, through which we have been able to leverage our limited investment. CTA has been playing a key role as a promoter of digital innovations for smallholder agriculture but, of course, we have also made our own investment and, given that the overall market size is rather small, our own investment has been quite reasonable. Of course, as the market grows, our share becomes smaller, but I think more than anything, CTA's role is creating visibility, sharing experience and keeping track of what is happening, which I think no other organisation is doing at the moment.

A key activity for CTA this year is the publishing of this report on digitalisation in agriculture in Africa. What is the report revealing that is going to be useful in taking this agenda and programme of work forward?

First of all, this is probably the first time that anyone has really looked at the space closely: what does the ecosystem look like; who are the key players; what is the reach of the various solutions; how many farmers or smallholders are actually using these services; what is the growth prospect and so on. Nobody has done this kind of examination of the current situation and then presented recommendations for different stakeholders, including the private sector, government and donors. We have come up with some interesting insights and we feel this report provides a baseline on which we can build upon, and track changes and developments in the future.

One of the key findings is that, across five cases (advisory services, market linkages, financial services, supply chain management services, and macro agricultural intelligence services), there are almost 33 million farmers that have been registered, but only 40% of registered farmers are making regular use of these services. That is quite an interesting insight that, in the future, we should be focusing a lot more attention on use as opposed to just increasing registration.

The other insight, which may not be surprising in terms of digital divides, is that women still only constitute about 25% of users, whereas youth account for 65% of the users. We, of course, know that women are not making as much use of technology as they should, and they constitute about 45% of the agricultural labour force. That is not surprising, as such, and confirms our belief that women are not well represented in technology use and the young, of course, will find farming more attractive with the application of these technologies.

This sector is evolving very quickly, and people are taking an interest. What are the key challenges that need to be addressed if this is going to go forward in a positive way?

You have the big challenge of digital infrastructure in rural areas and about how these services can be more easily deployed. There is the whole issue of engaging farmers in value chains; we see that most of the active users are in what you call 'tight' value chains, where there is very clear linkage from producers to processors to markets. Some of the challenges have to do with enabling policies in different countries. For example, in Kenya you have a lot of private sector-led solutions and activities because the policy environment has been quite encouraging for this kind of investment. So, there are a number of factors, including infrastructure and policy, which would promote more use of digital innovations in agriculture.

You will be sharing the report at a number of significant events and talking to policymakers and other donor organisations. If you had one key take away message from what this report is saying and what CTA is doing, what would that be?

I would say the key message is that digitalisation can be a real game changer in transforming smallholder agriculture in Africa, but it has to be given due importance in terms of policy and investment. Governments should take this as another key area which could make a huge difference in transforming agriculture, improving productivity, building resilience and creating opportunities for youth and women. So, my message would be that governments should take a serious look into leveraging digitalisation as part of their strategies to transform agriculture. ■

Enock Chikava

The promise of digital innovations

Deputy director for Agricultural Development, Global Growth & Opportunity at the Bill & Melinda Gates Foundation, Enock Chikava, highlights the benefits of digitalisation to farmers and agribusinesses.

Susanna Cartmell-Thorp

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Enock Chikava states that digitalisation will leapfrog the challenges farmers face

Can you outline the Gates Foundation's vision concerning digital transformation for agriculture?

Today, smallholder agriculture has many challenges; farmers are disaggregated into small units, dispersed and disconnected from functioning market systems. This is a result of poor infrastructure, like roads, water, power, and, also because some farmers have low levels of literacy, and information, services and products do not reach them effectively and in time. As a result, no one deeply understands how smallholder farmers transact. Owing to this lack of transparency of what they do, smallholder farmers are excluded from all formal market systems and services.

At the Gates Foundation, we are excited about the promise of digital innovations with the cost of tools and data going down. We work to bring about transformative innovations in digital technologies and infrastructure that can help smallholder farmers to be connected at scale, making them more equal in accessing market information, inputs for output markets, and advisory services, which are much needed in a time of climate change. Farmers need to be up to speed with climate-smart innovations in terms of improved seeds and animal breeds, and digital technologies could help in this regard.

What do you think are the most promising areas in terms of data collection and digital technologies that you believe will make the biggest difference?

It starts with having a vision; we are seeing many governments in Africa and India with a vision and strategy around the economy and digital agriculture. Once you have the vision, there is the need for infrastructure. You cannot get into digital agriculture if the infrastructure will not allow connectivity, so we need regulations and policies to attract private sector investment. So, the starting point is the government having that vision and knowing the power of digital innovation in making sure smallholder farmers are connected to the input and output markets, advisory services and to each other for collective action.

As CTA publishes its landmark report on digitalisation in agriculture, how do you think it will make an impact on future discussions and how people work in this area?

The CTA report is going to provide the landscape of what is going on – and where – at the small-scale level, and highlight the benefits of digitalisation, which will enable us to engage with governments, the private sector and donors around specific projects.

At the Gates Foundation, we hope the report will dive deeper into some of the ways digital innovations can be deployed. We know that the technology works based on the environment in the developed world, but we need to continually test the robustness and resilience of these business models against challenges in developing countries. So, we are looking to understand small-scale pilots, but we need to use countries and even regions as scaling-units, rather than a proliferation of village-level pilots.

It is good to get people excited and to realise that digitalisation is perhaps the best way to leapfrog many of the challenges we face. However, we need to understand regulations because, as you begin to collect farmers' data, there are issues of data security, ownership and sharing. If the data already collected, standardised and analysed remains in the hands and control of the few, it defeats the whole purpose of digitalisation. It is only when the data is widely shared that newcomers do not have to spend the same amount of time and effort collecting the same kind of data. To deploy this technology at the national level, there must be some key role for governments within the system. In most cases, governments do not often work in partnership with the private sector, so we need to find better mechanisms for them to work together. ■

Dossier

STEMMING YOUTH MIGRATION: OPPORTUNITIESIN AGRICULTURE

Africa's growing youth workforce presents enormous potential for agricultural transformation, but to capitalise on this promising resource the sector must become a more attractive employment option for the continent's young people.

JOB CREATION

Agriculture's potential to mitigate youth migration

As waves of young people leave their rural communities in sub-Saharan Africa in search of better work, can the agricultural sector provide the employment opportunities that they're looking for?

Stephanie Lynch

With financial and educational support, young entrepreneurs are developing profitable and sustainable agribusinesses in their local communities

Migration is not a new phenomenon; people have moved between geographical locations throughout the course of human history. Globally, however, rural-urban migration has accelerated in recent decades. But, contrary to popular perception, the vast majority of this migration occurs within countries, rather than between countries or continents. Among the myriad causes of increased levels of migration – from climate disasters and severe weather, to natural resource degradation and conflict – the growing 'youth bulge' in Africa is fast becoming the primary driver of migration on the continent.

Currently, half of sub-Saharan Africa's population is under 25-years-old and almost 20 million young people enter the job market in Africa each year – 12 million of whom are rural youths. In fact, according to FAO research, 65-75% of African migrants are youth, mostly in search of employment opportunities. As Africa's largest employer, agriculture offers the greatest opportunity to boost economic growth and create jobs for young people on the continent. To capitalise on the as yet untapped potential of African youth, agriculture must become a more attractive and viable employment option for young people. Stakeholders from both the public and private sectors have a critical role to play in incentivising and facilitating more young people to find decent work in agricultural value chains.

Exploiting economic opportunities

The World Bank predicts that African agriculture and agribusiness will grow to be an €890 billion industry by 2030. This presents significant rewards for young people who tap into the industry as farmers and entrepreneurs. "The rising population in Africa, and the entire world, creates an opportunity for farmers to produce more and increase our income. We have most of the necessary resources, like land and fertile soil, which we can utilise to take up market opportunities in the global food industry," says Kisseka Samson, 22-year-old co-founder and managing director of Hello Mushrooms U Ltd in Uganda.

Hello Mushrooms supplies inputs and offers free training to mushroom farmers in exchange for their produce, which is sold on to 20 commercial wholesalers and retailers, as well as ›

A second chance for rural youth in Mali

In Mali, young people with little formal education have been trained and supported in the creation of micro-enterprises. Financed by USAID's Out-of-School Youth Project (OSYP), an initiative – known in Mali as PAJE-Nièta (Projet D'appui Aux Jeunes Entrepreneurs) – has helped over 8,070 young Malian's to create their own agribusinesses through the provision of technical training courses, since it was launched in 2011.

After attending a bakery course provided by PAJE-Nieta, as well as national language and French lessons, 30-year-old Amadou Dao started his own bakery business. With the baking equipment provided by the project, he is able to produce and sell enough bread to feed the 20 members of his family in the village of Yorosso in the south of Mali. "Now, I earn between 300,000 and 350,000 CFA francs a month (€460-500). Thanks to my bakery, I have [been able to buy] three plots of residential land, a house and motorbikes." To meet the high demand for his products, Dao uses more than 50 kg of flour every day, and he employs three members of staff.

PAJE-Nièta has trained and recruited 309 volunteers, who have worked in 220 villages to assist more than 14,000 young people and supported over 220 youth associations with basic education programmes (reading, writing and maths in the national language). The beneficiaries also received French lessons, entrepreneurial training, support and guidance in choosing an income-generating activity, and training in how to create savings and loan groups. PAJE-Nièta has helped "Young people to be economically productive and to feel confident about their future at the heart of their communities," says Adwoa Atta-Krah, director of the Education Development Center in Mali.

In the village of Kinian, 60 km from Yorosso, Sidi Sanou, a 32-year-old vegetable grower, now supplies the small village with vegetables. Sanou received entrepreneurial training and lessons in vegetable growing techniques, along with courses in vegetable cutting care and the use of fertilisers. The vegetable grower estimates his monthly revenue at 10,000 CFA francs (€15), thanks to the sale of vegetables such as okra, lettuce and tomatoes, as opposed to 2,000 or 3,000 CFA francs (€3 or €4) before PAJE-Nièta's intervention.

Soumaïla Diarra

› individual customers. Similar examples of ambitious young agricultural entrepreneurs can be found across the continent; from Cameroon, where 22 year-old Awah Ntseh has founded Farmer's Forte – a range of beauty products developed from local materials, including coconut oil, neem and aloe vera – to Kenya, where Kevin Kibet, also 22 years-old, provides a ready market for his company's 130 avocado suppliers. By the end of 2019, "I am hoping to have reached 500 farmers; in 3 years - 1,000 farmers, and within the next 12 years, 1 million farmers," Kibet says. He is a firm believer that agriculture can reverse Africa's migration trend if entrepreneurs manage to unlock the economic opportunities available.

Realising technological incentives

Director general of the UN Industrial Development Organization, Li Yong, agrees that growing local and regional demand for food presents vast potential for the integration of youth in the agricultural sector. However, "This will require the transformation of food systems and the adoption of innovative technologies," Yong notes. The rapid development of agricultural technologies in recent years has already demonstrated the exciting new employment opportunities opening up for youth in the sector.

"Young people are eager to participate in agriculture policy processes, but they need to be equipped with the right skills to convey their messages well."

A group of young Zambian entrepreneurs have developed a digital platform that uses machine learning to forecast weather conditions and the probability of pest invasions or disease outbreaks. AgriPredict provides its users – who range from smallholders to commercial farmers, extension service providers, NGOs and government or environmental institutions – with the necessary information to take preventative action to mitigate these risks. Farmers simply take a photo of their crop and send it to AgriPredict, via social media channels or WhatsApp, and the system immediately provides a diagnosis, options for treatment (if needed) and locations of the nearest suitable agro-dealers.

Elsewhere, in Rwanda, a group of young engineers has designed a technology system that allows farmers to remotely manage their fields. Using sensors that gather real-time data, STES Group's web and mobile platform enables farmers to keep track of weather forecasts, as well as soil fertility and moisture. The company's automated irrigation system can be turned on or

Africa's youth employment challenge

Africa is home to the youngest population in the world. As the largest employment sector, agriculture has potential to absorb this youth workforce into productive employment

600 million Africans are **under 25**

72% of African youth are unemployed or vulnerably employed, living on **less than €2 per day**

11 million young people are expected to enter Africa's labour market each year

63% of sub-Saharan Africa's population live in **rural areas** where agriculture is the main source of income

Agriculture is set to create **8 million stable jobs** in Africa by 2020 – if the sector experiences accelerated growth, the figure could be **14 million jobs**

SOURCE: YOUNG AFRICA WORKS SUMMIT 2017

off by farmers via their mobile phones, depending on the information received from the sensors.

Both AgriPredict and STES Group demonstrate how youth can harness the transformative potential and economic rewards presented by agriculture's digitalisation. These innovations have not only provided jobs for the young people who founded the companies, but also helped to reduce the risks and improve the efficiency of farming – making it a more attractive livelihood option for rural young people. However, without the skills to develop, operate and maintain such technologies, African youth cannot make the most of the opportunities offered by agriculture's digitalisation.

Knowledge sharing and capacity strengthening

There is a pressing demand to build the capacity of Africa's rural youth, not just in terms of technical or digital skills, but also in terms of agricultural best practices and business know-how, in order to foster economic growth and promote youth employment. Fortunately, a number of promising initiatives intended to create jobs and support young entrepreneurs to establish viable agribusinesses have begun to emerge across the continent (see *Good farming practices help turn the tide on youth migration* in this edition). In Kenya, capacity development facility, USTADI, focuses on improving the technical skills and business knowledge of young people, with the aim of promoting the establishment of sustainable rural enterprises.

In Busia county, Kenya, USTADI set up a demonstration poultry farm and provided 22 young women farmers with both practical agricultural training – such as optimum feeding and disease management practices – and business skills. As a result, these women tripled their productivity, transforming young people's perceptions of agriculture as a subsistence activity into a sector that offers opportunities to establish professional and profitable businesses in the local area. Similarly, the Green Innovation Center (CIVA), launched in 2016 by AfricaRice targets rural youth with agricultural extension training to help create jobs, as well as improve farm productivity and incomes.

CIVA has developed over 30 online courses – available to students and graduates of 10 agricultural colleges in Benin – to prepare participants to work with farmers as extension advisors. After completing their training, the young agricultural instructors visit villages in Benin to promote the System of Rice Intensification, which provides set principles for sustainably increasing rice yields, including planting young seedlings (8–12 days old) with wider spacing. By 2022, the project aims to create 1,000 new jobs for young people and increase 50,000 smallholder farmers' incomes by 33%.

Facilitating youth entrepreneurship

Beyond training young people in agricultural best practices, a wave of incubators have emerged to support young entrepreneurs to transform their innovative ideas into sustainable agribusinesses. The International Institute of Tropical Agriculture's (IITA) Youth Agripreneur initiative has developed an 18-month entrepreneurship programme for unemployed graduates. With incubation centres in the Democratic Republic of the Congo, Kenya, Nigeria, Tanzania, Uganda and Zambia, young graduates across Africa are coached and mentored on business opportunities in the production and value addition of agricultural commodities, such as soybean, fish and livestock.

> According to FAO, 65-75% of African migrants are youth, mostly searching for employment opportunities.

The Youth Agripreneurs programme aims to change young people's mindset to help them realise the business potential in African agriculture by teaching them the best technologies to improve yields or process products, as well as effective marketing strategies to maximise profits. At the end of the programme, participants develop bankable business plans to enable them to access loans from commercial banks and establish independent agribusinesses. In December 2018, Youth Agripreneur alumni, Edmond Ng'walago, won the 2018 Young Graduate Entrepreneurship award for his business selling value-added rabbit products. With the TSh 5 million (€1,916) prize, Ng'walago intends to expand his business, Ng'wilago Youth Transcend, to make his rabbit urine biopesticide and rabbit fur sandals available in stores across Tanzania.

As young people begin to realise the profitable alternatives to migration, which lie in establishing their own agribusinesses, it is critical that they have access to the necessary capital to get their enterprises off the ground. For this reason, in October 2018, the Mastercard Foundation launched a new fund to support alumni of the Mastercard Foundation Scholars Program, who have viable, sustainable and scalable business ideas. The €1.8 million fund will be used to provide seed money to the most promising students from the Scholars Program, which provides education and leadership development for over 35,000 young Africans committed to changing the lives of their communities. "The Mastercard Foundation's new fund will initiate a wave of community transformation across Africa by kickstarting hundreds of social ventures pioneered by young African leaders themselves," says Kayiza Isma, Mastercard Foundation scholar and co-founder of Sparky Social Enterprise.

Creating an enabling policy environment

The value of entrepreneurship programmes like IITA's Youth Agripreneurs initiative and the Mastercard Foundation Scholars Program, not to mention CTA's own Pitch AgriHack competition, should not be underestimated. However, to further encourage young people to capitalise on the opportunities in African agriculture, governments have a critical role in developing policies that support ›

› youth entrepreneurship and employment, and thereby mitigate migration.

To ensure policies not only work for, but also with young people, there needs to be greater effort to engage youth in policymaking. The Rwanda Youth Agribusiness Forum (RYAF) was established in May 2016 for precisely this purpose. With 12,000 members, aged 35 and younger, RYAF is recognised as a national representation of Rwandan youth engaged in agriculture and agribusiness. Representatives of the Forum actively participate in policy dialogues and advocate for interventions aimed at strengthening youth participation in transforming the country's agricultural sector. Similarly, Young Professionals in Agricultural Development (YPARD) provides a platform for people under 40 years-old working in agriculture to advocate advantageous policies and interventions.

YPARD Ghana has more than 750 members from farmer organisations and the government to representatives of the private sector. In recent years, the platform has proposed a number of policy reforms that directly respond to the need to create job opportunities for youth in Ghana. In May 2018, YPARD Ghana signed a letter of cooperation with the Forum for Agricultural Research in Africa for the data population and local management of the eCapacities™ platform. The platform will foster engagement with African organisations on agribusiness, investment, human capital and production data to promote informed policies, targeted investments and enhanced monitoring and evaluation of growth in the agricultural sector.

The transformative potential of African youth

Digitally-savvy youth are primed to integrate technology into farming practices and modernise agriculture

90% of Kenyan youth have **embraced ICTs** in their farming practices

72% of young sub-Saharan Africans prefer to start their own business than work in an organisation

43% of new businesses established in Africa between 2015 and 2020 are expected to be in agriculture and agribusiness

50:50 is the ratio of men to women entrepreneurs in most sub-Saharan African economies

SOURCE: BUSINESS PARTNERS ENTREPRENEUR OF THE YEAR 2013; DJEMBE COMMUNICATIONS AND FORBES INSIGHTS 2015; YOUNG AFRICA WORKS SUMMIT 2017

Connecting youth around the world

As Sithembile Ndema Mwamakamba of the Food, Agriculture and Natural Resources Policy Analysis Network says in her interview with *Spore* in this edition, "Young people are eager to participate in agriculture policy processes, but they need to be equipped with the right skills to convey their messages well." Through platforms like RYAF and YPARD, youth in agriculture can influence the policy environment in response to their needs and help to make agriculture a more attractive employment option for rural young people.

As well as connecting young agribusiness leaders and farmers with policymakers and strengthening farmers' organisations, CTA has been working with AgriCord, the Pan African Farmers Organisation and the European Council of Young Farmers, to link up young farmers in Africa and the EU. As a result, young farmers on both continents have been able to exchange lessons from their different experiences of modernising agriculture and take these learnings back to their communities. Giving young Africans in the agricultural sector a voice on the global stage helps to increase the visibility of successful entrepreneurs and agribusiness leaders, as well as raise the profile of young farmers to ensure that their relevance in the world's future food security is universally acknowledged. Such platforms thereby provide inspiration for other rural African youth in search of a viable alternative to migration. ■

INTERVIEW

Sithembile Ndema Mwamakamba: Prioritising youth engagement in technology and innovation

James Thorp

As programme manager for climate-smart agriculture at the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), Sithembile Ndema Mwamakamba has a passion for working with and supporting African youth.

With over 200 million young people in Africa, what strategies can be developed for job creation that ensure the continent capitalises on the potential of this burgeoning youth population?

The opportunity is in technology. For a long time, African agriculture has been considered rather backwards, whereas the rest of the world has moved on so much. But the approach needs to change because the training that young people receive – either at technical college or university – has been designed to train people how to work for somebody and not themselves.

We also need to look at opportunities that exist within current challenges. For instance, within climate change, there are opportunities like carbon credits and carbon trading, which have spaces that young people can get into. In addition, we need creative and innovative financing packages that are designed for young people who want to set up their own businesses.

At FANRPAN you have been working with the Mastercard Foundation to advocate youth engagement in policymaking. What is the value of this?

We have been working together for the past 2 years to develop a policy guide for young people that demystifies the notion that policy development is just for government people or for adults, so to speak. The challenges that we are facing here in Africa do not discriminate, the old and the young are affected equally. By working with the Mastercard Foundation, we have recognised that young people are eager to participate in agriculture policy processes, but they need to be equipped with the right skills to convey their messages well.

Digitalisation is frequently seen as the answer to attract more youth to agriculture, but is it really the silver-bullet that the sector needs?

I personally believe that ensuring that young people engage in technology and innovation should be a priority for most governments. The world is advancing at a speed that I do not think we have ever seen before. We need to be able to harness technology and innovation properly in agriculture if we are going to chart a new development pathway for Africa, and young people are sitting right at the centre of all that innovation. So, I think there is a special need for our leaders to give credence to this view of getting young people further involved in the digital space and creating an enabling environment for them to do that. I think there is recognition of this by African leaders, because science, technology and innovation are key pillars of the African Union's Agenda 2063.

CTA's Pitch AgriHack competition provides business training and mentorship to help young entrepreneurs develop more sustainable e-agribusinesses. Why are such programmes important?

I believe young people learn by doing, and opportunities like the Pitch AgriHack competition challenge them to think innovatively. From what I understand, it is a competition that comes with training and mentorship as well, so it means that young people will be supported with actually starting their businesses.

Ultimately, it is about making sure that there is sustainability. So, there is a need to transfer knowledge from the old to the new. Climate-smart agriculture is being championed by FAO, CTA and FANRPAN, among others. This approach does not contain new information because it promotes practices like conservation agriculture and zero-tillage, which are techniques that farmers have been practising for years. But now, they have been researched further and there is a better understanding and appreciation of their value, so this knowledge needs to be transferred to our future farmers.

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To cope with rising youth unemployment in Africa, Mwamakamba calls for better efforts to support young people's engagement with technology, entrepreneurship and policymaking.

FANRPAN's Policy Training Manual was launched in 2018 and provides a good resource for young people who want to be more involved in policy decision-making: https://tinyurl.com/y6l33jtw

KENYA

Reality TV shapes up young farming in Eastern Africa

Agricultural TV shows that provide information on how to start an agribusiness are encouraging youths in Kenya and Tanzania to consider farming as a lucrative career choice

Pius Sawa

In Kenya, as in other African countries, young people often do not possess the collateral or adequate financial knowledge needed to venture into agricultural enterprises, deterring them from seeking and acquiring financial support for the development of agribusinesses. Further issues regarding the storage, transportation and market access of farm produce, and the resulting food loss and wastage in the country, can also deter youth from engaging in the sector.

To change the perception of agriculture in the country, TV programme Shamba Shape Up (SSU) has been running for the past 5 years to share young farmers' success stories and promote agriculture as a business opportunity. The show aims to give farmers and audiences the tools they need to improve their farms (*shambas*). The series tackles issues such as soil infertility, poor crop and livestock health, as well as dietary diversity and how to maximise the nutritional value of vegetables consumed.

So far, SSU has produced nine series, reaching an estimated 5 million people in Kenya, with broadcasts recently being extended to Tanzania. Each episode focuses on one farmer and their farm with the SSU team, including a film crew and experts such as veterinarians and crop specialists, visiting a different farm each week. Typically, the film crew spends 4 days with each farmer, allowing time to get experts' opinions and build any necessary improvement structures.

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Young farmers for food security

Gabriel Ingubu, a 28-year-old farmer in Kenya's Bungoma County, is now practising horticulture after watching the programme on TV. "I did not

have any knowledge on tomato farming, but after watching how they handled the farming – from selecting the seeds, soil preparation and disease control to harvesting – I am now an expert farmer," he enthuses. On 0.2 ha of land, Ingubu plants tomatoes, kale and other leafy green vegetables, earning him around KSh 10,000 (€88) a week, which is enough to meet his family needs. He is also saving money to start a greenhouse project in order to increase production to supply hotels and restaurants around Bungoma town.

Focusing on young farmers is important for Kenya's food security says Patricia Gichinga, head of productions at The Mediae Company, which produces the programme. "In Kenya, the average age of a farmer is pushing 60. There are many farms where less than half the land is being cultivated due to the age of the farmer and energy to invest in farming. These farmers also tend to be slow to innovate or change attitudes and behaviour, or use new ICTs for communication," she says. "At the same time, there is a very large young population, which has trouble accessing land to farm as parents are unwilling to hand over land to individual children as a result of inheritance traditions or conflicts with other children. Very seldom do young people actually lease or rent land from their parents, or other landowners, and put the land to use," explains Gichinga. "With SSU, we reach 2 million households in Kenya and we estimate around two people in the household are watching. Plus, 34% of that audience are youths of 18–30 years [according to Geopoll data]. In Tanzania we have an audience of 3 million."

Youths in Eastern Africa are making more informed agronomic decisions to increase their production by watching agricultural TV shows

Many farmers have been able to get feedback to any questions that arise whilst watching the show through a mobile phone-based agricultural information service called ishamba, also developed by The Mediae Company. In conjunction with SSU, the advice provided by the ishamba service helps farmers improve production and thus increase their incomes and livelihoods. ishamba has been running since 2015 and employs 12 young agricultural experts from Jomo Kenyatta University, who have been trained to write up agricultural information for mobile support. The premium service, which costs KSh 800 (€7) per year, currently has 270,000 subscribers – 44% of whom are women.

Don't lose the plot

To further engage youths in farming activities, the SSU production team launched a new reality TV show called Don't Lose the Plot in March 2017. Funded by USAID's Feed the Future programme, and working with Africa Lead, the show aimed to encourage youth to consider farming as a lucrative career choice, and provide information on how to start an agribusiness and share useful agronomic information. As part of the programme, which was aired in Kenya and Tanzania between May and July 2017, four young farmers from the two countries were provided with 0.4 ha of land to turn it into successful and profitable farms within 9 months. The winner would receive a prize of €8,960 to be used for their own farming operations back home.

Winrose Kaya from Tanzania emerged as the winner after working side-by-side with the show's experts to divide her farm into different sections. She planted quick maturing crops, including onions, potatoes, coriander, cabbage and spinach, and reared 500 broiler chicks. On returning home after completion of the competition, her parents offered her 0.5 ha of land, recognising their daughter's agricultural skills and ability to make a profit. The show was watched by 4.1 million youth in Kenya and Tanzania.

Whilst airing Don't Lose the Plot, The Mediae Company also created Budget Mkononi, an interactive web-based tool to help young farmers calculate the input costs of a chosen crop, as well as how much profit they could make over a short period of time. Nearly 25,000 youths are currently using the Budget Mkononi tool to start up farming projects in, for example, onions, potatoes and poultry to achieve maximum profit. "At first, I didn't realise that I could change the prices to suit my situation. But now that I know, I think the tool is useful and will help me to plan my spending," says Janet Oloo, one of the young beneficiaries from Kenya. Gregory Mutisya, also from Kenya, says the free budget service has greatly helped him in planning and making informed decisions, and has enabled him to attain the projected profit from his vegetable farm. ■

SENEGAL

Good farming practices help turn the tide on youth migration

A cereal production and marketing programme is substantially boosting smallholders' incomes, making the agricultural sector much more attractive to young people. As a consequence, youth migration has decreased.

Matteo Maillard

© MATTEO MAILLARD

In Senegal, young people from rural areas are seizing opportunities in diversified profitable value chains, which is helping to strengthen food security and combat childhood malnutrition, whilst mitigating youth migration. Launched in 2011, the flagship Agricultural Value Chains Support Project (PAFA) of the International Fund for Agricultural Development (IFAD) aims to sustainably improve the livelihoods of farming families based in the central groundnut basin of Senegal. Farmers benefit from support for the production and marketing of local cereal crops, such as millet, sorghum and cowpea.

"We aim to ensure that farmers will earn a decent income so that they can support the development of their villages rather than emigrating to cities or abroad – to the detriment of rural areas," says Benoit Thierry, head of the IFAD Western Africa Hub. "We help create jobs by providing farmers with access to agricultural equipment, certified seeds, fertiliser and then to markets, thus enabling them to sell their quality produce and gain a decent income."

Provided with access to agricultural inputs and training, and then to markets, Senegalese farmers gain better incomes, thus choose to help develop their village instead of migrating

Higher yields for better incomes

Based on the resounding success of the first phase of the project, which culminated in 2014, PAFA has been extended to 2022. The project's five value chains (millet, cowpea, roselle, sesame and maize) have generated striking results; over 37,700 farmers have been able to significantly ratchet up their cereal production from 3,131 t in 2011 to 33,687 t in 2016, which is sufficient to cover the food needs of around 158,250 people. Based on the high quality of the millet produced, a contract was signed with the food giant Nestlé for the export of 3,000 t of the cereal to Côte d'Ivoire between 2014 and 2019 to be processed into Cerelac instant cereals for infants.

> Farmers have been able to increase their cereal production to cover the food needs of around 158,250 people.

PAFA's key objective is to help Senegalese farmers achieve food self-sufficiency in relatively infertile regions and make agriculture a sustainable option. To help achieve this, the initiative draws on the drive and vitality of local farmers' organisations by training their members in good agricultural practices and providing organisational capacity building. This helps members to generate higher incomes and makes the agriculture sector more attractive to the youth, who otherwise seek job opportunities in cities or migrate overseas.

In the town of Niahrar, in the heartland of the Senegalese groundnut basin 144 km from Dakar, a local association perfectly exemplifies this knowledge transfer strategy. Created in 1989, the Jamm Bugum (meaning 'I want peace') sports and cultural association was initially a football team consisting of youths before becoming an agricultural organisation. "In 1998, we thought we needed to be more useful to society," says its president Mame Biram Sène. "We decided to invest in the development of our community. Our first initiative was to replant trees in public places in order to provide shade."

In 2012, PAFA gave them practical training on equipment options, which inputs and seeds to use to enhance cereal production performance, how to organise a profitable market with the surplus production, and how to make nutritious dishes with cereals and juice drinks from fruits. Thirty-year old Ndèye Ndong was one of the beneficiaries, "I didn't use to apply fertiliser in my field," she says. "Here the soils are very poor and crop yields are variable. The training taught me how to organise fertiliser spreading, and when to pour on urea to get bushier plants and stronger cereal heads." She now manages to produce 1.5 t/ha of millet on her 2 ha field, compared to 500 kg before the initiative was launched, and can readily feed her family during the lean months. She also produces surplus from her field that she sells at the market, and has saved time spent on the field through the application of more efficient practices. "This gives me time for other activities such as small-scale trading and managing my children's healthcare."

"Convinced to stay and farm the family land"

Téning Ngom, 22, was also fully aware of the benefits of freeing up time spent on the farm for other income-generating activities. After the rainy season, using the money earned, she began selling prepared breakfasts to students and workers passing by her house every morning. "I was also able to buy a television, radio and fridge in which I chill the juices I sell," she says. She has also been participating in a revolving credit group over the last 4 years to boost her income. This village savings and credit system includes 25 members who each put money into a common fund which, in turn, is used to finance members' purchases. The interest generated is then shared among the other members. "This system enabled me to buy 10 sheep and 10 goats," says Ngom. "I ›

› hope this will eventually help me turn my breakfast business into a real restaurant. I want to stop working in the field to replace my pitchfork with a dinner fork!"

Half of the 1,005 members of the Jamm Bugum association are men. As is often the case in poor villages, it is generally the men who go to cities or abroad to find a more profitable activity than unfertile lands in Senegal have to offer. Outmigration candidates abound, including 23-year old farmer Sheikh Diouf, who says: "I had planned to go to Spain to find work before PAFA was launched in 2012. Like my friends, I wanted to be able to send my family money back from Europe to tide them over during dry periods. This initiative managed to convince me to stay and farm the family land – and now we live well."

> "I'll prove to those who want to emigrate that they can earn more from local agriculture than they could from a dangerous trip to Europe."

Some young students have even decided to return to Niarhar after graduating with the aim of convincing other young people to stay. Twenty-eight year old Pierre Diouf is a Master's student in biology in Dakar. He was able to continue his studies with the earnings generated by the project. "Once I graduate, I'll go back to the village to help other young people," he says. "I'll prove to those who want to emigrate that they can earn more from local agriculture than they could from a dangerous trip to Europe."

Better off in the village

In the 1980-90s, most adult men left for Dakar as part of a seasonal migration trend during the dry season. Jacques Diou left Niarhar at the age of 18, but he only managed to become a poor dock worker in the capital. "In town, all we were offered was hand-to-mouth work, so I went back to the village." Back home, his crop production increased by applying the good agricultural practices he had learnt from PAFA. The supplementary income enabled him to set up a market garden where he grows cassava, dates, lemons, mangoes, oranges and soursop to help his family get through the lean months. He has even set up a pigsty and a henhouse.

"Subsistence agriculture had long prevailed in Senegal," explains Aliou Diouf, a young teacher in Niahrar and Jamm Bugum member. "PAFA has changed our mindset. We have gone from a threatening famine situation to food marketing. Farmers are now talking about yields and striving to develop their business." The association will be opening a bakery in May, selling bread made from local cereals – this is a first, and emblematic of the incredible change that has taken place. This entrepreneurship has earned Jamm Bugum two IFAD 'Golden Sheaf' awards for its innovations in the agricultural sector. In 2016, Mame Mbaye Niang, Senegalese Minister in charge of Youth, Employment and Citizen Building, praised the association. "It is experiencing emergence," he said, placing the association's success within the context of President Macky Sall's Plan for an Emerging Senegal (PES).

In addition to Jamm Bugum, PAFA supports 44 other youth associations across the country. Their overall positive results enabled 82% of beneficiaries to overcome hunger during the lean season, with malnutrition among children under 5 years old decreasing from 30% to 22% between 2011 and 2016. ■

A national plan to revamp agriculture

In 2014, Senegal launched a Priority Action Plan under the Programme to Accelerate the Pace of Senegalese Agriculture (PRACAS). This agricultural component of the government's PES aims to promote the growth of this vital sector so that it can become a catalyst for the country's economic transformation, in turn reducing the poverty that is forcing thousands of Senegalese young people to emigrate.

Agricultural production in Senegal is insufficient, thus placing the most vulnerable segments of the population (47% of Senegalese people are poor) in a food insecurity dilemma. The *per capita* gross national income is €932, with a life expectancy of 63 years. These indicators place Senegal 162nd out of 187 countries in the 2016 Human Development Index rankings of the United Nations Development Programme.

As a result of this underdevelopment, Senegal was ranked 10th by the European Parliament in terms of the number of illegal migrants entering Europe by sea in 2018. According to a paper published in the *African Studies Review*, from the 1980s onwards, economic liberalisation was a major reason for the deteriorating livelihoods of Senegalese people and a driving force behind outmigration (https://tinyurl.com/y4lmcsk6). Youth migration from rural areas has led to de-structuring and weakening of the agricultural sector. PRACAS and PAFA are currently striving to redress this situation by modernising farms to enhance nutrition security. One aim is to create synergies between family farming – the dominant form of agriculture in Senegal – and agribusiness, while preserving the environment. According to a recent study by the Migrations between Africa and Europe Project, nearly half of Senegalese migrants in Europe send money to their families back in their villages.

To compensate for the low incomes generated by the families who stayed in their village, agriculture must be organised in structured commercial value chains and become more productive. PRACAS intends to provide farm jobs, technical training and equipment to more young people and women to offset foreign currency remittances and develop profitable local agriculture.

SPORE

Agribusiness

APICULTURE

The Solomon Islands rediscover the taste of honey

Following destruction of the entire bee population by parasites in the 2000s, the Solomon Islands has now restarted its honey production, and has its sights set on the export market.

Vincent Defait

Producers in the Pacific islands – particularly women – are accessing apiculture commercial opportunities through training, and the provision of beekeeping equipment. Since 2015, nearly 700 hives have been distributed to farmers, and 140 small producers have been trained in hive management and other apiculture techniques, such as breeding queens, as well as good business management.

Supported by the Solomon Rural Development Programme (RDP), the Solomon Islands Small Business Enterprise Centre (SISBEC) has played a pivotal role in relaunching apiculture through such training and equipment provision across the archipelago. According to the Ministry for Development Planning and Aid Coordination, this assistance has helped generate average revenues of €13,000 per year for the Solomon Islands, which equates to around €1,430 per producer. Between 2016 and 2018, honey production grew from almost zero to more than 1,100 l, mostly sold locally.

The Solomon Islands are providing smallholder producers with new market opportunities through honey production

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In the 2000s, the Solomon Islands were producing enough honey to consider exporting a portion, thanks to the hard work of 2,000 beekeepers with over 400,000 hives. However, the introduction of Asian bees carrying the varroa parasite brought the sector to its knees.

Almost 15 years later, "Most of the producers sell their honey to an intermediary who then conditions it for selling on to wholesalers in cities," explains Rodney Suibea, a SISBEC member. As the primary intermediary in the sector, SISBEC guarantees an outlet for small-scale producers by purchasing their honey for between SI$40–50 (€4.40–€5.50) per 350 ml. "At the moment, honey production is around 4–5 t per year and this cannot meet local demand," adds Suibea. Despite this, SISBEC is projecting production of 10–15 t by 2020/22. "The honey could then be exported. We have tested the New Zealand market and have confirmed that there is a market for Solomon Islands honey there." According to Suibea, the honey is also appreciated in Japan.

"SISBEC will soon be signing up all of the apiarists to the Australia New Zealand Bank GoMoney programme (an online bank managed through an app), which will allow SISBEC to purchase honey from producers through their GoMoney account. SISBEC will also be creating buying centres for producers who do not currently have access to local shops [to sell their produce]," confirms Gabriel Hiele, manager of the RDP agricultural section.

700

beehives have been distributed across four island regions

10-15 t

of honey per year will be produced across the islands by 2020-2022

The most spectacular progress has been made by the Gizo Women in Business Organisation, also supported by SISBEC, which brings together more than 300 producers from Gizo Island. One such member, Janet Beri, currently earns SI$42,800–48,150 (€4,700–€5,300) a year through the sale of her honey. "My husband and I are villagers who work on our little plot in order to survive," says Beri, who has 10 hives. "Now we are able to sell honey and make ends meet. We can easily cover the school fees at the start of each semester and send our other son, who left school a long time ago, on a business course in a professional training centre." ■

BAOBAB BIO-INNOVATION

Zimbabwe commercialises its indigenous crops

A specialised research organisation in Zimbabwe is identifying and developing locally available and underutilised plant species into marketable products.

Tonderayi Mukeredzi

Over 4,000 small-scale farmers living in arid areas of Zimbabwe are earning incomes from selling various underutilised indigenous plants. Through the harvesting, processing and packing of 15 edible and non-edible plant species, local farmers – mostly women – are finding employment opportunities with non-profit research hub, Bio-Innovation Zimbabwe (BIZ). The organisation buys the wild-harvested crops from the farmers to process into various food and cosmetic products, such as conserves and moisturising oils, for sale at local and international markets.

Zimbabwe has many adaptable and drought-resistant plant species that require minimal or no agri-inputs at all and have significant commercial potential. Baobab, for instance, is a hardy tree that grows in very dry areas of the country and is used in BIZ's flagship products, such as baobab powder, marmalade and hair oil. Although, traditionally, baobab fruits have been eaten, the tree was never previously considered a cash crop by local farmers, but is now contributing to livelihood security. "In 2012, 1 year after I started harvesting baobab, I managed to buy a water pump, which I use in my garden to water maize, beans and other vegetables to sell to the community. The market gardening earns me an extra income of RTGS$300 (€50) per month," says Marcia Matsika from Manicaland province.

"At the moment, we are processing between 12 and 15 different species. We started with 40 plants which we whittled down so that farmers can harvest and sell on a predictable and regular basis, but not necessarily cultivate them, as most are available as wild plants," says Gus Le Breton, BIZ CEO. "Through our separate company, B'Ayoba, we have trained, contracted and organically certified 4,500 baobab producers... and, if you consider that an average household in Zimbabwe is five people, that is 20,000 people, and this is just one plant," he adds. Other indigenous plants processed at BIZ include, Bambara nut, marula tree, mongongo nut or *mankelli* tree, the resurrection plant, rosella, sausage tree or *kigelia*, the wild melon tree and ximenia.

The harvesters earn around €90 each season from the sale of the baobab fruit, according to Le Breton: "It is not a lot of money, but it is still the biggest source of cash in poor arid areas, where there are not many economic opportunities. Out of the 4,000 harvesters, 150 that we directly employ to work at our processing centres earn between US$500 (€445) and US$1000 (€890) [per season], and that's good money," he says.

BIZ sells most of its products to American and European markets, with baobab powder selling for around €10 per kg and moisturising seed oils for around €25 per kg, but local sales have been slow because of a negative misconception of indigenous resources. "The biggest obstacle to developing this industry locally is the lack of market, but internationally the market is going to grow," says Le Breton. "We are growing local awareness based on the demand from the diaspora and export market." ■

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Indigenous and underutilised plant species in Zimbabwe, such as the baobab tree, are being harvested and processed into marketable food and cosmetic products

INCUBATION KITS

Congo-Brazzaville grows mushrooms year-round

In response to high national demand for mushrooms, an agribusiness company in the Congo has developed easy-to-use, affordable production kits.

Marien Nzikou-Massala

In the Republic of the Congo, it is now possible to grow and eat mushrooms all year round. Bio-Tech Congo, founded in 2015 by engineer Tsengué-Tsengué, produces and markets incubated growing kits capable of producing up to 3 kg of fresh oyster mushrooms in 3 months. Commonly known as *mayebo* in Lingala, much-loved oyster mushrooms were previously only available for a few months during the rainy season.

10,800
incubated growing kits were produced in 2018

3 kg
of mushrooms can be produced from one kit

Each kit is made up of lightweight mesh bags that contain compost made of wood shavings collected from local carpentry workshops. The shavings are then ground down and mixed with wheat bran and ground maize. The substrate sachets are pasteurised to destroy any micro-organisms that could prevent the mushrooms from growing. Finally, the sachets are sown with mushroom seeds produced at the company's small factory in Brazzaville. The incubated growing kits only require water and shade to avoid drying up, and it takes just 3-4 weeks for the first oyster mushrooms to germinate.

© MARIEN NZIKOU-MASSALA

Incubated mushroom growing kits made up of lightweight mesh bags are gaining traction in the Republic of the Congo

"It costs us less than 5,000 CFA francs (€7.60) to produce a kit," explains Tsengué-Tsengué, who sells the cultivated mushrooms to major supermarkets and grocery stores in the Congolese cities of Brazzaville, Makoua, Owando and Pointe-Noire. Private individuals can buy incubated growing kits from Bio-tech Congo for 9,000 CFA francs (€13.70); and the company employs five full-time staff to produce around 30 kits a day. A total of 10,800 kits were produced in 2018.

Demand is high confirms regular customer, Anna Dyemo, "I was surprised to find these mushrooms [out of season] at the Casino supermarket. My husband loves them, so I went to Bio-Tech Congo's head office to buy a kit to produce them myself." Dyemo explains that the next steps were very easy – she hung the kit in her outhouse, in the shade, so that the mushrooms and the substrate would not dry out in the sun and watered them two to three times a day. Dyemo says she soon had her first mushroom crop, which she ate with fish, meat or *moambé*, a sauce made from palm nut. She says purchasing a new kit just once every 3 months has saved money on buying mushrooms from the supermarket. Not only that, but the oyster mushroom is a very good source of vitamin B (particularly vitamins B1, B2, B3, B6 and B9).

The mushroom kits are also gaining traction in the Democratic Republic of the Congo, with the company exporting more than 500 kits every month to the capital, Kinshasa, on the other side of the Congo River. To help supply the city of 12 million inhabitants, a partnership has been signed between Bio-Tech Congo and Kinshasa's Institut supérieur de techniques appliquées (Higher Institute of Applied Techniques) in order to train students in mushroom production.

Tsengué-Tsengué is also planning to penetrate the market in neighbouring Gabon and, in March 2019, three students from the country began following a video conference course on mushroom growing, delivered by Tsengué-Tsengué at a cost of 300,000 CFA francs (€458). The goal is to make these much-loved mushrooms available to all consumers in West Africa. ■

ORGANIC MAPPING

A zonal approach stimulates Madagascar's organic sector

The development of zones dedicated to organic farming in Madagascar is increasing local adoption of the technique and generating higher incomes for small-scale farmers.

Mamy Andriatiana

Maps of Madgascar's organic farmland are being used to identify zones where the practice could be expanded and supported with technical advice and assistance, supplies of organic seeds, and help for local farmers in obtaining certification. Once a zone is identified as organic, this serves as a starting point for intensifying and developing organic farming practices. The approach was developed by the Syndicat malgache de l'agriculture biologique (Symabio, Madagascar's organic farming syndicate), and is being adopted by local agricultural processing companies, including Lecofruit, the Melville palm oil processing plant, Jacarandas (spices and essential oils) and Sahanala (ginger, vanilla, cashew nut, etc.).

Small-scale producers in Madagascar are increasingly converting to organic farming. For instance, while 36,000 ha were dedicated to the sustainable practice in 2011, this increased to 121,000 ha in 2018. Not only that, but exports of organic food products totalled €84 million in 2018, compared to €22 million in 2012. Organic farming is much more profitable for smallholders as production and distribution costs are lower, and sales prices are more attractive than conventional farming. "I don't need to buy inputs or expensive chemical fertilisers any more; compost is enough. And the price of an organic product is much higher than that of a conventional product," explains Tendry Botomazava, an organic sugar cane grower in the east of the country.

According to Gaëtan Etancelin, director of the Melville palm oil processing plant, which produces 1,000 t of organic oil a year, 85% of which is exported, "There is less risk for farmers in organic farming. They have a contract, which guarantees them an outlet and the sales price. Also, as their land is not chemically treated, the soil will not become depleted over the medium or long term. On the contrary, natural treatment enriches the soil."

However, one barrier to the development of organic farming in Madagascar is the exorbitant cost of certification: at least Ar 8 million (€2,000). Symabio is therefore trying to obtain certification on behalf of cooperatives. In addition, certain external factors complicate the adoption of organic farming practices. For example, the use of toxic products to combat the invasion of locusts in the south of the country is essential, even though this could contaminate millions of hectares of land.

Symabio, which was created in 2011 and is made up of 40 organic-certified members (companies, farming cooperatives, farmers' organisations, etc.), has defined the national regulatory framework for organic farming with the Ministry of Agriculture, and is working with the government to create a strategic national phytosanitary plan incorporating the requirements of organic farming. While Madagascar is already a world leader in the organic vanilla, prawn and palm oil sectors, adoption of new legislation should allow scaling of the practice beyond the country's 35,000 organic producers. ■

In Madagascar, the area of land dedicated to organic farming has more than trebled since 2011

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SMART CONTRACTS

Reducing risk in agricultural supply chains

As agri-tech innovators focus on protecting and tracking commodities, their services are helping to reduce risk associated with lending to farmers.

Helen Castell

Smallholder farmers in remote, rural areas face a multitude of challenges in terms of getting their food to market safely and efficiently, and achieving a fair price for it. Erratic and expensive energy supplies, insufficient storage facilities, poor roads and unsuitable transportation methods mean perishable goods often lose some, or all, of their value before they reach processors or other buyers. Difficulties in tracking and recording the location, quality, volume and price of produce makes it easy for unscrupulous middlemen to cheat producers. These hurdles trap many farmers in a subsistence loop, which prevents them from increasing their profits and scaling up, and reduces lenders' confidence that any loans will be repaid.

Even when commodities do reach buyers safely, the informal, cash-based nature of many trades means farmers often lack solid transaction records. Such records would not only help them to identify problems or opportunities to grow their business, but also demonstrate to lenders that they represent an acceptable risk.

In-transit chilling

In just 1.5 years, agri-tech company, Savanna Circuit, has helped to overcome a number of challenges for over 800 small-scale dairy producers spread across six dairy cooperatives in Kenya. Through the company's MaziwaPlus solar-powered 'chilling-in-transit' system and associated app, the producers now enjoy increased profits and are able to keep proper transaction records. As a result, a number of dairy producers have been approved for loans, which they have used to expand their business or buy inputs such as feed, says Savanna Circuit's co-founder, Emmastella Gakuo.

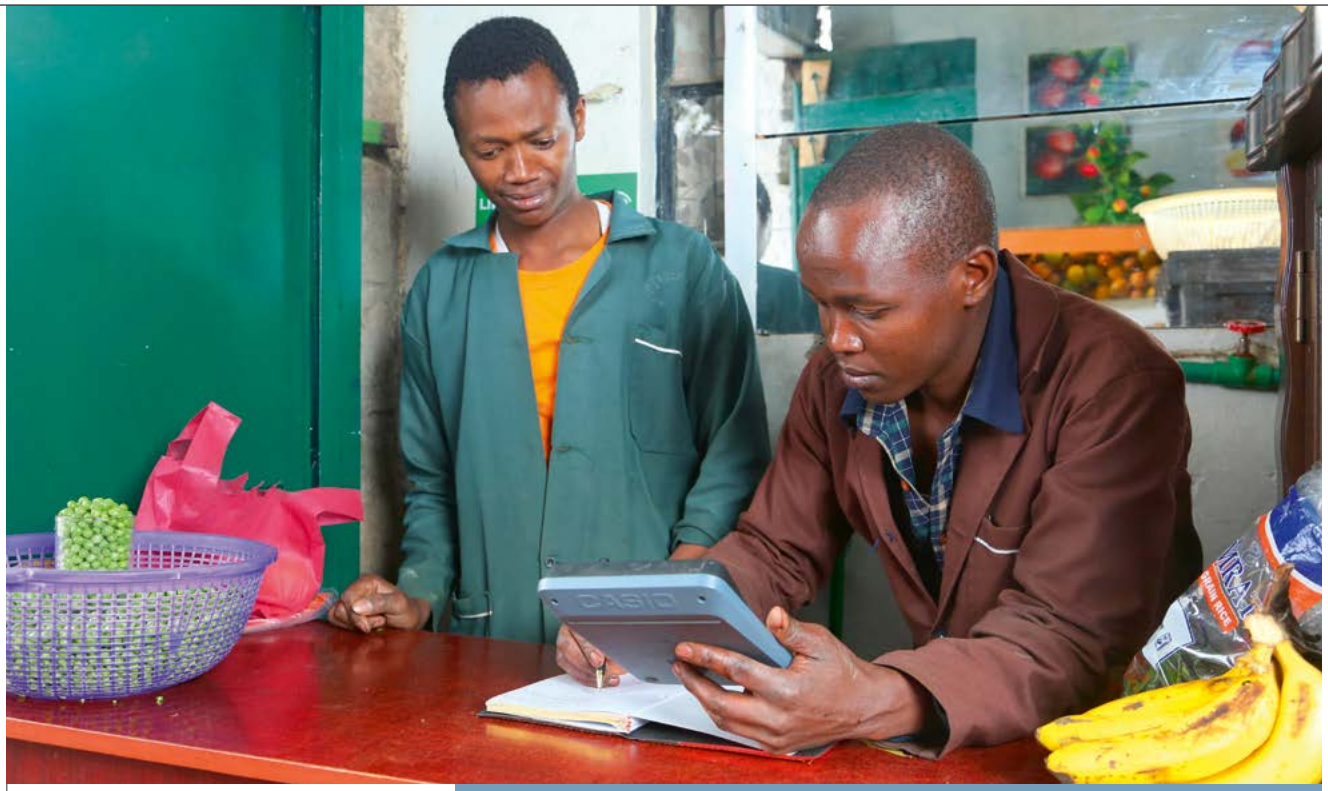
Under the MaziwaPlus system, milk is delivered from small producers to their local cooperatives by motorbike in specially designed aluminium tanks connected to solar panels. The tanks maintain the milk temperature at around 5˚C until it reaches the cooperatives' cooling plant, where it is chilled to 3˚C. The milk is also weighed and pH tested on collection, with this data fed automatically into the MaziwaPlus app. An electronic receipt is then sent to the producer's mobile phone with an agreed milk price from MaziwaPlus – minus a small commission that is shared between the producer and the cooperative – when the milk is sold on to processors. The e-system provides producers with daily income statements and production records, which lenders require for credit scoring and, in some cases, for collateral.

Savanna Circuit has also added a second milk collection in the evening, allowing some dairy producers to almost double their income. Along with reduced losses from spillage and spoilage, resulting from using the well-sealed, refrigerated tanks, this additional collection has helped farmers increase their average incomes from around €71 per month in October 2017 to €134 per month today. By receiving milk partially chilled by the MaziwaPlus tanks, cooperatives have also reduced power costs by up to 18%.

Savanna Circuit is now in the process of transitioning to using three-wheeler MaziwaPlus bikes to further reduce costs, and plans to apply MaziwaPlus technology to trucks with 10,000 l capacity within the next 3 years, says Gakuo.

B2B logistics

Launched in 2014, fast-growing business-to-business (B2B) logistics platform Twiga Foods is rapidly scaling up its work facilitating access to credit for farmers and food vendors in Kenya. The company currently connects more than 8,000 farmers in Kenya with food vendors by helping to manage everything from harvesting to centralised storage



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Blockchain technology is being used to accelerate loan applications for Kenyan food kiosk vendors

in state-of-the art cooling and ripening facilities, and eventual delivery to retailers. Acting as a wholesaler and a logistics provider, the company offers farmers a guaranteed market for their produce, as well as transparent pricing and farming advice, while ensuring that produce reaches buyers in perfect condition. All transactions are recorded electronically, which enables lending partners to build a picture of a farmer or vendor's creditworthiness.

Twiga Foods currently offers interest-free input loans to mid-size farmers and is looking to scale this service up by partnering with lenders, who would offer them low-interest commercial loans. The company is collaborating with the International Finance Corporation (IFC) and a commercial bank with a view to launching 18-month loans to cover some or all of the €45,000-62,000 cost of establishing mid-sized farms, which Twiga Foods would guarantee offtake from. The predictability of Twiga Food's daily demand, with the company willing to sign contracts to buy the farms' offtake at fixed prices for months and years ahead, means lenders can be confident they will be repaid, co-founder and executive director Grant Brooke says.

A creditable business

Andrew Mwok, a dairy farmer in Kaptabuk, West Pokot County, credits MaziwaPlus transaction records for enabling him to obtain credit for the first time. He took a KSh 100,000 (€887) facility – now repaid – from his local cooperative in March 2018, and used the funds to purchase four dairy cows, doubling his herd size to eight. This was followed by a KSh 320,000 (€2,837) loan, which he received through a state-subsidised scheme in November 2018, paying interest rates of around 10%. Mwok used this second loan to set up a dairy unit, including the purchase of equipment and feed. He hopes, by mid-2019, to borrow a larger amount from a commercial bank to cover dairy operations and expand his production further.

Mwok, who used to engage in dairy production as a subsistence activity with his mother, says that, since using MaziwaPlus, their daily milk deliveries have increased from 50 l to 170 l, and they now run the farm as a business.

On the vendor side, Twiga Foods partnered with IBM Research in 2018 to offer blockchain-based working capital loans to 220 food kiosk owners in Kenya, under an 8-week pilot. IBM used machine-learning algorithms to analyse purchase records from vendors' mobile devices and create a de facto credit score. Then, blockchain technology was used to safely accelerate the loan application and disbursement process. Twiga Foods says that recipients of the 4-8 day loans – which were typically for around €25-30 at an interest rate of 1-2%, and were used to buy stock – were able to increase their order sizes for produce by 30% and their profits by 6%, on average. The company aims to roll the pilot out further and is also on the brink of launching a 48-hour interest-free working capital product for vendors with another lender. In November 2018, Twiga Foods raised almost €9 million from investors led by IFC and now plans to expand across Eastern Africa.

As new technologies like those employed by Twiga Foods and MaziwaPlus support the creation and analysis of more data about farmers' business transactions – while helping to access markets for their produce and reducing the risks it is exposed to – smallholders' access to agri-finance will continue to increase. ■

FAIRTRADE COFFEE AND COCOA

A sweet deal for women farmers?

Established and start-up companies worldwide are adopting Fairtrade – or similar trading models – to deliver higher social standards and incomes for producers. But are women farmers benefiting?

Sophie Reeve

Following the global crash in cocoa prices, which dropped by a third during 2016/17, a typical farmer in West Africa receives just 6% of the value of final cocoa products and, according to the Fairtrade Foundation, lives on around €0.85 a day. The situation is even worse for women farmers, who carry out the lion's share of the labour, but rarely own the land they farm, have fewer rights than men, and therefore receive even less of the profits.

The thriving coffee value chain is no better. A handful of European and US transnational food giants, for instance, capture 40% of the value from each cup, whilst 25 million coffee farming families receive just 12% between them. So, what is being done to provide cocoa and coffee producers with an improved living wage? And how are the rights of women farmers being addressed?

Investing in cocoa cooperatives

Leading international Fairtrade company, Divine Chocolate, is 44% owned by the Kuapa Kokoo cocoa farmers' cooperative in Ghana. Of the 85,0000 Kuapa Kokoo members, more than a third are women. Divine invests 2% of its turnover into microfinance schemes to build capacity of women farmers in, for example, literacy and numeracy skills. As a result, women are better able to sign work contracts, negotiate prices and record transactions. "It is particularly important to me that women members see the benefit of organising themselves and receive training in skills, as well as cocoa farming, so they can earn more income, and save and use it sensibly," says Fatima Ali, Kuapa Kokoo president.

In September 2018, Divine launched a new range of high-quality dark chocolate bars across Scandinavia, using cocoa beans from São Tomé. The company is working with the CECAQ-11 cooperative on the island, which has 1,135 farmer members – 393 of whom are women – who receive the Fairtrade premium of €176 above the market price per tonne. The new deal will "...help revitalise the cocoa industry by providing long-term relationships and access to market for cocoa farmers," says CECAQ-11 co-op director, Adalberto Luis. The premium has already been used by CECAQ-11 farmers to set up a primary school, and to improve the local electricity supply and road infrastructure.

In Côte d'Ivoire, CAYAT – another Fairtrade-certified cocoa cooperative – is producing over 8,000 t of cocoa each year and selling to some of the biggest Fairtrade chocolate brands like KitKat. Under the leadership of female farmer, Awa Bamba, and using the Fairtrade premium, many women have been able to establish separate agribusinesses in fruit or vegetable farming to generate additional income. Bamba has also initiated diversification into poultry and egg production, through which women members are earning an additional

© JEROEN VAN LOON

Through Fairtrade business models, women coffee farmers across Africa are being linked with ethical markets and sustainable incomes

© NEIL PALMER/CIAT

According to the Fairtrade Foundation, a typical cocoa farmer in West Africa lives on just €0.85 a day

25,000 CFA francs (around €38), on average, per month. This helps to address the problem of cocoa price volatility and provides income in between cocoa harvests.

Specialty coffee

To ensure sustainable livelihoods for the coffee-growing communities of Kenya and Tanzania, Vava Angwenyi founded Vava Coffee in Nairobi, Kenya in 2009. Since its inception, the company has achieved global recognition for its premium coffees, as well as for its social impact.

The 30,000 smallholders that provide the coffee beans to Vava are paid an above-market price for the specialty coffee, increasing their revenues from €222 to €338 each year. And, by directly linking smallholders to markets that are keen on ethically-sourced, traceable coffees, this model provides farmers with sustainable livelihoods. Vava Coffee exports to buyers in Europe and the US, but has recently developed a direct-to-consumer arm to the business, enabling the sale of smaller amounts of coffee. In 2018, Angwenyi launched the company's first line of Fairtrade-certified coffee, owned by smallholder farmers from two women-centric cooperatives in the Rift Valley.

A handful of European and US transnational food giants capture 40% of the value from each cup of coffee, whilst 25 million coffee farming families receive just 12% between them.

In Uganda's Mpigi district, women coffee farmers are also achieving fair prices for their coffee beans. Elizabeth Nalugemwa founded her social enterprise, Kyaffe Farmers Coffee, in 2017 to help local women access new markets in the country. "We purchase our coffee at Fairtrade prices from 50 cooperatives consisting of 1,500 farmers in two growing regions in our country," Nalugemwa explains. The company trains women to grow 100% high quality organic coffee that they process themselves into a finished branded product and sell directly to the final consumer through local trade fairs, events and markets. Meeting with buyers directly means farmers are able to increase their profit margins and avoid the involvement of middlemen and traders.

The women farmers who supply Kyaffe are provided with training in fertiliser use and pest control methods to increase their production. According to Angwenyi, who also aims to empower women farmers, further education and agricultural training is essential so that smallholders can effectively utilise their resources and ensure improved, sustainable incomes in the long term. ■

OLAWALE ROTIMI OPEYEMI

Redoubling efforts to address food insecurity

Olawale Rotimi Opeyemi is the founder and CEO of JR Farms, an agribusiness working to transform Africa's agriculture by providing more jobs in the sector, and creating value addition for the continent's staple crops.

Emmanuel Maduka

A recognised young leader in Africa's agricultural sector, Olawale Rotimi has founded and co-founded numerous impactful initiatives and partnerships in his home country of Nigeria, and across the continent, with the goal of ending hunger and creating wealth in Africa. Here, he describes some of these initiatives, and speaks on the importance of business leaders stepping up to meet the Sustainable Development Goals (SDGs).

Technology is rapidly changing the nature of work across the globe. What are the key opportunities presented by agricultural digitalisation for youth in Africa?

In the agriculture sector, there is a lot that technology can do. Young people are able to tap into social media, for instance, to market their products worldwide. Other platforms, such as USSD-enabled facilities, allow functionality beyond smartphones for young rural farmers to connect with buyers.

Young people can therefore use digitalisation as an opportunity to solve critical challenges within the agricultural sector.

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Olawale Rotimi Opeyemi explains the innovative role that young people can play in agriculture and agribusiness

The use of drones, for example, makes application of fertilisers and pesticides much quicker and less expensive. I think youths in Africa should intensify their innovative power to create more tech-driven solutions to respond to challenges in the sector.

You have been collaborating with the International Labour Organization (ILO) to promote youth employment in Africa. How does JR Farms support young people to find quality work in agriculture?

ILO is doing a lot of work to create decent jobs for young people. The Rural

© EMMANUEL MADUKA

JR Farms processes coffee produced by over 4,000 Rwandan farmers to sell in international markets

Development Academy in Egypt, for instance, was established by ILO to gather together stakeholders, ministers and the private sector from across the continent, and train them on how to create jobs in rural areas. We are happy to work with ILO on initiatives like these.

"As business leaders, we are able to gather people together to lobby government and influence policy to help access food at affordable rates."

We are also collaborating with the Lagos State Employment Trust Fund in the area of capacity building and job creation. Through this partnership, which has resulted in agriculture being added to the State government's area of focus for youth empowerment, JR Farms provides young people with an interest in agribusiness with training on agricultural production, and work opportunities at the company or affiliate organisations.

In Rwanda you are working with the government to improve the livelihoods of coffee farmers. How has this public-private partnership helped to maximise the impact of your work?

The Rwandan government has provided us with a platform to work with over 4,000 coffee farmers, and to roast, package and export our product from Rwanda to Côte d'Ivoire, Egypt, Japan, Nigeria and the US, among other markets. We are the first African business to have this kind of partnership with the Rwandan government and it is one of the business's major breakthroughs, helping us to impact on farmers' livelihoods through the promotion of African products. The partnership has added credibility to what we do, demonstrating our dedication to Africa's development through agribusinesses.

Last year, the UN released the* Sustainable Development Goals Report 2018. *What actions has JR Farms taken to achieve the SDGs and promote sustainable food systems?

Over the years, we have been committed to the SDGs relating to food security, zero hunger and creating decent work opportunities for young people across the continent. One of our initiatives that demonstrates our contribution is the Inmates Farming Scheme with Nigeria Prisons, where we train prisoners in farming practices. This is a first – which I know of – for Nigerian prisons, whereby inmates are able to learn new skills and access healthy meals from what they produce.

In addition, we produce a minimum of 35 t of cassava for the local market each month, which is helping to solve the food crisis on the continent. Across the cassava value chain, we empower farmers by buying their produce at very good rates, while employing young people to process the crop into garri. We have a similar initiative with coffee in Rwanda, and with cocoa in Côte d'Ivoire; hence, we are helping to solve problems, such as market access, post-harvest losses and poor living standards for farmers.

Why is it important that business leaders like yourself step up to address global challenges like climate change and food insecurity?

I started seeing the reality of climate change in 2018 when the rains stopped really early in Nigeria. The rains that came were unpredictable and insufficient to support crop growth. Food is life, so it is important that we step up to solve food insecurity, particularly in Africa where so many live off less than a dollar per day, and cannot afford to lose their harvests.

Food business leaders should help develop more food security initiatives and raise the required funding to bring projects to fruition. As business leaders, we are able to gather people together to lobby governments and influence policy to help access food at affordable rates, and promote greater climate change mitigation on the continent. ■

LEONARD MIZZI

"We need to put food systems high on the political agenda"

Leonard Mizzi, head of unit at the European Commission, Directorate-General for International Cooperation and Development, highlights the critical need for collaboration in order to address the challenges raised by the latest *Global Report on Food Crises*.

Susanna Cartmell-Thorp

© FAO

Leonard Mizzi discusses the drivers of global food crises and the action required to address them

Over the past 3 years, the* Global Report on Food Crises *has consistently shown that more than 100 million people are suffering from acute hunger. Why do so many people still lack food on such a large scale?

From media coverage each day, it is clear that food crises are not a novelty. Unfortunately, it still happens, and it happens due to a multitude of reasons. What is unprecedented is the complexity of the multiple drivers of fragility contributing to food crises; climate change is the major cause, but changing demographics, conflict, poverty, inequality, migration pressures, and rural-urban pressure points also play a role. Food crisis is just the tip of the iceberg and is the extreme manifestation of the vulnerability of populations due to complex and varying crises.

Many of these factors are not likely to get better in the short term. How will this report be of value to decision-makers in designing and implementing better strategies to overcome these challenges?

This report is global, evidence- and consensus-based. We want to convey that prevention and response to food crises must be based on timely, reliable, complete and locally-owned information. The ambition now is to work and coordinate better together at global, regional, country and local level to tackle the root causes of food crisis through the Global Network against Food Crises (GNFC). The network has three dimensions: firstly data, information, and evidence-based analysis; secondly, strategic investments and programming for food and nutrition security, along the so-called humanitarian/development nexus; and thirdly, going beyond the food dimension of crises by having a fully integrated approach, thus including responses to other drivers of fragility, such as the peace and security dimension.

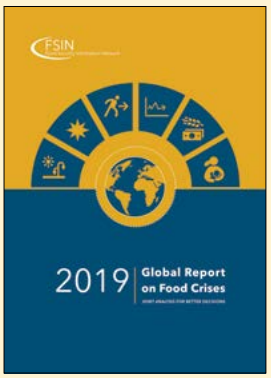
So what more would you like to see happening in terms of action? Are you hopeful that better coordination will happen?

We are hopeful because the world cannot continue with the business-as-usual approach. We should not have a systemic problem every time there is a disaster, especially when an extreme climate event hits, and this will happen more and more in the future, with catastrophic impacts that, if not addressed, will be even more problematic in years to come. The recent example, with the anomaly of two simultaneous cyclones – Idai and Kenneth – in Mozambique is a case in point.

I think what we are seeing is rallied action of the key players from all angles of the nexus – from the humanitarian side, the development side and the

Food security

Analysing global hunger



The 2019 *Global Report on Food Crises: Joint Analysis for Better Decisions* is a product of the GNFC. It is the result of a collaborative effort involving 15 leading global and regional institutions – including the EU, FAO and WFP – to share data, analyses, knowledge and expertise regarding people facing food crises. The report aims to provide evidence-based and consensual information on acute food insecurity to better inform decision-making by policymakers, and humanitarian and development organisations. Food crises are the extreme manifestation of complex crises often caused by interlinked drivers of vulnerability. The report identifies three lead causes of food insecurity: conflict and insecurity, attributed to 74 million cases of acute hunger; climate and natural disasters, attributed to 29 million; and economic shocks, attributed to 10.2 million.

The number of people who need assistance to meet their daily food needs has been rising in recent years and, although humanitarian spending has significantly increased, from €16.4 billion in 2013 to €24.3 billion in 2017, the report points out that, too often, these resources are spent on tackling the effects of food insecurity, and not on addressing the underlying causes early enough. Nevertheless, according to the authors, humanitarian and development actors are now improving coordination mechanisms, including actors active in conflict prevention where appropriate in order to move away "from delivering aid to ending need." This 'new way of working' is a response to a call for more innovative approaches to sustainably address food crises from the Agenda for Humanity at the World Humanitarian Summit in 2016.

Global Report on Food Crises: Joint Analysis for Better Decisions
By the Food Security Information Network
FSIN, 2019; 202 pp.
Downloadable as a PDF file from: https://tinyurl.com/y3fseqtu

peace side. The action should involve processes that are locally-owned and state-driven, but also guarantee better coordination among the donor community, whereby GNFC can play a key role. All this requires a new way of thinking, and I think the momentum is there because there is important steer from us, as the EU, with our member states. We hosted the Global Event 'Food and agriculture in times of crises' on 2-3 April 2019 in Brussels. We tried to bring together individuals and organisations involved and interested in the GNFC to actually say, "Look, this is what we achieved today and these are the gaps, let us work together so that we address these gaps and make food crises history."

You mentioned the disaster situation in Mozambique. Do you see the future as bleak or do you see glimmers of hope?

It is clear that the impact of natural and man-made climate shocks will vary by geographic location, but risk will be especially high across vulnerable areas, particularly certain parts of sub-Saharan Africa. The evidence shows that food systems are increasingly under stress and that large segments of populations remain highly vulnerable. So, new and innovative initiatives – such as the GNFC – that foster better coordination and efficiency are essential. You cannot tackle food crises with just a 'silo' approach; a food systems approach must also be territorially based to examine the interlinked drivers of fragility and complex dynamics, such as south-south migration, south-north migration, rural-urban tensions and tensions around land-tenure issues and access to resources. If we do not try to systemically tackle these in a more holistic way, then we will still have future hotspots of food crises.

Do you see examples of where we are achieving this in terms of the food system?

Food crises are not a novelty and there are many examples of effective responses in the recent past. What is required is a more systemic approach in terms of forecasting, anticipation, prevention and building more resilient societies so that they can bounce back and recover quickly from any shock. Research can help to adapt food systems to climate change, take a more nutrition-based approach, target the most vulnerable, and look into land tenure systems, insurance schemes and forecasting. The challenge is a global one, but solutions need to be locally-owned and tailored to specific circumstances. Examples are plenty, including Ethiopia with its country-owned Productive Safety Net Programme, focusing on social protection of the vulnerable segments of the population.

Finally, if you had one key thing that you wanted to say to get people to sit up and listen, what would that be?

Several worrying trends point to the risk of unprecedented crises. However, solutions exist and should be pursued. The EU wants to be a leader of change, a leader of direction-giving and such a leader must place emphasis on the resources and efforts that need to be prioritised. We speak a lot about agriculture, food systems and nutrition, but we need to put food systems high on the political agenda. Agriculture and rural development are at the core of vast regions and have a key role to play to ensure the well-being and development of societies. We want to provide a human rights-based approach to policymaking by empowering women and young people through the creation of vibrant rural communities – that is why we are promoting private sector engagement in agriculture. It is only through a blend of public and private sector investment that we can create the right framework conditions for young people to construct prosperous livelihoods in rural areas. ■

PRESERVING FOOD CULTURE

Fixing food systems for environmental sustainability

Two reports and a new book highlight how food can be used to meet the UN's Sustainable Development Goals (SDGs).

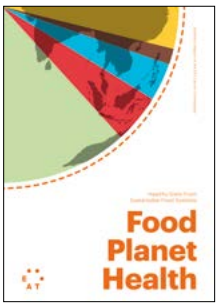
James Thorp

If the world were to get 5°C degrees warmer by 2100 – a scenario that is not far-fetched – there will be 50% less grain to feed a global population that may well be 50% bigger. To cope with such an outcome, the way we produce and consume food and our culture(s) surrounding that is going to have to change.

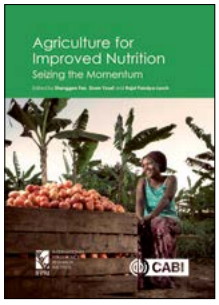
The EAT-Lancet Commission's 2019 report, *Healthy Diets from Sustainable Food Systems*, in its very first sentence of the summary, explains: "Food is the single strongest lever to optimize human health and environmental sustainability on Earth. However, food is currently threatening both people and planet." Using sophisticated infographics, including adaptions of the 'Planetary Boundaries' graphic (https://tinyurl.com/yxhw2wak), the report explains just how much a risk unhealthy diets are for the global population, as well as the degree to which the global food system threatens the environmental sustainability of the planet. The extent of the threat, the report states, is dire and requires a "radical transformation of the global food system", implying a required shift in, or a reimagining of, unstainable food culture. To achieve this, the report identifies two 'end-points' of the system – healthy diets and sustainable food production – that must be our targets, and proposes five strategies for the global community to meet them.

The importance, underappreciation and underdevelopment of nutrition is the basis of the International Food Policy Research Institute's new book: *Agriculture for Improved Nutrition: Seizing the Momentum*. The book's primary emphasis is that the recognition of agriculture's "vast potential to improve nutrition" is only just being acknowledged by scientists and policymakers. Looking at recent history, the book draws attention to the fact that significant levels of resources, time and effort were put into increasing food production in the 20th century, but the ability of nutrition to deliver world-impacting results on food and diets has frequently been overlooked. Agriculture, perhaps obviously, can play a key role in improving food system nutrition, with methods such as biofortification and changing (food) culture.

An examination of traditional cultural practices related to food as not only "a strong driver of cultural identity", but also ways by which the global population can "produce and consume food in harmony with their environment", is also the focus of FAO and the United Nations Educational, Scientific and Cultural Organization's report, *Chefs as Agents of Change*. The report argues that chefs "shape public opinion and influence the general population, the private sector and governments", and therefore they have an important role to play. The report also reveals that the influence of such actors in the field of food culture and nutrition will lead to improvements relevant to 13 of the 17 SDGs. ■



Food in the Anthropocene: The EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems – Summary Report
By W Willett *et al*.
EAT, 2019; 32 pp.
Downloadable as a PDF file:
http://tinyurl.com/ycpxjo6b

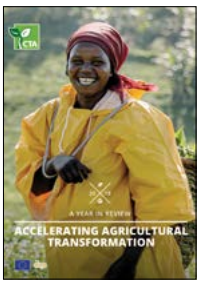


Agriculture for Improved Nutrition: Seizing the Momentum
Edited by S Fan, S Yosef & R Pandya-Lorch
IFPRI, 2019; 233 pp.
ISBN 978-17-8639-931-1
Downloadable as a PDF file:
http://tinyurl.com/y2dmqzwx

Chefs as Agents of Change
By FAO and the United Nations Educational, Scientific and Cultural Organization
FAO and UNESCO, 2019; 8 pp.
Downloadable as a PDF file:
http://tinyurl.com/y3abch2q

Driving development

Digitalisation: an important lever for agricultural transformation



In the 48 pages of its annual report, CTA demonstrates the extent to which its actions in support of digitalisation contribute to agricultural transformation in ACP countries. "It is becoming increasingly evident that a strong focus on digitalisation as a means to drive agricultural transformation is bearing dividends in the forms of increased production, better livelihoods, more efficient value chains and ultimately greater food and nutrition security," is the message from Michael Hailu, CTA Director. At the heart of CTA programmes lies the promotion of the enterprising spirit of youth and the creation of jobs in rural environments, which have benefitted from ICTs. Other opportunities arise as a result, including the use of digital apps and the promotion of climate-smart farming practices.

In addition, the data compiled in the report demonstrates that these actions are successfully reaching their target audience; entrepreneurs from 14 countries have benefitted from training in the use of drones and no less than 50 cooperatives from Cameroon and the Democratic Republic of the Congo have had their members trained in good governance. In Eastern and Southern Africa, CTA's Data4Ag project has had 86,298 registrations and in Ethiopia and Kenya, 10,827 farmers signed up for livestock insurance.

The annual Pitch AgriHack competition, organised by CTA since 2013, has also enabled more than 1 million farmers to benefit from the services of the participating start-ups. This year, female entrepreneurs were particularly successful: 14 of the 26 starts-ups that reached the final – and half of the companies that went on to receive awards – were managed by women. The annual report provides details of landmark projects, from job creation amongst West African rice growers, and empowerment of young workers (especially women) to transform Kenyan agriculture, to increasing yields and benefits in Uganda, or the revitalisation of island farming in Samoa. In the context of climate change, CTA has promoted the use of weather updates, livestock and crop insurance, as well as the use of more resistant seeds in order to improve smallholder resilience.

The lessons learnt from these different projects have enabled participants to reap long-term benefits. Improved post-harvest practices for maize in Rwanda, improved market access for fruit and vegetable growers in Zanzibar, and the promotion of soya production in Uganda are just a few of the projects that have benefited from workshops where experiences have been shared, and which cost little to organise. ■

CTA 2018, A Year in Review: Accelerating agricultural transformation
By C Pye-Smith
CTA, 2019; 48 pp.
ISBN: 978-92-9081-649-2

Downloadable as a PDF file: https://tinyurl.com/y3wqxhdm

Fair incomes

A living wage for West Africa's farmers

The Fairtrade Foundation's latest report, entitled *Craving Change in Chocolate: How to Secure a Living Income for Cocoa Farmers* sets out to explain three key points: the size of the cocoa and chocolate industry worldwide; the poor working conditions and poverty of West African cocoa farmers; and how to tackle these issues.

Globally, cocoa is traded in massive volumes and, in the UK, one of the largest consumers of chocolate, the industry is worth €4.6 billion. Despite the incredible size of the industry and its profitability, on average, only 6.6% of the value of 1 t of cocoa sold is received by the growers. In this report, the Fairtrade Foundation argues that a living income for producers is key to ensuring the future sustainability of cocoa, and calculates that, if paid €2.15 per day, a cocoa farmer in Côte d'Ivoire (€1.85 in Ghana) could live a decent life.

To help achieve this standard, the Foundation is increasing its minimum price – no other scheme has a mandatory minimum price – and its premium, both by 20%. But, recognising that it covers only a small proportion (6%) of the global cocoa industry, Fairtrade is calling on others to do follow suit.

This easily digestible short report with colourful photographs, and detailed infographics and graphs is directed at governments and chocolate businesses, but also, to chocolate lovers worldwide, to help bring the living income into effect. The third chapter, for instance, outlines an Agenda for Action, which sets out recommendations for all stakeholders, including the backing of other global initiatives, such as Belgium's Beyond Chocolate' initiative, to drive change. ■

Craving a Change in Chocolate: How to Secure a Living Income for Cocoa Farmers
By D Taylor & S Henty
Fairtrade Foundation, 2019; 28 pp.
Downloadable as a PDF file: https://tinyurl.com/y5pq4zw3

Do the benefits outweigh the risks of increased foreign investment in African agriculture?

VENKATARAMANI SRIVATHSAN

Doing business in Africa, for Africa

Venkataramani Srivathsan,
managing director for Africa and the Middle East, Olam International

Since Olam's 1989 inception in Nigeria – sourcing cashews – the agricultural landscape in Africa has evolved into an engine for economic growth, job creation, poverty reduction and food security. Prompted by the reality of the 2008 financial crash, the liberalisation of the agricultural sector by African governments has created new opportunities for private investment, boosting economic growth and, with it, opportunity for smallholder farmers.

Since then, huge strides have been made from this renewed focus on agriculture, with countries seeing productivity and exports rise. In Côte d'Ivoire, cocoa and cotton production has doubled, and cashew nut production tripled. Not every country, however, can tell the same success story. Currency and counterparty risk probably top the fear factors for potential investors but, generally, the 'failures' tend to come down to due diligence issues. These include inadequate market analysis and an assumption that business models can simply be transplanted across markets. Ghana, for example, is no more like Mozambique than Singapore is like Indonesia.

Any investment can incur considerable reputational and financial cost if it fails to undertake its own due diligence and be willing to commit to ongoing engagement with local stakeholders. A 2016 World Bank conference heard that 45% of land investments fail in Africa due to community conflicts. The investor has a responsibility, alongside the beneficiary country, to make their investments work; it is not enough to rely on government assurances. Companies need to substantiate their social licence to operate by applying their own risk assessment – such as Environmental & Social Impact Assessments – with a reputed third party.

Prioritising the right investments

Meanwhile, farmers continue to face poor infrastructure and inadequate access to credit and markets. In processing and distribution, the challenges essentially boil down to the problem of preserving product quality. In Nigeria, even though groundnuts are a key crop, the country is unable to export them; the lack of warehousing means the groundnuts are left too long in fields, leading to the growth of aflatoxins, which prime export markets do not accept due to health risks. Agribusinesses like Olam can invest in storage, but ports – being highly congested, generally inefficient and costly – are a different matter.

Addressing logistical issues would not only encourage trade, but help to reduce food waste. Some African governments are already making moves in the right direction, but more needs to be done before Africa becomes a serious player in the global productivity stakes. That said, this status should not belie the potential that the continent still holds for agricultural growth – if managed sustainably. With about half of the world's fertile, but as-yet-uncultivated land, it is estimated that agribusiness in Africa will grow to be a US$1 trillion (€880 billion) industry in Africa by 2030. Then there is Africa's demographic dividend, from having the fastest growing and most youthful population in the world (40% below 15 and 20% below 24), which if provided with adequate education and training, presents a huge opportunity in terms of labour force and consumer spending.

Focusing on people and infrastructure

For 3 decades, Olam has grown alongside Africa, investing US$2.8 billion (€2.47 billion) across 25 countries, and collaborating with NGOs and development finance institutions. From starting in Africa as an exporter of cash crops, the development of Olam's packaged foods, and rice and wheat milling operations for the domestic market, means we can truly say that we are doing business in Africa, for Africa.

Considering that African agriculture is essentially built on the activity of more than 35 million smallholders, any investment that does not catalyse their productivity will not be sustainable. So, placing a strong focus on supporting the 2.8 million smallholder farmers that supply Olam with crops, ranging from coffee and cotton, to cashews and rice, makes business sense. Our ability to continue supplying our customers depends on lifting these farmers out of poverty and ensuring they can produce sustainable volumes in the face of any market or climate-related risks.

Looking ahead, we see tremendous potential for economic development in Africa. For this reason, we will continue to prioritise the region as a globally competitive supply for our commodities, as well as maximise its strong underlying demand for growth through our domestic foods business. ■

EDWARD MABAYA AND REBECCA DADZIE

Establishing a win-win investment framework

Agriculture plays a key role in Africa's growth and economic development, employing about 60% of the workforce and accounting for a third of its GDP. Yet the continent remains the most food-insecure region in the world, with more than 232 million of its 1 billion people categorised as under-nourished. The continent also spends too much on food imports – US$35 billon (€28 billion) every year, and potentially US$110 billion (€98 billion) by 2025.

***Edward Mabaya**, manager of Agribusiness Development, African Development and **Rebecca Dadzie**, senior agribusiness officer, African Development Bank*

Filling the investment gap

Studies conducted by FAO show that additional investments in excess of US$80 billion (€71 billion) are required annually to meet targets for reducing poverty and the numbers of malnourished Africans. Despite the Comprehensive Africa Agriculture Development Programme goals and Malabo Declaration commitment to increase agricultural spending to 10% of public expenditure, most African countries still spend much less. Against this background, foreign direct investment (FDI) will play a complementary role.

Agricultural investments from domestic sources alone are simply inadequate to cover growing demand for food in Africa. FDI will therefore be important in supplementing domestic investment requirements, boosting productivity, and serving as a conduit for knowledge and technology transfer to African economies. Beyond this, FDI will provide the channels to integrate local businesses into national, regional and global value chains. Such investment provides room for agribusinesses to learn new business practices, management techniques and concepts that help them develop an ecosystem and access new markets.

The last 3 years has seen a surge of interest in international investment in African agriculture, particularly in land, agribusinesses, and water entitlements. The drivers of this growth include the increasing demand for food and feed in major importing countries; the need to secure adequate food supplies internationally; the growing demand for biofuel feed-stock; and concerns about vulnerability to the volatile global food markets.

Risks and mitigants

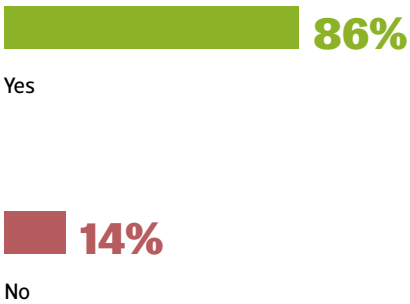
Increasingly, skeptics are raising concerns about the possible adverse impacts of some new forms of FDI. They point to one growing phenomena: the acquisition of large-scale land by foreign players. As a result, smallholders are displaced, grazing land for pastoralists is diminished or totally lost, rural families and communities suffer loss of income and livelihoods, and natural resources and biodiversity degenerates.

To mitigate these challenges, policymakers, development agencies and local communities need to maximise the benefits of foreign agricultural investment, while minimising the risks. This will, however, depend on several factors and variables, namely, transparency, good governance, appropriate linkages with smallholder farmers and agrarian communities, and the quality of institutions and institutional frameworks.

Investment projects that combine the strengths of the investor (capital, management and marketing expertise, and technology) with those of local farmers (labour, land, local knowledge) are likely to be most successful. It is also important to establish a win-win framework; the business model must leave farmers in control of their land, provide incentives for all parties to invest in land improvements and favour sustainable development. ■

Poll

Do the benefits outweigh the risks of increased foreign investment in African agriculture?'



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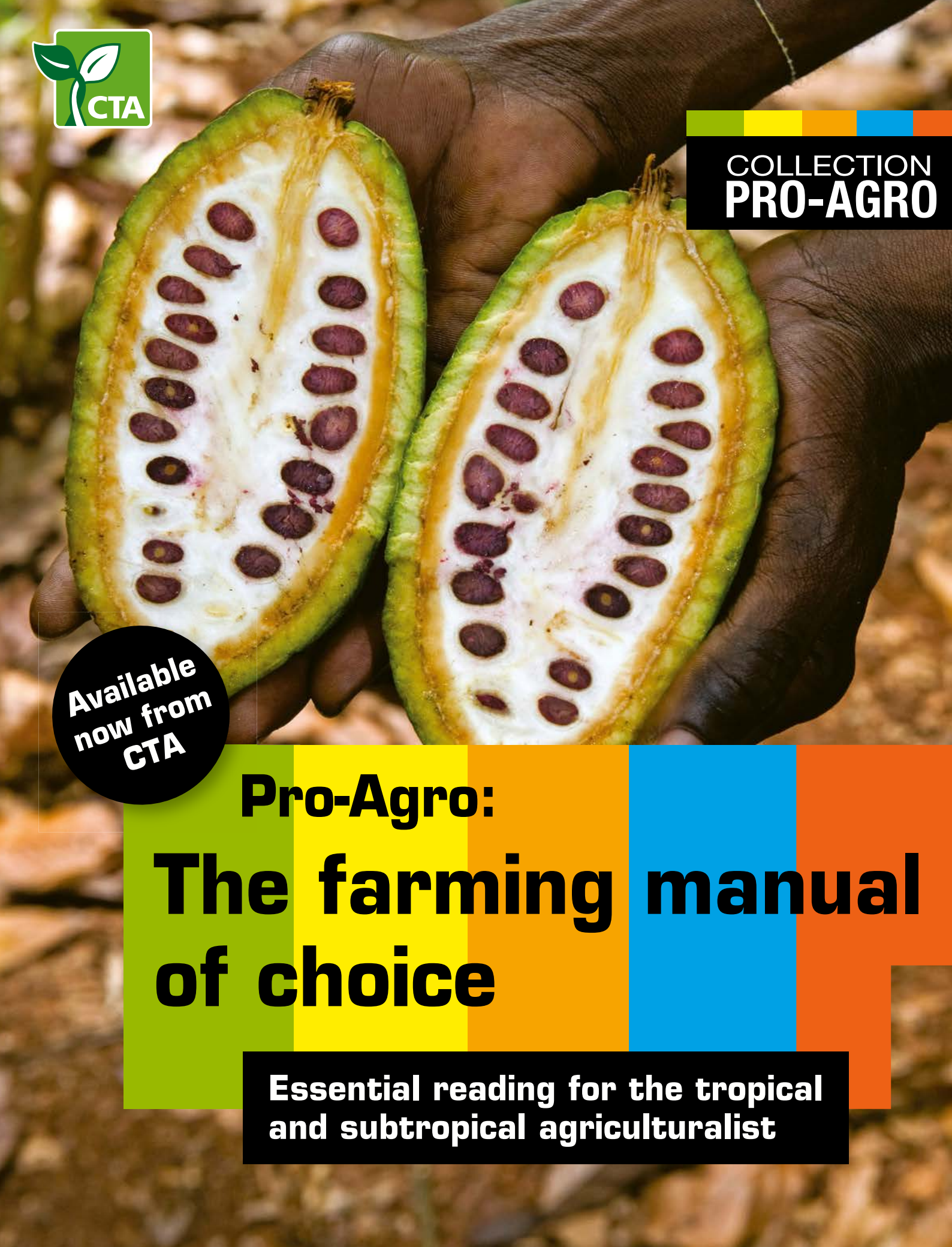

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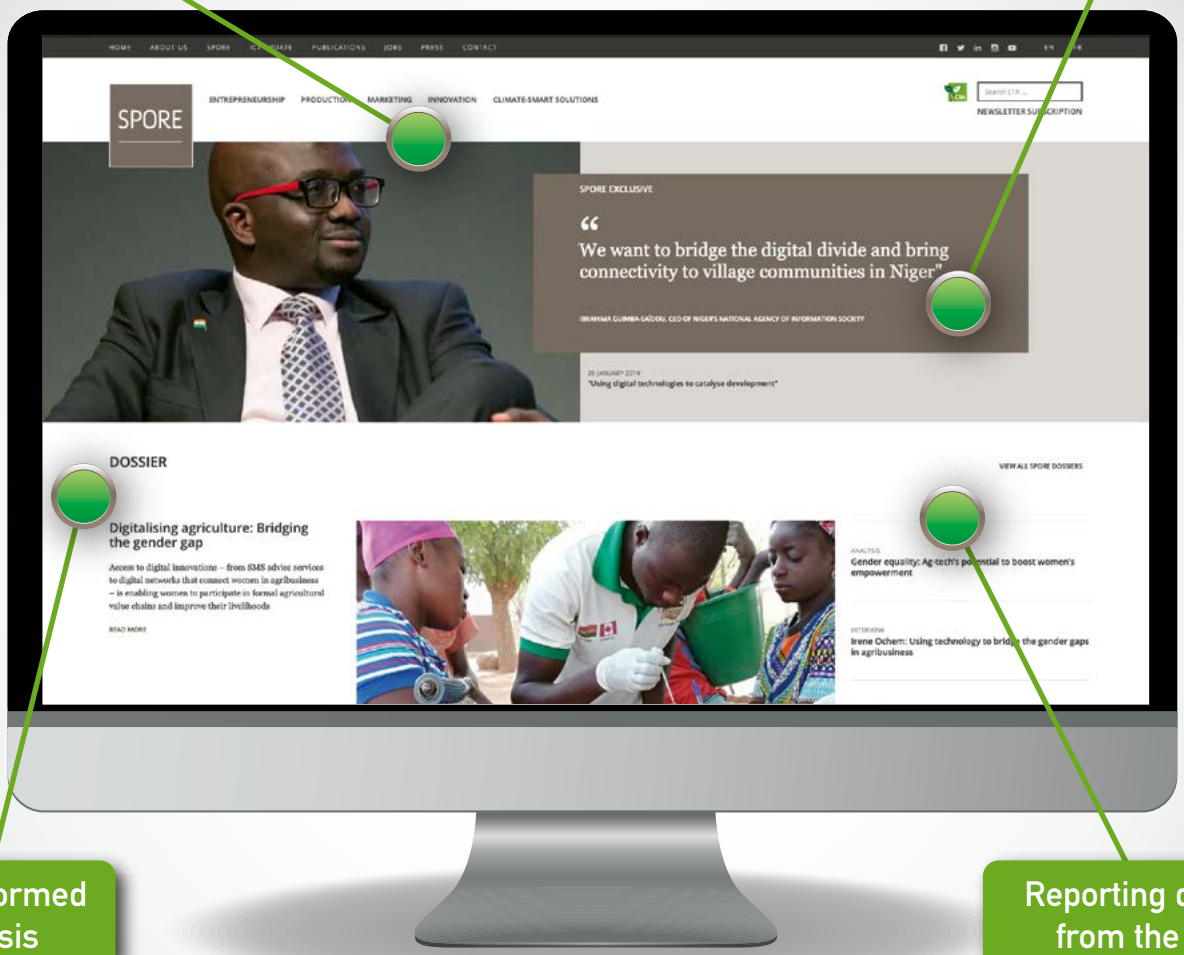

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