

ICT Update

a current awareness bulletin for ACP agriculture



e-agriculture
<http://ictupdate.cta.int>

IITA Youth Agripreneurs in Nigeria support ICT entrepreneurship and conduct agribusiness incubation.

Ignitia in Ghana gained trust and scaled-up the business by engaging with local partners and initiating reliable impact measurements.

Insights on how entrepreneurs in e-agriculture build their business models and gain access to start-up funds.



Youth e-agriculture entrepreneurship

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ICT Update



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Editorial coordinator: Ken Lohento
Reviewer: Isaura Lopes Ramos
Editor: Evert-Jan Quak
Layout: Flame Design
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Guest editor

Home-grown ICT solutions in agriculture come from young entrepreneurs

Young innovators in Africa, the Caribbean, and Pacific region, have recognised the need for creative solutions to raise agricultural productivity and the huge prospective market for their ICT-enabled services in agriculture. Although they still face many challenges, their products have the potential to transform agricultural value chains in developing countries.

E-Agriculture entrepreneurship in ACP (Africa, Caribbean, and Pacific) countries probably began in 2004 with the market information services offered by TradeNet in Ghana (rebranded later as Esoko). Today, entrepreneurship is becoming common in this field even if the sector is still nascent in most ACP countries, according to the FAO's 2015 "e-Agriculture 10 Year Review Report". This issue of the ICT Update magazine focuses on businesses led by young entrepreneurs who usually face specific challenges and greater difficulties than more seasoned entrepreneurs.

Many young people who develop ICT-based applications for agriculture (ICT4Ag) consider themselves as entrepreneurs or start-up owners (although many have not necessarily been officially incorporated or did not develop a proper business strategy). It is often unclear whether they would define themselves as social entrepreneurs (with the main motivation being the social good) or as business entrepreneurs. Our conversations with young entrepreneurs show that although most of them are truly motivated by supporting the development of the agriculture sector and farmers' livelihoods, they wish to set up a profitable company to increase their livelihoods opportunities. Indeed, the two goals are not necessarily mutually exclusive, and business and social objectives can also be pursued in parallel.

There are many examples of young e-agriculture entrepreneurs in Africa

Young innovators often have a limited understanding of the agriculture sector, specifically the functioning of value chains and the diversity of stakeholders.

(and to a lesser extent in the Caribbean and Pacific) along the different segments of the value chain. The publication "Innovate for agriculture", prepared jointly by the Technical Centre for Agricultural and Rural Cooperation (CTA) and the organisation Ashoka, presents about 30 such businesses, most of which were set up in the last two years.

The majority of ICT4Ag applications focuses on the production segment, in particular on the provision of extension and advisory services, such as Farmerline (Ghana) and m-Shamba (Kenya). Other innovative examples include GPS-based tracking of livestock (Daral Technologies, Senegal) and "smart" tractors integrating geo-localisation services, SMS features for communication between farmers and tractor owners, and data collection on usage (Hello Tractor, Nigeria).

In the marketing and trade segment, ICT-enabled services have been developed to offer market information to farmers and virtual markets to sell



Photo on the right: Winners of the AgriHack Talent Caribbean in 2014.

their produce. This segment relates directly to revenue generation for farmers and thus has attracted an important amount of mobile applications and entrepreneurial initiatives. M-Farm in Kenya, launched by three young women in 2010, is one of the most prominent examples. Others include AgroCentral in Jamaica and MIlouma in Senegal. Also important in this segment are agribusiness and supply chain management services (e.g. mFamrs, Ghana) which can greatly improve efficiencies.

Applications in the consumption segment are fairly new and opportunities for developing innovative applications are still to be explored. One example is Chowberry from Nigeria (former Foodrings) which aims to fight food waste by offering a platform to help collect food for disadvantaged groups.

As a cross-cutting application, ICT-enabled solutions are also being developed to offer financial services, such as mobile payments, insurance schemes or group lending, some of which are targeted at farmers and other value chain actors while others are more widely available.

What has helped e-agriculture entrepreneurs to emerge?

A number of factors have supported the growth of e-agricultural entrepreneurs in ACP countries. We have seen an increasing ICT democratisation in the agriculture sector. Access to affordable (albeit low-tech) handsets has greatly improved and mobile networks have expanded deep into rural areas. These technological advances have opened

up a large customer base for ICT4Ag applications. Also influential has been the growth of mobile banking in many African countries, which has created additional incentives for purchasing phones and expanding the network, has familiarised people with non-call related uses of their phone, and facilitates the provision of ICT-enabled services that require payments.

In addition, entrepreneurs have benefited from the emergence of supportive innovation environments in some ACP countries. ICT innovation hubs have sprung up in several countries, driven initially by visionary entrepreneurs and tech developers (such as the founders of the iHub in Kenya), and more recently also by large companies such as Nokia, IBM, Orange and Safaricom. The hubs offer a space for developers, mentorship from more experienced entrepreneurs, and opportunities to interact with fellow developers, business partners and, sometimes, investors. At the same time, the human resource pool in the ACP regions is growing rapidly, thanks to the large, tech-savvy and increasingly confident and risk-taking youth with improving access to education opportunities through universities and specialised training institutes (such as the Mobile Technology Institute eMobilis in Kenya).

International cooperation has also helped to strengthen ICT innovation and entrepreneurship in ACP countries. ICT4Ag is seen and promoted as a promising means to engage young people in agriculture by making farming more attractive and lucrative as a source of income and offering

additional employment opportunities. Donors and development organisations are financing innovation hubs, incubators and accelerators, and provide start-up grants to entrepreneurs and technical support. The World Bank, for instance, has assisted in the creation of mobile innovation laboratories (mLabs) in different regions. CTA has also offered support through various initiatives such as the AgriHack Talent Programme and Plug and Play events.

Last but not least, while the role of national governments in actively supporting ICT entrepreneurs has been limited in many ACP countries, some examples highlight their potential contribution. In Kenya, for instance, the government has established a unified and open licensing regime, invested in submarine and terrestrial fiber optic cables, removed VAT for mobile handsets, supported an internet exchange point and reduced the calling costs between networks. These measures have played an important role in attracting private sector investment, increasing competition, improving network quality and reducing the cost of mobile access. Some countries have also organised innovation competitions. In Senegal, for example, the telecom regulator Agence de Régulation des Postes et Télécommunications (ARTP) rewarded ICT innovations for agriculture, livestock and health. In Côte d'Ivoire, the government launched an innovation fund of EUR 200 million in July 2016, in collaboration with the African Development Bank, which aims at supporting innovative businesses and start-ups.

Many challenges for young e-agriculture entrepreneurs remain

Despite the rapid growth of e-agriculture businesses and applications, most ICT-enabled solutions have yet to reach scale and companies are struggling to move from start-ups, or even from application owner, to fully-fledged businesses. Young e-agriculture entrepreneurs in ACP regions are facing a number of challenges related to three key factors.

First there are the characteristics of the agriculture sector. While the agri-food sector offers a huge customer base with potentially more than 7 billion clients who consume services on a daily basis, most of the farmers are digitally illiterate and small-scale with limited financial means. They are strongly dependent on climate variabilities and natural hazards, which may suddenly deprive them of many of their assets. Moreover, outdated infrastructure, unreliable electricity and weak network coverage still persist in many rural areas. Despite this reality, many entrepreneurs market their ICT4Ag services to farmers while business-to-business opportunities are weakly explored. Young innovators often have a limited understanding of the agriculture sector, specifically the functioning of value chains and the diversity of stakeholders that could be targeted by service offerings.

The second key factor is the early age of ICT adoption in the agriculture sector. In addition to farmers, other key agricultural stakeholders – such as extension officers, agro-dealers, retailers, agricultural researchers and policy makers – could be promising clients with a higher purchasing power and better access to ICT infrastructure. However, many lack the necessary understanding of ICTs to request or employ ICT4Ag services. This is also due to the fact that ICT applications in the agri-food sector are still relatively new, even in more advanced economies, and many e-services are still being developed (although this can also be seen as an opportunity by e-agriculture entrepreneurs).

Insufficient support for entrepreneurial activities is the third factor. Specific gaps frequently mentioned by young entrepreneurs and application developers include the lack of business courses in agriculture and ICT curricula, the lack of capacities and sustainability in innovation hubs and incubators, the limited availability of venture capital (especially mid-level financing needed for

scaling), and an unfavourable business environment in general. The e-agriculture sector is more acutely affected by these challenges because it is a new market with unclear potentials for many stakeholders, including investors. Young entrepreneurs often struggle to develop profitable business models for their products. Information on their target market, its products and services is very limited. As a result, similar solutions are being marketed in parallel and most of them fail to reach profitability.

Attracting impact investors will require raising awareness of investment opportunities in e-agriculture.

Looking ahead

Addressing the above-mentioned challenges will require actions at various levels. Governments need to create an enabling environment for e-agriculture (and other) entrepreneurs and then leave the start-up sector to grow. Attracting impact investors will require raising awareness of investment opportunities in e-agriculture and better information about the market potential of ICT4Ag solutions. Innovation environments will need to be further strengthened, not only for e-agriculture, but the ICT sector as a whole, including through sustainable incubation spaces and mentorship. In addition, training opportunities for e-agriculture entrepreneurs need to be expanded by integrating relevant topics in university curricula and developing specific courses and training centres.

Such measures will help to establish the necessary framework conditions for young e-agriculture entrepreneurs to develop and commercialise their applications. In addition, to overcome challenges of marketing, purchasing power and literacy, more developers need to think beyond farmers as the main end users to increasingly target other players in the value chain with linkages to farmers (e.g. agrodealers, processors, supermarkets or insurance providers) or stakeholders that can facilitate the use of ICT-enabled solutions (e.g. farmers' organisations or savings groups). This will also require thinking beyond mobile phones, which

have been the preferred delivery channel for many service providers, to also take advantage of other mobile technologies, such as weather stations to monitor rainfall for insurance purposes, electronic scales and tags for supply chain management or sensors to measure soil moisture and nutrient levels for farm management. Such a broader focus on users and technologies will yield a much greater diversity of ICT4Ag services to support agricultural growth and rural development in ACP countries. ◀



About the authors

Heike Baumüller (hbaumueller@uni-bonn.de) is a Senior Researcher and Coordinator of the Programme of Accompanying Research for Agricultural Innovation (PARI) at the Centre for Development Research (ZEF) at the University of Bonn, Germany.

Ken Lohento (lohento@cta.int) is ICT for Agriculture Programme Coordinator at CTA; he notably coordinates e-agriculture and entrepreneurship activities. He is a former member of the United Nations Advisory Group on Internet Governance.

Related Links

FAO's 2015 "e-Agriculture 10 Year Review Report"

→ <http://goo.gl/YIA9NA>

CTA's 2016 report "Innovate for Agriculture: Young entrepreneurs overcoming challenges and transforming agriculture"

→ <http://goo.gl/cG2JkG>

Heike Baumüller's 2016 publication "Agricultural Service Delivery Through Mobile Phones"

→ <http://goo.gl/Kzb1GD>

'Farms could become the offices of the future'



Michael Oluwagbemi is co-founder and executive partner at LoftyInc Allied Partners and operator of the Wennovation Hub (www.wennovationhub.com) based in Lagos, Nigeria. He has extensive experience in business venture support and development. He serves on several boards including AfriLabs, where he is chairperson.

What is the objective of AfriLabs?

AfriLabs is the network of innovation open spaces and support organisations across Africa. The organisation is committed to promoting knowledge sharing, to enabling resource sharing, and to promoting integration among Africa's emerging innovation hubs, "incubators", and hacker spaces that have been instrumental to supporting Africa's new generation of technology innovators and enthusiasts.

What are "incubators"?

Incubators and accelerators are now jointly referred to as "incubators". They face familiar pioneer challenges. One of the main challenges is to create awareness of both the general public and policy makers about the value of their utility. Incubators are

relatively cheap and perform useful functions in Africa. They are the gateway to further engagement of Africa's youth population, especially the tech savvy youth, and reap the consequential rewards of social impact, innovation and job creation.

What can they do for agricultural development in Africa?

Africa's agriculture is still largely subsistence despite billions of development aid and grants towards advancing productivity and the attractiveness of the sector. Africa even continues to be a net importer of food despite having one of the largest proportion of arable land globally and despite having such a diversified bio-system that it could be the food basket of the world. Most of the advances in agriculture have been externally imposed on the continent with consequently poor adoption either due to lack of fit or cost. ICT start-up incubation and acceleration in agriculture provides a unique opportunity to re-engage Africa's own youths across the agricultural value chain, empowered with technology, so Africa can develop its own technologies fit for purpose and feed her citizens freed from the external dependency. Furthermore, it puts the "sexy" back in agriculture for our youths. Our farms could become the offices of the future.

What are the major challenges for young ICT entrepreneurs in agriculture?

I like to speak more about opportunities. The many obstacles in the food value chain provide entrepreneurs with golden business opportunities if they are willing to invest in solutions, for example in monitoring, storage, preservation and agro-industrialisation that enhance the value of crops and animals to the end-users as well as middle-men in the value chain. Along the many different operational challenges of running such a business, one interesting challenge for Africa's young entrepreneurs is how to represent Africa's staple foods to the

world. The field of food technology, product presentation and packaging holds many answers for this less explored path.

How can entrepreneurs in e-agriculture achieve revenue generation and profitability?

The surest path for revenue generation or profitability for any start-up in Africa is creating value. Start-ups that add real value to their customers (the farmers and the consumer) become the winners in the market. To do so would require a degree of collaboration with existing players, and leveraging the market channels that traditional players had built but have exploited sub-optimally. And as the latest Aso Villa Demo Day in Nigeria for start-ups showed with companies like FreshDirect and Foodstantly, there are many opportunities for entrepreneurs in e-agriculture in Africa.

How can ICT entrepreneurship in agriculture be strengthened in Africa?

There is no doubt that enhanced collaboration between farmers and techies has to be the first step towards achieving convergence in e-agriculture incubation and acceleration. Today, techies are more comfortable in their offices and rooms and farmers cannot fathom the essence of a hackathon. Bridging that gap by investing in immersion type experiences for techies in farms while developing a methodology already has been pioneered by Wennovation Hub and CTA in YEEFA Agrihack in Nigeria. This could go a long way in translating current problems to future solutions and markets. Both public policy advocates and their development partners such as banks, multilateral institutions, funders etc. have to invest more directly in suitable e-agriculture programmes in collaboration with stakeholders in the ecosystems, like incubators, accelerators, networks of angel investors, and organisations like AfriLabs that aggregate these efforts. This conversation must start and should result in precipitate efforts and actions. ◀

Building a healthy ecosystem for ICT entrepreneurs

Countries could see economic growth in e-agriculture when the private and public sectors are aligned to create a climate that fosters innovation. Some lessons can be learned from the Caribbean and Latin America on creating a healthy ecosystem for ICT start-ups in agriculture.

Troy Weekes and Leonard Seale of CropGuard attend a convening to create an agtech ecosystem in Barbados.

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In February of 2016 the Caribbean Development Bank and the Trident Angels Network, an investment group of Barbadian business leaders, convened a meeting to talk about how they can support scalable business development in Barbados. The Barbados Ministry of Labour, the Organisation of Eastern Caribbean States and the World Bank attended along with the Barbados Chamber of Commerce, PitchIT Caribbean, Start-Up Jamaica, Devlabs, and the Barbados Youth Entrepreneurship Scheme.

Critical to the meeting were local start-ups in different stages of development, from students with a business idea, to small businesses looking to expand from services to scalable solutions, to start-ups generating revenues and hiring their first employees. The stakeholders opened their networks to the entrepreneurs to allow them insight into the market, access to potential customers and support services. All the players identified gaps in the support structure for entrepreneurs,

and they formed a working group to foster a healthy ecosystem.

Validate with paying customers

CropGuard is one of such Barbados-based start-ups that was present at the February meeting. It tackles pests in agriculture with an innovative software platform that connects farmers to agri-suppliers while offering vital data to government agencies. CropGuard was launched in September 2014, and was the second prize winner in the AgriHack competition sponsored by CTA in October 2014.

CropGuard had developed a product, but was not yet making significant sales. Therefore, the team was encouraged to start approaching large customers immediately and to test their product by solving the needs of paying customers. Devlabs provided a sales opener, who had come out of the Start-Up Jamaica network, to fill up CropGuard's sales pipeline in Barbados. In three months CropGuard had approached all of the

farms in Barbados and closed contracts with 50% of them.

The CropGuard example illustrates that software based agriculture companies have the potential for quicker growth at a lower cost because they do not need a physical product before they start creating revenue. Entrepreneurs can test their product on paying customers, giving them vital access to develop solutions for their customers. This advantage is lost if entrepreneurs are taught to first seek out unrealistic investment. Most early stage ICT start-ups in agriculture do not need cash investment, they need technical development and sales support. Business leaders, business associations, incubators and accelerators can create impact by talking directly to entrepreneurs and giving them targeted sales or technical support.

Learn to pivot

The following two examples highlight further lessons learned based on the

experiences of Devlabs in supporting ICT start-ups in agriculture. Jermaine Henry is an entrepreneur based in Kingston, Jamaica, who specialises in business development. He worked with a team to create a two-sided agriculture marketplace, connecting farmers to wholesalers. Their business would have to get both farmers and buyers on their platform. His team was winning pitch contests, going to conferences, getting press attention, and speaking at the United Nations about alleviating hunger in developing nations. Their business plan expanded to providing capital upfront to the farmers while wholesalers sold their product. Yet after a year and a half they had not finished building their platform and they had not made one sale.

An advanced ecosystem allows entrepreneurs to fail and learn from their mistakes.

Devlabs brought Henry and his team to Silicon Valley for an informal fellowship. In the first week Henry was talking to farmers and buyers. He realised that his solution was too complicated and unsustainable. Henry spent time on the Oakland docks with wholesalers, watching them work and found that their systems were analogue and time consuming. Henry saw an opportunity for a software solution that would be manageable to create and added value. He pivoted from a marketplace to a management tool for freight forwarders in his new company, Quicdock.

Henry's experience shows that ICT entrepreneurs in agriculture need to focus on talking to their customers to develop a product that fits the needs. Education and training programmes as well as incubators and accelerators need to understand this and not distract entrepreneurs from building a product and making sales. In addition, moving away from two-sided market places and focusing on selling business to business are sustainable strategies for entrepreneurs that do not have access to angel or venture capital and need to make sustainable revenues immediately.

Learn by failure

Chile is a country that has invested heavily in the software and ICT start-up ecosystem and has transformed itself into

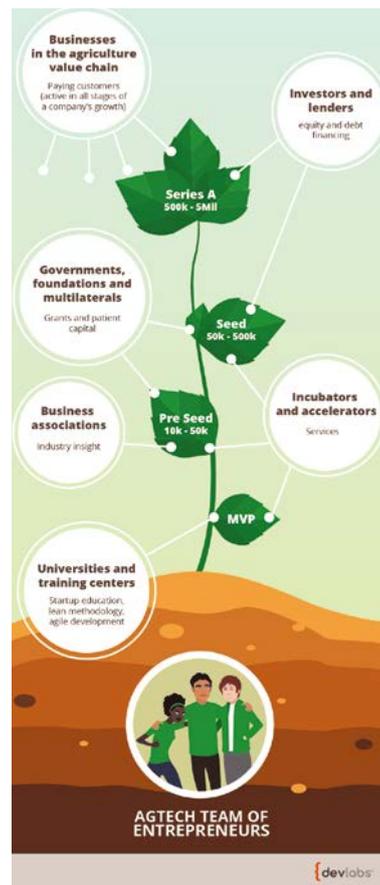
the innovation and entrepreneurial hub of Latin America. In 2010 the Chilean Economic Development Agency (CORFO) launched Start-Up Chile, which offers training, mentoring, networking events and US\$40,000 in seed grants to start-ups. Universities support start-up entrepreneurship, and there are tax and immigration policies to attract foreign investment.

ReinSystem is one of the start-ups to come out of the fertile ecosystem in Chile. The team created the business at Universidad de la Frontera as their thesis project. ReinSystem was a combination of hardware and software to help farmers monitor soil conditions. They leveraged the university's incubator, Incubatec grant programme. The seed funding they received allowed them to develop the software and hardware to begin selling across Southern Chile. After a year of generating revenues, some members of the team realised that their revenue margins were too low and decided to create a new business. From their work with ReinSystem they learned that most large farms already have sensors in their soil and that the indicator that makes the biggest impact is water. They decided to focus solely on vineyards. In three months the team launched Irricrops, a software platform that helps vineyards manage irrigation. Irricrops is now experiencing growth five times as fast as ReinSystem.

The Irricrops example illustrates an advanced ecosystem that allowed entrepreneurs to fail and learn from their mistakes. The Irricrops team learned from their first experience and launched their minimum viable product (MVP) quickly, with contracts already pending. They applied for and received the same funding that they received for their first company. The ecosystem did not penalise the team for their failure, but allowed for experimentation and learning. Governments, foundations and multilateral organisations should not invest in companies, but should invest in the talent in the region.

Collaborative relationship

What the three examples show is that when stakeholders including governments, investors and the business community, are committed to investing in entrepreneurial success, a diversity of entrepreneurs are empowered to create inventive methods and solutions. An ecosystem in which agriculture technology can be developed and flourish, therefore, depends on the



collaborative relationships that support the local ICT entrepreneurs and trust building among the actors, like education institutions, start-up incubators, accelerators, business associations, government and multilateral programmes. Everyone in the ecosystems needs to understand the key points that make e-agriculture companies different from traditional agriculture businesses and how to support their growth. ◀

About the author

Barni Qaasim (barni@devla.bs) is a partner at US based Devlabs Venture Capital, which helps potential high-growth ICT start-ups in the Caribbean and Latin America to become investment ready.

Related Links

- Website of Devlabs Venture Capital
→ <https://devlabs.vc/>
- Website of Start-up Chile
→ <http://startupchile.org/>

Enabling user-inclusive innovation in African agriculture

Ignitia has developed a disruptive technology that allows smallholder farmers in West Africa to access accurate weather predictions. Engaging with local partners and initiating reliable impact measurements were key factors to gain trust and scale-up the business.

Youth e-agriculture entrepreneurship

Within ICT there are a few successful examples of technically advanced solutions that radically change opportunities in underserved markets, such as mobile payment solution M-Pesa. However, there is a lack of similar successful examples by small and medium-sized enterprises (SMEs) or new ventures. Many companies manage to do a promising pilot, but to execute a scale-up has proven very complex. The reasons are still not well researched and current literature for scaling strategies in underserved markets are simply not proving to prepare or guide entrepreneurs well enough, with exception of a few hands-on business accelerators such as Dasra (India), the Unreasonable Institute (US) and Villgro (Bangladesh).

One longitudinal study of the Royal Institute of Technology in Sweden focuses on how innovative entrepreneurs could scale-up while engaging with

end-users who are poor, live in rural areas and often are low-literate. The study includes the company Ignitia, with its headquarter in Sweden and subsidiaries in Ghana and Nigeria. It all started with the realisation of a young meteorologist that there were no accurate weather forecasting models specifically developed for tropical Africa. Existing forecasts provided information that was more often wrong than correct, leaving farmers trying to predict changes in weather based on observing nature. The basic need for accurate forecasts is to get a good estimate of whether it will rain or not, sufficient for sowing and applying fertilisers, and to plan the harvesting. Few farmers in Western Africa have irrigation and low productivity effects the economic risk of buying high-quality inputs that may go to waste if the farmer has little idea whether the coming month will be wetter or drier than normal.

Finding local partners

A team of young entrepreneurs decided to set up the operations of Ignitia in Accra and developed an enhanced weather forecasting model. The idea was to deliver 2-day forecasts in such simple format that the simplest phone could be used and to the lowest possible cost for the user. Still, the forecast had to be very accurate, not just for a district, but at the location of each user's farm.

One of the first practical challenges was the frequent power cuts, which led the team to put the supercomputers that are critical in processing the huge amounts of satellite data and run the algorithms that the team developed, in Sweden instead of Ghana. It took two years (and a total of 15 man years) to research and develop the high-resolution tropical forecast model before the service was piloted with farmers in Northern Ghana.

During a farmer training in Northern Ghana, Ignitia explains the concept of predictions and how the mobile service works.



A start-up has to deal with the many mixed feedback messages that it receives from end-users and clients.

During the pilot phase the business model was tested. First of all, how to engage with local partners such as farmer cooperatives and NGOs to make farmers aware of the service and to train them. If these partner organisations see the service as a productivity-enhancing tool, they may be willing to pay for it on behalf of the associated farmers. Therefore, Ignitia first researched and networked its way among local farmer associations and international development communities to find the right local partners. In parallel to this, the company researched farming practices, so that it would understand better how farmers would use weather information depending on type of crop and different farming methods.

The local partners became important actors that provided the company also with feedback on how the service was perceived in terms of accuracy over time and to evaluate whether the service influenced farmer's behaviour. Once these factors have been validated and impact measured, Ignitia is better equipped to approach more partners, which are essential to reach out to the poorest and the most remote farmers in Western Africa and for the business model as local partner organisations pay for the forecasts on behalf of the farmers. The other important channel to market the service is offering the tool through a mobile operator via short code so that any person can subscribe to the service. The users are charged just a few cents per day from their mobile credits.

Learning from the illiterate users

Symbols for clouds, rain and sunshine would help low-literate and illiterate users to understand the forecast, the team initially thought. In addition to the symbols, these messages also included the number 1, 2, and 3 to indicate how certain the forecast was. However, the number indication caused a lot of confusion. The decision was made to train farmers on this rather than taking it out of the message, as the message could be misinterpreted that the company is dictating the weather rather than predicting it. And when



Ignitia's team is receiving feedback from farmers that their yield has increased with the assistance of better forecasts.

international staff in one of the NGO projects pointed out a problem with the symbols, they were changed into words. The users may be illiterate but they have proven perfectly capable of recognising the few words that are used in the forecast.

A start-up has to deal with the many mixed feedback messages that it receives from end-users and clients. This should certainly not be interpreted that decisions to change things are not necessary, but must be inspirational for further development of the ICT service and business decisions. Today, the company has a marketing team that includes competence in anthropology and have introduced a rapid-prototyping process to test marketing ideas. Getting to know markets and end-users, whose preferences vary a great deal across such diverse countries as in West Africa, is expected to take time and require testing of different approaches. Observations of what people do and the influence on behaviour changes as they interact with ICT based services, rather than interviewing, would sometimes be more effective to overcome language barriers and biased responses. For a small enterprise with very scarce resources this is rarely feasible.

Impact measurements

In the case of Ignitia there were some external studies that gave the company indications that its ICT tool was helpful for smallholder farmers to increase their productivity, which in turn may lead to increased economic status and poverty reduction. Any business that produces a type of decision tool for a farmer, needs to be careful with impact measurements as it has to measure changes in behaviour

of farmers and then try tracking what the effect of this changed behaviour could be. For example, a willingness to chose higher quality inputs and more fertilisers, because they are more confident about when rain is coming by using the ICT tool, which then may in turn lead to higher yields. A study done by students at Yale has given Ignitia preliminary results that their service indeed does influence farmers' behaviour and that the forecast is often shared among neighbours.

The Ignitia entrepreneurs have also been subject of questioning and outright suspicion from international meteorology institutions, due to their claims of achieving higher accuracy than other, more established organisations. Part of the controversy is not about the science and what the company has managed to develop, but comes down to the start-up being a private company, which is selling its services in low-income markets. A start-up that is disrupting a traditional sector, is not welcomed by all with open arms. ◀

About the author

Ruth Brännvall (ruth.brannvall@indek.kth.se) works at the Department of Industrial Economics and Management, KTH The Royal Institute of Technology in Sweden.

Related Links

Official website of Ignitia.
→ www.ignitia.se

Balancing entrepreneurial values with social impact

Social entrepreneurs in Africa have developed innovative ICT-enabled models for agriculture with the aim of combining profit with inclusive rural development. Their main challenges are scaling-up and earning an income while serving the poorest rural communities.



Youth e-agriculture entrepreneurship

private sector actors (e.g. short-termism), public sector actors (e.g. budget constraints), and civil society (e.g. entrepreneurial limitations) leave many options open for improvements, it is social entrepreneurs' mission to fill this gap by combining social and entrepreneurial values.

The majority of small-scale farmers are excluded from formal financial institutions and borrow at high interest rates from informal sources. Most lack information and awareness of the benefits of improved inputs such as hybrid seed, concentrate feeds, fertilisers and pesticides, or machinery. Most smallholder farmers rely solely on rainwater for their crops, while basic irrigation systems could double a field's productivity. Social enterprises play an increasing part in using innovative business models and technology to solve such challenges. Esoko, for example, is a social enterprise that has developed apps that train and support farmers in monitoring production, increasing yield and marketing. Esoko tracks data generated from the apps for analytics and uses it to improved farm yields.

One way to strengthen the efficiency of lending to smallholder farmers is through mining the credit history of potential customers for financial institutions. FarmDrive, for instance, conducts credit assessment of smallholder farmers using a digital book-keeping platform. The enterprise's technology enables farmers

The concept of social entrepreneurship, the idea of using business to solve major social and environmental problems, is gaining traction in East Africa and particularly in agriculture. Poor farming practices, inefficient processing, storage and supply chain infrastructure leads to wastage, distorts pricing and supply. For the social entrepreneur such challenges in the food value chain provide business opportunities.

Intelcap analysed over 400 social enterprises across East Africa, of which many are working in agriculture. The findings have been captured in the Game Changers Report (2016). Technology was

identified in the report as a key enabler for social entrepreneurs in agriculture; lowering transaction costs and enabling scale through provision of information, finance, collectivising smallholders and providing market linkages. The report classifies social enterprises across three levers based on their interaction with the bottom of the pyramid (BoP): access, ability, and knowledge. (See table below.)

Business opportunities

Social entrepreneurship has the opportunity to improve rural employment, to empower communities, and to tackle various constraints in the food value chain. While

	BoP Involvement	Value to BoP	Agriculture Models	Target Market
Access	As consumers of critical products and services	Improved access to critical products and services that are high quality and affordable	Agriculture inputs	Rural and urban BoP
Ability	As partners in enterprise value chain and/or skill development	Through skills improvements, increased productivity and output	Agro-processing and capacity building of farmers	Rural, urban and export market (middle and upper income)
Knowledge	As consumers of information	Improved awareness and behaviour change towards better quality of life	Information linked to good farming practices	Rural and urban BoP

Access/Ability/Knowledge Framework (Source: Intelcap 2016)

to track their productivity, expenses and revenues which are analysed to reveal performance patterns. The information helps financiers to make lending decisions based on the credit profiles of the borrowers.

Small vendors lack money and time to travel distances to remote rural markets to purchase fruits and vegetables. Therefore, social enterprise Twiga Foods has developed a tool that vendors can use to order stocks. It procures the produce directly from farmers at a guaranteed price and delivers it to the vendors. The vendors are allowed to make flexible payments using mobile money depending on what they sell during the day.

Social entrepreneurship has the opportunity to improve rural employment, to empower communities, and to tackle various constraints in the food value chain.

Challenges for social enterprises

Social entrepreneurs that serve poor and remote rural communities face many obstacles. Although for social entrepreneurs the social mission is as important as profit-making, earning an income from their activities is a must. A key challenge, however, is the limited purchasing power of a low income rural population. Intellecap noticed a shift in the way social enterprises in Eastern Africa react to the challenges of affordability. Creating affordable products was synonymous to creating low-cost products with basic features. However, social enterprises now focus on designing innovative pricing and payment solutions for full-feature products and services. They use sliding fee scales or special discounts for people of lesser means or introduce new payment models.

For example, there is the pay-as-you-go model that is also referred to as a progressive ownership model or rent-to-own model. Social enterprises use this model to provide rural asset financing for the low income population. In this model, a consumer pays an initial deposit for an asset and pays instalments on a regular basis. Once the instalments are paid to cover the balance cost, the consumer owns the product and can stop paying instalments.

Another challenge for social enterprises is that they often have to build markets, create demand for their offerings and educate customers. Poor infrastructure and uneven geographic distribution

make it cost-prohibitive for small companies with limited scale to reach a network of thousands of disparate farms while larger companies encounter a host of logistical issues. Transportation bottlenecks can also run up costs.

Way forward

Intellecap's analysis has shown that East Africa has seen a proliferation of entrepreneurship and innovative business models with two factors emerging as key for success. Firstly, the importance of providing end-to-end support across all stages of the value chain. Those enterprises that provide quality inputs and processing facilities, support capacity building of farmers, and ensure market linkages were the most successful. This model locks in revenue stream and collectivises smallholder farmers to reap economies of scale whilst ensuring that farmers receive fair pricing for their products on a regular basis. Secondly, enterprises should consider leveraging technology. Enterprises with access to customer data can collect, analyse and predict future trends and highlight business opportunities. In the absence of such data, customer insights remain locked within individuals and enterprises and responses to challenges remain reactive.

Despite numerous examples of social enterprises in e-agriculture, social entrepreneurship is still nascent in East Africa and more than 60% of enterprises interviewed for the report were younger than five years old. Around half of the enterprises have not achieved break-even and 67% earn revenues of less than US\$100,000. Investments of US\$100,000 to US\$500,000 are critical for the growth of these enterprises, but currently demand for such investments outstrips supply. As such, impact investors focusing in East

Africa need to design innovative financing mechanisms such as multi-year financing plans, result-based financing, and other forms of blended finance in order to cater to the growing demand. With financing and support the enterprises will be able to scale simultaneously creating profit and much needed impact.

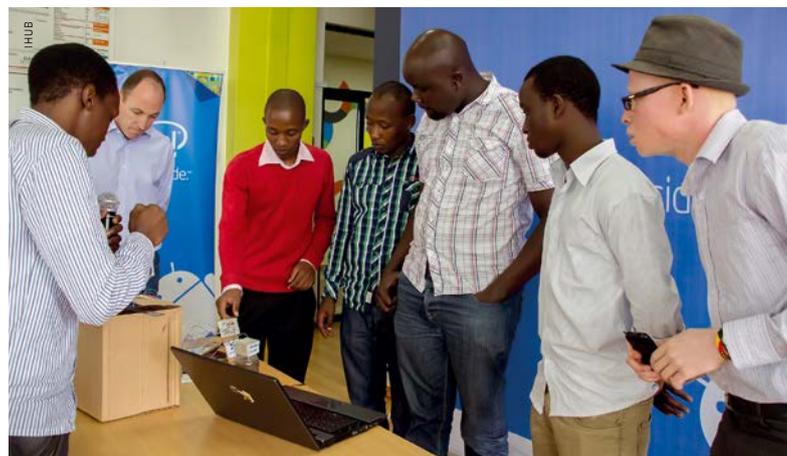
Ultimately social entrepreneurs need a lot of support not only financially but in capacity building and networking. This can come from governments, NGOs, donors, private sector actors (e.g. angel investors or impact investors), and increasingly specialised support organisations for the social enterprise. The support should not only target the individual social entrepreneur, but must seek to create the perfect ecosystem for social entrepreneurship to succeed in their social mission. Because such ecosystems are less advanced in rural areas, support should take into account the special measures to succeed social enterprises in rural circumstances. ◀

About the author

Sheena Raikundalia (sheena.r@intellecap.net) is a senior advisor with Intellecap's consulting team in Kenya providing strategic advisory services to corporates, start-ups, development agencies and NGOs across the East Africa market.

Related links

Website of Intellecap
→ <http://www.intellecap.com>
Game Changers report (2016)
→ <http://goo.gl/lyM6AP>



A look in the iHub in Kenya where young innovators meet each other.

Young ICT entrepreneurs provide solutions for agriculture

The IITA Youth Agripreneurs' (IYA) ICT unit has established its own businesses by making use of ICT tools, like drones. The members also give ICT trainings with the aim to enhance agriculture and sensitise rural entrepreneurs.

Youth e-agriculture entrepreneurship

Just as there is e-commerce, e-banking, e-learning, there is now “e-agriculture”. It refers to the use of ICT to provide solutions to problems encountered in the agricultural sector. E-agriculture is attracting youths to agriculture and some have identified opportunities for income generation through enterprises that deliver ICT empowered services to farmers and to other actors in agriculture. In other words, the advent of ICT in the agricultural sector has changed the face of Africa’s agriculture and now forms part of what is attracting young people into the sector.

IYA is a group of young graduates established by the International Institute of Tropical Agriculture (IITA) in 2012, which foresees a bright future for e-agriculture in Africa. The youth who are from diverse educational backgrounds have embraced agriculture as a business. They are involved in several profitable agribusiness enterprises from involvement in the production, packaging, and marketing of farm produce. The goal of this IITA

youth-in-agribusiness programme is to reorient youths towards more productive engagement in agriculture through expanded opportunities in agribusiness, service provision, and market-oriented agriculture, for example by making use of ICTs. It conducts agribusiness incubations and offers training and mentoring to other youth. Furthermore, it creates and develops promising collective enterprises and stimulates the involvement of youth in agribusinesses for the benefit of the larger rural community through employment, out-grower opportunities and income generation.

Investing in drones

IYA’s ICT unit has started its own business to help farmers adopt to modern farming methods. For example, it adopted the use of drones for capturing aerial pictures and video documentation of field activities, monitor crop performance, and perform other research-related functions. Starting the drone delivery services within IITA, the group first had to sensitise researchers to ensure that the

technology became widely accepted among researchers who can use it for data capturing.

Using a Phantom 2 vision + drone the ICT unit could earn about US\$1,000 every month from the services rendered to research scientists. With an aggressive marketing strategy, and through sensitisation and awareness on the usage and benefits of the drone, the youth agripreneurs managed an increase in their drone business activities and revenues, even resulting in a long waiting list of clients. The ICT unit could purchase another sophisticated DJI Inspire 1 drone from their earnings and now provide more research-related services to scientists depending on duration, location, and intensity of the work.

Another group of clients emerged at the same time. Local farmers in the Joga-Orile in Nigeria learned about the benefits of using drones and were eager to hire the services of the youth entrepreneurs. Although drones are becoming cheaper, smallholder farmers in Nigeria are still not able to afford the technology and do not have the

This photo was made during a drone operation conducted by IYA’s ICT unit in Joga-Orile, Nigeria.



A start-up has to deal with the many mixed feedback messages that it receives from end-users and clients.

necessary knowledge and skills in using the technology and analysing the data. Therefore, the majority of farmers prefer working together with the entrepreneurs from IYA's ICT unit.

The expectation is an increase in demand for the drone service in the future and high return on investment for the youth entrepreneurs, which could result in competition with other entrepreneurs involved in using drone technology in agriculture who could enter the market in the near future. However, the youth agripreneurs of IYA are not afraid of competition. They have built an extensive network of scientists, researchers, and local farmer communities that could secure further expansion of their business activities.

Empowering youth entrepreneurs

IYA is also taking up the challenge of training other young agripreneurs in Ibadan, Abuja, and Kano, on the use of a 'smart tractor' developed by Hello Tractor. The Smart Tractor is a versatile machine with eight attachments to serve farmers throughout the farm production cycle. It has attachments which include those for tilling, ploughing, threshing, haulage, irrigation pumping and sprinkling, iron wheels for wet paddy rice production, and other vital farming needs. The tractor is also fitted with a GPS antenna, local SIM card, hard drive and telematics capabilities, which enables them to connect the Smart Tractor to the powerful cloud software of Hello Tractor, even in rural environments with low connectivity. Its connectivity feature enables Hello Tractor to pair farmers in need of tractor services with a Smart Tractor owner within their vicinity through a simple text message service.

Hello Tractor sells its Smart Tractors to entrepreneurs, farmer organisations, and individual farmers that provide agricultural mechanisation services to farmers in Nigeria for US\$4,000. However, it has to train these entrepreneurs in maintaining the tractors and promoting their services. IYA now is involved in training the



Demonstration of Hello Tractor in Nigeria, where currently only 4% of the country's demand for tractors is being met.

entrepreneurs. It gets paid by Hello Tractor for delivering trainings for them. So far IYA has received nearly 3,000 applications for the trainings.

IYA is also finalising and launching an e-commerce platform for the sale of agricultural produce. The platform will link farmers to buyers and create a level playing ground for all the players along the value chain to benefit. The application is being developed by the GreenWealth Agripreneurs, who are currently running an incubation programme in IYA. The Incubates get stipends for up-keep and are expected to be at the incubation centre for 18 months after which they establish their own agribusiness enterprises with loans that are based on a bankable business plan.

Some of the "incubates" have seen the opportunities that come with establishing firms that could create solutions to agricultural problems using ICTs, and in turn create job and wealth for themselves. However, major challenges to e-agriculture remain such as high costs of acquiring the skills and the tools, and the level of reluctance shown by farmers in adopting innovations. Convincing the older farmers to make use of these tools is difficult as many of them prefer to do agriculture the conservative way. However, the young farmers who are taking over from the ageing farmers will find ICTs more interesting and will develop better skills over the years.

IYA and within it the ICT unit, is committed to encourage ICT entrepreneurship in agriculture. With its incubator programme, trainings, and by establishing entrepreneurial activities themselves, they give the youth the opportunity to learn,

understand, and increase confidence in becoming an ICT entrepreneur. This will change the dynamics of rural entrepreneurship in general and will create unlimited opportunities for youths to successfully run agriculture as a business through innovative ICT service delivery and trainings. ◀

About the authors

Festus Oluwadamisi Okunlola (f.okunlola@cgiar.org) is a graduate of Plant Breeding and Seed Technology. He joined IYA in 2015 and is currently working with the ICT unit of IYA in Ibadan, Nigeria. Adetola Adenmosun (a.adenmosun@cgiar.org) is a graduate of Mass Communication. She joined IYA in 2014. She currently works with the communication unit of IYA in Ibadan.

Related Links

Official website of IYA

→ www.youthagripreneurs.org/

Follow IYA on Twitter

→ www.twitter.com/iitayouthagri

More cases of ICT entrepreneurs in agriculture on ICT Update's brand new website. Read exclusively on [http://ictupdate.cta.int/about-ICT-entrepreneur Robert Gichuru from Kenya, who has created Mulika Pesa software. And about David Jonathan from Nigeria, who has started FarmAfriQue.](http://ictupdate.cta.int/about-ICT-entrepreneur-Robert-Gichuru-from-Kenya-who-has-created-Mulika-Pesa-software)

Unleashing the next generation of entrepreneurs in e-agriculture

The Tony Elumelu Foundation has started a Pan-Africa entrepreneurship programme for a total of 10,000 start-ups. Many of them work in agriculture and strive to modernise the sector with technology-based solutions.

Tony Elumelu at 2015 TEF Entrepreneurship Bootcamp.

Youth e-agriculture entrepreneurship



In December 2015, shortly after Nigerian billionaire businessman and philanthropist Tony Elumelu publicly committed US\$100 million to empower African entrepreneurs, recommendations poured in from world leaders, technocrats and African business owners. The Tony Elumelu Foundation Entrepreneurship Programme is rooted in the inclusive philosophy of Africapitalism - the belief that a vibrant African-led private sector with significant participation from entrepreneurs, is the key to unlocking Africa's economic and social potential.

The Entrepreneurship Programme is now in its second year of a decade-long commitment to grow 10,000 African start-ups and businesses capable of collectively creating at least one million new jobs and contributing up to US\$10 billion in revenues across Africa. Studies reveal that 60% of small and medium-size enterprises collapse within a few months of launching in Kenya, while 95% of SMEs die within twelve months in Nigeria, due to constraints that vary from insufficient financing to a lack of access to mentorship, networks,

and markets, amongst others.

To combat these sober statistics, there has been a flurry of entrepreneurship competitions and accelerator programmes in the local start-up scene. As Marième Jamme, CEO-Entrepreneur and Curator of Africa Gathering, observes in the Huffington Post, these initiatives have had little success in supporting entrepreneurs due to the short-term nature and an over-focus on a single aspect of the entrepreneurship value chain at the detriment of other areas the entrepreneur needs crucial support in.

The entrepreneurship programme of the Tony Elumelu Foundation addresses these sustainability challenges that have afflicted many past SME-support initiatives. The programme is deliberately holistic with seven core pillars: start-up business skills training, expert mentoring, seed capital funding, access to an online resource library, membership in the Africa-wide alumni network of the Tony Elumelu Foundation, frequent meetups with stakeholders (including top policy-makers), and participation in Africa's biggest annual entrepreneurship networking Forum.

Building enterprises that last

The programme actively addresses the diverse needs of young African businesses, from funding to mentoring to training and focused networking. By doing so it ensures that the start-ups are built to last. Throughout the task-based business training exercise, each entrepreneur is guided by a mentor with relevant sector experience. At the end of this learning period, the young entrepreneurs are fully equipped to create sound business plans after which they receive the first non-refundable tranche seed capital of US\$5,000. The second US\$5,000 investment is only eligible to entrepreneurs who have demonstrated consistent progress and is given in the form of either a loan or equity.

Since 1 January 2015 65,000 applications have been received from all over the continent. During the first two years 2,000 entrepreneurs have made the final cut to become Tony Elumelu Entrepreneurs based on their scores on five factors: feasibility, market opportunity, financial understanding, scalability, leadership potential and entrepreneurial skills. The other 63,000

Africa's youth are aggressively identifying opportunities in agriculture, and leveraging innovation and technology tools to build sustainable and profitable agri-businesses.

candidates remain as members engaged in the Tony Elumelu Foundation Entrepreneurship Network where they receive non-financial support and access to diverse opportunities for their business ideas.

Young entrepreneurs in agriculture

Amongst these start-ups, agriculture is by far the most popular sector. The data suggests that contrary to mainstream belief, Africa's youth are aggressively identifying opportunities in agriculture, and where possible, leveraging innovation and technology tools to build sustainable and profitable agri-businesses. Over 20,000 of entrepreneurs in the network are engaged in ventures along the agriculture value chain and at least 600 of the 2,000 finalists are involved in agri-business.

The majority have built businesses in the more advanced end of the value chain including processing, cold rooms, storage, distribution and increased reliance on ICT. They are utilising innovative techniques that enhance the competitiveness of the sector, resulting in standardised produce and products that are eligible for export overseas.

This trend of utilising technology to increase transparency and efficiency in agriculture is widespread in Africa and gives insight to what extent entrepreneurs are employing ICTs and a range of technology platforms to drive development in agriculture. Transforming agriculture will unlock jobs and improve skills at a time when forty million young people in Africa are out of work. Over 30% of the finalists who work in agriculture have joined local cooperatives to share the training they have received and provide support to farmers. Others have become inspired to return to school to earn advanced degrees in agriculture.

SME-friendly policies

Entrepreneurs do not exist in isolation. In order for entrepreneurs to succeed, they must operate in economies with SME-friendly policies in place that allow them to thrive, generate income and create employment for others. Essentially, to succeed, they need the public sector to create an enabling environment for

their businesses. In line with this, the Foundation produces evidence-based reports to support policymakers in addressing key issues in finance, access to markets and information, high operating costs, scarce inputs and equipment, obsolete land laws, and high taxes that affect start-ups. In May, the Foundation released the "Unleashing Africa's Agricultural Entrepreneurs" publication at the 2016 World Economic Forum on Africa in Rwanda.

The report's insights come from case studies and experiences of Tony Elumelu agricultural entrepreneurs, as well as input from established stakeholders, practitioners and investors across the value chain. Eleven key recommendations are included for decision-makers in the private and public sectors to improve the agriculture value and supply chains: cheaper and more reliable access to finance, insurance, and inputs such as fertiliser, seeds, livestock vaccination, pesticides; more formal degrees of training and extension services; improved storage and warehousing to mend the fractured value chain; agri-friendly financial products, like warehouse receipts to enable borrowing from banks; reduced taxes or tax breaks and provision of infrastructure to support and engender productivity rather than hinder entrepreneurial investment in the long term. ◀

Four of the finalists in the Tony Elumelu Foundation Entrepreneurship Programme:

Crowd Farm Africa Ltd is a Kenyan crowd-farming company. Crowd Farm Africa uses technology to promote shareholding farming, strengthen local agricultural value chains, and connect smallholder farmers to markets. Crowd Farm's online platform enables investors to invest in the food value chain. All investments are centrally managed by Crowd Farm Africa to ensure high returns. (www.crowdfarmafrica.com)

Sub-zero Foods Networking Company in Nigeria is an e-platform that preserves and distributes a variety of frozen foods, like sea foods, poultry, fruits and vegetables. All produce is preserved via freezing technology, marketed online and distributed to customers. The mission is to reduce food wastage and losses caused by poor preservation and storage methods. (www.sub-zerofoods.com)

Enric Farm Fresh Delivery Enterprise in Kenya is an online store that facilitates home and office delivery of locally-sourced organic fresh fruit and vegetables. It provides local farmers with trainings, seeds and seedlings for planting. The sales strategy targets working professional and business owners with no time to visit food markets and supermarkets. The company makes a small premium on every delivery. (www.enricfarmfresh.co.ke)

Fasbol Global Link Limited in Nigeria produces, packages and distributes gluten-free foods and flour through its online platform. The client base includes gluten-sensitive individuals, celiac disease patients and diabetic patients. The company's vision is to be the preferred supplier for people living with health challenges in Nigeria. (www.fasbolglobalink.com)

About the author

Somachi Chris-Asoluka (somachi.chris-asoluka@tonyelumelufoundation.org) is the head of research for the Tony Elumelu Foundation in Lagos, Nigeria.

Related Links

Website of Tony Elumelu Foundation Entrepreneurship Programme.

→ <http://tonyelumelufoundation.org/teep/>

Tony Elumelu Foundation's publication "Unleashing Africa's Agricultural Entrepreneurs".

→ <http://goo.gl/PDbRRD>
Article in The Huffington Post of Marième Jamme.

→ <http://goo.gl/xzmWAU>

Support for ICT entrepreneurs to match each need

French mobile phone provider Orange has developed several support programmes for ICT start-ups in Africa and the Middle East. By providing the right, tailor made support facilities it aims to enable a home-grown e-agriculture sustainable growth model for innovative, young entrepreneurs.

Social Venture
Prize winners 2015.

Youth
e-agriculture
entrepreneurship



Launched in 2011, the Orange for Development Programme (O4D) supports the development of innovative solutions to meet local needs and contribute to the creation of digital ecosystems to drive social progress and economic development in Africa and the Middle East. The programme's three pillars are: developing infrastructure and connectivity, providing services tailored to needs, and supporting innovation in local ecosystems. Agriculture is one of the main areas of engagement together with healthcare, education, financial services, and women.

Better connectivity to farmers through a reliable infrastructure gives opportunities building tailor made support and services for farmers. Therefore, the O4D programme also invests in start-ups in e-agriculture, which take part in Orange's various support channels (see box on page 17). One of the flagship activities is the Orange Social Venture Prize. This prize awards three start-ups each year with €25,000, €15,000, and €10,000. Since 2011, twenty-two start-up enterprises have received not only prize-money, but also extensive support.

All finalists and the "Entrepreneur Club's choice" award winners will receive support to develop their products and services in a six-month private coaching programme that includes professional entrepreneurs, ICT experts, and NGO representatives. Only the first prize-winner will be awarded a registered patent.

The French mobile phone operator also supports entrepreneurship by sharing experiences and know-how by offering access to its exchange platforms and networks and by facilitating the creation of new ICT services through application programming interfaces (APIs). Furthermore, Orange opened incubators in Senegal, Mauritius, Niger, Mali, and Guinea. The idea for these incubation programmes is to design an inclusive space with horizontal governance that brings together the public sector, the private sector and civil society, to increase the success rate for start-ups.

Technical support

Abdou Maman Kané from Niger is one of the prize-winners of the first edition of the Social Venture Prize with his enterprise Tele-Irrigation. He developed a technological process allowing farmers to remotely pilot the irrigation

of their fields with a mobile phone (even with the simplest models), from any geographical location of a certain radius. This smart system allows farmers to save time and water.

Winning the Orange Prize in 2011 has had a decisive impact on the development of his enterprise. Kané acknowledges that the prize opened many closed doors as the prize gave his company credibility, in particular with banks. International experts also back his ICT solution. He has received an award at the Geneva International exhibition of inventions in 2012 and was then selected by the French-speaking Institute for Sustainable Development and represented at the World Water Forum in Marseille. With all the support he managed to improve the product and could increase his clientele to more than a hundred paying customers in Niger.

Another entrepreneur who received support, is Aboubacar Sidy Sonko from Senegal. He founded the virtual agricultural hub MLouma in 2012, which publishes real-time information on the price, location and availability of farm products. Farmers and buyers can receive updates via the internet, SMS notifications or a call centre to quickly find out where to buy their



DOMINIC CHAVEZ/WORLD BANK

Photo on the left: Farmers working in their fields in preparation to plant corn in Gnongouya Village, Guinea.

products at the best price. Mlouma won the 2014 Orange Developer Challenge, integrating three APIs in the process: USSD, to make the platform available via feature phones; SMS, to notify users of prices; Billing, to charge users communication credits while they browse. Since winning the Challenge and integrating the APIs, Mlouma's user base has grown from 500 exclusively web-users to more than 100,000 mainly mobile phone users in 2016. The ambition now is to cover Senegal's entire agricultural sector and make inroads into neighbouring countries.

'Our major challenge at the start was to reach farmers who live in rural areas without access to the internet,' says Sonko. The Challenge was our best opportunity to extend our services to the mobile market that could reach farmers more easily. Sonko appreciates most of all the technical support received from Orange Senegal in the implementation phase. 'Our two strengths are the scalability of our service and the quality of our partnership with Orange and their network of APIs in Africa,' he adds.

Challenges remain for winning enterprises

Sonko hopes that start-up support programmes also will focus on promoting solutions and training in the use of ICT in agriculture to end-users that are the producers, transporters and traders. 'This would achieve a critical mass of users in agriculture for the good of all stakeholders. And it should open APIs to other young entrepreneurs in the field of ICT4Ag.'

Not all the prize-winners do have the same success story. Among the

Start-up support programmes should also promote trainings in how to use ICTs in agriculture to end-users to create a critical mass of users.

prize-winners many saw difficulties to which they had to adapt, or that occasionally became too big to be solved, which was for example the case of Kachile in Ivory Coast. This company was one of the prize-winners of the 2011 edition, but because of the crisis in the country and an immature market, it could not survive. Or take the Agasha Business Network, created by Sharon Againe, a 2011 prize-winner, who designed a web marketing agency that promotes and connects African SMEs in agriculture who are having difficulties in accessing the global market. Technical problems prevented the web-based platform from being created. Now the concept continues in the AgaSha Group, the publisher of Agribusiness Directory East Africa that consists of linking agribusinesses, experts, professionals and supporting sectors in agriculture. It also facilitates Whatsapp Agribusiness Information Platform groups with over 1,500 participants sharing opportunities, experiences and challenges in real time with experts and practitioners.

Both successes and failures determine the future of O4D's entrepreneurship programme by providing the right, tailor made support facilities, which enable an e-agriculture sustainable growth model for enterprises. ◀

Orange start-up support in Africa:

Entrepreneur Club: this free digital hub enables anyone to access operational advice, tools or Orange activities whatever their entrepreneurial stage.

→ <http://entrepreneurclub.orange.com/en/>

Orange Social Venture Prize: since 2011 the winning entrepreneurs have been awarded €265,000. A further 22 enterprises have benefited from expert coaching.

→ <http://entrepreneurclub.orange.com/en/social-venture-2016.html>

Imagine with Orange: a free Orange platform to test entrepreneurial ideas and concepts with a community of 12,000 members in 56 countries worldwide.

→ <http://imagine.orange.com/en/startup>

Incubators: co-created by Orange and its local partners in 5 countries: CTIC in Senegal, CIPMEN in Niger, EBENE in Mauritius, SABOUTECH in Guinea, CREATEAM in Mali.

Orange Fab: a 3-4 months' acceleration programme with the objective to sign a partnership opened in Ivory Coast, Senegal, Jordan and Cameroon

Orange Developer/ APIs: a platform dedicated to developers to access APIs that can be downloaded and bought. Orange also organises regular API Challenges since 2014.

→ <https://developer.orange.com/>

Orange Digital Ventures: this capital venture takes financial minority participation in tech start-upsChallenges since 2014.

→ <http://digitalventures.orange.com/>

Teranga Capital: created in March 2016 in Senegal, this capital venture is dedicated to the "missing gap" between €75,000 and €300,000 investments in ICT enterprises.

→ <http://www.terangacapital.com/>

About the author

Catherine Flouvat (catherine.flouvat@orange.com) works for Orange on Corporate Social Responsibility in Africa, Middle East, and Asia, in particular, with a focus on strategies to improve farmers' life in rural areas by making use of ICT services.

Insights from Benin's EtriLabs

Technology hubs give young innovators and entrepreneurs the unique opportunity to develop their products and services and to make them marketable. The lack of awareness about the opportunities that e-agriculture has to offer, is one of the main obstacles to succeed.

Youth e-agriculture entrepreneurship

The youth in Benin are increasingly connected to the internet by smartphones. They mainly use mobile apps to gain information and exchange it with family and friends. Mobile apps are also used for agriculture purposes by some. There is a growing, but still weak recognition of the opportunities e-agriculture could provide for young entrepreneurs and innovators. To develop a product or service that is marketable and suits the demands of all the stakeholders that are involved in agriculture needs time, money, and networking skills. To help the youth entrepreneurs and innovators to improve their skills, to connect them in local and international networks, and to make their innovations suitable for end-users, is why technology labs spring up all around in Africa.

In Benin, Etrilabs is such an incubator that welcomes e-agriculture innovators. Benin is a country heavily dependent on agriculture. The agricultural sector contributes to more than 30% of the Gross Domestic Product (GDP), provides 75% of export earnings, and 70% of total employment. The sector could give young innovators and entrepreneurs in e-agriculture many opportunities to strengthen their business case.

Mentoring and advising

EtriLabs is a project of Educational Technology and Research International (ETRI), an NGO dedicated to the use of ICTs for development. It aims to support technology developers, entrepreneurs, civil society, businesses, and governments to create and stimulate the usage of innovative technological solutions in agriculture.

The lab supports youth through mentoring and advisory. It provides a workspace in which innovators can exchange their ideas with others. EtriLabs also facilitates dialogues between stakeholders in agriculture, which helps the young innovators a lot, because their network is still limited. Strengthened with EtriLabs' support

some innovative products and services for agricultural usage have been developed and marketed yet.

These include Agri-Help, an enabling platform to determine urgent problems in food production that was developed during the Space Apps Challenge 2016, a competition organised by NASA. Another app that has been launched from EtriLabs is Smart Grange, an automated management system for farmers that allows them to develop parallel activities while managing the farm via the app.

Partnerships

In addition, EtriLabs has partnerships with other technology hubs and incubation programmes. For instance, it is a partner in the AgriHack Talent Programme in West Africa, also known as the Youth Enabled AgriHack Fish Farming (YEFFA). This is a project supported by CTA and managed by Wennovation Hub Nigeria. Within YEFFA many stakeholders, such as fish farmers, wholesalers, retailers, academics, and policy makers participate with the young innovators. In August 2016 a site visit, boot camp, and a hackathon were organised simultaneously in four cities: Cotonou (Benin), Lomé (Togo), Warri (Nigeria), and Lagos (Nigeria). At the EtriLab in Cotonou two prototypes were selected for further development and support: e-MAS and Fisher_Innove. The regional final is scheduled to take place in Lagos.

EtriLabs faces different challenges to support young innovators and entrepreneurs. Inadequate financial resources, lack of direct support from the government in Benin for e-agriculture innovations, the inadequacy of local stakeholders to build an enabling environment that suits particularly the young entrepreneurs, are among others the most important challenges.

According to Murielle Anatohon, Programme Assistant at EtriLabs, young innovators that successful went through the mentoring process still face



difficulties to find further financial support dedicated to technological innovation in agriculture, inadequate promotion and subsidies for young agronomists, and low awareness of the opportunities of e-agriculture entrepreneurship within Benin.

To boost technological innovation in agriculture in Benin and in the sub-region, EtriLabs suggests to clearly define successful cases to increase awareness on opportunities. It also would like to involve more agricultural youth organisations in the debates to define agricultural policy recommendations that include references to e-agriculture. Furthermore, hackathons and e-agriculture competitions should give investors, policy-makers, and the youth the chance to understand the business opportunities in agriculture through innovations. ◀

About the author

Louis Agbokou (louisassou@gmail.com) is engineer of rural development in Benin, consultant in agricultural entrepreneurship. His blog: <https://suivifermesdevage.wordpress.com>

Related links

Website of EtriLabs
→ www.etrilabs.com

'They did not believe that a 15 years old student could advance with the app'

Seventeen years old Nicholai Rajkumar is a student of St. George's College in Trinidad and Tobago. He is pursuing studies toward a career in IT. Nicholai at age 15, completed a Microsoft course in App Development, which aided his participation in the Caribbean AgriHack Talent Competition in 2014.

Nicholai's passion for ITs combines with his interest for agriculture. 'I have always loved pursuing IT, and the idea of involving agriculture makes me feel elated to be giving back to the farmers, as they provide so much for us,' he says. The IT aspect in agriculture came initially as a surprise for him. As a young innovator in the Caribbean, he believes that there is a huge demand for agricultural based ICT applications, if released and promoted well. 'More and more the population is becoming aware of healthy food practices and demand good quality of food from farmers,' Nicholai says.

The application Nicholai and his team have developed for the Caribbean AgriHack Talent Competition placed them in the finals. The app is a guide for farmers in Trinidad and Tobago to increase productivity and marketing their products. 'I could not find any app that provides farmers with easy accessible problem-solving information. Therefore, the app that we have developed allows for a wide range of features to inform farmers about crops and livestock, pest management, and irrigation,' says Nicholai. With the support of the Community HUB Corporation - a Caribbean NGO that aims to enhance youth and communities by leveraging ICTs - Nicholai and his team designed and built the application for the local farmers to access agricultural information by the internet.

After the AgriHack Talent Competition in Suriname at the Caribbean Week of Agriculture 2014, Nicholai's team developed further the app by implementing a text-to-voice speech output for the weather forecast, they integrated maps to the soil management feature, and attained support from CARDI, FAO, IICA and the Ministry of Food Production in Trinidad and Tobago.



Nicholai Rajkumar (left), with his mentor Atiba Phillips (middle) and on the right his AgriHack Talent team mate.

Hackathon

The App was designed to be simple, effective, and written and sold in farmer friendly jargon. Information on crops and livestock, soil management, pest management, fertilisation, a live weather forecasting for the week ahead, and news feeds for current events, are now all available for farmers with one click or touch. New users sign up for the app by setting up a profile - "My Profile" that allows them to log-in and sign-in to the "Messaging Centre", which is a dialogue platform where stakeholders can meet and market their produce. A feature for "Feedback" is also available to communicate with the developers. The app is designed to run on Android, Windows and iOS platforms.

What is Nicholai's role in the enterprise? 'I am the marketer and designer of the application. I am responsible for the choice of colours, pictures, and the overall layout for the app.' He adds that he represents the app in different media and in business events that are arranged by the Community HUB. He reinforces that young people must get involved in agriculture. 'As youth, we must continue in the footsteps of our farmers in this modern

age. Without agriculture we will surely cease to exist.'

Nicholai outlines that being very young at 15 years during the AgriHack Talent Competition posed major and unexpected challenges. 'I think the judges did not believe that we could advance with the app as a viable product along with a business prospectus and to formalise partnerships, as well as our pre-occupation of being in school.' He admits that indeed it has been quite difficult to build a business venture and recommends organisers of hackathons and other entrepreneurial events on ICT innovation amongst youth to provide a special stakeholders' fund for supporting young innovators. Nicholai would like to see, for example, better buy-in methods from stakeholder agriculture organisations. 'More validation could help us as young people to move into the business world and provide the appreciation for innovation across the sector,' says Nicholai. ◀

Related links

Website of the Community HUB Corporation
 → www.mycommunityhub.org

AgriHack Talent Programme

CTA has initiated the AgriHack Talent Programme to support youth ICT innovations and entrepreneurship in agriculture. A new component of the programme is Pitch AgriHack! - a bootcamp followed by a pitching competition, and opportunities to win grants and investments. Pitch-AgriHack! targets existing e-agriculture start-ups with working prototypes or services already in operation.

→ <http://pitch-agrihack.info/> and <http://hackathon.ict4ag.org/>



Innovate for Agriculture

Plug and Play

CTA's tech-dating for agriculture event showcases the range of ICTs/mobile platforms developed and being implemented along the agricultural value chain. The event offers ICT innovators the opportunity to demonstrate their solutions to interested clients; users to discover the latest ICT platforms along the value chain; investors to identify viable areas for investment; donors to discover emerging areas for support; and agriculture policymakers to understand and explore areas for action.

→ <https://goo.gl/jVb01L>



Tech-Dating for Agriculture

Disrupt Africa

Read all about Africa's start-up initiatives, incubation and acceleration programmes, and hubs on the tech start-up portal Disrupt Africa. It is a one-stop-shop for news, information and commentary pertaining to the continent's tech start-ups and their ecosystem.

→ <http://disrupt-africa.com/>

Innovation Village

Innovation Village is about promoting new technologies, businesses, products, services, and start-ups in Africa. This news blog gives information about innovation and business in Africa, especially for start-ups and young entrepreneurs.

→ <http://innovation-village.com/>

News about UAVs Evaluation of incubation programmes

"Measuring Value Created: By Impact Incubators & Accelerators" (November 2014) is a report of I-DEV in conjunction with the Aspen Network of Development Entrepreneurs (ANDE) and Agora Partnerships, which examines and evaluates the value created by impact incubators and accelerators for entrepreneurs.

→ <http://goo.gl/AFpQ5p>

Insight into incubation in rural areas

This report with the title "Good Incubation in India: Strategies for supporting social enterprise in challenging contexts" (January 2016) was commissioned by the UK Government's Department for International Development. It looks at the challenges of incubating enterprises outside of the metropolitan cities.

→ <http://goo.gl/vxdKpW>

Knowledge in the impact accelerator market

The Rockefeller Foundation, in conjunction with Monitor Deloitte tried to understand the needs of start-ups by studying the ecosystem of more than 160 impact accelerators, in the US, Sub-Saharan Africa, and Southeast Asia. The results have been summarised in the report "Accelerating Impact: Exploring Best Practices, Challenges, and Innovation in Impact Enterprise Acceleration" (February 2015).

→ <http://goo.gl/nx8aJ>

Social entrepreneurship in agriculture in Kenya

"A case study of health and agriculture social enterprises in Kenya" (March 2014) was produced by a team from ODI, Bertha Centre for Social Innovation and Entrepreneurship, University of Cape Town, KCA University, Nairobi, and the East Africa Social Enterprise Network (EASEN). This is one of the few reports that focuses on social entrepreneurship in agricultural in Kenya.

→ <http://goo.gl/z1ZiDt>

Links to start-up funds and fund sources

Start-ups are being backed by both overseas and domestic investors and funds. Not sure where to look for investment for your business idea? This list of start-up funds could help you further (Source: CTA and Disrupt Africa - <https://goo.gl/uxqosf>).

The MasterCard Foundation Fund for Rural Prosperity has launched the Innovation Competition and the Scaling Competition for innovative entrepreneurs that work on new financial products and services that can effectively meet the financing needs of people living in poverty in rural and agricultural areas.

→ www.frp.org/

The Africa Agriculture and Trade Investment Fund focuses on investments into the agricultural sector. It targets small, medium and large scale agricultural farms as well as agricultural businesses along the entire agricultural value chain.

→ www.aatif.lu/

African Business Angel Network is a pan African non-profit association founded to support the development of early stage investor networks.

→ <https://abanangels.org>

CapitalFinder from AlliedCrowds is a free database on alternative finance in the developing world. It lists from crowdfunding platforms to venture capitalists to government programmes.

→ <http://alliedcrowds.com>

The Seedstars Group is a Swiss-based venture builder that is active and invests in emerging markets in Asia, South America, The Middle East and Africa.

→ www.seedstars.com/

South African venture capital firm 4Di Capital announced a first close of US\$16.8 million in initial commitments for a new technology venture capital fund.

→ www.4dicapital.com

As worldwide start-up fund that is very active in Africa, Village Capital looks set to scale up its activities after announcing the close of a US\$17.7 million fund by its investment arm VilCap Investments.

→ <http://vilcap.com/>

Capria Accelerator announced the launch of a US\$100 million fund that will invest in equity and debt funds targeting early-stage impact businesses across Africa, Latin America, and Asia.

→ <http://capria.vc/>

UNICEF has launched a US\$9 million Innovation Fund to target open source technologies for children

→ www.unicefinnovationfund.org

Tech accelerator mLab Southern Africa and the Technology Innovation Agency have launched the App Fund 2016 with grants of up to US\$35,000.

→ www.mlab.co.za/funding/

VC4Africa is the largest online community of entrepreneurs and investors. Entrepreneurs have access to free online tools, mentorship opportunities and private deal rooms.

→ <https://vc4a.com/>

Ways of fundraising for young e-agriculture entrepreneurs

Many start-ups rely on fundraising in their own networks. However, new platforms have unlocked new ways to raise money for start-ups.

Like all enterprises, e-agriculture businesses need finance to evolve products, to grow, and to make a valuable presence in the marketplace. Understanding the needs in the market, documenting potential marketable solutions and sectoral challenges, and developing a business plan to address them, must be the first step. Furthermore, you have to ward off any possibility of failure by distinguishing between money for you and business money. Once convinced that the business can pay you and itself; then you are ready to start the journey to drive your business.

Most e-agripreneurs do not have enough own capital to invest in the start-up. The decision to borrow money is paramount. Where must the money come from? When I started my own business, my bank closed the day I left my job. My money was stuck in there. I had to start offering services even with no resources or peace of mind. Fortunately, I had my first contract to set up a computer network in a friend's company. It made sense linking up with someone who had trained me on entrepreneurship so that he could fund the purchase of the network resources and the other equipment needed.

No doubt, fundraising starts with your own skillset and your networks. Dhairy Pujara the founder of Ycenter and my business partner in Ycenter Africa, an enterprise that trains value chain ICT4Ag design thinkers, says rightly that knowledge is the first tool that is needed to create impactful and scalable solutions. He indicates that on-the-field learning experiences that provide cultural awareness, learning languages and empathy with the market is necessary. My own experience when I started the precursor of my ICT4Ag business, Octagon Data Systems in 1995, is that networks and own knowledge are more important than cash given or borrowed.

Advance payments

In the end your start-up needs capital to survive. So speak to successful and trusted



TechCamp West Africa, 2015, in Accra, Ghana. At such events young innovators get in touch with different stakeholders, like angel investors, to increase their business network.

entrepreneurs or family members who have experience in the field. Identify people who can either put money in your business with a promise on shared ownership or deferred investment in which you can define their returns in the future. Another option is to use clients' advance payment. This, however, assumes that you have some record to trade for trust. If you do, this is a good source of investment cash since they pay you in advance and pay you your worth once you are done.

New opportunities of fundraising have occurred recently. An angel investor, for example, is a wealthy individual who invests his or her personal capital in a company in exchange for equity in that company. Angels typically fund a start-up at the seed stage of a company. If investing with a group, they can do it as part of an angel fund or as part of an angel syndicate. When you bring an angel on board, you want to make sure you have the right one. They become your business partner whether you like it or not. You would hope that the angel, in addition to capital, brings in new knowledge and networks to the start-up. While there are angels that have tremendous insight into building a company, there are also young founders who might not have the knowledge that

can help your company. Try contacting other start-ups in that angel's portfolio to see if he or she would be a good fit for you.

The advent and relative growth of crowdfunding platforms have proven a great advancement for start-ups to sell their idea direct to the consuming public. One of the benefits of crowdfunding is that none of your "investors" are shareholders in your company, so you get to maintain equity while raising capital to get your company off the ground. The difference is that you have to deliver something to get that money; whereas angel investing and venture capitalists provide investments up front so that you can build out a company and deliver a product to customers down the road. ◀

About the author

Kiringai Kamau (kiringai@gmail.com) is an agricultural economist, founder of ICT4Ag businesses, a farmer support NGO, and a mentor of community and individual enterprises. He leads the Center for Agricultural Networking and Information Sharing (CANIS).

Shave, haircut and a video

Even without smartphones, internet or electricity, rural Malawians are gaining access to video material through young entrepreneurs called DJs who work mainly from barber shops.

A farmer previews a video with his DJ.



Youth
e-agriculture
entrepreneurship

In small towns in Malawi, young men who want to start their own ICT business are teaming up with the unlikely of partners, including barbers. The entrepreneurs are almost always men in their 20s or even teens. Most have some schooling and can read and write. They call themselves DJs, copying video materials for a small fee in a shop called a “burning centre”.

Many of these DJs partner with relatives or friends who have some sort of shop. This senior partner buys a used computer or a PC assembled in Malawi, which can cost about US\$200: a lot of money for the youth, but affordable for an older man with a small, profitable business. Kinship is crucial in this relation. There can be mistrust and tension between shopkeepers who buy a PC and simply hire a youngster: the older man doesn't understand exactly what the young one is doing.

A barber is the perfect partner for an ICT shop. Both businesses rely on a little skill, some fixed capital assets and a loyal customer base. When the barber can no longer find more heads to cut, an ICT shop where they burn video materials may be a logical way to expand, and clients like the combined services of uploading videos while getting a haircut.

The customers

The shop itself is just a small room with some plastic chairs or a wooden bench, and a PC on a table. The DJs live in small towns with electricity, while they also sell cold drinks, stationary or other small items and ICT services. The clients are often smallholder farmers. After buying supplies and paying to charge up their cell phones, the farmers pass by the burning centre to upload some videos or ask for other small ICT services. Back in the village, they watch the movies in the evening with friends or family.

The customers rarely ask for a specific title; they say they want so many movies of a certain genre (Nigerian, Hollywood, Indian or Malawian gospel music, for example). Each upload costs between 20 and 100 kwacha (US\$0.03 to US\$0.14), depending on the DJ and the file size. The more successful DJs buy DVDs in the city, or from travelling salesmen, “rip” (download) the content onto their hard disk, and convert it to 3GP format (smaller file size, and runs on a phone). Struggling DJs swap movies with their friends.

The network

Few of the DJs have access to internet or email, although they do have Facebook on their cell phones. The DJs like movies

and some are making their own movies or music videos. They share the videos they make with their friends, so even though they are off the internet, they have a real-life social network to swap original and copied content. Some DJs can provide other ICT services, as farmers begin to demand them, for example they sell blank CDs, and helping to film or edit videos of local events.

The burning centres pay no royalties, so Malawian entertainers have the cold comfort of becoming famous without getting rich. But for the non-profit development sector, the DJs can be ideal partners, to get educational videos into farmers' hands. In 2015, the international NGO Access Agriculture distributed educational videos for farmers in 3GP and on DVD to 70 DJs. The DJs sold 456 DVDs and 645 videos in 3GP on the parasitic weed *Striga*, 551 DVDs and 547 3GP videos on rice, and 507 DVDs and 559 3GP videos on chili growing and processing. By tapping into entrepreneurial DJs, educational videos can be distributed to thousands of rural people. ◀

About the authors

Jeff Bentley (jeff@agroinsight.com) is an agricultural anthropologist at Agro-Insight. Paul Van Mele (paul@accessagriculture.org) is co-founder and chairman of Access Agriculture. Ronald Kondwani Udedi (rkudedi@gmail.com) is an ICT and media expert at Malawi Polytechnic.

Related links

Website with farmer-to-farmer videos available for free download.

→ www.accessagriculture.org
Website with blogs, books, articles and other resources on agriculture and communication.

→ www.agroinsight.com

Developing your business strategy

As the digital age advances further rapidly, more and more e-agriculture entrepreneurs are able to launch a start-up cheaper and faster than ever before by leveraging technology, access to wider range of skills, grants, competition money, crowdfunding, and accelerator and incubator programmes. e-Agriculture entrepreneurs can choose to take a traditional approach to developing a business plan or they can examine new approaches, such as the Lean Start-up Canvas and the Business Model Canvas.

Business Model Canvas (BMC)

As specified by Osterwalder Alexander in The Business Model Ontology: A Proposition in a Design Science Approach (2004), 'it enables both new

and existing businesses to focus on operational as well as strategic management and marketing plans'. The canvas has nine sections: Key Partners, Key Activities, Value Propositions, Customer Relationships, Customer Segments, Key Resources, Channels, Cost Structure and Revenue Streams. The BMC tool allows for ICT4Ag entrepreneurs to plot out their ideas for any new or existing businesses and test different scenarios before writing a single line of code. Delivered on a single page, this tool is fast becoming the global 'go-to' method for plotting strategies and seizing ICT-driven opportunities. It can be used for both non-profit- and profit-focused agribusinesses. (<https://goo.gl/tvFwVv>)

Lean Canvas

Developed by Ash Maurya in his book Running Lean (2010), the Lean Canvas tool is an alternative to the BMC. It focusses more on start-ups. Thus, it is more adapted to young ICT agripreneurs and is widely used, for example by East African tech hubs. The Lean Canvas tool also has nine levels: Problem, Solution, Unique Value Proposition, Unfair advantage, Customer segments, Key metrics, Channels, Cost structure, Revenue Streams. A key component of the Lean Canvas is the 'Problem' section, which is particularly important, as most e-agriculture entrepreneurs do not have a profound understanding of agriculture. (<http://theleanstartup.com/>) ◀

This text is an adaptation of a section of the upcoming publication of CTA: Path to Success: a guide for effective ICT Agripreneurship.

Element	Business Model Canvas	Lean Canvas
Target	New and existing businesses	Start-up businesses purely
Focus	Customers, investors, entrepreneurs, consultants, advisors	Entrepreneurs purely
Customers	Lays emphasis on customer segments, channels and customer relationships for all businesses	Does not lay much emphasis on customer segments because start-ups have no known or tested products to sell
Approach	It lays down the infrastructure, lists the nature and sources of financing and the anticipated revenue streams of the business	It begins with the problem, a proposed solution, the channels to achieving the solution, costs involved and the anticipated revenue streams
Competition	It focuses on value proposition in quantitative and qualitative terms as way to stay smart in the market	It assesses whether the business has an unfair advantage over the rest and how to capitalise on it for better grounding
Application	It fosters candid understanding, creativity, discussion and constructive analysis	It is a simple problem-solution oriented approach which enables the entrepreneur to develop step-by-step

(Source: Canvanizer.com: <https://goo.gl/V8fglx>)



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20 YOUNG ICT ENTREPRENEURS

INNOVATING ALONG THE AGRICULTURAL VALUE CHAIN



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