

SPORE

The magazine
for agricultural and
rural development
in ACP countries

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INTERVIEW

Roberto Ridolfi, director, sustainable growth and development, Directorate General for International Cooperation and Development, European Commission

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AGRICULTURAL TRAINING

**Fresh challenges
and new
approaches**

FOOD INDUSTRY

**Small producers,
big markets**

THE CONNECTED FARMER

**A new opportunity for
the agricultural system**



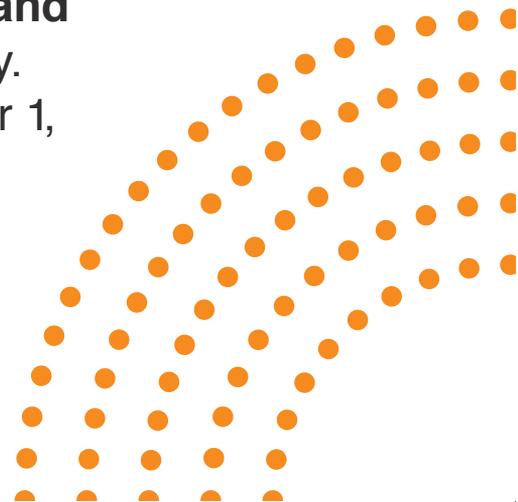


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Editorial

Falling food prices – no time for complacency

The FAO Food Price Index, which tracks international prices of a basket of five major commodities, fell by 16% between January 2015 and January 2016, extending its more-or-less continuous decline over the past five years.



The slump in crude oil prices – from over US\$120 per barrel in 2011 to less than US\$30 in early 2016 – is one of the main factors behind these falling food prices. Lower oil prices mean cheaper nitrogen fertiliser and lower fuel and transportation costs. Some experts predict that oil prices could stay low for another 10 years.

This may seem like good news. On the face of it, cheaper food is positive, at least for consumers, especially the poorer ones, who spend a large share of their income on food purchases. It will also benefit the many ACP countries that are net importers of staples such as rice and wheat.

But the long-term danger is that low food prices take pressure off governments to invest in agriculture. The 2007–2008 food price crises led to unprecedented attention being given to agriculture by governments and development agencies, and the emergence of the likes of the Sustaining CAADP Momentum exercise, the Malabo Declaration and the “L’Aquila” Joint Statement on Global Food Security, all of which called for increased investment in agricultural development.

Without the immediate driver of high or rising food prices, will governments continue to invest in agriculture? Will major bilateral and multilateral development agencies continue to make agriculture one of their priority sectors? Without this investment, where will the innovations come from to deliver the huge increases in food production that we need in the coming years?

CTA and its partners are committed to creating a future in which agriculture provides decent jobs and incomes for young people and women, produces nutritious and healthy foods and promotes inclusive growth and prosperity for millions of people. We hope the strong global commitment to sustainable agriculture we have witnessed since 2008 will not lose momentum due to declining food prices.

Michael Hailu
Director – CTA



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A new opportunity for the agricultural system

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AGRICULTURAL TRAINING

Fresh challenges and new approaches

Agricultural training is the key to agricultural and agro-industrial development. Ensuring quality education is the 4th Sustainable Development Goal (SDG) adopted by the UN in New York in September 2015 and is now a highly political issue.

Plenty has been done to build and implement effective agricultural training strategies in developing countries but the process is far from complete. ACP governments, universities, the private sector and partners are aware of the issues and new approaches are gaining momentum.

Agricultural training in review

A World Bank report published in 2014 was highly critical of the overall situation in Africa, primarily noting that the low level of human capital in the agricultural sector is a major impediment to growth, poverty reduction and food security throughout the continent. Yet the same report underlines that African leaders now regard agriculture as capable of driving overall economic development (with 32% of GDP and 65% of employment attributable to agriculture), and are thus pressing for a radically new approach to agricultural education, as the current system is disconnected from the labour market.

The university environment in Africa has improved markedly over the last 10 years according to Professor Didier Pillot at Montpellier SupAgro, a French agricultural institute. “Intellectual investment in universities has again become attractive for African states. Countries like Côte d’Ivoire, Ghana, Kenya, Senegal and Uganda have shown a genuine political determination to invest in youth training. Salary conditions of university staff are more favourable than in the past,” says Pillot. He regrets the ongoing dearth of links between universities and the private sector, but points out that current initiatives like agricultural incubation programmes are heading in the right direction, e.g. the UniBRAIN initiative led by the Forum for Agricultural Research in Africa (see Dossier in *Spore* 179).

Challenges facing agricultural education in the Pacific and Caribbean regions mirror the situation in Africa. But the good news is that agriculture is an integral part of the curriculum in many Pacific countries and sometimes even compulsory in secondary schools (12-17 years). There is, however, a gulf between trends in secondary schools and universities, and most

educational programmes would require a substantial revamp.

The participation of farmers’ organisations in drawing up training programmes is insufficient and there is a lack of communication between universities and research centres. The uncertainty of funding from national governments also seriously impedes knowledge-driven economic development.



Innovation and partnership – a springboard for change

An important indication of current developments is the institutional impact of transformation. Fresh political and institutional frameworks are emerging that embody new mindsets and values.

In 2014 at Malabo, in Equatorial Guinea, Heads of State and Government of the African Union (AU) adopted a strategy for science, technology and innovation for Africa, primarily with the aim of eradicating hunger and ensuring food security. The AU also signed a memorandum of understanding with RUFORUM (a network of 42 African universities) to promote capacity building in Eastern and Southern Africa. Since 2004, CTA has partnered with RUFORUM, a pioneer in the fields of trade and partnership. RUFORUM organised, in collaboration with the President of Malawi, Arthur Peter Mutharika, a side event at the 70th United Nations General Assembly in New York to discuss 'A strategy to strengthen higher education in Africa for implementation of the SDGs'.

Collaboration and networking are essential for innovation and links are clearly tightening between universities in ACP countries, and also between them and universities in OECD member countries and emerging countries. These partnerships have helped raise the level, accessibility and availability of higher education in Africa.

According to a World Bank report, African leaders are pressing for a radically new approach to agricultural education, as the current system is disconnected from the labour market



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Meanwhile, the New Partnership for Africa's Development (NEPAD) has adopted a strategy and roadmap to guide the Comprehensive Africa Agriculture Development Programme (CAADP) in implementing agricultural training and capacity building over the 2015-2025 period. Professor Hamidou Boly, NEPAD agricultural and training coordinator, presents it as a means to streamline approaches and increase the human capital necessary to meet the objectives of CAADP and of the Malabo (2014) and Addis Ababa (2015) declarations on African agricultural development.

In the Pacific region, the Pacific Insular Universities Research Network (PIURN) was formally launched on 10 July 2013 with the aim of strengthening academic collaboration between 11 South Pacific universities in research, training and exchange. PIURN is one of the initiatives listed as an SDG partner (<http://tinyurl.com/j8fxuhs>).

Promising initiatives

Strengthening Universities Capacities for Mitigating Climate Induced Vulnerabilities in East Africa, instigated by RUFORUM, is a partnership between Austrian, Kenyan and Ugandan universities, financed by the Austrian Development Cooperation. It aims to provide smallholders severely affected by climate change with access to inexpensive tailored technologies and innovations. The project fosters exchanges and mutual training between research students and rural communities. A novel feature is that students are encouraged to collaborate 'with' rather than conduct research 'on' farmers so as to jointly contribute to mitigating climate change in highly affected areas.

In the Caribbean, the International Fine Cocoa Innovation Centre (IFCIC) is currently being set up in Trinidad and Tobago with EU funding. IFCIC is the brainchild of Professor Pathmanathan Umaharan, Director of the Cocoa Research Centre. He says, "IFCIC is a multi-purpose facility with a chocolate factory and a business incubator with a teaching area." This exemplary 'bean-to-bar' model will integrate agriculture processing, research, training and marketing.

The Papua New Guinea University of Technology launched an initiative to assess the university's role in improving food and nutrition security in the Pacific region. The South Pacific Institute for Sustainable Agriculture and Rural Development was thus set up and is operated through a concept whereby 'model villages' are established in various agro-ecological zones in the country, with training being offered in various domains (cropping, processing and basic entrepreneurship).

Strengthening the involvement of agricultural education institutes in food and nutrition security policy processes is crucial. Wageningen University and CTA, in partnership with regional networks and 10 universities in ACP countries, have thus developed and launched the Auditing Instrument for Food Security in Higher Education in 2015 (<http://aifshe.cta.int/en>). This very targeted tool addresses two of the SDGs – zero hunger and quality education. ■

Anne Perrin

AGRICULTURAL PRODUCTION

SORGHUM

Improved supply chain in Cameroon

A public-private partnership between the Ministry of Agriculture and brewing company Diageo has increased the incomes of 10,000 smallholder farmers in Cameroon. Since 2011, growing demand from brewing companies has caused sorghum production to increase from 6 million t to over 9 million t, and prices to rise from €0.76 to €1.

COLLECTING DATA

Cape Verde's first agriculture census in decades

Cape Verde is undergoing its first agriculture census in decades. Census data will inform much-needed agricultural modernisation projects to reduce the country's heavy dependence on imports. As well as farming, the study will collect data on aquaculture, cattle rearing, forestry and water resources on the archipelago's nine inhabited islands.

COCOA

Boosting production in Côte d'Ivoire

International chocolate-maker Mondelez International's 'Cocoa Life' scheme has improved the cocoa value chain and is helping farmers receive higher yields and incomes in Côte d'Ivoire. The scheme has trained over 20,000 farmers in 170 communities since 2013 on disease prevention, weed control, pruning, harvest and postharvest practices, soil health, replanting and compost production.

FORGOTTEN MINES

Combating drought in Zimbabwe

An innovative farmers group in Gwanda, Zimbabwe is using water trapped in a disused mine to run flourishing agriculture enterprises in an otherwise drought-prone area. Farmer's incomes have increased from selling fresh cabbage, spinach, tomatoes and onions.



According to specialists the vaccination against Newcastle disease will impact many farmers in Mali

AVIVAC i2

Vaccination against Newcastle disease

In October 2015, a chick was inoculated with the first dose of AVIVAC i2 in Fana, a village in southern Mali. The AVIVAC i2 vaccine is revolutionary in preventing Newcastle disease, a huge problem faced by the Malian poultry sector.

Dr Boubacar Diallo, director of the Malian Central Veterinary Laboratory, is proud to have developed AVIVAC i2. His laboratory produces and markets this new vaccine that is "easy to apply and is efficient" in the fight against Newcastle disease. Currently, farmers in Mali can lose up to 80% of their poultry flocks (including chickens, guinea fowl, turkeys, ducks, pigeons, geese and quails) once infected.

The poultry sector is important for livelihoods in Mali with over 36 million birds: 80% of which are raised as backyard poultry. Specialists believe that this new

vaccine will impact many poultry farmers, notably those engaged in traditional raising.

Unlike previous temperature-sensitive vaccines, there is no need to keep AVIVAC i2 cold as it is thermostable (not deactivated by heat). Because of this, rural farmers can store the vaccine at home. Previously, heat was the main problem faced by vaccinators and the reason for high levels of vaccination failure. Vaccine transport was also unreliable, due to difficulty reaching rural farms, which destroyed any chance of success in poultry vaccination campaigns.

AVIVAC i2 is also easy to use. The vaccine can be added to poultry drinking water or be applied directly into bird's nostrils or eyes. Farmers therefore do not require veterinary assistance to inject the birds and animal stress is also reduced.

To date, the vaccination has a 100% success rate because even if poultry escape inoculation, birds still benefit once they re-join vaccinated poultry thanks to the spread of the vaccine strain. According to the Malian laboratory, the new vaccine will be marketed in Angola, Benin, Burkina Faso and Togo, as well as in other regions if requested. ■

Soumaïla Diarra

CONGO-BRAZZAVILLE

Mucuna's benefits

In Djambala, 450 km north of Brazzaville in the Plateaux Department, farmers are experimenting with cultivating mucuna to fertilise soil and avoid long fallow periods, developing year-round agriculture.

Mucuna (also known as velvet beans) is well-adapted to the weather conditions in the Congo and can grow with an annual rainfall of 300 mm over 4-6 months. Mucuna quickly produces biomass and is a major source of nitrogen for the soil. The plant leaves, stems and pods are covered in coarse hairs, and can reach over 15 m in length when mature. Burying fallen mucuna leaves produces a rich manure with high fertilising qualities.

Growing this cover crop is an agro-ecological practice that helps Congolese farmers to address many problems such as poor access to inputs, soil erosion and vulnerability to climate change. Its large quantity of biomass smothers weeds so farmers do not have to spend time weeding. Mucuna also improves soil by fixing up to 170 kg of nitrogen per ha and producing

up to 200 kg of nitrogen from its residues. Moreover the biomass produced effectively controls wind and water erosion.

"Last November, we harvested three 50 kg bags of mucuna seeds and we are intending to distribute them among women and groups for multiplication. By doing so, each village where we notice a soil impoverishment should have a remedy," says Dzaba Ivanovo Brucelov, head of the agricultural sector in Djambala. In this region of the Republic of Congo, the agriculture department has been testing the cultivation of mucuna as soil fertiliser for more than 3 years.

The sowing season of mucuna starts from the first rains and lasts until March. The plant has a 3 month life cycle (harvest can begin in May or June). It can be intercropped with maize and many other cereal crops, but it is advised to let the main crop grow for one month before planting mucuna to prevent competition. "The advantage of this plant is that where you grow it, there are no weeds," observes Joëlle Martine Gabio, a potato producer from Abala-Ndolo, about 12 km from Djambala.

Beside the Plateaux Department, mucuna is also being experimented with in two other regions, Cuvette-Centrale and Cuvette-Ouest. ■

Marien Nzikou-Massala



Mucuna grows with an annual rainfall of 300 mm over 4-6 months and adapts well to Congo's weather conditions

SOIL CONSERVATION

Restoring Haiti's hillsides

Development organisation, Plant with Purpose, has worked with 714 family farms in 105 communities to construct 200 km of soil conservation barriers in Haiti, preventing loss of nutrient rich top soil. Farmers have also planted fodder crops, sugarcane, elephant grass, legumes, maize, eucalyptus and oaks to fix nutrients like nitrogen. Since 1997, farmers have planted 2.4 million trees for household use, fruits, and timber for sale.

BIO-FUEL

Cooking gas by the rucksack

Portable biogas - a clean, cheap alternative to cooking on wood fires - is being provided by start-up company, B Energy. Gas produced from waste is transferred into 2m-long balloons holding 1.2 m³ of gas, enough for 5 hours of cooking. With two franchises in Ethiopia and Sudan, plans are to extend across Africa; bags are sold for about €0.44 each.

CLIMATE CHALLENGES

Africa's new food security institution

To deal with climate change challenges, agricultural experts and policymakers have formed the African Ecosystem Based Adaptation for Food Security Assembly to promote sustainable food systems in sub-Saharan Africa.

GENETIC DIVERSITY

Protecting food security

In 2015, Papua New Guinea and Tonga signed the International Treaty on Plant Genetic Resources for Food and Agriculture. Through this, they will have access to a gene bank containing over 1.6 million varieties of plants, including the most important food crops worldwide.

COLLECTIVE GAINS

Boosting incomes in Mozambique

Over 10,000 Mozambican smallholder farmers in 11 associations and 232 clubs have tripled their incomes because of better prices obtained through a collective marketing system. Farmer, Macelino Malissane, earned €267 in the 2015 season from selling 20 bags of pigeon peas, three times higher than the previous season.

AGRIBUSINESS

Special economic zones

Twenty-four 'development hubs' have been identified as special economic zones across Mozambique, chosen for climatic/growing conditions, strategic location to markets and infrastructure. Soybean, wheat, beans, maize, rice, poultry and cattle producers will receive tax exemptions to promote investment and increase production.

PONDS

Increasing fish yields with greenhouses

Using ponds with greenhouses, Kenyan farmer Onesmus Githui has grown his fish-rearing business from 200 to over 35,000 fish in 5 years. Increased greenhouse temperatures lead to quicker fish maturity and Githui harvests mature fish twice a month, selling them at KSh300 (€2.50) each.

ORGANIC BANANAS

Haiti exports to Europe

100 t of Haitian organic bananas from Haiti have been exported to Germany as a result of a project by the company Agritrans, supported by the Haitian government. The initiative plans to plant 2 million banana seedlings across 1,000 ha of land and, by 2017, it is hoped that 45,000 t will be exported to Europe each week.

ARLA DAIRY

Setting up in West Africa

The fifth largest dairy in the world is setting up in Nigeria and Senegal. Arla Foods, a Danish company, intends to increase its revenue in the region fivefold by 2020. What impact will this have on local producers and consumers?

The Danish dairy cooperative, which includes 12,700 European farmers among its members, is set to take over the West African dairy market. In Nigeria, where it already has a presence, Arla Foods plans to triple its turnover. To achieve this, Arla Dairy Products has been created which, since September 2015, has been responsible for packaging, marketing and distributing Arla products under the Dano brand within the country. In Senegal, where it does not yet have a presence, the company has created a subsidiary for which it holds 75% of the capital. Arla Sénégal SA will have the same roles in Senegal as its counterpart in Nigeria. The Senegalese milk market already contains several large companies, such as the French companies Lactalis and Danone, which have partnered with a local company, *Laiterie du Berger*

(see article in *Spore* 162). 'West Africa faces a milk deficit, which gives Arla an opportunity to provide milk powder and other dairy products that meet consumers' needs. We are here to build a long-term business, and that requires strong local partners,' says Steen Hadsbjerg, head of sub-Saharan Africa at Arla Foods.

However, in Senegal, the 'local partners' are not milk producers. Arla argues that the low quantity and quality of local milk means that supplies should come exclusively from imported goods. However Arla also highlights possible negative impacts of mass imports on the local markets, with consumers switching to powdered milk exclusively and dairy farmers being unable to sell their products.

For this reason, Guillaume Bastard, an expert in agricultural sectors and representative of the French development NGO, GRET, in Senegal believes it would be better to support the milk industry and help producers improve the quality and quantity of the milk produced. 'Of course, building up the local milk sector is a real challenge, but milk products are currently Senegal's second most imported foodstuff, amounting to CFA 65 billion (€39 million) annually. Local businesses, the government and dairy farmers all have an interest in seeing it done so that income can be redistributed to the most marginalised rural populations,' he concludes. ■

Anne Perrin



Strengthening Senegal's local milk industry will help meet consumers' needs



The banana trade plays a key role in Côte d'Ivoire's economy

IVORIAN BANANA

Standards are key to European markets

Côte d'Ivoire is the second largest banana exporter to Europe among ACP countries and the world's thirteenth largest. The sector makes up 8% of national GDP. Europe is the main destination of Ivorian banana exports but there are some conditions.

The banana sector plays a major role in Côte d'Ivoire, economically and socially. It directly employs almost 10,000 people and generates large quantities of foreign currency and tax revenues. The sector also contributes to developing small-scale farming in the country. The Ivorian Government has recently boosted the sector by lowering corporate income taxes from 35 to 27%. The EU is the main destination of Ivorian bananas, receiving 80% of exports. Banana export prices are volatile, and vary from CFA200 to 600 (€0.3-€0.9) per kg. After sorting, dessert bananas unselected for export, which account for 10% of production, are sold in local markets for CFA30-40 (€0.05-€0.06) per kg. Belgium,

Germany and the Netherlands have become gateways for Ivorian bananas, besides France and the United Kingdom.

The main challenge faced by the sector is to remain competitive in an increasingly open and quality-demanding European market. Falling customs duties will increase competition in the European market but also in North Africa. New diseases (such as banana bacterial wilt from Eastern Africa) and more resistant pathogens are other problems. Another challenge is the lack of local investments: considering the very small share of Ivorian capital invested in the sector, any withdrawal of foreign funding could put an end to banana production in Côte d'Ivoire.

Several strategies are being considered to address these commercial challenges: reducing production costs, searching for new varieties or obtaining certification to enter high added-value niche markets.

To remain in the international market, plantations need to be certified. Plantation companies are certified to meet European distribution standards and make every effort to maintain their certification. There are many certifications, each with its own characteristics (ISO 14 001, Globalgap, Tesco Nature's choice, Rainforest Alliance), and all are aiming to meet European customer requirements in terms of food security and safety, working conditions and respect for the environment. ■

Patrice Kouakou

TRAINING

Exchanging pineapples and guava

São Tomé and Príncipe is now exporting its agricultural produce surpluses to Cape Verde, particularly pineapple, guava and tomato. In exchange, technical staff from the São Tomé and Príncipe Ministry of Agriculture will receive training in hydroponics and drip irrigation, benefitting from Cape Verde's extensive experience in developing these watering techniques.

GROWING POTENTIAL

Connecting smallholder farmers

Lima Links, launched by the NGO iDE Zambia, is a mobile phone-based market information tool that connects smallholders with markets. With no call charges involved, farmers and buyers are provided with real-time price and demand information for the 10 most commonly grown vegetables.

ANGOLAN WINE

First Angolan wine on market

Angola's potential to produce high-quality wine has finally been realised. The first 60,000 750 ml bottles of red and white *Serra da Xixila* wine are now on the market. Produced in Kuanza-Sul province as a result of the 2013 harvest, this is the first bottle wine to be made wholly in Angola.

SOURSOP

Grenada's fruit goes global

Soursop fruit – once only locally-produced and consumed – is now providing an increasingly lucrative market for Grenadian farmers. In 2014, Grenada exported more than €540,000 in soursop to Canada, the UK and USA.

PROTECTING OCEANS

Palau leads the way

Palau has set aside 500,000 km² (80%) of its maritime territory for full protection; the highest percentage of an exclusive economic zone devoted to marine conservation by any country in the world and the sixth largest in terms of size. The remaining 20% of Palau's seas are reserved for local fishing by individuals and small-scale commercial fisheries, with limited exports.

ARTIFICIAL HABITATS

Fisheries for Somali coastal communities

FAO and the EU are using 25 'fish magnets' along Somalia's 3,300 km coastline to boost small-scale fisheries. The 'fish-aggregating devices' are a buoy and a 3 m 'habitat mat'. Plant life grows under the mat, attracting fish to create new high-density fishing grounds. The 25 fish magnets attract species that normally small-scale fishers cannot easily catch, including tuna. This makes fishing safe, efficient and encourages fishers away from vulnerable habitats such as coral reefs and sea grasses.

OCEAN CONSERVATION

Benefits to people of expanding Marine Protected Areas

A study by the Institute for Environmental Studies in Amsterdam has found that if 10% of the world's oceans were Marine Protected Areas, estimated total economic benefits would be €570-846 billion over 2015-2050; and for 30% coverage, between €659-1,050 billion. Ecosystem services covered include coastal protection, fisheries, tourism and carbon storage by coral reefs and mangroves.

FOOD SAFETY STANDARDS

Accessing new markets

The Caribbean Regional Fisheries Mechanism (CRFM) is creating new market opportunities for Caribbean fishermen. CRFM is notably helping fishers to better comply with food safety standards required to access more profitable markets in the EU and Canada. An online short film presents the project (tinyurl.com/hj9cbgo).



A whale watching expedition organised by the NGO Nature Tropicale

WHALE WATCHING

Threatened species conservation

The Benin coastline is home to whales, dolphins and turtles, among other marine species. 'Whale watching' cruises organised by the Beninese NGO, Nature Tropicale, in partnership with International Union for Conservation of Nature, aims to help protect these species.

The Benin Centre for Environment and Economic and Social Development (CBDD) is the national body in charge of implementing the Sustainable Development Agreement between the Netherlands and Benin. In its first scientific expeditions off the coast of Benin in 2000, CBDD found the presence of humpback whales (*Megaptera novaeangliae*) and various dolphin species. Humpback whales are migratory animals that feed during the summer in the Polar Regions and move every winter towards tropical seas to breed. In the Bight of Benin, marine mammals such as whales pass through various territorial waters, with some countries better able to observe species than others.

As a result, available data for conservation is inconsistent and lacking, preventing accurate estimates of marine mammals.

For several years, the presence of marine mammals in the Gulf of Guinea has contributed to ecotourism known as whale watching. "For the countries that are fortunate enough to have such a heritage, the scientific and economic stakes are high," says Joséa Bodjrenou, executive director of Nature Tropicale. Each year since 2000, the NGO organises whale watching expeditions from mid-August through to mid-November. "The opportunities to watch and observe humpback whales are exceptional," says Bodjrenou. These whales can be 12-14 m long and weigh 30-40 t.

For the 2015 season, six sea expeditions had been planned, one every two weeks. Due to low demand, only four trips were organised, bringing together more than 200 tourists. These trips brought in €5,400, half of which will help Nature Tropicale to continue its turtle observation activities in the Gulf of Guinea. Fishermen often catch turtles that come to nest on sand beaches, threatening their survival. As a result, conservation of these species requires constant monitoring.

For more information about whale watching in Benin: <https://youtu.be/FIBXrqkkFU4>

Joachim Saizonou

FOOD EDUCATION

Saving lives

More than 400 children die each day due to malnutrition in Angola. The country's public primary school syllabus will include education on nutrition for the first time.

Fifteen primary schools in Luanda have had classes on nutrition since the start of the academic year in February 2016. The programme benefits more than 2,000 children aged 6–12 at this initial stage. It aims to reduce child mortality in Angola, which is the country most affected by this problem in the world.

In Angola, the average number of deaths among children under five is 167 per thousand live births. One in six children do not reach the age of five, according to UNICEF data. Neonatal mortality is very high and is caused, above all, by malnutrition linked to acute respiratory illnesses, malaria and diarrhoea.

To try and address this plight, a committee of nutritionists and technical staff from the Ministries of Education, Health and Agriculture have created nutrition textbooks to train teachers and activity books for pupils aged 6–12, with support from Nestlé Angola. For 15 minutes,

three times a week, topics such as the food pyramid, food safety and physical exercise will be discussed in classes and integrated into subjects including environmental studies, Portuguese, and moral and civic education.

In a country where chronic malnutrition is so prevalent among children, obesity rates, at the other extreme of poor diet problems, are similarly worrying. Angola is second only to Guinea-Bissau among the Portuguese-speaking African countries with the highest number of obese people: 18.7% of women, 12% of men and 6% of children and young people are obese.

In a 2014 study by Oxfam, Angola was one of the three nations with the worst nutrition and dietary habits. More than half the population only eat carbohydrates, and access to drinking water is a serious problem. Lack of vitamin A and iron are also key issues.

The HANCI ranking, which measures the government's actions and commitment to fighting hunger and malnutrition, places the Angolan government in the second to last place in a list of 45 countries. This is yet another indicator that the Ministry of Education hopes to counteract by extending the nutrition lesson programme, at least in the short term, to all 18 provinces in the country and more than five million pupils in primary education. ■

Rita Vaz da Silva

PROCESSING

Many uses for sweet potato

Vitamin A-rich orange-fleshed sweet potato is revolutionising people's diets in Rwanda. The crop has a high nutritional value and is "rich in vitamins C, B3 and B2" according to Regis Umugiraneza from Carl Sweet Food that processes sweet potato into cookies, doughnuts and spaghetti.

VARIETIES

Enriched beans

In Rwanda, a farmer cooperative, supported by the NGO HarvestPlus, is growing new iron-rich bean varieties. "The new varieties are tasty with a high iron content. You can harvest more than 3 t/ha compared with less than 1 t/ha for native varieties," says Héléne Mutezintare, a cooperative member.

EBOLA

Agriculture returning to normal

In September 2015, WHO declared Liberia Ebola-free. This is helping the severely affected agriculture sector return to normal. The Famine Early Warning Systems Network underlines that "this is contributing to the recovery of certain economic activities, excluding labour work and petty trade."

MALARIA

Help from spiders

The East African spider (*E. Culicivora*) mainly eats anopheles, the mosquito which carries malaria. The spider, which poses no harm to humans, could be an ally in the fight against malaria according to Fiona Cross, arachnologist at *icipe* in Kenya.

These pages were produced with contributions from: B H Carreon (Palau), S Diarra (Mali), F Diza (Zimbabwe), J Karuga (Kenya), P Kouakou (Côte d'Ivoire), M Makoni (South Africa), N Mutumweno (Zambia), E Ngalame (Cameroon), F Niyonagize (Rwanda), M Nzikou Massala (Republic of Congo), J Saizonou (Benin), L Straker (Grenada), and R Vaz da Silva (Angola).



In 2016 the public school system in Angola launched a nutrition education programme



ROBERTO RIDOLFI

Roberto Ridolfi joined the European Commission in 1994 and worked in several delegations: Malawi, Namibia and Kosovo as development and economic adviser

Financing smallholder farmers: from risks to opportunities

Investors still perceive rural markets as risky. To attract private finance for viable agricultural investments, the European Commission (EC) has launched a new Agriculture Financing Initiative (AgriFI). "AgriFI addresses the whole value chain system, to boost investment in rural areas and achieve inclusive and sustainable agricultural growth", says Roberto Ridolfi, director of the EC for Sustainable Growth and Development at Directorate-General for International Cooperation and Development.

Conventional thinking is that financing smallholder farmers and agribusinesses has high transaction costs, low investment returns and is risky business. Is this a myth or a reality?

In our view, inclusive financing is about long-term availability, patient capital, and financing mechanisms adapted to smallholders and micro/small/medium enterprises (MSMEs). There has been serious underinvestment in the agricultural sector for decades, particularly in smallholder agriculture. The FAO estimates that we need to invest €240 billion per year to eradicate hunger by 2030. Given that smallholders account for more than 95% of all agricultural holdings, the major share of this investment has to go to smallholders.

It is true that there is an inherent high risk related to agricultural production in general. This is because of production and market risks such as environmental conditions, quantity and quality of produce, and fluctuating prices. There is often a higher perceived risk associated with small producers due to limited technological and innovative capacities, market inefficiencies and disruptions, and limited access to financial services and markets. On top of that is the high cost of doing business in small remote, rural markets. That's why agricultural risk management is so important. We see a lot of new developments in this area, including

smallholder insurance, but also market information systems, warehousing, and other more conventional programmes, such as road and market infrastructure development and access to energy.

How will AgriFI help to tackle investment risk?

Regarding risks, AgriFI will have a twin track approach: firstly reducing risk on the producer side – meaning business and advisory services, skills, technology and innovation; and secondly, by providing greater risk-bearing finance.

We will also provide greater risk-bearing capacity through using public money to attract private finance to viable investments which would not have happened otherwise. AgriFI aims to finance initiatives that have a clear development impact on those not normally reached, including smallholders with limited market orientation, vulnerable groups, women and young farmers and entrepreneurs.

How will AgriFI be implemented?

AgriFI is an initiative under which various programmes will be implemented and can be financed from various sources. We will have financing available from a variety of thematic, regional and country programmes but, of course, there will be loan contributions from development banks and financing institutions, and from the private sector.

Most AgriFI investments will be done within the EU blending framework. AgriFI is meant to be flexible, using different financing products most suited to the specific circumstances. All blending instruments like direct investment grants, technical assistance but also provision of risk capital, guarantees or other risk sharing mechanisms can be used in principle. Given the perceived high risk environment of smallholder agriculture and agribusiness MSMEs, the use of risk sharing mechanisms is an important instrument to use.

So how would you convince a financial service provider to invest in smallholder farmers and agribusiness MSMEs?

We can offer a trusted and reliable partnership with those investors. Such partnership offers advantages in terms of spreading the risk and in terms of long-term engagement. Another argument is that global food supply cannot be guaranteed without tapping into the underused agricultural production potential of smallholder farms. These are the producers that currently feed 80% of the population in the developing world. And they will remain vital in the pursuit of global food security. So we need to better tackle this together now, otherwise we will never reach the required impact at scale that is required. ■

Joshua Massarenti

In the knowledge-intensive 21st century, what does it mean for a farmer to be connected? And what kinds of tools, support and approaches will allow him or her to fulfil their potential?

THE CONNECTED FARMER

A new opportunity for the agricultural system



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Establishing links:
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AND TOBAGO**
Online marketplace –
a convenient connection

The rapid evolution of mobile technology is enabling remote farmers to access and share information: even with basic mobile phones. Better 'connections' improve farmers' access to knowledge, markets, financial and healthcare services, and more productive and transparent supply chains. Positive communication developments stimulate 'business-like approaches' to agriculture as farmers better assess risks, access inputs, set prices and control when products are sold. And - rather than acting individually - connected farmers profit from strategic decisions made collectively. Nevertheless, this information-rich world is not without its challenges as agribusinesses cope with climatic changes and fluctuating market prices.

So how do we analyse farmers' connectivity? We can define farmers as being connected horizontally to each other, vertically to other actors, or holistically as part of a 'system perspective', which considers the context and complexity of farmer's connections.

In past decades, connections were often linear and rather limited. Farmers may have received extension advice, but little in the way of market information. Establishing farmers' associations and cooperatives allowed farmers to share experiences, act collaboratively and sell collectively, yet 'connections' tended to be passive and information exchange 'slow'. But, if farmers remain at the bottom of the information chain, it is impossible for farmers to maximise productivity and run more efficient agribusinesses.

To help farmers connect to others, development actors have focused on access to information and improving linkages within the value chain to enhance market opportunities and prices. However, to improve decision-making about climatic and market risks and opportunities to grow/raise the right produce at the right time and for the right price, farmers need immediate access to a greater diversity of knowledge.

Making it mobile

Access to reliable weather forecasts is critical for farmers to make informed decisions about the timing of farming activities, from production to harvesting. But in the tropics, the most reliable forecasts are only 40% accurate. Tropical weather is localised and conventional climate models have failed to provide the accuracy that farmers require. However, ISKA™ - a new weather forecasting service launched in West Africa and developed by Swedish company, Ignitia - provides GPS-specific 2-day, monthly and seasonal forecasts sent to customers via text. In the first full commercial season in 2014, over 80,000 Ghanaian farmers subscribed to the IKSA service, with 97% of farmers continuing into the next season.

Whilst mobile penetration in West Africa (except Nigeria and Mali) is around 100%, most people own basic handsets. Therefore, for simplicity, the ISKA SMS



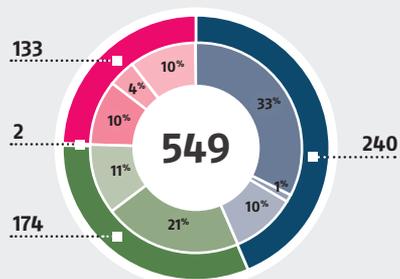
service uses seven key words that change depending on the forecast. "Messages are constructed so that literate as well as illiterate farmers are able to extract useful information after little training," says Lizzie Merrill of Ignitia, the ISKA forecasting company. With each forecast customised to the farmer's GPS location, ISKA has an 84% success rate compared to global forecasts. Farmers are charged around €0.035 per day for the service, paid via micro-instalments from prepaid mobile credit. "Spraying at the right time increased my yield by 40%," says Stephen Andoh, a cocoa farmer in western Ghana. He adds, "ISKA weather forecasts have helped me and neighbouring farmers make the right decisions at the right time. We have had a lot more rain this season and the forecasts have helped us plan how to protect our crops." With ISKA being rolled out to Mali, then Côte

Reliable weather forecasts are pivotal for farmers to make decisions about their farming activities

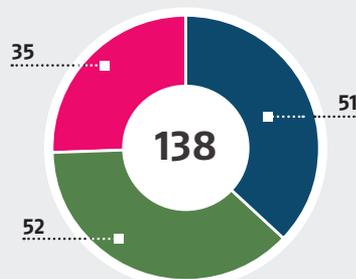
The impact of mobile services by 2020

The opportunities for mobile identified across three areas (information provision, financial services and agricultural trade services) have potential to increase agricultural income by an estimated US\$138 billion (€123 billion) across 26 countries by 2020; a significant proportion of this will be gained in developing countries. It is estimated that a total of 549 million users will be connected to these services.

CONNECTIONS TO SERVICES IN 2020 (MILLION)



INCREASE IN AGRICULTURAL INCOME IN 2020 (US\$ BILLION)



KEY

MOBILE INFORMATION PROVISION

- Mobile information platform
- Farmers helpline

MOBILE AGRICULTURAL TRADE SERVICES

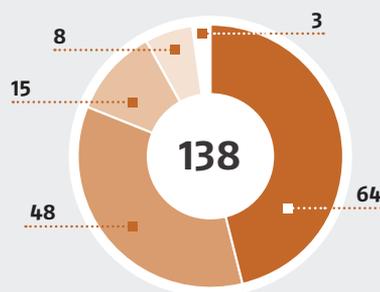
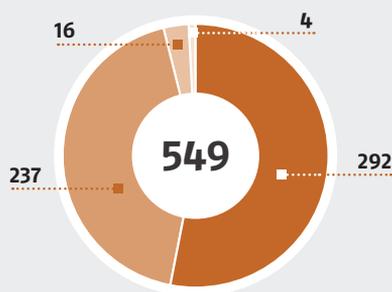
- Agricultural trading platform
- Agricultural tendering platform
- Agricultural bartering platform

MOBILE FINANCIAL SERVICES

- Mobile payment system
- Micro-insurance system
- Micro-lending platform

The impact of mobile services by 2020 by region

The most significant increases in agricultural income can be achieved in developing countries. Mobile is the most common form of communication in emerging markets and is increasingly available in remote locations. Mobile has the most potential to improve the income of smallholder farmers in developing countries by 2020 in Africa, India and Middle East.



SOURCE:
Vodafone Connected Agriculture Report
<http://bit.ly/1oganQi>

d'Ivoire and Senegal; it is predicted that around 1.2 million farmers will be accessing the service by the end of 2017.

SMS is increasingly used to transfer information to farmers through a wide range of mobile apps. But Farmerline, a company from Ghana that provides access

to advisory services for smallholder farmers and other agricultural stakeholders, uses a different approach. Its service communicates relevant agricultural information (weather alerts, best farming practices, financial tips and market prices) through voice messages in local languages. In rural areas, where extension advice is often difficult to access, Farmerline provides locally-relevant content translated, recorded and sent by voicemail direct to farmers' mobile phones.

"We have faced challenges with fluctuating prices but through subscribing to this service it's now easier for farmers to know what is going on in local markets," says Nana Kwaku Siaw who is practising aquaculture. "Farmers in Ghana are being encouraged to take up fish farming to provide an alternative source of protein for the population. I can now access the information I need on what to do and when to do it." As well as voice messages, Farmerline has a dedicated support team that answer farmers' questions. Regionally, the company also supports global food companies, governments and agribusinesses with farm management communication, data collection, and traceability to better manage and connect with over 200,000 farmers and supply chain actors across five countries in West Africa. ▶

Handsets and video huts

In Malawi, 'video huts' that sell or loan DVDs are loading agricultural videos onto micro SD cards, playable on basic mobile phones. In one small town at a video shack, farmer Andrew Njorinjo, says "It is good; through watching these films, I have learned to conquer kaufiti (striga) in my fields." Although Andrew's mobile is not a smartphone, for a few kwacha (local currency) he is able to watch videos in his own Chichewa language. In January 2016, Access Agriculture completed a video translation training course in Malawi in four local languages – Sena, Yao, Chichewa and Tumbuka – so more programmes will soon be available for farmers to access across the country.

An insightful approach to sharing knowledge

To support farmers to share and use agricultural development knowledge, CTA, FAO, IFAD, IICA and partners are developing a new project on 'experience capitalisation'. The initiative will train stakeholder organisations to document farmers' experiences, describing challenges faced, the approach developed to overcome challenges, and lessons learnt in applying the approach. Additional personal insights that emerge along the journey will complete the 'story'. The aim of the project is to enable farmer organisations to apply 'experience capitalisation' techniques, share knowledge and to see the benefits, such that the approach eventually becomes institutionalised.

► Farmer to farmer

ICTs are becoming more and more important in connecting farmers and providing information. However, traditional channels (audio, radio and video) used in new, innovative ways - including in combination with ICTs - retain a vital role in communication.

To inspire farmers, Access Agriculture uses local language 'farmer-to-farmer' training videos. On the organisation's website, over 700 videos can be downloaded covering 60 languages. Ghanaian farmer Yakubu Rahman says, "The video was filmed in Mali, but it speaks to me in a language I understand." For farmers in areas where electricity, internet and mobile signal is unreliable or unavailable, videos are accessible via a 'smart projector'. "The kit comprises a projector and loudspeaker powered by a solar rechargeable battery. It fits into a backpack so anyone doing extension is able to carry it around," enthuses Bob Muchina, chairman of the newly-formed Forum for Agricultural Advisory Services, Kenya. In Malawi, videos can be loaded directly onto farmers' mobile phones at 'video shacks' (see box).

Across Africa, Farm Radio International (FRI) promotes a similar farmer-to-farmer learning approach by supporting local and community radio stations to develop programmes for group listening. One key participatory technology used by FRI is an interactive voice response system.

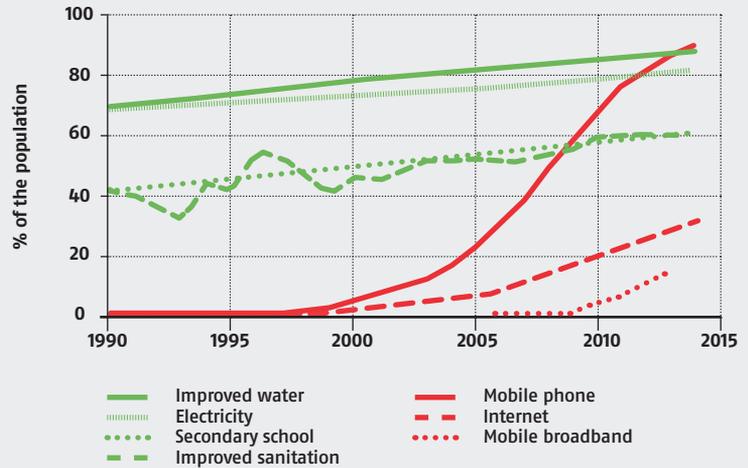
This system allows farmers to access important messages and alerts, to re-listen again to radio programmes, and to share voice messages with radio stations, such as lessons they have learned in the field from implementing new methods.

Redefining the 'middle' link

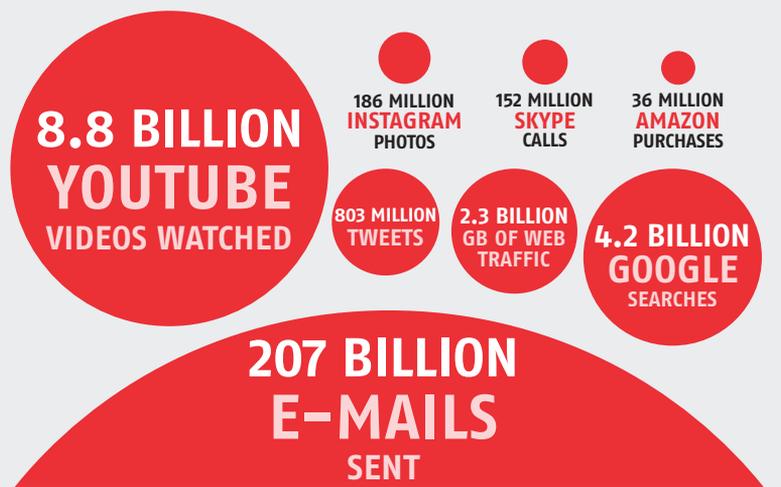
ICTs help keep young people involved in agriculture. "I use the internet daily, especially social media

Digital transformation in action

The internet and related technologies have reached developing countries much faster than previous technological innovations. More households in developing countries own a mobile phone than have access to electricity or improved sanitation. But while the internet has reached almost all countries quickly, the intensity of its use has been lower in poorer countries.



A typical day in the life of the internet



SOURCE: World Development Report 2016: digital dividends overview <http://bit.ly/1lhG3Yo>

networks, to gather information and communicate with the farming sector," says 25 year-old Devica Sookoo, a young melon farmer and director of the Agricultural Society of Trinidad and Tobago. "I hope to influence other young people to get involved in agriculture by sharing my knowledge and experiences - good and bad." She adds, "With training from the Caribbean Farmers Network, I've also learned that social media is a great tool for helping to market my produce and directly attract customers." (see also Field report: Online marketplace - a convenient connection).

Besides social media marketing, more sophisticated interactive digital platforms enable farmers to be better connected. The East African Farmers' Federation e-granary platform links farmers to buyers. "Each farmer posts how much rice they want to sell and at

Tech4farmers: Linking farmers to markets

Providing farmers with real-time access to market information, tech4farmers helps farmers sell their produce as well as receive other critical information to manage their business.

By 2020, tech4farmers will have achieved:



what price. Once traders get the information, they give us (farmers) a call,” says William Juma, a rice farmer from Busia, western Kenya. “This platform also helps to stabilise cereal prices. After harvest, farmers come up with a fair price based on our production expenses that earns us some profit and is favourable to our buyers.” As e-granary is developed and scaled up across the region, farmers will also be able to connect to insurance and financial services. (see also Viewpoint: *Establishing links: a visionary approach*).

As new technologies evolve, the role of the ‘middleman’ - who buy from producers and sell to consumers - can adapt to new dynamics and offer services that enhance group marketing, price stability and negotiation. Tech4farmers is one such service provider which operates a digital commodity exchange and warehouse receipt system in Uganda for 6,300 farmers and 87 businesses. A warehouse receipt is used as collateral against grains and cereals placed by a named depositor into a secure storage environment. “Hedging trade through the tech4farmers online exchange reduces our business risks and increases investment returns since transactions are guaranteed by banks,” says Hajji Ahmed Naleba, rice farmer in Butaleja district. This financing mechanism promotes transparency in value chains, mitigates against side-selling and improves product traceability as farmers and agribusinesses can freely trade receipts on the digital exchange.

“Being connected means having timely access to critical information and the necessary support to fully undertake farming as a business,” concludes tech4farmers CEO, Deogratius Afimani. However, for all farmers to be better connected, challenges facing rural farmers still need to be overcome with continuing ICT innovation and appropriate policy support. ■

Susanna Cartmell-Thorp

Viewpoint

Stephen Muchiri is chief executive officer of the Eastern African Farmers Federation (EAFF). As with other farmers' associations, EAFF was set up to help its members connect to and learn from each other but, increasingly, the organisation is also helping to connect farmers to other agricultural actors.



Establishing links: a visionary approach

In this digital age, can you describe what the ‘connected’ farmer means to you?

A connected farmer owns a mobile phone to make transactions, get inputs, call buyers, receive weather and pest alerts and can call the agro-vet or extension officer for advice. For farmers to attract investors, they have to use technology, especially ICTs. ICTs are revolutionising agriculture; the opportunities are enormous. However, farmers need a mindset shift - they have to become more business-like and become part of the private sector instead of relying on development agencies and donors for support.

How do farmers' organisations like EAFF help to ‘connect’ farmers to other value chain actors?

We have had a lot of interesting innovations in ICT4Ag but the missing link has been a lack of ownership by farmers and farmer associations. EAFF has partnered with service providers, particularly financial partners and commodity buyers, to develop an interactive mobile platform known as the ‘e-granary’. By aggregating farmers in 30 cooperatives for maize and rice, we can locate farmers by gender, age, enterprise, and when and what they planted. This enables us to produce harvest projections. Even on a very simple phone, farmers can interact with the platform. Within 2 months of piloting e-granary, we had registered 20,000 farmers. As the platform gets upscaled, we will add other services e.g. extension, inputs, insurance, and access to credit according to farmers' needs.

What steps will help farmers be better connected?

Setting up these digital platforms is expensive and require resources. To be a part of the process, farmers need skills and capacity building to interact with the platform and see the benefits. Farmers also need incentives to engage. For example, the association needs to help market farmers' products. We can have a wonderful system but if people don't know how to use or interact with it, then it is wasted. We want farmers to use the technology very easily and the data generated should not be a burden to the farmer. The data generated can also help to highlight the challenges that farmers face to inform policies and bring about change.



Online marketplace - a convenient connection

D'Market Movers, the first digital marketplace in Trinidad and Tobago, is centred on local health foods and organic products. Connecting around 60 producers and 650 consumers, the initiative has also changed the way consumers relate to local farmers and the food they produce.

Enabling consumers to purchase grocery products online, D'Market Movers is an innovative initiative connecting farmers directly to the marketplace. Locally produced niche items such as gourmet chocolate, specialty goods that are difficult to find, as well as organic produce, vegetables, meat, and dairy products are posted online. People click to order and D'Market Movers delivers the products direct to the consumer.

"I used to plant lettuce and sell at wholesale markets," says D'Market Movers' founder, David Thomas. "We would normally sell to middlemen but I realised that if we sold directly to the consumer, we could double or triple our profit margin." To give farmers direct access to consumers, cut out the middlemen and increase producer income, the company launched an online marketing model with the ICT expertise of business partner Rachel Renie. D'Market Movers now stands as one of the best examples of a successful agribusiness using ICTs in Trinidad and Tobago.

Two way relationship

Consumers are drawn to the online platform for its convenience. And producers want to work with the company for its strong consumer access. Now with over 140 products, D'Market Movers continues to expand and is looking to enter the export market with a frozen fruit yogurt product.

"Our business is dynamic in that we always keep in mind that we are dealing with agriculture which is at the mercy of seasonality, supply, demand, time and perishability," states Renie. "More importantly, we remember who we are selling to. Not every customer remains a customer. This is a major lesson we've learned."

Based on this philosophy, the co-founders regularly seek feedback from their consumers on current products as well as to test new products. The company engages with consumers through social media, as well as their website. "We always ask for feedback. One of the advantages of being an online company is that we can easily gather data and analyse specific trends for future strategies," Thomas adds.

Local links

A new face-to-face service called 'Our Moving Table' has encouraged consumers to buy local foods. Together with local partners, chefs and other similar agribusinesses, 'Our Moving Table' is a roaming event that provides communal dining to showcase local products. The entire menu features items only available in Trinidad and Tobago. Also referred to as 'farm dining', the monthly event held outdoors encourages consumers and the general public to support local producers when they eat out. "We promote the moving table event via social media and so far each monthly event has sold out. Our customers feel more connected to us and also to the producers that supply the food, as they know where it comes from," enthuses Thomas.

One particular customer, Christian Cwick explains the benefits of D'Market Movers. "I work at a large prominent company and we use D'Market Movers to show appreciation to our clients. We purchase fruit baskets and other gift bundles. For us, convenience is paramount because we know that D'Market Movers will make time to find the best produce so that, in turn, we can make the best impression on our clients," he explains. Cwick adds that D'Market Movers' reliability, convenience and consistent quality provides value for money.



© CTA

D'Market Movers brings together 60 local organic producers and 650 consumers in Trinidad and Tobago on its digital platform

Whilst Renie established the business and uses social media to interact with consumers, Thomas, as a past producer himself, is well-connected to D'Market Movers' supplier network. Many are greenhouse farmers growing high-quality but perishable products in more remote island areas so were unable to get good prices at local markets. But, by creating demand through its online platform, D'Market Movers provides a higher profit and producers now refer the company to other growers.

"D'Market Movers assists us with marketing our perishable product," says Dereck Legall, a sweet pepper and tomato producer. "It's greatly important to us that we agree a year-round price to ensure we always make a profit," he states. He adds that the 'Our Moving Table' initiative has also been encouraging for producers. To help D'Market Movers make more accurate predictions of available produce, Legall keeps them informed of his

production cycle. Simultaneously, he has moved toward producing niche items in response to consumer demand. For instance, instead of producing the common variety of patchoi (bok choy), Legall now produces Swiss chard.

D'Market Movers continues to grow by adding new, innovative products and services. By paying attention to consumer feedback, the company maximises satisfaction whilst maintaining its core values of health, wellbeing and customer satisfaction. The farmers also benefit as they not only engage with D'Market Movers but also with each other; the company's farmer network has grown via recommendation and referrals. By interacting with each other and sharing the available market demand that is provided to them, the farmers are working together to be well-connected in the local marketplace. ■

Keron Bascombe

Small producers, big markets

Small-scale ACP farmers are challenging the stereotype of subsistence producers and demonstrating their capacities as reliable food industry suppliers.

For any small-scale producer in ACP countries, being able to supply a big industry requires many conditions. These range from access to finance and technology, to the presence of other actors willing to ‘pull’ small-scale producers along.

The case of the Haitian mango sector illustrates how small-scale farmers contribute to sustainable sourcing in an ACP food industry. The Haitian Association of Fruit Producers and Sellers of the South organises the picking, sorting and washing of its 750 members’ production. High quality fruits are sold to one of the larger local exporters of fresh mangoes. Fruits that do not make export grade are bought by a local processing plant which dries them for the domestic market, thereby adding value to what would normally be rejected. The driver of strengthening the value chain here is primarily the organisation of farmers into a single association that manages harvesting and postharvest operations with professional acumen. The exporter’s contribution also plays a role in driving up quality. It helps too that working capital requirements are low and can be met by farmers themselves.

In Vanuatu, the Farmers Support Agency linked isolated village farmers to a processing and marketing firm, while providing training and technical support. The linkage generated higher value for all actors of the value chain. After training, technical support and organisation, smallholders proved they could produce export quality products. Vanuatu vanilla extracts are now sold to ice cream companies in New Zealand, while extracts and paste are exported to Australia. The involvement of a proactive processor-come-exporter has been a major ‘pull factor’ in the value chain.

The pull-factor

In West Africa, Unilever is developing an inclusive supply model involving small-scale palm oil producers, enabling them to meet household socio-economic objectives by guaranteeing markets in



In Ghana small-scale maize farmers are provided with inputs and services by a major actor in the value chain

return for adherence to certain production standards. The integration of small-scale producers in the palm oil value chain generates income that lifts households out of poverty and enables children to attend school.

Similarly, a major actor in the maize value chain in Ghana, where maize is a staple food, provides small-scale farmers with inputs (high yielding seeds, chemicals, farm equipment) and services (training, loans) against the pledge to be their preferred sales channel. The strengthening of links within the value chain results in increased and secured supplies for the marketing company, alongside higher outputs and margins for farmers.

Such arrangements are not without downsides. The business relationship is often skewed in favour of the buyer who may use its bargaining power to lower prices or dictate a technology that is not the most appropriate. On the other hand, side-selling by farmers may also endanger the relationship.

Drivers and triggers

Grouping smallholders in producer organisations and favouring the operation of market forces, for instance through a strong procurement actor within the industry, are both clear drivers for strong value chains.

Other factors that strengthen small-scale farmers range from support in accessing finance and technology, to providing a proper market environment that promotes smallholder development. These conditions are well reflected in the recently launched CaFAN Regional Value Chain Alliance Project which emphasises capacity-building, organisational development, technical training, regional learning exchanges, market visits, multi-stakeholder collaboration, and private sector engagement, among others.

Jethro Greene, chief coordinator says: “CaFAN aims to build capacity among farmer leaders by sharpening these [value chain] tools and strategising how value chains can be upgraded and implemented for specific crops.” ■

Pierre Bertycy Berthelot

Smart agriculture



@ This booklet presents 14 ‘stories from the field’ of climate-smart agricultural practices, tools and policies that are having an impact on farmers’ lives and livelihoods in ACP countries. Climate-smart agriculture aims to increase farm productivity and incomes in a sustainable manner, enable farmers to adapt and build resilience to climate change and (where possible) reduce greenhouse gas emissions. Yet what does this mean in practice for local farmers? Stories are grouped in six themes: water, livestock, staple crops, ICTs, insurance and climate resilience. Pye-Smith summarises each story succinctly, clearly highlighting the research or innovation and

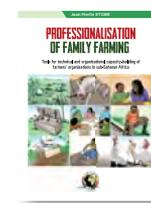
Climate Solutions that Work for Farmers

Climate Solutions that Work for Farmers
By C Pye-Smith
CTA, 2015; 24 pp.
CTA no. 1867
2 credit points
Downloadable as a PDF file from:
<http://tinyurl.com/h26k2gm>

impact in practice. Particularly interesting examples include: indigenous water harvesting boosting yields in the Sahel despite changing rainfall patterns; Somali pastoralists enhancing food security by on-farm fodder production; and agricultural insurance in Mauritius providing a crucial safety net for sugar growers with the potential to scale-up in other small island developing states.

Importantly, the stories recognise that agriculture is not just a ‘victim’ of climate change; it is also a significant cause and contributor, directly responsible for 10-12% of human-generated greenhouse gas emissions. So what makes climate solutions work for farmers? Active farmer participation, youth and private sector engagement, and proven benefits and improvements to incomes and livelihoods are just a few factors widely seen as a key for success.

Representative organisations



Professionalisation of Family Farming: Tools for Technical and Organisational Capacity-building of Farmers' Organisations in sub-Saharan Africa

By J M Etobe
CTA, 2015; 54 pp.
ISBN 978-92-9081-593-8
CTA no. 1864
5 credit points
Downloadable as a PDF file from:
<http://tinyurl.com/hknqrc0>

@ According to the World Food Programme, hunger kills more people than AIDS, malaria and tuberculosis combined. Feeding a growing population is a major challenge faced by ACP farmers – the majority of whom can be considered ‘family farmers’. In order for farmers to be recognised as stakeholders in their own right and for them to meet the high expectation of feeding the world by producing more and better and with less means, we must form strong, representative and professional farmers’ organisations. This manual recognises that professionalising family farming is a priority yet remains a challenge in African countries. With practicality and action in mind, the author offers helpful tools to build the capacity of farmers’ organisations in sub-Saharan Africa. This book is a timely response to the fact that farmers’ organisations often find it difficult to develop long-term strategic visions, access the right information and secure funding with very little resources.

▼ DAMS

The world’s most biodiverse river basins – the Amazon, Congo, and Mekong – are experiencing a boom in construction of hydropower dams. These projects address important energy needs, but advocates often overestimate economic benefits and underestimate effects on biodiversity and important fisheries. Powerful new analytical tools and high-resolution environmental data can clarify trade-offs between engineering and environmental goals. This enables governments and funders to compare alternative sites for dams.

Balancing Hydropower and Biodiversity in the Amazon, Congo, and Mekong

By K O Winemiller, P B McIntyre, L Castello *et al.*
Science, 2016; 2 pp.
Volume 351, Issue 6269

▼ ENERGY

@ Jamaica has a high and costly dependence on petroleum imports, which provide 95% of the country’s energy. This working paper demonstrates how sustainable renewable energy programmes can be integrated into residential development and community planning strategies by collaborating with local renewable energy providers. The aim is to help communities lower energy costs and build climate resilience across the Caribbean region.

CaribShare Biogas and Richmond Housing Development: An Innovative Collaboration in Jamaica

By C Lue
CTA; 2015; 14 pp.
CTA no. 1868
Downloadable as a PDF file from:
<http://tinyurl.com/jym7mfv>

▼ CLIMATE CHANGE

Although farmers’ livelihoods are under threat from climate change, they also have the potential to reduce emissions. This report demonstrates how changes in Africa’s agriculture sector could enable farmers to adapt to and mitigate climate change, while contributing to poverty reduction and economic growth. But to achieve this, adaptation efforts need support from new technologies, increased financial investments, and effective institutions and regulation.

Montpellier Panel Report 2015: The Farms of Change – African Smallholders Responding to an Uncertain Climate Future

By K Glatzel, G Conway, E Alpert *et al.*
Agriculture for Impact, 2015; 44 pp.
Downloadable as a PDF file from:
<http://tinyurl.com/zyqmxku>

Why straw?



Crop Residues for Animal feed: Especially in Stall-feeding

By H Schiere & A Vink

CTA, 2015; 98 pp.

ISBN 978-90-8573-148-1

CTA no. **1879**

5 credit points

Downloadable as a PDF file from: <http://tinyurl.com/htjnsq>

@ 📖 What are 'straws'? For the sake of simplicity this book uses the word 'straws' to describe all fibrous crop by-products and emphasises different ways of using a wide variety of straws, especially for stall-feeding ruminants. Based on information collected from farmers and researchers in different parts of the world, the authors draw on practical experience and a large body of scientific literature to explore how straws continue to play an important role in livestock feeding and sustainable farming. For example, common traditional uses of straw include: protecting soil and reducing wind and water erosion (mulch); compost for maintaining soils; thatching, roofing and building materials; cooking fuel when firewood is scarce; animal bedding; and animal feed. The main take-away message is clear: straws, as natural by-products of grains and pulse crops, are an important asset not least as nutritious feed for ruminants. Informative reading for extension workers, advisors and farmers.

▼ ECOSYSTEM SERVICES

All human life ultimately depends on land. This report is an overview of the economics of land degradation and the benefits of sustainable land management. It outlines ecosystem services that land provides, the economic costs of degradation, and benefits of sustainable land management. The report also identifies conditions for success to ensure that sustainable land management processes are put in place.

The Value of Land: Prosperous Lands and Positive Rewards Through Sustainable Land Management

Edited by N Stewart

ELD Initiative, 2015; 166 pp.

ISBN 978-92-8086-061-0

Downloadable as a PDF file from:

<http://tinyurl.com/ze77u9x>

Rearing goats



Goat Keeping: Useful Management Practices for Smallholders

By H Blauw, G den Hertog & J Koeslag

CTA, 2015; 104 pp.

ISBN 978-90-8573-150-4

CTA no. **1858**

5 credit points

Downloadable as a PDF file from: <http://tinyurl.com/h6jbh5a>

@ 📖 In this book the authors provide detailed information about the importance of goat keeping and how to do it properly in the tropics. Chapters include information on: housing, feeding, health and diseases, reproduction, kid rearing, milk production, slaughtering and recording animals, produce and finances. Practical and comprehensive, simple line drawings and ordered chapters illustrate points clearly for readers. For example, what are the different ways goats can be kept, what factors should you consider? From flooring to shed positioning, avoiding worm infections, breed types and kid rearing from birth to adulthood are covered. The final section on records is essential reading for ACP farmers interested in good management. Recording simple information about animals, inputs and prices complements day-to-day farm cash flow, and is effective in promoting technical expertise, strategic decision-making and healthy, productive goats.

▼ GENDER

After analysing good practice in promoting women's leadership in producers' organisations (PO), this paper presents recommendations for guiding design and implementation of interventions in support of women's leadership. Key messages outlined include the need to raise awareness of women's contribution to food security and poverty reduction, create women-only spaces within POs to gain a critical mass of women leaders, and target value chains dominated by women.

Promoting the Leadership of Women in Producers' Organisations: Lessons from the Experiences of FAO and IFAD

IFAD, 2015; 71 pp.

ISBN 978-92-9072-619-7

Downloadable as a PDF file from:

<http://tinyurl.com/jr5gczk>

Accessing finance



Study on Appropriate Warehousing and Collateral Management Systems in sub-Saharan Africa, Volume 1, 2 and 3

By J Coulter Consulting & Sullivan & Worcester UK LLP

AFD, CTA & IFAD, 2015;

212 pp., 552 pp. & 264 pp.

ISBN 978-92-9081-587-7,

978-92-9081-588-4 &

978-92-9081-589-1

CTA no. **1855, 1856 & 1857**

40, 60 & 40 credit points

Downloadable as PDF files from:

<http://tinyurl.com/gvdos4y>;

<http://tinyurl.com/zub4zlf>;

<http://tinyurl.com/hr9xozm>

@ 📖 Farmers in developing countries face considerable challenges in accessing finance, and this can often influence their decision-making. These volumes on appropriate warehousing and collateral management systems in sub-Saharan Africa address: key findings; technical country reports from Cameroon, Côte d'Ivoire, Ghana, Madagascar, Mozambique, Niger, Senegal and Uganda; and a review of applicable laws, respectively. The study aims to support warehouse operators and collateral managers to better provide storage and services that facilitate warehouse receipt finance in favour of smallholder farmers. Four main types of finance - community inventory credit, private warehouses, public warehouses, and lending against the security of current or future production - are covered. Authors argue that warehouse receipts, when used as collateral, can facilitate lending to farmers.

▼ PRIVATE SECTOR

The new Sustainable Development Goals - which build on the Millennium Development Goals - set out ambitious targets to end poverty and hunger, protect the planet and ensure that every person prospers. This paper sets out practical examples of how the private sector can contribute to achieving these goals. It identifies the roles all sectors need to play to create the essential conditions for success in every community and country.

Business and the Sustainable Development Goals: Building Blocks for Success at Scale

By J Nelson, B Jenkins & R Gilbert

Business Fights Poverty, Harvard Kennedy School & UK Aid, 2015; 56 pp.

Downloadable as a PDF file from:

<http://tinyurl.com/hhxmrc>

Mobile agriculture



ICTs in Linking Farmers to Markets; Markets in Their Palms?; The Extent of ICT Adoption by ACP Farmers

a. ICTs in Linking Farmers to Markets

By Y Mammo
CTA, 2015; 32 pp.

CTA no. **1874**
<http://tinyurl.com/gnepx25>

b. Markets in Their Palms?

By F Odhiambo
CTA, 2015; 18 pp.

CTA no. **1869**
<http://tinyurl.com/h4cw7ve>

c. The Extent of ICT Adoption by ACP Farmers

By A Gichamba
CTA, 2015; 14 pp.

CTA no. **1877**
<http://tinyurl.com/gkw9vpg>

@ More than just a communication tool, mobile phones link farmers to markets and financial services, and are status symbols. Yet the technology's potential for agricultural production and extension is yet to be fully realised. Although Kenya boasts over 70% mobile phone penetration, the technology has not been adequately applied in the agriculture sector. Research presented in these three working papers agree that mobile technology will help farmers feed a growing population in sub-Saharan Africa and the rest of the world. Mobile technology also assists farmers' in running more efficient business processes, information sharing, reduces transaction costs and leads to higher profits.

▼ MALNUTRITION

By highlighting progress towards meeting global nutrition goals, this report seeks to accelerate action and enhance accountability. The report concludes that although a great deal of progress is being made in reducing malnutrition, it is still too slow and uneven. Commitment to and financing for nutrition will need to increase significantly to achieve the Sustainable Development Goal and World Health Assembly targets of ending malnutrition by 2030.

2015 Global Nutrition Report: Actions and Accountability to Advance Nutrition and Sustainable Development

International Food Policy Research Institute,

2015; 171 pp.

ISBN 978-08-9629-883-5

Downloadable as a PDF file from:

<http://tinyurl.com/jnyyr68>

Global warming



Climate Change: What Challenges for the South?

By M Reinert

IRD Publishing; 2015; 272 pp.

ISBN: 978-27-0992-172-5

€28

IRD Distribution

32, avenue Henri-Varagnat

93143 Bondy Cedex

www.editions.ird.fr/

■ The French research agency, *L'Institut de recherche pour le développement* (IRD), has over 65 years experience of studying the relationship between humans and the environment across Africa, the Mediterranean, Latin America and French overseas territories. Climate change is a major threat to the future of the planet. In preparation for the 21st United Nations Conference on Climate Change (COP 21) held in Paris from 30 November to 12 December 2015, IRD mobilised 50 researchers from various disciplines (climatologists, physicists, chemists, biologists, economists, sociologists and anthropologists) to publish this book, which aims to explain complex phenomena leading to global warming, specifically for more vulnerable southern environments and populations. This beautifully illustrated book is structured around three parts: observing and understanding climate change; analysing its main impacts on environments and societies; and national public policies at the heart of the climate challenge. A chapter is devoted to agricultural development in light of climate change.

▼ HUMAN HEALTH

In sub-Saharan Africa, increasing numbers of dams are being constructed to promote economic growth, ensure food security, alleviate poverty, and increase resilience to climate change. However large dams have increased 15 million people's risk of catching malaria and contribute to more than 1 million cases of malaria annually. This paper calls for more research into additional malaria control methods to reduce the impact of dams on the health of surrounding populations.

Malaria Impact of Large Dams in Sub-Saharan Africa: Maps, Estimates and Predictions

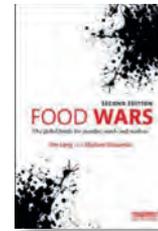
By S Kibret, J Lautze, M McCartney *et al.*

Malaria Journal, 2015; 12 pp.

Downloadable as a PDF file from:

<http://tinyurl.com/zpwrnr>

New visions



Food Wars: The Global Battle for Mouths, Minds and Markets

By T Lang & M Heasman

Routledge, 2015, 2nd Edition;

296 pp.

ISBN 978-11-3880-262-9

£35 • €45.95

Routledge

2 Park Square

Milton Park

Abingdon, Oxon

www.tandf.net

■ Every day, millions of men, women and children are direct or indirect casualties of failures of food policy to deliver safe, nutritious and life-enhancing diets. 'Food wars' refer to battles over food policy that occur between states, corporate sectors, and civil society. This interesting book argues for a new vision for food policy, which links human health with the environment, or 'ecological public health'. Lang and Heasman's analysis cuts across the whole global food system – from food culture and the way food business operates to agriculture and land use. It brings readers' attention to the complexity of the way food is produced and processed and highlights the overwhelming evidence about food's impact on the environment: natural resources used to grow, process and distribute food are major factors in climate change, energy and water use. Social dimensions to 'food wars', including gender, class and culture, also affect how and what we eat. Thoughtful reading for more academic audiences and those involved in making or influencing of policy.

▼ ADAPTATION

The global food system is increasingly vulnerable to production shocks caused by extreme weather, and this risk is growing. To improve resilience, this report calls for more research to understand and quantify the risks, development of contingency plans and early warning systems, and significant investment to increase the productivity, sustainability and resilience of agriculture to climate change.

Extreme Weather and Resilience of the Global Food System

By R Bailey, T G Benton, J Elliott *et al.*

UK-US Taskforce on Extreme Weather and Global

Food System Resilience, 2015; 18 pp.

Downloadable as a PDF file from:

<http://tinyurl.com/pzgsy3m>

Growing staples



Maize, Rice, Wheat: A Guide to Sustainable Cereal Production

FAO, 2016; 124 pp.
€40.30
ISBN 978-92-5108-519-6
FAO Publications
Viale delle Terme di Caracalla
00153 Rome, Italy
www.fao.org/publications
Downloadable as a PDF file
from: <http://tinyurl.com/zdfth6>

■ Maize, rice and wheat – with a combined annual harvest of 2.5 billion t – are the world’s most widely cultivated crops and the foundation of world food security. The topic of this comprehensive guide is how ecosystem-based farming systems are helping smallholder farmers boost cereal yields despite climate change and environmental degradation. Practical applications in maize, rice and wheat production show how farmers worldwide can strengthen their livelihoods, reduce pressure on the environment, and build resistance to climate change. The book convincingly argues that sustainably increasing the productivity of existing farmland is the best option for preventing large increases in food prices, improving rural economies and farmers’ livelihoods, and reducing hunger and malnutrition. FAO’s ‘save and grow’ concepts and practices are explained using practical examples. They also outline the policies, institutions, technologies and capacity-building needed to upscale lessons learned in national and regional programmes. A valuable reference for policymakers and development practitioners.

▼ SUSTAINABLE DEVELOPMENT

The Sustainable Development Goals (SDGs) set a new agenda for development, with the ambitious aim of eradicating extreme poverty within the next 15 years while also recognising the pressures faced by natural resources. This briefing explores how a socially-integrated approach to landscape policy can effectively contribute towards meeting the SDGs, and achieve sustainable development in Africa.

A Whole-Landscape Approach to Green Development in Africa

By M C Diaw
IIED, 2015; 4 pp.
Downloadable as a PDF file from:
<http://tinyurl.com/jl43n69>

Future diversity



Seed Sovereignty, Food Security: Women in the Vanguard of the Fight Against GMOs and Corporate Agriculture

Edited by V Shiva
North Atlantic Books, 2016;
424 pp.
ISBN 978-16-2317-029-5
£10 • €14
North Atlantic Books
2526 Martin Luther King Jr. Way
Berkeley, CA 94704
www.northatlanticbooks.com

■ *Seed Sovereignty, Food Security* shows that as seed keepers and food producers, as scientists, activists, and scholars, women all over the world are dedicated to renewing a food system that is better aligned with ecological processes as well as human health and global social justice. An inspiring call to consider alternatives to industrial agriculture and decreasing seed diversity worldwide, authors present striking cases for agroecology and reclaiming traditional methods that work to secure a healthier, diverse future. “In the five decades since the Green Revolution, ecological science has taught us the value of diversity to ensure sustainability, an increase in food production, and resilience. At the ecological level, agroecology and biodiversity-based, organic farming rejuvenate the natural capital on which sustainable food security depends... Biodiversity and soils rich in organic matter are the best strategy for climate resilience and climate adaptation.”

▼ PASTORALISM

This review outlines the livestock market system in the Horn of Africa and the major vulnerabilities and challenges to resilience faced by pastoralists. After identifying cases from across the world that have some relevance in addressing these challenges, the review draws together these lessons, highlights best-practice for interventions to promote resilience in pastoralist systems, and suggests possible ways forward.

The Horn of Africa Livestock Market System: Lessons From Elsewhere

By The Economist Intelligence Unit
The Economist Group; 2015; pp. 22
Downloadable as a PDF file from:
<http://tinyurl.com/zrpf4ry>

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ICTs in the service of agriculture

Information and communication technologies (ICTs) for agriculture are now clearly essential. Young ICT enthusiasts have plenty of ideas for facilitating agriculture and boosting profits. Ken Lohento, ICT programme coordinator at CTA, explains how CTA is promoting this trend.

1 *CTA launched the AgriHack Talent Programme 2 years ago. What does it involve?*

AgriHack Talent targets young ICT-oriented men and women. It strengthens their innovation capacities and promotes entrepreneurship in relation to offering ICT services for agriculture. The programme includes many activities such as: boosting the awareness of young ICT specialists on agricultural issues and opportunities; e-agriculture entrepreneurship training; competitions (hackathons) to develop ICT tools tailored for specific agricultural issues; incubation (mentoring) over several months for the best participants to improve their prototypes; and field-testing support for selected products that have reached a certain finalisation phase. AgriHack has already been launched in Eastern Africa, South Africa, and the Caribbean. So far, around 300 young people have been involved in this programme, and about 15 prototypes of tools and ICT applications have been selected. The launch of four young companies has been facilitated, including Ensibuuko, an enterprise whose mobile banking and information software application facilitates agricultural finance management for at least 60,000 Ugandan farmers. CTA is probably the main international organisation that uses these type of tools to generate agricultural ICT opportunities for youth and encourages innovation in this sector.

2 *To what extent do your activities facilitate agricultural entrepreneurship for ACP youth?*

As part of a call for proposals last year, we selected projects promoting CTA-funded agricultural entrepreneurship. This included the creation of a web TV channel in West Africa and a virtual



agricultural business incubator platform in the Caribbean. In another project, at least 300 young farmers will be trained on climate-smart agriculture and introduced to entrepreneurship in Zambia. We foster a new model of entrepreneurship that we call 'e-agricultural entrepreneurship' implemented by people who are developing and providing ICT services for agriculture. AgriHack plays a key role in this approach. I cited Ensibuuko above, FarmDrive in Kenya is another initiative which provides farmers with a digital platform to help them with their bookkeeping and facilitate access to funding. This kind of entrepreneurship is also promoted via other CTA activities such as our 'Plug and Play' events. We bring together and facilitate collaboration between youth ICT specialists and young farmers – an ideal way to consolidate the adoption and use of innovations in agriculture.

3 *Are new ICTs sufficiently available for farmers' use, especially in rural areas?*

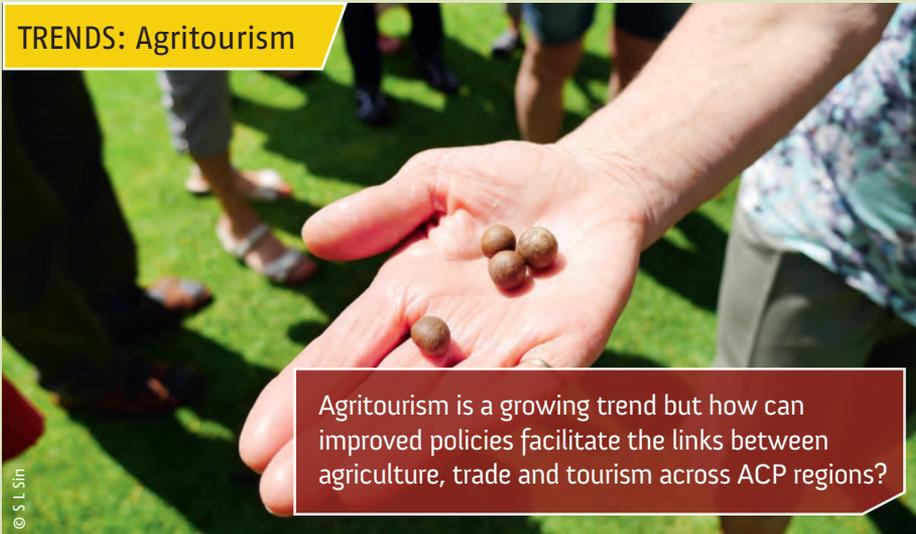
ICTs are increasingly available, even in rural areas, but there are disparities. For example, while access to mobile phones and use of SMS is widespread, access to internet is more sparse. Over 70% of Africans have a mobile phone subscription, whereas only 29% of the population has internet access. Internet

is still expensive and power networks are very unstable or absent, but things are changing. In Benin, 41% of rice farmers use mobile phones and one of our surveys revealed that over 90% of young farmers own mobile phones, with many of them using applications such as WhatsApp. Effective e-agriculture strategies should be developed to promote ICT adoption in rural areas. We are therefore implementing a variety of activities, including social media training (Web2forDev) and support for the development of e-agricultural strategies.

4 *Last year CTA won a prize for your activities with young people. Can you briefly tell us about that?*

At the United Nations 2015 World Summit on the Information Society Project Prizes ceremony, CTA won the award in the e-agriculture category following a round of global online voting and a review by a panel of international experts. We have been specifically rewarded for our initiatives that promote ICTs in agriculture, for example our AgriHack Talent initiative and the Youth in Agriculture Blog Competition Awards. This international recognition spurs us to do even better and CTA is launching new activities to reach a broader youth spectrum and achieve even greater impact.

TRENDS: Agritourism



Agritourism is a growing trend but how can improved policies facilitate the links between agriculture, trade and tourism across ACP regions?

DOSSIER: Water in agriculture



Water for agricultural use is a major issue for agribusinesses and small producers in ACP countries, let alone at a time of climate change.

VALUE CHAINS: Transportation



An insight into transportation, one of the biggest challenges for value chains in ACP countries.

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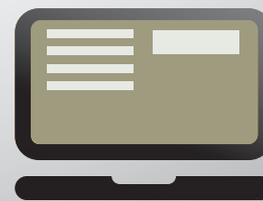
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