

CTA Handbook

An ICT Agripreneurship Guide

A Path to Success for Young ACP Entrepreneurs



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About CTA

The Technical Centre for Agricultural and Rural Cooperation (CTA) is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). Its mission is to advance food and nutritional security, increase prosperity and encourage sound natural resource management in ACP countries. It provides access to information and knowledge, facilitates policy dialogue and strengthens the capacity of agricultural and rural development institutions and communities.

CTA operates under the framework of the Cotonou Agreement and is funded by the EU.

For more information on CTA, visit **www.cta.int**



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Acronyms

ACP	African, Caribbean and Pacific Group of States
ARDYIS	Agriculture Rural Development and Youth in the Information Society
BMC	Business model canvas
BMS	Big picture items, Middle view considerations and Self-assessment of the firm
CTA	Technical Centre for Agricultural and Rural Cooperation
DAIN	Diaspora Angel Investment Network
DRC	Democratic Republic of Congo
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
ICT	Information and communication technology
ICT4Ag	Information and communication technology for agriculture
IP	Intellectual property
IVR	Interactive voice response
MFI	Microfinance institution
MIT	Massachusetts Institute of Technology
MNO	Mobile network operator
MVP	Minimum viable product
NGO	Non-governmental organisation
RFP	Request for proposal
SACCO	Savings and credit cooperative
SWOT	Strengths, weaknesses, opportunities and threats
USAID	United States Agency for International Development
WIPO	World Intellectual Property Organization

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ConnectiMass is a non-profit that inspires, connects and trains young people and women, to become tech entrepreneurs through events and media content in the Caribbean. The organisation works to empower the next generation of technology and business leaders to leverage technology, entrepreneurship and community to create, launch and prosper through their start-ups, and develop a solid future for themselves and others in the region.

The ConnectiMass team involved in the project was: Ingrid Riley, CEO; Samuel Suraphel; Tyrone Hall; and Papa Dembele.

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Foreword

Scaling up e-agriculture entrepreneurship to accelerate socio-economic growth

Agribusiness is one of the priority themes in CTA's Strategic Plan 2016–2020. This calls on the Centre to *“strengthen the significant and growing pool of entrepreneurial and innovative people ... by supporting the organisational and entrepreneurship capacities of young people.”* This is the focus of this publication, which builds on CTA's experience of working with young people in the information and communication technology (ICT) sector.

The populations of African, Caribbean and Pacific (ACP) countries are growing rapidly and people are living longer, driving increases in demand for food. In Africa, urban food markets are set to quadruple to US\$400 million a year by 2030 and total food and beverage markets are projected to be worth around US\$1 trillion by then. This represents huge opportunities to create wealth and employment in the agri-food sector, especially for young people. Provided that conducive frameworks are put in place to support their endeavours, today's youth can, not only seize these opportunities by trading in agricultural products, but also by offering innovative and income-generating services to the sector.

Work by CTA – such as the AgriHack Initiative – and others has demonstrated that ICT has a key role to play in supporting and enhancing the performance of economies, including in the agriculture sector. However, young innovators interested in entering this sector commonly lack key skills and knowledge. Many of them lack the basic business development knowledge needed to launch successful start-ups, in large part because they have not benefited from adequate business education. In particular, they lack knowledge on the agricultural value chain stakeholders and their needs, and on how to design successful ICT services for the agricultural sector.

This guide has been prepared to provide introductory knowledge and recommendations to young people interested in developing e-agriculture businesses. It is the first publication of its kind focusing specifically on needs of ACP countries. It provides key insights into how to generate e-agriculture service ideas, customer discovery, hypothesis testing, strategies for developing successful business models, recommendations on how to formalise the business, and strategies to scale up services and ensure their financial sustainability. It also suggests key institutional and documentary resources.

Support for innovative youth agripreneurship is central to CTA's programme. We hope that this guide will encourage young entrepreneurs to enter the agricultural arena. We look forward to collaboration with institutions willing to support such young entrepreneurs in order to consolidate youth employment and accelerate agricultural and socio-economic growth in ACP countries.

Michael Hailu
Director, CTA



Introduction

Big opportunities

The role of information and communication technologies (ICTs) in strengthening and promoting agricultural enterprises has never been greater. Furthermore, governments, private sector, multi-lateral and non-governmental organisations (NGO), and especially young people, are increasingly viewing the intersection of ICTs and the agriculture sector as a prime means of tackling the global youth unemployment challenge by enabling enterprise.¹ The opportunity for youth employment in a merged ICT and agricultural sector represents a potential boon for enterprising young people in African, Caribbean and Pacific (ACP)² countries.

Agriculture is so important in the African continent's evolving income, population and urbanisation dynamics that, in 2003, governments endorsed the Maputo Declaration on Agriculture and Food Security.³ The agreement aimed to slash the continent's food import bill of nearly US\$35 billion by earmarking 10% of public spending towards agriculture (Africa Progress Panel, 2014). With increasing population, food security has become a critical issue, especially in Africa where the population will double, from the current estimate of about 1.2 billion, to 2.4 billion by 2050. Therefore, agricultural productivity needs to be strengthened radically to increase food availability. ICTs, which are often spearheaded by youth (Rahman and Fong, 2016), can contribute to this.

Below: © Jake Lyell / Alamy Stock Photo



Through ICTs, youth are thus well positioned to help advance agricultural transformation, while improving their own livelihoods. Clearly, they also need adequate support in this process.

Why this guide?

This guide is designed to equip young aspiring ICT entrepreneurs who are interested in creating (social) businesses that address challenges in the agricultural sector (including fisheries, livestock and forestry) with key information and knowledge that can help them to use ICTs effectively to launch agriculture-oriented businesses. It is aimed at helping young entrepreneurs,⁴ in particular, to deal with the intricacies involved in conceptualising, launching and succeeding in a merged ICT and agricultural enterprise. Therefore, knowledge contained in this document covers agricultural value chains and stakeholders, ICT business challenges, effective business plans and models of designing, funding and scaling ventures.

Developed by a team of international agribusiness and ICT consultants with over five decades of cumulative experience,⁵ this guide presents users with a road map for starting a business in the agricultural sector using ICTs, and outlines key opportunities and challenges that will be encountered when creating a business. Leveraging real examples of challenges faced while developing businesses, the guide provides strategies and pathways for averting common mistakes faced by early-stage entrepreneurs using ICTs for agriculture (ICT4Ag). As well as containing carefully selected case studies, business and product development tools, the guide showcases interviews from 17 entrepreneurs – from countries such as Ghana, Jamaica, Kenya, Nigeria, Senegal and Uganda⁶ – to highlight best practices. Other inputs (boxes, excerpts from articles) are from secondary research.

The guide is designed to serve as a comprehensive introductory reference to entrepreneurs. The reader is strongly encouraged to read additional relevant publications detailing the issues discussed. Some of these publications are referred to throughout this document, or in the appendices.

Who should use this guide?

This publication is intended to be used in two primary ways:

- As a step-by-step road map for those about to start an ICT-enabled agribusiness.
- As an accessible resource that can be used to provide guidance on specific aspects of setting up and running a business – from idea generation, to funding and scaling up.

This guide is intended for individuals/teams who are interested in creating enterprises in the ICT and agricultural sectors and also for those who are engaged in the sectors but are struggling to thrive. It is relevant for social enterprise or commercially-driven enterprise endeavours. It will be most useful to readers with at least a secondary school education, basic business skills and computer literacy. Resources and pathways listed throughout the guide will assist young entrepreneurs to leverage insights from others who have developed ICT4Ag ventures and push forward their own initiatives.

New entrepreneurs can use the information provided in this guide either prior to exploring possible business ideas or after embarking upon their ventures. Though sections are written in order of a new company's formation and growth, individual sections can be used as needed.

¹ Issues such as youth unemployment are predicted to worsen with rapid urbanisation. By 2030 50% of Africa's population is expected to live in urban areas (Leke et al., 2010).

² The African, Caribbean and Pacific (ACP) Group of States is an organisation created by the Georgetown Agreement in 1975. It is composed of 79 African, Caribbean and Pacific states, with all of them, excluding Cuba, also signatories to the Cotonou Agreement (known as the ACP-EC Partnership Agreement) which binds them to the European Union (EU). There are 48 countries from Sub-Saharan Africa, 16 from the Caribbean and 15 from the Pacific.

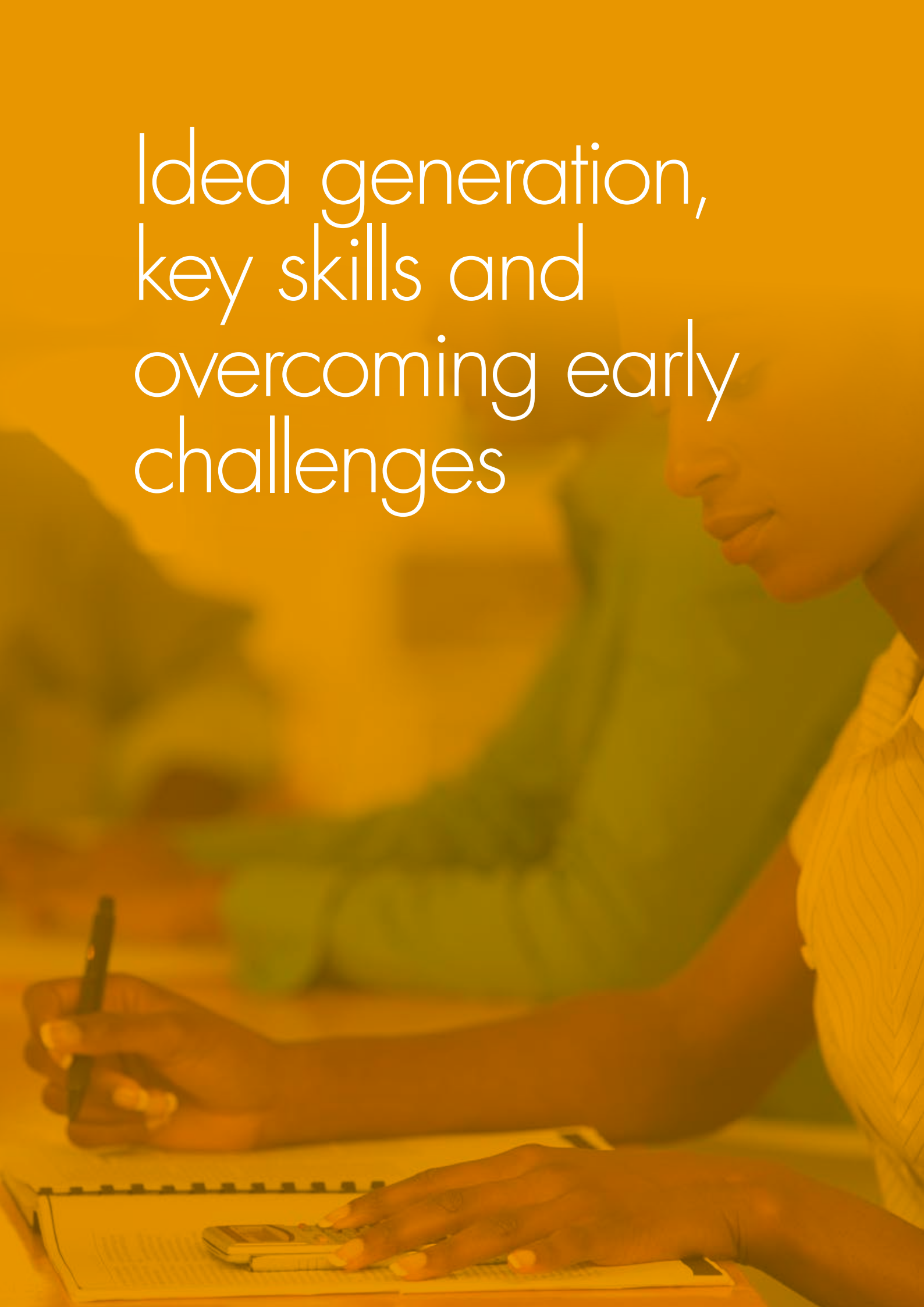
³ The Maputo Declaration on Agriculture and Food Security was signed by the African Union (African Union, 2013).

⁴ CTA defines 'youth' to be people in the age range of 15 to 35 years old, as per the African Union definition.

⁵ Spanning ICT incubation and start-up management, virtual ICT consultancy services, agribusiness development, youth entrepreneurship and policy development.

⁶ Full list of organisations interviewed can be found in Appendix 1.

Idea generation,
key skills and
overcoming early
challenges



The early stages of any company are fraught with challenges that require: a) a strong focus on the core idea being developed; b) leveraging of necessary skills and human resources to develop the idea; and c) overcoming business and technical barriers.

This section provides a selection of strategies to aid emerging ICT4Ag entrepreneurs. The chapter starts by outlining suggestions on how to develop and test a business idea by understanding the value chain – from research and development to retail. In understanding the value chain, the entrepreneur can then implement the process of market analysis and pretesting of a developed product.

Identifying the key skills of the entrepreneur and their team is an important next step which is explained. It is noted that outsourcing the key skills to start and operate a small business is costly. With this in mind, early challenges of moving from idea generation to execution are then identified, and suggestions are provided on ways these can be managed.

The end of the chapter examines how, after all of these considerations, the entrepreneur can determine the potential success of the business by using a three-step method to review what is in demand and what is possible and engage in an early strengths, weaknesses, opportunities and threats (SWOT) analysis of the business.

Developing and testing the business idea: Understanding agricultural value chains

When beginning an ICT4Ag venture it is important to **understand the agricultural value chain**. An example of an agricultural value chain framework is presented in Figure 1.

Key cross-cutting enablers not illustrated in Figure 1 include **financing** and **policy-making**. These value-chain segments are also relevant for the other components of the agriculture sector such as fisheries and livestock.

As illustrated in Figure 1, an entrepreneur can provide services to various customer segments and stakeholders besides farmers. An ICT solution could be created to improve the efficiency of input suppliers, cooperatives, processors, exporters or point-of-retail-sales, yet many entrepreneurs do not consider all of these existing gaps.

Young entrepreneurs who wish to venture into e-agriculture service provision should carefully consider specific areas and value-chain and stakeholder segments that they could target in order to offer unique value propositions.

Figure 1. Agricultural value-chain segments and stakeholders

Input supply	Production	Post-production	Marketing	Consumption
- Government agencies - Farm stores - Service providers: - Livestock association - Extension officers - Agricultural society - International organisations - Research institutions - Animal Breeders - Training institutions - Veterinarians - Water providers - Financier (Agri Dev Bank) - Food/nutrition experts - Regulators (e.g. public health)	- Small farmers - Large commercial farms	- Butchers - Abattoirs - Processors: - Milk - Meat - Food - Farmers - Value added intermediary - Packaging/labelling - Traders - Transporters - Storage companies	- Government agencies (trade foreign affairs etc.) - Trade policy - Traceability - Regulators (EPA) - Wholesale/retail - Fresh markets - Supermarkets - Retail shops - Trade & promotion agencies - Exporters	- Individuals - Restaurants - Hospitality industry - Households - School nutrition programs - Prisons - Military/national security - Hospitals

Source: Infocomm Technologies (2014)

Case study 1

Hello Tractor: Integrating agriculture with technology

A great example of a young company taking advantage of the broader value chain is Hello Tractor (www.hellotractor.com), a social enterprise focused on improving food and income security throughout Africa by pairing the owners of low-cost 'smart tractors' with farmers via an innovative SMS-based service. In addition to individual farmers, Hello Tractor targets organisations that work directly with farmers, including NGOs, financial institutions, extension service providers and farmer cooperative representatives. Examples of the groups with which the company have formal and informal marketing and distribution relationships include Fortis Microfinance Bank, Cellulant and the National Agricultural Cooperative Organisation in Nigeria.

Case study 2

Modisar: Livestock management made simpler

Modisar (www.modisar.com), a Botswana-based livestock information management start-up, was created when one co-founder, a livestock farmer, wanted a system to better monitor the health of his cattle. From this experience, and noting the broader needs of other farmers in the country, the co-founders, Thuto Gaotingwe and Tebogo Dichabeng, developed a web, phone and SMS-based system that provides support for farm management and financial reporting, while providing a knowledge bank of articles and resources about on-farm management. They have modules to support animals, farm equipment, human resource management, sales, costs and overall financial reporting. A social media presence also provides an additional platform for distributing resources and best practices to their target audience. By empowering farmers to keep better records and obtain rich farming knowledge, Modisar works to increase their likelihood of long-term economic sustainability.

Case study 3

AgroCentral: Connecting small farmers and buyers

AgroCentral, a Jamaica-based start-up, works to overcome the lack of market access for farmers and help businesses access local produce. They were able to achieve this by developing a marketing platform for agricultural producers and a complementary purchasing platform for businesses.

AgroCentral leverages both a web and mobile platform, suitable for the level of ICT access and connectivity of both buyers and farmers in the Caribbean nation. Additionally, the company offers online purchasing via the service, simplifying procurement and tracking processes for all parties. As a result, AgroCentral tackles major challenges in the local agricultural sector such as the lack of transparency, access to larger market and mistrust between farmers, middlemen and buyers.

Case study 4

M-Farm: Serving farmers in Kenya

In Kenya, during a 48-hour technology competition, Jamila Abass and fellow teammates, produced an application, M-Farm, which helps farmers obtain more accurate market price information regarding their produce. Previously, a farmer's only knowledge of market price was the price offered by middlemen trying to buy their produce. Combining their computer science and entrepreneurial skills, the team set out to produce an SMS- and web-based solution to provide current retail price information directly to farmers. Understanding the value chain further, the team later developed means for groups of farmers to benefit from pooled inventories of crops, and discounts on inputs gained from collective buying. All the information is put in a database and tracked via the service. The platform has enabled farmers to access larger markets and better prices, and stay up to date with agricultural market trends.

Entrepreneurs generally **develop ideas** by either connecting with a problem they have encountered or by identifying existing needs in a given community. Ideas are then generated in response to the needs observed.

An initial solution is conceived in order to respond to the demand or need identified. **Market analysis** is then conducted to gather information about the demographic composition (age, sex, education level, civic associations, profession/job etc.) and trends in the community to determine the target market and its nuances. Funds would then be sought from investors, the government or other stakeholders. Further customer development can be done. These steps are not necessarily chronological.

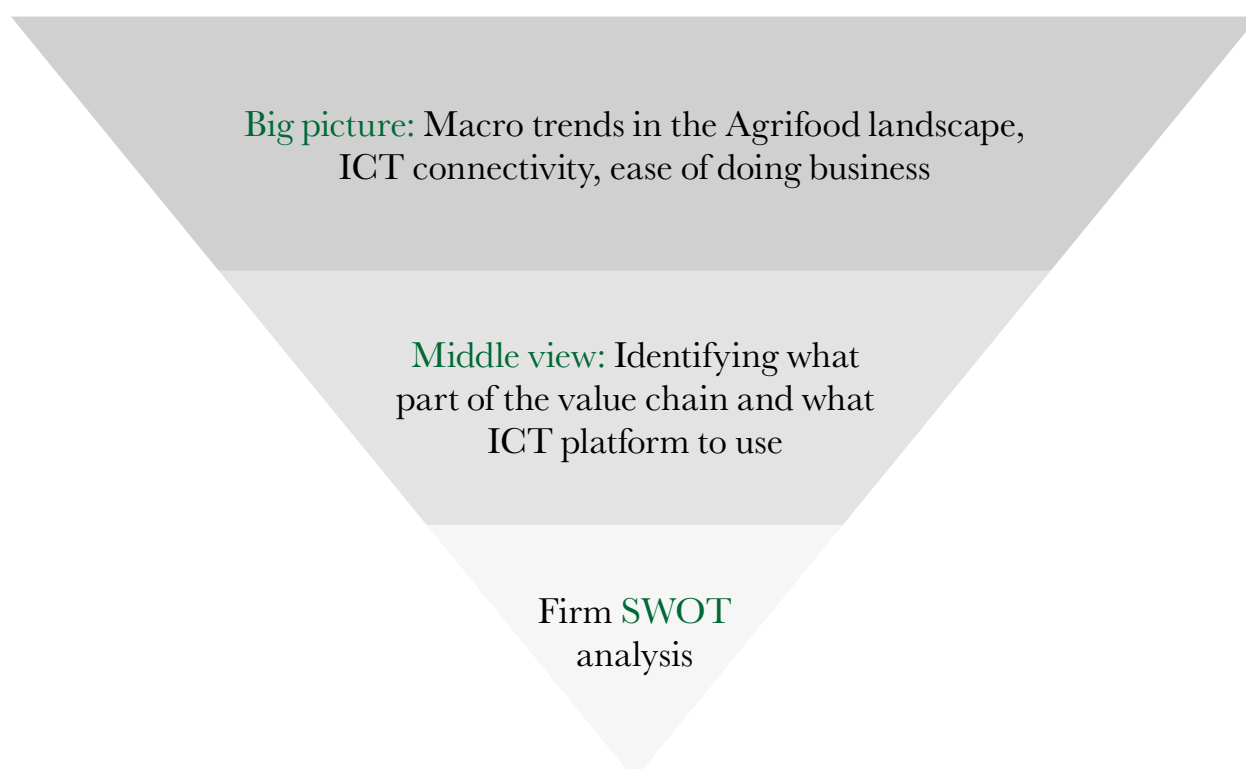
Once the target market has been defined, the product or service is developed and **pretested** with the target group. Pretesting involves the entrepreneur trying to gauge the reaction of potential buyers and users of the product and/or service. Pretesting is very important for obtaining feedback and making adjustments based

on concrete customer feedback, which can boost profitability potentials and avoid costly mistakes. When the product is deemed to be ready for its targeted market, it is then **officially introduced**.

Using a three-step method: What's in demand, what's possible, SWOT analysis

There are three levels of analysis that can be conducted when determining the likelihood of success of a particular ICT4Ag venture, using what is referred to as **BMS** (**B**ig picture items, **M**iddle view considerations and **S**elf-assessment of the start-up). The BMS model proposed here does not replace business model analysis (our recommended Lean Startup approach or Business Model Canvas (BMC) tool will be discussed later in the guide). Though some middle view considerations can be incorporated into the BMC, the BMS is focused on providing a start-up founder or team with a framework for understanding their readiness to invest in the sector and prepare them for this.

Figure 2. BMS (Big picture items, Middle view considerations and Self-assessment of the start-up) analysis



Source: Authors.

Case study 5

Mlouma and Mkulima Young: Understanding the problem

For Aboubacar Sidy Sonka, the founder of Mlouma the problem was clear. Because of their lack of reliable market information, farmers are often shortchanged and offered poor prices by middlemen and farm-gate buyers from the big cities. His solution was to create Mlouma, a web and mobile platform that will give farmers, and buyers and sellers of agricultural produce, current market information and guide their decisions on where to buy or sell their produce.

For Mkulima Young, the problem is the declining interest of youth in agriculture and agribusiness. A clear picture of youth perspectives and tendencies lead to an innovation that provides an online marketplace for young people wanting to buy or sell agricultural produce. This improves the image of many young farmers as users of new technologies and attracts more youth to the platform and to agriculture. To manage this new set of youth demand, the platform then added a Q&A section to provide answers to the production and marketing questions of its users.

Understanding the big picture

Apart from using pre-existing knowledge of the agricultural makeup of a country or region the start-up wants to serve, the best approach is to search for recent publications, for example, by the country's Ministry of Agriculture and international institutions such as the Food and Agriculture Organization of the United Nations (FAO) or CTA. Information to seek includes a government's priority cash and food crops, and livestock and/or fishery data. This information should also point to the region in which the agriculture activity is taking place. In addition, knowledgeable agricultural experts could be consulted.

Similarly, in a quickly developing telecommunications market, one must identify what level of connectivity and models of ICT use exist in the country/region and, more specifically, for the potential target audiences of the proposed ICT4Ag service.

Box 1

Country profiles

Key sites for general information on the agriculture or ICT profiles of countries can be gleaned from FAO's country profiles (<http://www.fao.org/countryprofiles/en>) and the International Telecommunications Union's country profiles (<http://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx>). Local ICT and communication regulators also provide key data on information and communication status.

The World Bank's *Ease of Doing Business Index* provides founders with a quick and high-level view of what it will take to register a business and pay taxes, and the ability to enforce contracts (World Bank, 2015). This may not impact a go/no-go decision to start the ICT4Ag company, as all companies within the country face the same conditions, but it will provide useful background information for early-stage planning and resource allocation.

Considering the middle view

ICTs can be leveraged across the agricultural value chain to improve areas including research and development, access to inputs, production, marketing, wholesale distribution, retail and traceability. Therefore, firms need to identify which part of the value or service chain they seek to serve. Dalberg (2013) noted three areas with the highest perceived ICT need within the agriculture sector: supply-chain management; communication, awareness and marketing; and information management. Two ancillary cross-cutting segments that also present opportunities are agricultural finance and risk mitigation (notably through insurance schemes).

Start-ups should identify gaps in services offered along the value chain and avoid, if possible, areas where competition is very strong. For example, many apps are developed to improve general access to markets, but most of them struggle to generate revenue. Other areas for which (social) entrepreneurship can be ventured into are agriculture-related sectors such as livestock or fisheries, or issues and segments such as consumption of agricultural products, drone uses, etc. The determining factor, however, should be the existence of actual needs and the ability to address customer values.

Using ICTs in emerging markets requires a broad view of what technology will be used, its availability and whether there are adequate devices within the target population. Table 1 lays out a number of options for mobile-based services.

Self-assessing the start-up

Lastly, young entrepreneurs should evaluate their actual potential to address the needs of the sector. We recommend that they perform a baseline SWOT analysis of their business. Following this assessment, the start-up can begin developing their business plan using tools such as the BMC.

To illustrate the SWOT self-assessment, we will take the case of a company created by two young software engineering graduates from a top university in Benin. They learned of a significant opportunity in the agriculture sector and, after looking at the big picture, realise that shea butter is a growth opportunity and that a specific ICT application could improve its commercialisation processes. The description below is limited and is provided only as an illustration.

Strengths

The entrepreneurs have current and relevant ICT skills for developing a prototype service. Additionally, they will have access to other technically trained individuals who attended the same university. They have a high appetite for risk.

Case study 6

Musoni: Cloud-based microfinance

Musoni is a cloud-based microfinance system that leverages mobile money, SMS and mobile apps to improve financial inclusion for people in rural areas in Kenya. For the founder, this is based on an understanding of both the strengths of the platform and the increasing microfinance needs of the environment.

Musoni's platform improves the efficiency of microfinance systems and safety of the staff while boosting clients' ease and satisfaction with the transactions conducted with microfinance institutions (MFIs). With its system, time taken for loan disbursement has been largely reduced from the traditional 2 weeks to 2 hours. The flexibility of mobile access has been central to its increasing adoption, as clients in rural communities no longer have to disrupt their schedules or travel to conduct their finances. Other MFIs in Kenya are increasingly adopting Musoni's software to manage their operations.

Table 1 Options for mobile-based services

Minimum delivery method requirements	Minimum device requirements
Basic: SMS	Basic: Basic mobile phone
Intermediate: Interactive Voice Response (IVR)	Intermediate: Basic mobile phone
Advanced: Mobile and web-based applications	Advanced: Feature phone, smartphone, tablet

Source: Woodard *et al.* (2014).

Weaknesses

As youths, who have not been exposed to businesses from their family contacts, they have insufficient training to make adequate business decisions and limited understanding of the regulatory framework for ICT-based services/products.

Opportunities

Given 'big picture' and 'middle view' research, the graduates know that more farmers are cultivating shea trees to service growing local and global demand. From the value chain, they have come to understand that the process includes separating/cracking, crushing, roasting, grinding, separation of the oils, then collecting and shaping the final product. The graduates are now positioned to investigate where their ICT skills, from database support to online marketing, can be applied to reduce costs or increase sales for farmers. They have identified local incubation and other business support programmes, and have identified potential sources of funding their venture.

Threats

The graduates have to contend with the lack of reliable infrastructure (power cuts, stagnant ICT connectivity), and limited ICT literacy among the target audience. Additionally, there are also regional competitive threats from Ghana and Nigeria where more established ICT4Ag companies have developed ICT services to support the shea value chain and could expand into Benin.

Having carried out this exercise, the entrepreneurs should reflect on how to mitigate the weaknesses and threats revealed by this SWOT analysis. For example, regarding the threat of regional companies expanding into Benin, the entrepreneurs could research these companies to identify how they serve their customers and decide whether obtaining licences to operate these businesses in Benin is more beneficial than creating a new service. They may decide to identify gaps in the services the competitors offer, notably the market segments they serve.

After this SWOT analysis, they may then take an initial decision to move ahead with their business idea.

Case study 7

Mkulima Young and Ensibuuko: Identifying gaps in the market

Mkulima Young, an online platform, taps into the drive to enhance youth involvement in agribusiness in Kenya by assisting young people in agriculture with information, market access and financing. The platform provides an online marketplace for young agripreneurs to sell and buy agricultural produce and inputs. In addition, there is a Q&A section where its staff and fellow farmers respond to agribusiness questions submitted by young farmers. Although, the platform started with Facebook, which is its most popular online marketplace with over 60,000 followers, it expanded to other social media platforms like Twitter and now has an Android app.

Ensibuuko, a Uganda-based company, exemplifies the ability of an ICT firm to adapt its products to market needs. Launched in May 2012, the company sought to help farmers improve their access to markets while cutting out middlemen to save money.

Once Ensibuuko began providing SMS-based services to connect local farmers to buyers, they noted that increased demand for farm products meant that the team had to assist farmers to access financing support. This led to the identification of another gap in the market, as local savings and credit cooperatives (SACCOs), which traditionally provided loans to individual farmers, had been struggling to manage information and ensure efficient reporting of their members. In response to this, Ensibuuko provided a platform that helps SACCOs to manage information and reporting and better deliver financial services to farmers.

Given the fast-developing nature of the ICT sector and previous work done in the ICT4Ag domain, new entrepreneurs can learn from a wealth of cases, which may be a source of inspiration. Analysis of the competition can also assist with unique product/service design. Box 2 lists a selection of tech-innovations developed by Africans in the agricultural sector.

Box 2

Some popular ICT4Ag innovations in Africa

- **Daral Technology** facilitates livestock management (Senegal)
- **Farmerline** provides accurate and timely agricultural information to farmers and also provides technology to stakeholders so that they can work more efficiently (Ghana)
- **iCow** is an app that enhances and facilitates livestock management (Kenya)
- **M-Shamba** is an interactive platform for smallholder farmers and traders (Kenya)
- **Mobipay** provides technology solutions to various economic sectors to drive commerce and trade (Namibia)
- **Mobis** (Ensibuuko app) is a mobile platform for the management of credit and loans for smallholder farmers and agricultural cooperatives (Uganda)
- **Rangerland Solutions** is an online livestock marketing platform that directly connects buyers and sellers, reducing marketing costs (Kenya)
- **Redcore Interactive** is a platform for online international money transfers to mobile money services (Uganda)
- **SmartMoney** provides free branchless mobile banking to unbanked rural communities (Tanzania and Uganda)
- **YieldUganda** sources high quality, traceable food products for local and export markets (Uganda)

Source: AGRA (2015); Village Capital website⁷ (2015)

⁷ <http://vilcap.com/>

Case study 8

Ensibuuko and Farmerline's winning strategy: A variety of skill sets

Uganda-based start-up Ensibuuko has 10 staff members who are knowledgeable in finance, ICT and agriculture. One founder, Otim Gerald, has financial experience and has managed start-ups, while the other founder, Opio David, has first-hand experience in rural farming communities. To complement the current staff, 400 model farmers have now been trained through Ensibuuko to share their knowledge at the community level. From acting as a means to connect farmers to available markets, Ensibuuko has been able to use its existing presence in the marketplace and relationships within the agricultural value chain to branch out and offer additional services such as providing access to solar power kits and mobile banking.

In Ghana, where there is one extension agent for every 2,000 farmers, Farmerline was founded to improve the collection of data from small-scale farmers while providing them with information related to price, weather and farming techniques. Farmerline's platform provides this information via traditional outbound text messaging, an Android application and voice-based messages in local languages for farmers with low literacy levels. The founders of Farmerline brought together a team that included people with master's degrees in ICT, electrical engineering and business development to build the original multiplatform system and ongoing web features. Additionally, the team includes staff with experience in building relationships with agricultural extension agents who are key in maintaining relevant and appropriate content. In the face of growing demand for their services, they performed internal skills assessments and looked for additional staff.

Reviewing and improving the team's capacity

A common feature of ICT4Ag businesses is the challenges faced in recruiting and building the team. It is important to evaluate team members' skills to ensure that they are able to work together to realise the goals set for the enterprise's success. New skill sets should be brought on board when they are needed.

To execute an ICT4Ag idea, **knowledge of agriculture and value-chain dynamics, business skills and technology skills like software development/coding** are key requirements. For example, if the team has business and agriculture skills but lacks technology skill sets, an entrepreneur may be able to compensate by partnering with technology companies. The benefits of such a partnership should justify the cost of outsourcing technical development of the product.

Overcoming early challenges

Moving from an idea to execution poses many challenges for early-stage entrepreneurs. The following are key challenges often faced by surveyed start-ups:

Lack of available partnerships between start-ups and existing financial and/or governmental institutions

The ICT4Ag sector is a relatively new sector that established institutions – government and financial – are generally still struggling to understand. This is even more so in ACP countries. Because ICT4Ag innovations are often ahead of existing regulatory and financial frameworks, entrepreneurs may find themselves labouring more than expected to establish partnerships with government and financial institutions. Support from public institutions is critical and possibly what is most lacking, usually because of this inadequate understanding.

However, research shows that these key challenges can be managed successfully at the early stage through a variety of means. Businesses can work together to build partnerships with donors, and non-governmental and private-sector organisations interested in promoting agricultural activities or interested in investing in making agriculture more productive.

Box 3 Partnership: Key for Esoko and Daral Technologies

Esoko, a Ghana-based service that provides market prices and other value-added information to farmers, has partnered with the United States Agency for International Development (USAID) to launch a farmer helpline call-centre, which operates in 12 local languages.

Daral technologies is a Senegalese innovation that uses nose rings to track cattle in order to prevent theft. It enhances the traceability of the animals and prevents the risks and proliferation of infected meat on the market. In addition, by working with government institutions it has been able to prevent an epidemic at least once. Daral works with Ministry of Agriculture in Senegal to promote the adoption of nose rings in its herds and is working on developing a national register of farmers and livestock. This database will help government planning for the sector and enhances Daral's profitability through information-sharing with agricultural insurance companies.

Capacity building and role of incubators/accelerators

Incubators are institutions that provide aspiring or young innovators and entrepreneurs with a variety of support services to help them develop, launch and scale up their products and services (Box 4). Services offered can include office space, internet connectivity, advanced coding skills, business development skills and contact with business partners, including potential investors. Accelerators offer advanced services and are more relevant to young start-ups that have already developed a working prototype or that have already begun offering their services. Incubators or accelerators can be run by civil society, academia, government or private-sector institutions. In ACP countries, there are more incubators than accelerators and many young ICT4Ag start-ups lack the support of accelerators that can help turn their innovations into viable businesses and assist in scaling up. Many start-ups are still young and fragile, and need to be strengthened.

Box 4

Incubators and co-working spaces

The recent launch of co-working spaces and incubators across Africa allows entrepreneurs to reduce office, electricity and connectivity constraints. For those in Accra, these include spaces such as Hub Accra and iSpace Foundation. Most major capital cities across Africa have similar locations, for example, Jikkolabs in Senegal, Etrilab in Benin, Buni Hub in Tanzania and mLabs in Kenya and South Africa.

Apart from ICT incubators, agriculture incubators also exist in ACP regions. They are certainly best placed to provide knowledge and networking related to agribusiness. An ICT4Ag start-up will benefit the most if it receives support from both ICT and agriculture incubators working in collaboration.

Some key initiatives are worth mentioning:

InfoDev has been involved in the promotion of incubation at different levels and has supported incubators interested in agriculture and ICT (among others); **AfriLabs**, a network of African incubators is an adequate interface to reach incubators in Africa; finally, a new **African Agri-business Incubator Network** has recently been launched. Appendix 4 includes contact details of such initiatives and a list of selected incubation centres.

Poor relationships with mobile network operators (MNOs) prevents start-ups from connecting with their value-added service platforms⁸ including mobile payment services

To date, many start-ups operate outside of MNO infrastructure, or have difficulties collaborating with them to use their platforms. Telecom operators own infrastructure through which developers of ICT applications can reach agricultural stakeholders who own a mobile phone. If a young entrepreneur wishes to use these platforms to provide information services (through, for example, a short code like #222) to connected stakeholders, they have to pay fees that are usually beyond their financial means. Ways to overcome these challenges with MNOs include:

- entering competitions sponsored by MNOs
- attending pitch competitions, events and meetings co-sponsored by MNOs to establish relationships
- seeking co-founders who may have worked for MNOs
- negotiating with MNOs via a network of start-ups, or supported by another powerful partner/stakeholder – and not individually.

Whereas many start-ups try to form direct relationships with MNOs, they take a significant amount of time to develop, and are not transferable from one country to another. As an alternative, start-ups can work with players that already have relationships with MNOs and have integrated into their value-added service platforms and payment systems. These include Cellulant, Voto Mobile and Kopo-Kopo, all of which are service providers that allow you to bypass direct collaboration with an MNO.

Most MNOs tend to take, unsurprisingly, a very commercial approach to partnerships with young start-ups. Young companies should strive to demonstrate their value and augment their traction⁹ in order to improve their bargaining power with MNOs. If possible, negotiating with them as a network of start-ups, and not individually, may be a winning strategy. This however depends on the capacity and willingness of young operational companies sharing the same strategic objectives to join forces.

Staff turnover

In many instances, staff members leave the company after becoming highly trained and move to other businesses that may provide higher wages. To plan for this type of staff turnover, it is best to consistently maintain a roster of potential new staff or create an internship programme for recent graduates who can gain work experience while you evaluate them.

⁸ Telecommunications' value added services can be defined as services enabled notably by new technologies, rather than other standard services such as the standard voice and fax offered by telecom companies.

⁹ Market traction can be defined as a proof that services of a company are requested by the market – this may be the number of clients who have strongly expressed interest or have already paid for/subscribed to the service, promises or contracts secured, etc.

Case study 9

Agripro: Connecting young farmers

Agripro, a youth-led venture based in Accra, Ghana, provides farm-to-market advisory services. These include investment finance, training, technologies that provide market access for organic fresh fruits and vegetables, and awareness programmes that encourage young people to pursue farming as a career through university-based farm clubs. To raise awareness of their services, Agripro has elected to use free social media tools such as Twitter, Facebook, YouTube, Google+ and Pinterest. They engage their followers by sharing topical information and keeping their clients informed of upcoming products, services and events.

Right: © Gallo Images / Alamy Stock Photo

Below: © CTA



Developing the business plan



As we move further into the digital age, ICT4Ag entrepreneurs are increasingly 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. But everything starts with a plan. The ability to convert an idea to a business plan is essential, but few young entrepreneurs ever bother to complete a proper plan.

Additionally, there are some ICT4Ag entrepreneurs entering the so-called start-up world in search of repeatable scalable business models, but since this is a nascent sector there are no particularly trusted business plans or models that entrepreneurs can adopt. They will either have to import models from other industries or create new ones themselves.

ICT4Ag entrepreneurs can choose to take a traditional approach to developing a business plan or they can examine new approaches, such as the Lean Startup approach and its key tool, the BMC, which has become a standard tool used by many ICT-driven start-ups. Below is a brief overview of the traditional approach followed by a detailed explanation of the Lean Startup approach, which we recommend for ICT4Ag entrepreneurs.

The traditional approach

A traditional business plan covers a wide range of topics necessary for a company to obtain financing, make future projections and effectively market to customers.

Table 2 Typical elements of a traditional business plan

Executive summary	Description of business
Your executive summary is a snapshot of your business plan as a whole and touches on your company profile and goals. • What is the business? • What is the market? • What is the potential for the business? • Forecast profit figures • Funding requirements • Prospects for the investor/lender	Your company description provides information on what you do, what differentiates your business from others, and the markets your business serves. • A brief description of the business idea and why it should be a success • History of the enterprise and its ownership • Information about the entrepreneur's qualifications, experience and financial status
Products and services	The market
• A description of the product and what it does • An explanation of ways in which the product is distinctive and unique • Analysis of the competition • How the product will be developed and what new products are being considered as replacements • Intangible assets and protection (e.g. copyright, trademarks)	• Size and expected growth of the market • Analysis of market by segments • Identification of target segments • Competitors: who they are, ownership, size, market share, likely response to the challenge • Customers (existing and potential): who they are, where they are, how they buy, why they buy • Distribution channels
Strategy and tactics	Marketing: key questions to be answered
• How are we to get there? • Outline the broad approach to achieving the objectives • Describe the tactics (the details of the strategy e.g. the promotional mix) • The detail will be contained in programmes and budgets	• Who are the customers? • Who are the competitors? • What is the size and growth rate of the market? • How is the market segmented? • What is special about the product or service? • What are the product/services' competitive advantages? • What is the marketing strategy?
Marketing plan	Operations plan
• Market research • Segmentation and targeting • Detailed outline of the product or service • Unique selling points • Chosen pricing strategy • Promotional plans • Distribution strategy (including online) • Customer service strategy	• Physical location • The production process • Facilities • Equipment • Scale and location of operations • Capacity – potential and actual • ICT strategy • Staffing requirements
Management and organisation	
• Organisational chart • Details of senior management • Corporate governance • Staffing requirements • Key personnel • Recruitment and selection	• Training • Rewards for staff and even service providers if relevant (financial and non-financial) • Labour relations • Employment and related costs

Box 5

Developing an initial business plan: AgroCentral

AgroCentral is Jamaica’s first digital agricultural clearing house, using web and mobile services to connect farmers and businesses. Businesses have the ability to source large amounts of agricultural produce directly from farmers and farmers are able to sell their produce directly to businesses. The solution aids farmers in locating markets for their produce without the involvement of a middleman. AgroCentral also helps businesses to streamline their purchasing processes.

Their business plan was conceptualised by Janice Mcleod, a co-founder of the business, who has a bachelor’s degree in economics and has been working as a business development consultant since 2009. She has assisted the formation of several start-up companies based in Canada, Jamaica, the United Arab Emirates and United States by using the traditional business plan method.

Table 3 provides an example of the headings found within their traditional business plan.

According to many experts, such as entrepreneur and Lean Startup Advisor, Paul Foster, “a traditional business plan is full of assumptions and guesses” (Foster, 2014), which is why the Lean Startup approach and BMC tool are being seen as far superior methods, and can be used to start and launch an ICT-enabled agribusiness.

Lean Startup approach

With the Lean Startup approach,¹⁰ an ICT-enabled agribusiness is focused, first of all, on developing what is called a Minimum Viable Product (MVP). Popularised by Eric Ries, a consultant and writer on start-ups, an MVP is a technique in which a new product or website is developed with sufficient features to satisfy early adopters, yet the final, complete set of features is only designed and developed after considering feedback from the product’s initial users.

¹⁰ The Lean Startup approach is a method for developing businesses and products first proposed in 2008 by Eric Ries. Based on his previous experience working in several US start-ups, Ries claims that start-ups can shorten their product development cycles by adopting a combination of business-hypothesis-driven experimentation, iterative product releases, and what he calls validated learning.

Table 3 Examples of headings found in a traditional business plan

Executive summary	Description of business
Products and services	The market
Management team	Milestones
Market overview	Market segmentation
Information hub through blog	Future product development
Advertising strategy	Revenue business model
Revenue drivers	Regional forecast
Financial model	Proforma balance sheets
Expansion plans	Logistics

So in simpler terms, an MVP is the most pared down version of your product/start-up idea. Yet it still:

- has enough value that people are willing to use it or buy it
- demonstrates enough future benefit for early adopters
- provides a feedback loop to guide future development.

The ideas behind Lean Startups can be drilled down to a few straightforward actions:

- Deploy resources stringently, incrementally proving assumptions that drive the business model.
- Get customer feedback as early as possible.
- Revise your product or service as quickly as possible.

The BMC tool

This tool emanates from the Lean Startup approach and can be used to launch ICT-driven businesses. Simply put, “it enables both new and existing businesses to focus on operational as well as strategic management and marketing plans” (Osterwalder, 2004).

It has nine sections: Key partners, Key activities, Value propositions, Customer relationships, Customer segments, Key resources, Channels, Cost structure and Revenue streams. A further description on each element of the BMC tool can be found in Table 4.

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. It’s a quick test and can be carried out in only 30 minutes, provided the required market information is available. 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.

Table 4 Components of the BMC

Key partners	Key activities
• Identifying private-sector partners • Connecting with partners (government, private sector, funders)	• What key activities does the value proposition require? • What activities are most important in distribution channels, customer relationships, revenue streams etc.?
Key resources	Value proposition
• What are the key resources that are already available and will be needed?	• What core value will be delivered to the customer? • Which customer needs will be satisfied? The value proposition of the ICT-enabled agribusiness is about the collection of products and services the business will offer to meet the needs of its customers. It should speak to various elements such as newness, performance, customisation, getting the job done, design, brand/status, price, cost reduction, risk reduction, accessibility, and convenience/usability. The value propositions can be, for example: • Quantitative: price and efficiency • Qualitative: overall customer experience and outcome

Customer relationships	Customer segments
An agripreneur must be clear about: • The relationship the target customer expects them to establish • How they can integrate that relationship into their business in terms of cost and format	Additionally, which customer segments are being targeted and who is the most important customer? To build an effective business model, the ICT-enabled agribusiness must identify the customers it seeks to serve. Various sets of customers can be segmented based on different needs and attributes to ensure appropriate implementation of corporate strategy to meet the characteristics of selected groups of clients. The different types of customer segments may include: • Mass market: there is no specific segmentation for a company that follows the mass market element as the organisation has a wide range of potential clients, e.g. potatoes • Niche market: customer segmentation based on specialised needs and characteristics of its clients, e.g. truffles • Segmented: a company applies additional segmentation within an existing customer segment. For example, the business may distinguish its clients based on gender, age and/or income • Diversify: a business serves multiple customer segments with different needs and characteristics • Multi-sided platform/market: for smooth day-to-day business operations, some companies will serve mutually dependent customer segments. A credit card company will provide services to credit card holders while simultaneously assisting merchants who accept those credit cards
Sale/distribution channel	Product or service cost
An ICT-enabled agribusiness can deliver its value proposition to its targeted customers through different channels. Effective channels will distribute a company's value proposition in ways that are fast, efficient and cost-effective. An organisation can reach its clients either through its own channels (website), partner channels (major distributors), or a combination of both.	• Cost structure: this describes the most important monetary consequences while operating under different business models • Classes of business structures: - Cost-driven: this business model focuses on minimising all costs and having no frills - Value-driven: less concerned with cost, this business model focuses on creating value for their products and services • Characteristics of cost structures: - Fixed costs: costs are unchanged across different applications, e.g. salary, rent - Variable costs: these costs vary depending on the amount of production of goods or services, e.g. food festivals - Economies of scale: costs go down as the amount of goods ordered or produced increases - Economies of scope: costs go down due to incorporating other businesses that have a direct relation to the original product.
Revenue stream identification	
This is where an agripreneur has to answer the following questions • For what value are the customers willing to pay? • What and how do they currently pay? How would they prefer to pay? • How much does each revenue stream contribute to overall revenues?	There are several ways to generate a revenue stream: • Usage fee: money generated from the use of a particular service • Subscription fees: revenue generated by selling a continuous service • Licensing: revenue generated from charging for the use of a protected intellectual property • Brokerage fees: revenue generated from an intermediate service between two parties • Advertising: revenue generated from charging fees for product advertising.

An alternative to the BMC: The Lean Canvas

Developed by Ash Maurya in his book *Running Lean* (Maurya, 2012), the Lean Canvas tool is an alternative to the BMC. It is more focused on entrepreneurs and start-ups just being launched. The Lean Canvas model is thus more adapted to young ICT agripreneurs and is widely used for example by Eastern African tech hubs and ICT start-ups (irrespective of the focused theme: health, agriculture, entertainment or others). The Lean Canvas tool, like the BMC, also has nine levels, but some components are different (Figure 3).

A key component of the Lean Canvas is the 'problem' section, which is particularly important for ICT agripreneurs, as most do not have a good understanding of the agriculture sector. It is particularly important to demonstrate a good knowledge of the problem, which will help to better identify solutions. A table comparing the BMC and the Lean Canvas is included in Appendix 3.

Figure 3. The Lean Canvas model.

Problem List your customer's top three problems 1	Solution Outline a possible solution for each problem 4	Unique value proposition Single, clear, compelling message that turns an unaware visitor into an interested prospect 3	Unfair advantage Something that can't be easily copied or bought 9	Customer segments List your target customers and users 2
Existing alternatives List how these problems are solved today	Key metrics List the key numbers that tell you how your business is doing 8	High-level concept List your X for Y analogy (e.g. Youtube = Flickr for videos)	Channels List your path to acquiring customers 5	Early adopters List the characteristics of your ideal customers
Cost structure List your fixed and variable costs 7			Revenue streams List your sources of revenue 6	

Source: <https://leanstack.com/lean-canvas/>

Case study 10

SlashRoots and M-Shamba: Building business models

The SlashRoots Foundation is a Jamaican non-profit that leverages technology to create solutions to social problems endemic to the Caribbean region. SlashRoots works with governments, development organisations and civil society to improve public service programme design and delivery, with a focus on open innovation and user-centred design. SlashRoots also works to develop the regional technology ecosystem, facilitating the emergence of a technology industry that employs best practice, engages in global discourse and is responsive to the Caribbean environment of which it is a part.

Their five-strong lead team used the BMC tool at canvanizer.com to build their business model. The following are examples of the headings found within their Lean Canvas business plan (only some components highlighted).

Problem	Solution
Weak technology	Build a community
Community/ecosystem	Initiatives
Ineffective government policy	Research and support
Donor consultant	
Results and capacity	
Customer segments	Channels
Technology community	Website
Government institutions	Mailing list
	Events

M-Shamba is a Kenyan ICT4Ag start-up that uses SMS to bridge the information gap between farmers and research institutions and markets. M-Shamba provides three categories of information services to farmers: production information; information on agro-services providers in their locality; and market information.

The start-up used the BMC, with other tools, to design a system with which they convinced service providers that needed to maintain contact with farmers to pay an annual subscription of US\$8-US\$15 depending on the service and population density of the area. As a result, M-Shamba has been able to attain financial sustainability and is now marginally profitable.

“Validated learning is a process in which one learns by trying out an initial idea and then measuring it to validate the effect. Each test of an idea is a single iteration in a larger process of many iterations whereby something is learnt and then applied to succeeding tests. The term coined in the lean startup scene, but it can be applied universally.”

https://en.wikipedia.org/wiki/Validated_learning

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Formalising, sustaining and scaling your business



Doing business comes with significant risks that are best minimised through formalisation. The formalisation process ensures your business venture is legitimised and protected. It is often extensive and varies significantly across sub-Saharan Africa and the Caribbean. However, these economies are rapidly evolving and the ease of doing business is generally improving.

According to the World Bank's *Ease of Doing Business Index*, 35 of the 47 economies in sub-Saharan Africa implemented at least one regulatory reform – a total of 75 reforms – making it easier to do business in the June 2013 to June 2014 period (World Bank, 2015).

The *Ease of Doing Business Index* is an important marker as it speaks to aspects that are critical to doing business, such as respect for intellectual property (IP), the time it takes to register a business and the associated requirements. Since 2005, every economy in Africa implemented at least one reform measured by the globally recognised index. So notable are the improvements that sub-Saharan African countries make up half of the countries on the list of the 10 most improved regulatory environments in the 2015 edition. Benin, Côte d'Ivoire, the Democratic Republic of Congo (DRC), Senegal, Togo and Trinidad and Tobago made the list of the most improved business environments.

This chapter details the various formal processes required for a business start-up, including business name check and reservation, business registration, IP registration and branding. The chapter then looks briefly at bootstrapping, a concept that involves taking into account the current realities of early-stage business models, managing cash flow

and sharing costs, balancing the search for grants and product development, and leveraging existing assets to gain income. Grants, microfinance and private equity are recommended as the best ways to raise capital for a start-up.

Registering your business

Registering a business, for-profit or non-profit, is crucial in ensuring legal status and protection, and credibility with current and potential suppliers and customers. However, registration also comes with the responsibility to ensure compliance. This responsibility will vary based on the registration status of the business (for-profit or not-for-profit), tax obligations, reporting procedures, internal and oversight of governance structures, and civic and investment activities/engagements. The cost of registering a for-profit start-up varies greatly across countries.

In DRC, for instance, it costs US\$120 to register a business, compared with US\$100 in Nigeria (70% less than it was in 2013), approximately US\$240 in Jamaica, while in Kenya the total cost of registering a business worth 100,000 Kenyan shillings (about US\$990) will be approximately US\$50.

Step 1**Business name check and registration**

All businesses must register a business name. The first step is to fill out a 'Name approval/name reservation' form and submit it to a local companies' registry/office and pay a fee that in most African and Caribbean countries is less than US\$10. This is a crucial process as similar and identical business names to those already in use are prohibited. To avoid losing money, do not seek to register a name that is similar or identical to an existing one. The public records of business names can be searched at a local companies' registry/office for a one-off fee. Upon being satisfied that the name is original, it can then be submitted without fear of having it rejected.

Registering your business name may include additional steps depending on the country. The service of a lawyer/solicitor/attorney should be required and is recommended to complete these processes.

Step 2**Protect products, ideas and branding****Intellectual property rights**

The World Intellectual Property Organization (WIPO) defines IP as "creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce" (WIPO, 2015).

Box 6**Creative Commons use by Farm Radio**

Creative Commons and Open Source licensing are alternative ways to manage intellectual property. Creative Commons and Open Source licensing are complementary processes to copyright that allow originators of ideas to protect their work in a simple, standardised way that gives the public permission to share and use their content, but only under the conditions of their choosing. In a social entrepreneurship world in particular, building a product with open source codes is common and can boost innovation in society.

Farm Radio Ghana, a division of Canada-based Farm Radio International, is a non-profit ICT4Ag organisation that ensures that information required by small-scale farmers and rural communities gets to them in a timely manner, and is accurate and relevant. It is one of the divisions that serve the 500 radio stations that make up the Farm Radio network, which works in 38 African countries to fight poverty and food insecurity, and give rural communities a voice. Each programme targets a listener base of approximately 200,000 people. In addition to radio broadcasts, listeners can interact via their mobile phones using IVR systems to ensure that they obtain required information after the programme.

Given Farm Radio's membership in an international network that spans most of the

African continent, formalisation and intellectual property rights issues are key to its structure. During the course of registration, Farm Radio Ghana had its name and brand colours registered (copyrighted) with the help of a solicitor or lawyer, who not only assisted them to formally copyright the material but also exposed them to a complementary process called Creative Commons licensing.

Creative Commons licensing allows Farm Radio Ghana to protect their work in a simple, standardised way that gives the public permission to share and use their content on the conditions of their choosing. So whereas traditional copyright terms entitled them to 'all rights reserved,' they were able to alter the rights to 'some rights reserved' and determine precisely what those are. The advantage of this is that their creative works can go viral on the conditions they set. A common condition is that works can be used but not for profit purposes, and if profit is involved then the conditions are stipulated by Farm Radio.

Creative Commons licensing allows the owner to give people the right to share, use, and even build upon a work they created, on their terms. An advantage of Creative Commons licensing is that it is free. There is also the benefit that as they seek to build their own ICT4Ag businesses and services, entrepreneurs can access and/or use a wide array of works available on the internet under Creative Commons licensing to perfect their innovations.

Case study 11

Hello Tractor: Protecting IP with patents

Hello Tractor is a social enterprise focused on improving food and income security throughout sub-Saharan Africa. The company designed an innovative, low-cost 'smart tractor' to meet the labour needs of small-scale farmers. Equipped with various attachments, owners can tailor its use for a variety of crops and stages of the production cycle, allowing them to serve their customers throughout the year. A GPS antenna allows Hello Tractor to track its usage and gather data on location and uptake. The company also uses a cloud-based booking system that allows farmers to conveniently request, schedule and prepay for tractor services, from nearby 'smart tractor' owners, through SMS messaging and mobile money. Once the service is completed, the prepayment is automatically released to the 'smart tractor' owner.

The social enterprise tackles a crucial problem as resource-poor farmers are undermined by labour shortages. This often leads to under-cultivation, poor harvests and lost income. Targeted farm mechanisation can effectively deal with these challenges but small-scale farmers throughout sub-Saharan Africa lack access to tractors that can, for instance, improve farm productivity.

Given the degree of innovation involved, Hello Tractor is keen to protect its intellectual property rights. The company, which was created in 2014, is working to secure a provisional patent for its software that powers both the cloud-based and SMS services.

However, the company feels confident that its first-to-market reputation and significant reach also gives it some protection with respect to copyright, which is true from a legal perspective.

IP is valuable as it is protected in law. There are various types of IP, including patents, copyright and trademarks but some jurisdictions recognise additional classes, which allow owners to earn recognition and/or financial benefit from their invention or creation. The intent of the IP system is to strike a balance between the interests of innovators and the wider public in such a way that enables an environment in which creativity and innovation can flourish (WIPO, 2015).

How can creations and/or innovations be protected?

To protect IP, you must follow a formal process to either copyright, patent or trademark the ideas and work.

Copyright

Copyright is a legal term used to describe the rights that creators have over their literary and artistic works. Works covered by copyright range from books, music, paintings, sculpture and films, to computer programmes, databases, advertisements, maps and technical drawings.

Patent

A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application. Getting patents is very demanding and costly, and usually impossible for most young companies in developing countries. It has to be noted that software patents are impossible to get under various jurisdictions.

Trademark

A trademark is a sign capable of distinguishing the goods or services of one enterprise from those of another. Trademarks are protected by IP rights.

Most entrepreneurs are unaware of the rigorous process needed to protect any unique creation or idea within their business. Additionally, they may also elect not to pursue a path to legally protect various portions of their IP due to a lack of ready laws, ignorance, complacency and/or high costs of obtaining proper legal assistance. Of the start-ups surveyed for this guide, the extent of IP protection involved trademark protection, but little was done to identify or secure the IP of novel software code.

Therefore, if the service being provided will be largely available to the consumer online, obtaining a trademark to protect the brand should at least be considered.

A **non-disclosure agreement**, which is also known as a confidentiality agreement, may also be used to protect IP rights to some extent. It is a legally binding contract in which a person or a business promises to treat specific information as a trade secret and promises not to share that information without authorisation.¹¹

How to secure your intellectual property: Practical recommendations

Despite the trend to forgo IP for a myriad of reasons, the global nature of ICT-based businesses demands those with novel ideas and concepts to properly examine how to protect their IP rights in advance of expansion to additional markets where the IP regime is more established. Given the time and cost requirements, securing IP rights should be considered as an investment.

There are a number of important steps that should be taken to protect a business and its creations, inventions and ideas. Steps that can minimise the likelihood of encountering challenges in the event of IP theft and greatly limit risks should a problem arise include:

- Register the idea formally.
- Consider how the idea is discussed with or revealed to partners. Discussing the business ideas may help entrepreneurs to benefit from inputs from others (including peers), which can be helpful, but there is also the risk of having the idea stolen. If possible, build the idea first before talking about it. Having commercial visibility often creates a market entry barrier for competitors.
- Record the idea in detail.
- Apply for a trademark as soon as possible.
- Ask for a non-disclosure agreement and/or get a patent if possible.

Bear in mind that defending IP rights could be very expensive depending on the depth of an opponent's pocket and their ability to attract a good lawyer. This should not prevent a young start-up from protecting its innovation, and this should be done as quickly as possible.

¹¹ <http://www.ip-watch.org/>

Case study 12

Farmable.me: A copyright approach

Farmable.me is an innovative ICT-based food security solution that also tackles the issue of limited agricultural funding in Ghana. Farmable.me uses a concept called 'crowd farming' to make farmers more efficient by moving cattle farming online. In this virtual farming scenario, people from around the world can browse smallholder farms across Ghana and invest in them by buying all or part of (up to 20 parts) a virtual cow. When a cow is fully paid for, it is linked to a real animal on a specified farm. The real cow is tagged with a radio frequency identification tag, and the investor(s) can then follow the progress of the cow, interact with the farmer and profit once the cow has been slaughtered. The interactive tool, which uniquely leverages ICT and forward-thinking funding arrangements, such as crowdfunding and cloud farming to boost agriculture in Ghana, also centralises information about the cow that can help track its health, welfare and ultimate readiness for slaughter.

While Farmable.me does not yet have its intellectual property rights fully secured, it makes use of a non-disclosure agreement on its website and uses a lawyer who is involved in all cases. A non-disclosure agreement is also called a confidentiality agreement. It is a legally binding contract in which a person or a business promises to treat specific information as a trade secret and not share that information without authorisation (<http://www.ip-watch.org/>).

This is important as an entrepreneur engages partners and team members who they divulge information to in a bid to secure their engagement. The documentation of Farmable.me's services on its website and in the media also provides some cover by objectively establishing its use of the software and its approach.

Branding

Naming your business, and brand development and management

All successful businesses have a clear image designed to elicit a specific line of thinking about the company, its products and services. Effective branding requires a defined identity to be created and sustained. The identity of your brand entails the visual representations of the company or identity markers – namely a name and a symbol/logo that distinguishes it. The process of developing these identity markers is known as branding. Identity markers such as a name and logo that capture the essence of a business are important first steps as an entrepreneur prepares to register their business. Once an original business name and logo for the idea has been decided on, they should be trademarked. A relevant and memorable trademark will help the business or product stand out from competitors and can help in promotion of the product in the future.

Brand development and management

In much the same way people protect their personal identity to safeguard them from fraud and manage their reputation and credibility, brand identities ought to be carefully crafted and managed. Brand development and management should be contemplated as soon as the product or service is ready to be pitched, as a solid brand concept helps to justify credibility and explain ideas to funders, potential employees and partners. The process can take anywhere from a couple of weeks to months depending on the scope of the branding effort, but most start-ups can do a credible job, including pretesting in 5-10 days. The process includes identifying the brand's essential components, the terms of use and standard guidance on how the brand's identity markers ought to be used. The careful management and promotion of a brand requires using the correct copyright symbols on documentation and products associated with the business. This further enhances ownership of ideas, creations and inventions. It also creates resonance with colleagues and customers.

Box 7 Logos

Font-based logos use a type treatment (text) with a twist to make its main identifier distinctive and relevant. Dell, IBM and Disney are ideal examples of this. Strict font-based logos are uncommon in the agriculture sector, but Esoko, Syngenta and AgriPro utilise font-based logos.



Abstract graphic logos often have no clear or detailed meaning but become associated with the company over time. AgroCentral's logo is a prime example of this. As the brand's identity becomes more established, the image and the company will merge. Famed examples of this include Apple, Nike and Shell.



Key principles to designing logos

- Keep it simple
- Make it memorable
- Ensure it is timeless
- Strive for versatility
- Ensure it is appropriate (consider cross-cultural implications).

Key questions to consider in the branding (logo design and naming) process

- What is the brand and how does the primary target audience perceive it relative to the main competitors?
- What is the brand value? Define the differentiating points in terms of the what, how, to whom, where, why and when questions.
- What are the components of the product/service and the rationale for building things that way (is it natural, organic, intuitive?).
- What unique values, behaviours or thoughts should the brand say about the business? What personality should the brand have? How should it look, act and talk to ensure that it properly communicates the values and mission of the company?

- What kind of emotions (edgy, rustic, irreverent, familial, etc.) and perceived benefits (luxurious, comfortable, affordable, durable, etc.) should customers associate with the brand? How should the brand evolve over time? (Creative Market, 2015).

A logo will fall in one of three categories – font-based, literal or abstract. While ICT-oriented agriculture companies tend to combine elements of these categories, their dominant elements allow them to be assigned to one of them.

Finances and your start-up

Bootstrapping

Investopedia.com¹² defines bootstrapping as “A situation in which an entrepreneur starts a company with little capital. An individual is said to be bootstrapping when he or she attempts to found and build a company from personal finances or from the operating revenues of the new company.” The current early-stage financing option for ICT4Ag entrepreneurs is often limited to savings or funds accessed by competitions or grants. Though many services are knowledge-based – meaning they don’t require capital-intensive equipment and machinery – even the basic costs of software development, and office and general administrative costs may be beyond the financial means of entrepreneurs to sustain during the first years of their venture. Therefore, there is a need to sustain the business until revenue generation begins (bootstrapping).

Managing cash flow and sharing costs

To retain cash, entrepreneurs have to reduce general and operational expenses to the lowest level possible. Tech entrepreneurs, in general, accomplish this by using shared resources such as office space, the internet, power and tools like cloud hosting. The expenses that remain will then be the cost of the founding team’s time and that of additional support.

Bringing on a co-founder is also a form of sharing costs, though it must be done only when the person is providing substantial value to the start-up at the seed stage, assisting with the refinement of the core concept, providing necessary skills that complement other founding members. Firms such as Farmable.me, SlashRoots, AgroCentral and Farmerline have all benefited from the ability to pull from their co-founders’ knowledge and experience, as opposed to procuring the skill from a third-party provider.

Balancing the search for grants versus product development

As many of the entrepreneurs surveyed for this guide stated, the initial funding for their company was derived from grants or contributions from donor organisations. Largely structured as for-profits, entrepreneurs do not plan for the staffing required to continuously research, review and apply for further grants that may become available. This is despite the ever-present need to develop the product (detailed in the section describing the Lean Startup approach).

Start-ups may find that bartering for services provides another option for reducing the outlay of cash. For example, an entrepreneur may barter with a grant writer to provide ongoing support for seeking and applying for grants in exchange for support on graphic design needs.

The co-founders of Farmerline have chosen to use fellowships such as Echoing Green and other small grants, to provide salary support along with networking opportunities. This strategic use of grant resources, provides funding within a time-horizon and structure that are favourable for operating business owners.

Generating revenue streams and sustainability

As the majority of expenses for a nascent ICT4Ag entrepreneur are likely to be related to cost of living, there may be a need to gain additional employment or contracts with another entity. One way of doing this is by providing direct services to other businesses (not necessarily in agriculture). The closer the industry segment of the client business is to agriculture or ICT, the more cross-relevance will exist for future use of the developed solutions.

¹² <http://www.investopedia.com/terms/b/bootstrapping.asp>, consulted in July 2016

To increase revenue streams, many ICT4Ag companies have added consulting services to their product line, in addition to subscription services, and online transaction fees. Companies such as Growth Mosaic¹³ (Ghana) and SlashRoots (Jamaica) all provide project-based consulting services to agripreneurs. This not only provides needed income during periods when other products are in development, but can also develop into separate and self-sustaining services.

Farmerline, for example, was able to leverage their SMS- and voice-based platform to support the 2014/2015 Ebola response by developing local-language messages for farmers in Ghana. Using this experience, they were then able to market their existing capacity to support health sector initiatives in Liberia, Sierra Leone and other countries.

Agripro runs a monthly event called ‘Accra Green Market’ to promote organic produce and lifestyle products. By providing an opportunity for farmers to showcase their goods in an urban setting, Agripro is able to stay engaged in the value chain and also generate additional revenues.

Raising capital

Funding is essential for any business idea to be realised. Raising capital constitutes an important part of a company’s financial planning, which affects rollout, sustains operations and guides scaling up. All businesses require an initial investment. How innovative the ideas for raising capital are will have a bearing on the growth pathway and viability of a business. Initial fundraising requirements and activities should be based on an analysis of expected expenses. ICT-enabled agribusiness operations are fairly new, and as such face above average scrutiny from funders.

¹³ A Ghanaian business that helps companies in their growth strategies.

Case study 13

Edyn: Crowdfunded innovation

Edyn is an innovative ICT4Ag start-up that designs solar-powered smart sensors that measure soil moisture, soil temperature, humidity and light, nutrient level and other important soil data and stream them to the cloud.

Being a hardware-based innovation with its capital outlay, and because of limited financing, the founders had to leverage on the crowdfunding platform – Kickstarter – to fund the initial development of their product.

In the early stage of an entrepreneurial venture funding may come from a range of sources: personal income, family income or loans, grants, microfinance, commercial loans or private equity. Whether and how much these funding sources are used will vary widely for each person and business, as they are dependent on the founder’s financial position, ownership of assets and the general availability and accessibility of loans in the country. Commercial loans, in particular, are costly and even low-subsidised loans often prove difficult to access for young ICT agripreneurs. Below is a brief description of sources of funding (grants, microfinance and private equity) more suited to the nature of this emerging sector and guidance as to when and how to tap these facilities.

Grants and prizes

A grant is funding/support for a given period that does not need to be repaid. Grants are available from a wide variety of sources including government (central, local), NGOs/community-based organisations, foundations, development agencies (national, regional and international) and some commercial entities. While grants aren’t reimbursed, they are made with conditions, namely strict reporting standards, performance targets and spending limitations, and they will end at a particular point. Even in cases where they are renewable, the conditions could be onerous given the size of the business and available human and technical resources.

Honouring the terms of a grant will require well organised planning and competent staffing. Careful planning can help meet the strict reporting standards for grants, so the aim should be to maximise the use of grant funding to limit debt and depletion of equity.

A wide range of grants exist and will require significant research to identify. A good starter resource to use for grants in agriculture, forestry and the environment is the Terra Viva Grants scheme, which develops and manages information about grants for the developing world.¹⁴ Local youth, finance and community development ministries are also good starting sources for grants and awards.

Many governments have launched funds to promote agribusiness and youth development. While government and non-governmental supports are still insufficient, there is an emerging community of impact investors.¹⁵ To attract these funds, ICT4Ag entrepreneurs must pitch their products or services in a highly effective and convincing manner.

Prize money won in various competitions is a common source of funding. The benefit of this approach is that there are fewer or none of the stringent requirements for how the funds can be utilised – as is often the case with grants. However, contests with substantial prize money are infrequent and could distract start-ups given the time commitment they require.

Leveraging funds from the 3 F's

A start-up will likely need to either leverage financing from the three F's (friends, family, fools), bootstrap or tap into a combination of both. This was certainly the case for the majority of companies interviewed for this guide.

Loans

Many young rural entrepreneurs tap into in microfinance as a source of funding for their start-ups. Getting money from microfinance institutions is not as prohibitive as getting a loan from a regular bank and there is more flexibility to return money. Conversely, some microfinance loans are costlier than commercial loans, which often traps entrepreneurs. So it is important to compare and contrast interest rates and repayment terms (duration, penalties, etc.) for the amount you intend to borrow before deciding on a loan institution.

Case study 14

Esoko and Moringa Connect: Grant funding

Esoko won a US\$1.1 million grant from the UK's Department for International Development to start operations in six Eastern African countries. This grant allocation is part of a programme called 'FoodTrade East and Southern Africa'. The goal is for Esoko services to reach 3 million farmers by 2020. As Esoko expands to other countries, it is seeking local partners to help adapt and develop its activities.

Many start-ups including Modisar used prize money from local innovation challenges sponsored by MNOs or various organisations.

Ghana-based Moringa Connect which trades moringa based products via ICT platforms, raised start-up capital from partners of the Massachusetts Institute of Technology (MIT) and various grants, while the founders were students at the institute. The team were then awarded scale-up scholarships and access to the MIT D-lab (Development through Discovery, Design and Dissemination).

Private equity

Often young entrepreneurs with great ideas or promising businesses get easily frustrated when they exhaust funding sources or can't find any in the first place. However, most young entrepreneurs do not consider one source that can be used to expand or bring their ideas to life: equity. Equity – or offering a stake in the company in return for investment – is a valuable tool for funding entrepreneurial ventures. If an entrepreneur owns all of their new start-up or business idea, they own 100% of the company's equity. Each time the entrepreneur offers a proportional ownership stake in their venture in return for funding, their stake, or equity, is reduced.

¹⁴ <http://www.terravivagrants.org/Home/view-grant-makers/group1-agriculture-fisheries-forestry>

¹⁵ Impact investors are individuals who invest in organisations with the clear intention of generating social and environmental impacts and with less focus on high financial return.

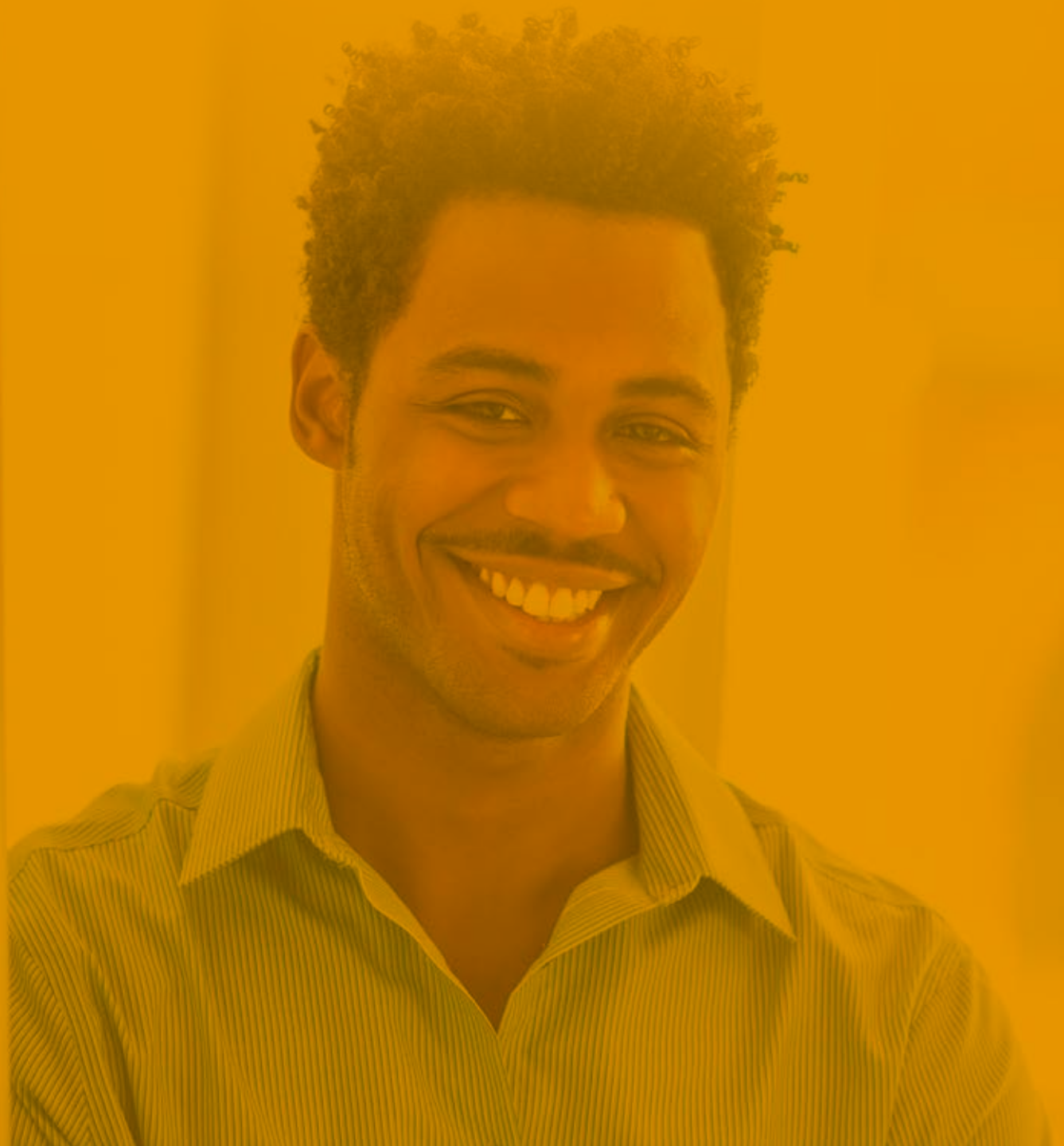
Everyone who is given equity (a relative, a peer, a stranger) for funding becomes a co-owner and may require a flexible horizon for a return on their investment – often dependent on the amount invested – and proof that the product/service has traction in the market. However, the entrepreneur has full control over how much they are willing to redeem for funding. Equity therefore can be of value and is an underutilised means of raising funds for start-up business ventures among young people. After exhausting grants and microfinance options, which are often limited in range, young entrepreneurs can use equity to raise funds to start or expand ventures.

Although an entrepreneur may seem to be losing part ownership of the idea or business through the private equity route, it does bring more resources (financial and human) to move a small and fledgling effort into something bigger and more viable. Ultimately what a young entrepreneur once fully owned becomes more valuable as the business expands. As such we recommend using as much grant funding to get started before leveraging equity, but if a start-up has a significant skills gap and it does not have the resources to source and pay for these, equity should be offered as a means of attracting the skills. Equity, therefore, can aid a business in doing two things – attracting key skills without paying upfront and locking in funding.

It has to be specified that this kind of funding requires the start-up to demonstrate an effective market traction.



Scaling up



Scalability is the ability of a nascent business to grow. It means a business can adapt to a larger workload without compromising performance or losing revenue. Scaling is particularly challenging for ICT4Ag businesses due to poor business models, planning and dependence on donor funding, which often ends after pilot projects.

Scalability requires the right systems, people and mindset, otherwise you run the risk of scaling prematurely, which can be a costly mistake. Companies make greater use of a wider range of resources, primarily money, people and systems to capture greater market share when they are on the cusp of scaling. It is for this reason that scaling is considered one of the most serious times (due to risks, the ability to secure the needed resources and uncertainties to get market traction in the new market/segment) in a company's evolution.

Box 8

Sustainable and scalable business models

(The following is an article extracted from CTA's ICT Update Magazine, N°80, August 2015)

Why is it important to consider different business models in ICT4Ag?

Most of the products that I see in the market today can be defined as either direct-to-farmer (the majority of products) or business-to-business (a growing segment). The direct-to-farmer model was the focus for many of the first generation of ICT4Ag products – many of which were donor- or NGO-driven and focused more on farmer impact than on sustainability and scalability. Direct-to-farmer products are exciting because of the large potential customer base, but very few businesses have been able to translate that potential into reality, even those with clear value and low costs. (...)

Business-to-business models targeted at agricultural businesses are starting to get more attention now. These businesses are often better positioned to understand and quantify the value of ICT solutions (e.g. transparency, visibility, farmer loyalty and cost of sourcing), and thus can justify paying for them. (...)

How are business models being used in different ICT4Ag sectors?

Much of the donor- and NGO-driven efforts have focused on direct-to-farmer models – typically providing agronomy content, weather content or market prices directly to farmers for a small fee or for free. Private-sector players are a bit more varied – you have mobile network operators that are offering a similar direct-to-farmer content product, and are banking either on direct revenue from the product (via subscription or per-piece fees) or are looking for indirect benefits linked to their core business (e.g. more subscribers, stickier SIMs, mobile money transactions, reduced churn and increased average revenue per user). You also have private-sector players using business-to-business 'B2B' models targeting businesses in the value chain – we have seen Farm Force, M-Farm, Connected Farmer and others play in this space.

The reality is that there are very few clear winners yet in the ICT4Ag space – few businesses that have achieved scale and sustainability. I think that many of the products that eventually succeed will be the

result of Public Private Partnerships – private sector owning the IP/product and contributing funds; donors contributing additional funds to buy down the risk; and NGOs providing initial technical assistance and field staff. (...)

How can business models increase the scale, sustainability and impact of ICT4Ag-enabled services?

I think we need to be more creative about how we go to market. It is easy to get excited about the large numbers of underserved farmers, but they can also be a challenging customer to acquire and monetise. We need to think about other value-chain actors, particularly businesses that will more easily understand the value of ICT solutions and have money to pay, and think about how to create products that serve their needs while also providing value to farmers. If we can leverage existing market actors to register farmers (by providing them value for doing so), we can drive down our farmer acquisition costs dramatically.

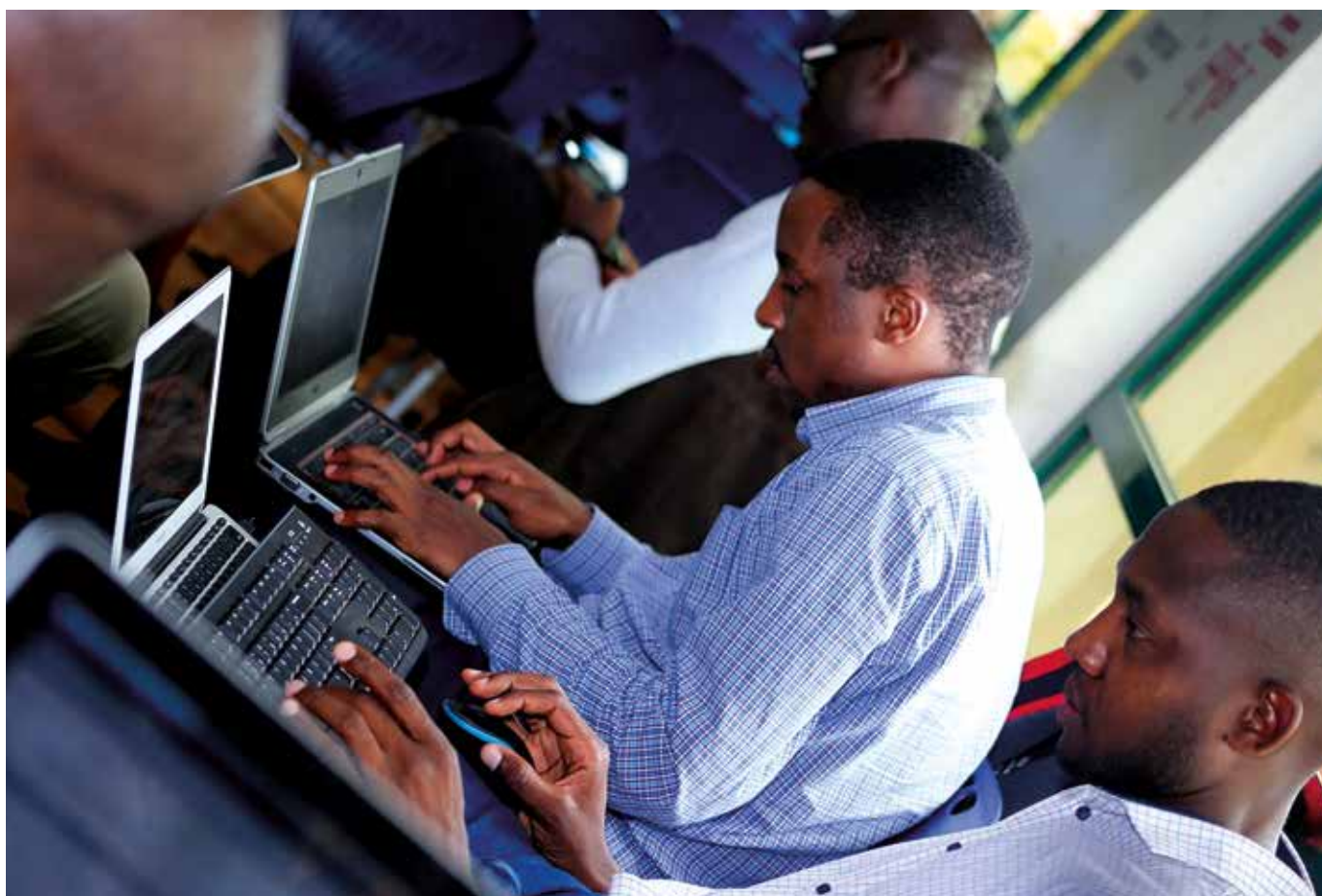
I am also excited about the possibilities for integrating digital financial services into ICT4Ag products. Digitising value-chain payments should be a quick-win – simply by moving existing cash payments onto mobile money or digital platforms, we can increase transparency and safety for businesses and farmers, and decrease costs of sourcing. We also drive transactions, which is a core revenue stream for mobile network operators and financial institutions. We should also look at integrating savings, credit and insurance products that are leveraging mobile phones, as they can drive financial inclusion for farmers.

We also need to think through how to monetise the data we collect on farmers. An ad-based business model is probably not feasible in most markets today, but there are other ways to monetise data, some of which could have incredibly positive impacts for farmers. If we think about sharing ag-payment data with financial institutions, we have the potential to make those farmers creditworthy and drive financial inclusion for millions. Obviously we must be vigilant about misuse and privacy concerns, and I expect the industry as a whole to actively address this.

Michael Elliott is TechnoServe Regional Programme Director of the Connected Farmer Alliance covering Kenya, Mozambique and Tanzania.

Right: © Mile 91/Ben Langdon / Alamy Stock Photo

Below: CTA (CC BY-NC-SA 2.0)



Common mistakes, solutions and advice



This chapter presents nine common problems faced by ICT4Ag start-ups and their solutions. It ends with advice from ICT4Ag entrepreneurs.

Common mistakes and their solutions

Single founder

Problem: Single founder status can limit potential. Most successful companies and start-ups tend to have many founders although one of them may be more prominent than the others – acting as the face of the business. Single founder companies do exist and many become successful, but there are unique challenges. Single founder status can hamper funding and outreach efforts as it is seen as a risk.

Why? It suggests others did not buy into the vision. Entrepreneurial ventures, especially in technical and agricultural fields, are difficult to structure and require multiple skill sets that are often only traded for equity. Even in cases where an individual can perform the varied tasks required, colleagues are needed to brainstorm and contemplate difficult decisions with and to boost morale (Graham, 2006).

Solution: Talk with your friends and explore your network to find partners. Strong co-founders will increase the chances of success as it brings more ideas to the table, and boosts morale and ownership.

Solution-in-search-of-a-problem

Problem: Products and services that are developed without a primary purpose almost always fail. This is because without a clear purpose or issue to be addressed, entrepreneurs are unable to identify who to convince to buy the service or product and often spend limited resources (possibly all) trying to pitch it to non-existent or unidentifiable customers. The solution-in-search-of-a-problem challenge is often exacerbated by a failure to listen to consumers.

Solution: Market research or customer development for small-scale businesses. Do not be too rigid with your ideas. Be open to changing direction.

Not listening to the customer

Problem: The old adage ‘the customer is king’ rings true in business at all times. Failure to listen to and understand customers can pose serious challenges to the viability of a business.

Solution: It is important to first understand who the ideal or target customers are. This allows a start-up to spend limited resources in a more targeted fashion rather than ‘try a little bit of everything’ with no clear sense of how to measure impact. In taking this approach, entrepreneurs are able to adapt their products and services to meet the needs of existing and potential customers. This requires active and continuous listening that may take the form of market research (customer discovery or development) to identify who to reach, where to find them and how they will react to promotional activities and services.

Choosing the wrong platform

Problem: Building an application on the wrong platform can be catastrophic. Platform could mean “an operating system, or a programming language, or a ‘framework’ built on top of a programming language” (Graham, 2006). It implies something that both supports and limits, like the foundation of a house. Platforms affect service delivery experience/usage and accessibility, so this is crucial.

Solution: Choose the right platform(s). One sure way to do this is to hire good programmers and let them choose. Consulting with computer departments at universities to see what they are using is also an option as they tend to use cutting edge platforms with less vulnerabilities.

Inappropriate location

Problem: The ICT and agribusiness sectors, like many others, are often negatively affected by poor location, which affects funding opportunities, service/product quality and customer satisfaction.

Solution: Given the nature of this emerging sector, two key factors should determine where ICT4Ag businesses are located: 1) infrastructure to enable the development and delivery of the service/product; and 2) proximity to talent pool and supporting industries or likelihood of talent relocating to the location. These factors combine to boost the prospects of an ICT4Ag venture in various ways from location to location.

¹⁶ www.next2.us

Bad choices of team members

Problem: Choosing the wrong team is one of the costliest errors entrepreneurs make because it results in the loss of income and time, and depletes morale, on which businesses, particularly start-ups, thrive.

Solution: It is crucial to choose people with varying skill sets, as well as those with whom an entrepreneur shares common values and the ability to trust in difficult circumstances. This aspect of business is akin to a sports team. Each player brings specific expertise to the table and is only allowed to play their position if the team trusts them to deliver. So past experiences of working with co-founders and early employees under difficult conditions should be given more credence than friendships or family ties. Participating in group problem-solving activities can allow an entrepreneur to gauge team-fit among potential partners and employees. This also applies to corporate governance in terms of who is appointed to a board to provide oversight.

Too much focus on raising money

Problem: Start-ups demand the full attention of founders in the early stages. Although securing and managing funding is a crucial aspect of this process, founders run the risk of focusing on raising money almost to the exclusion of many other equally important things: understanding the customer, building the product, managing staff etc.

Solution: Set clear funding goals and track the time spent sourcing funds versus other tasks. This will serve as a guide and keep everyone on track during day-to-day operations. By making sure goals are specific, measurable, attainable, results-based and time-bound (SMART), founders can identify where they want to go and outline specific steps that they will take to get there while reallocating time and other resources to core business management functions when necessary.

Poor understanding of finance and accounting (and related matters)

Problem: Accounting reporting standards are often complex and come with little guidance. As a result, start-ups tend to violate these rules or incur significant unanticipated costs in hiring professional help.

Solution: Budget for professional accounting help. Invest more time in understanding accounting reporting standards. Contact designated government departments and business support organisations about informational sessions on these standards.

Poor understanding of the legal and regulatory environment

Problem: ICT regulations almost always lag behind innovation. This, in tandem with the myriad complex requirements for setting up businesses, and keeping them in good standing with tax rules, labour laws and corporate governance, often poses significant challenges for established businesses and more so for emerging ones.

Solution: Seek legal support from local businesses, development agencies and incubators. When hiring legal talent, even those with experience, ensure they have relatable experiences. This is crucial given the complexities of the emerging ICT and agribusiness space.

Advice from interviewed entrepreneurs

The following table presents a selection of advice provided by established and emerging ICT4Ag entrepreneurs.

Organisation	What advice would you give to a peer who is contemplating or about to start a business in ICT4Ag?
Modisar (Mudisa Net Pty. Ltd.)	It's not easy, but it can be done if you are determined. Keep working hard and eventually people will listen.
Hello Tractor	• Don't try to build a business around a request for proposal (RFP). To build a good business will take 1-2 years of business planning. Be committed to something and stick to it. If a RFP comes in the meantime, good, but focus on your sector or product. Focus on a pain point (the problem or need a business or company aims to solve) in the market and find funding that's non-dilutive. • Don't build a product that a donor is asking you to build around a grant. You're given a short window to solve a really big problem, which is not realistic. Commit yourself to the product and let the donor money fall where it fits. • Take the private-sector approach to create value in the market.
Agripro	Understand agriculture, and use design thinking to see how the farmer will use the product. Execution before planning. Don't worry about technology.
Farmable.me	Just start. There are problems, but just keep going. Find out and link with people who are already in the agriculture sector.
Growth Mosaic (Ltd.)	Prototype, prototype, prototype. Have a good product before you begin piggy-backing off of the development sector. Build something and show that it works, get customers and customers' testimonials.
Esoko	• Starting an agribusiness is frustrating because adoption is slow. Be prepared financially for the early stages. • Understand the industry before starting, and understand that it requires cash flow to keep growing until you break even. • Build a network within the industry.

Organisation	What advice would you give to a peer who is contemplating or about to start a business in ICT4Ag?
Ensibuuko	Be part of the process, network, have commitment and openness to people, and be very active in the development of the enterprise.
Climate Wednesday	Having access to information is important as well as learning skills. Being passionate about the work is paramount, even when money is not coming as fast as hoped.
TechnoServe Uganda	Proper documentation benefits and leverages other players for expertise and reach.
SlashRoots	Be clear about the problem that you are seeking to solve and do not go the way of creating a solution that needs to find a problem.
AgroCentral	Just get things done. Put together a great team.
Farmerline	Everything comes back to a team. If you are an ICT person, find a business partner. If you are a business person, find an ICT person. The character of your team makes the difference. Only a few of the companies founded in 2012 are still around. The team should be skilful and willing to take less money.
Serve Africa	Constantly experiment with programme models and don't lose hope if the situation is difficult.
Diaspora Angel Investment Network (DAIN)	There's a lot of opportunity. Hurry up and get started. Don't wait any longer.
Moringa Connect	• First and foremost, be encouraged that you are good for pursuing this route. ICT is an enabler, so aspiring ICT4Ag entrepreneurs should invest in learning. • Get operations right as there are so many opportunities to get things wrong. Pilot every stage of the business with as little cash as possible, and use the remaining cash to scale it.

Conclusion



It is hoped that this guide has provided a road map of the opportunities and challenges likely to be encountered when launching an ICT4Ag business. The ICT4Ag sector is just emerging.

Though there are copious opportunities to create sustainable and impactful businesses, few ICT4Ag businesses are currently making profits, but many are generating revenues. The future may then be brighter. Venturing into this sector requires:

- patience, discipline and ingenuity
- innovative products/services – which requires a clear understanding of the agriculture value chain and the variety of stakeholders involved
- openness to underutilised fundraising tools such as equity
- expense and cash-flow management, and cost sharing
- balancing the search for grants versus product development
- leveraging existing assets to gain income.

In order to effectively start an ICT4Ag business, it is important to have a basic understanding of the value-chain structure and process, and to ensure that team members have the required background to run the enterprise successfully. There are challenges that will be encountered, such as the lack of support from the financial services sector and the government, because of insufficient awareness of the potentials of ICT4Ag businesses.

As a result, strong partnerships must be built with local media stations and organisations to spread awareness and, eventually, garner support.

When determining the likelihood of success in a particular ICT4Ag venture, there are three major investigative steps the entrepreneur has to follow: big picture (knowledge of the host country's business environment and macro trends for crop consumption); middle view (identifying what portion of the value chain to focus on and what ICT platform to use); and a start-up-based SWOT analysis.

A negative view of agriculture, limited and inaccessible capital (finance), and poor business climate are among the chief impediments to young ICT4Ag entrepreneurs across ACP regions. Agriculture is still viewed as a largely subsistence and unprofitable activity. This view affects how innovative pitches, plans and requests for finance are treated. Changing the perception of agriculture from a merely manual, low return, strenuous and purely on-farm activity is a crucial step in altering the fortunes of the sector.

The negative perception of the sector is deeply entrenched and is manifested most evidently in terms of the availability of capital and finance in general. The issue of capital and finance for agriculture operates at both private sector and government level (where already limited youth-oriented finance schemes that spur entrepreneurial ventures do not consider the specific nature of the agriculture sector). In the private sector, agriculture is conceived as a high-risk enterprise and so loan requirements (collateral) and terms (interest, repayment period and general conditions) are onerous (beyond the means of both young and older farmers).

As we seek to resolve these issues the banking sector must acknowledge that although the ICT4Ag sector may be risky, there is great potential for long-term growth, especially given the increasing demand for food consumption in the fast growing populations of the ACP region and the efficiencies being enabled by technologies. These new ICTs allow for agricultural risk to be mitigated through innovative crop insurance schemes; sector and crop-specific repayment periods, including linking repayment with reaping periods; and linking interest rates with expected yield, given that economies of scale assist with mitigating risk. So greater financial support for the ICT4Ag sector is crucial and it is the private sector that will be the lead.

Governments must also factor agriculture into their efforts to scale up youth-oriented funding schemes for entrepreneurs. However, governments must provide greater incentives for agriculture and efforts to optimise the sector through ICTs. The mix of incentives includes grants, concessional loans with sector-sensitive repayment terms, and capacity building opportunities. This approach offers a unique opportunity to help boost skills and open funding mechanisms for a wide array of young ICT4Ag business-minded young people that will drive employment creation and boost food security.

Governments should also do more to ensure that young entrepreneurs are better able to protect their IP. ICT4Ag businesses like Hello Tractor, Ensibuuko and others have developed innovative technology-aided solutions and tools, with real value, in the agriculture sector. In almost all cases young ICT4Ag entrepreneurs have not protected their IP in formal ways, often because they do not know how and/or simply cannot afford to do so. Adding legal services to small business development agencies and youth entrepreneurship programmes can help to resolve this challenge. IP offices can also do more to simplify the process by creating templates eliminating the need for lawyers, which is possible in most cases.

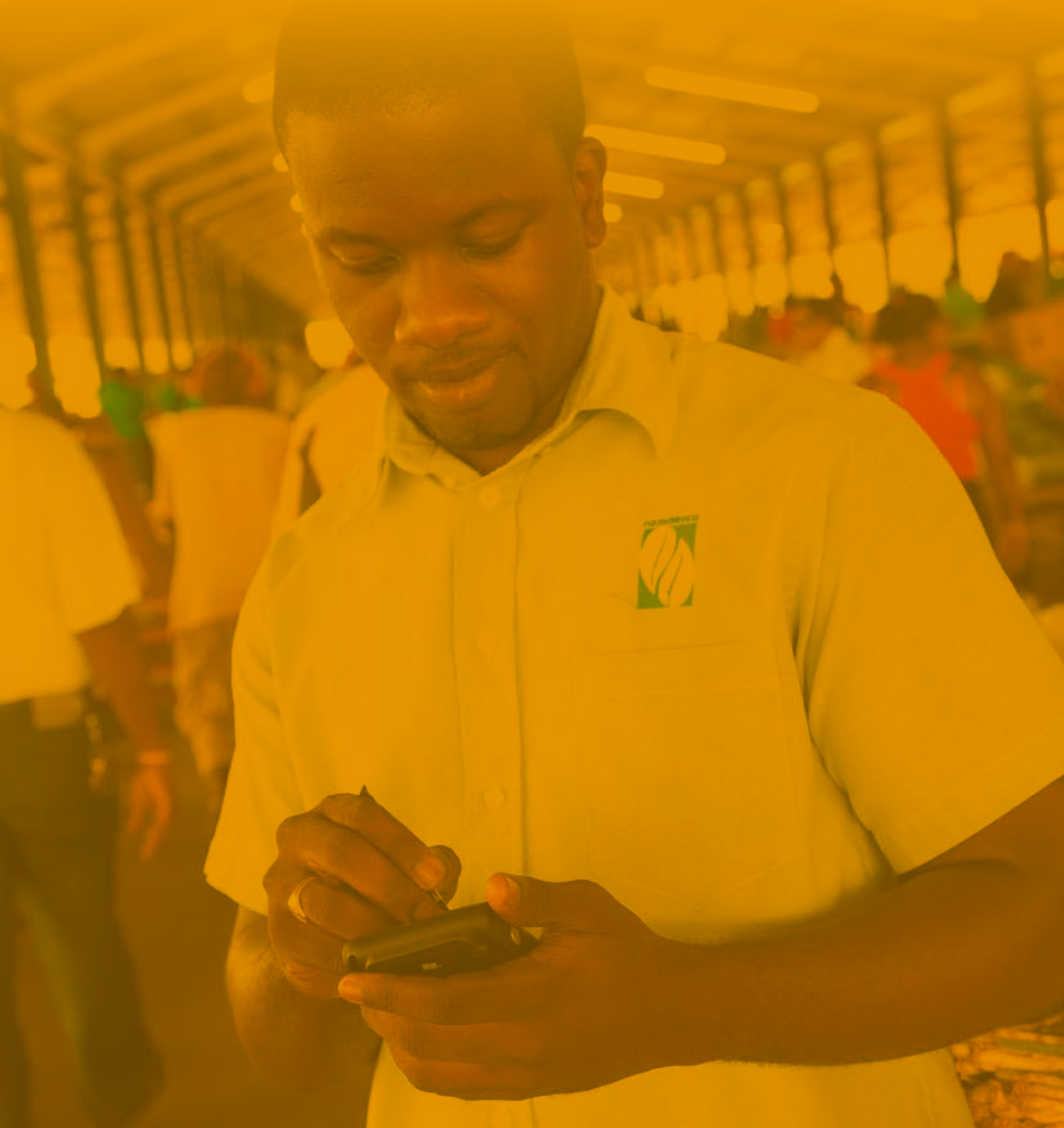
Aside from leveraging resources and information that improve the chances of a venture succeeding, the most important factor is to START. Making a plan and acting on it is the most common attribute of successful entrepreneurs. While an ICT4Ag business takes a long time to generate profit, it is important to be patient and persevere regardless of the obstacles.

Although ICT4Ag businesses are nascent, and many already in operation are experimenting with a number of revenue streams, we are seeing the emergence of a few that should most likely lead to profitability:

- Consultancy fees from serving partners and customers – this includes leveraging on their technological and agricultural expertise to guide partners' businesses
- Software development and white labelling of software (where a product or service developed by one company is re-branded and re-sold by another) allows others to sell the branded service, while the start-up maintains and supports the core technology
- Working with NGOs on grant-funded projects
- Physical and online marketplaces that connect buyers and sellers
- Research, data collection and aggregation services
- Advertising.

Once the business has started, the foundation should be laid for future expansion. It is important that an entrepreneur thinks about the nature of that expansion periodically and the timeframe over which it is likely to occur. Scaling a venture requires an ability to create, test and repeat a process that benefits more customers without disproportionately adding costs that will lead to the loss and eventual demise of the venture. In countries across the ACP region, this means delivering services using the most prevalent devices found among target customers. Using widely available technologies such as radio broadcasts and SMS, coupled with an operating model that leverages established and local teams to implement or provide ongoing support, serve as key components to growing revenue or impact, while running a lean operation.

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World Intellectual Property Organization (WIPO).
 2015. *What is Intellectual Property?* World
 Intellectual Property Organization [online].
 Available at: <http://www.wipo.int/about-ip/en/index.html#ip> [Accessed in July 2016].

Additional web resources

Name	Web link
Babban Gona	http://www.babbangona.com/purchase-from-bg-members/
e-agriculture Knowledge Base	http://www.e-agriculture.org/knowledge-base-resources
Venture Capital Ghana: Ghana Angel Investment Network	http://www.venturecapitalghana.com.gh/?launch=gain#
Canvanizer (allows testing of Lean Canvas)	www.canvanizer.com
Why the Lean Canvas Approach	http://www.ashmaurya.com/2012/02/why-lean-canvas/

Appendix 1

List of organisations interviewed

Name of survey respondent	Title	Organisation	Type of organisation	Country
Thuto Paul Gaotingwe	Co-founder	Modisar (Mudisa Net Pty. Ltd.)	Private sector	Botswana
Jehiel Oliver	Founder/CEO	Hello Tractor	Private sector	Nigeria
Edison Gbenga	Founder	Agripro	Private sector	Ghana (Accra and Cape Coast)
Kamal Yakub	Co-founder	Farmable.me	Private sector	Ghana (Volta, Upper East, Upper West, Northern Region)
Benjamin K Fiafor	Ghana Country Director	Farm Radio, Ghana	Public sector/ government	Ghana (all regions) Farm Radio International headquarters is in Canada but also has offices in seven African countries.
Wayne Miranda	Founder/CEO	Growth Mosaic (Ltd)	Private sector	Ghana Francophone West Africa
Frances Adjei and Benjamin Gyan-Kesse	Content Manager and Business Development	Esoko	Private sector	Uganda (all regions, but particularly in the Northern, Upper East and Upper West regions). Also has an office in Kenya, with resellers in Benin, Burkina Faso, Malawi, Nigeria, Tanzania,
Opio Obwangamoi David	Founder and CEO	Ensibuuko	Entrepreneur	Uganda
Marthe Montcho	Founder	FADER	NGO/civil society	Benin

Name of survey respondent	Title	Organisation	Type of organisation	Country
Olumide Idowu	Team Leader	Climate Wednesday	NGO/civil society	Nigeria
Charles Mugoowa	Monitoring and Evaluation Manager	TechnoServe Uganda	NGO/civil society	Uganda
Matthew McNaughton	Co-founder	SlashRoots	NGO/civil society	Caribbean
Jermain Henry	Co-founder	AgroCentral	Private sector	Jamaica
Alloysius Atta	Co-founder	Farmerline	Private sector	Cameroon Ghana Sierra Leone
Kody Emmanuel	Casamance Youth Agriculture Project	Serve Africa	NGO/civil society	Senegal
Worlali Senyo	ICT and Agricultural Advisor	DAIN	Social enterprise (private sector)	Ghana
Kwami Williams	Co-founder/CEO	Moringa Connect	Private sector	Ghana United States

Appendix 2

Web presence for organisations interviewed for guide

Organisation	Website
Modisar (Mudisa Net Pty. Ltd.)	www.modisar.com
Hello Tractor	www.hellotractor.com
Agripro	http://www.agriprohub.com
Farmable.me	www.farmable.me
Farm Radio Ghana	www.farmradio.org/country/projects-ghana/
Growth Mosaic (LTD)	http://www.growthmosaic.com/
Esoko	www.esoko.com
Ensibuuko	http://www.ensibuuko.com/
FADER	https://agricultureaufeminin.wordpress.com/tag/fader-benin/
Climate Wednesday	http://www.climatewed.org/
TechnoServe Uganda	http://www.technoserve.org/our-work/where-we-work/country/uganda
SlashRoots	http://slashroots.org/
AgroCentral	www.agrocentral.co/
Farmerline	www.farmerline.org
Serve Africa	https://www.facebook.com/serveafrica.senegal
DAIN	http://www.dainnetwork.org/
Moringa Connect	http://moringaconnect.com/

Appendix 3

The Business Model Canvas vs the Lean Canvas

Element	Business Model Canvas	Lean Canvas
Target	New and existing businesses	Start-up businesses purely
Focus	Customers, investors, entrepreneurs, consultants, advisers	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	Lays down the infrastructure, lists the nature and sources of financing and the anticipated revenue streams of the business	Begins with the problem, a proposed solution, the channels to achieving the solution, costs involved and the anticipated revenue streams
Competition	Focuses on value proposition in quantitative and qualitative terms as a way to stay smart in the market	Assesses whether the business has an unfair advantage over the rest and how to capitalise on it for better grounding
Application	Fosters candid understanding, creativity, discussion and constructive analysis	Is a simple problem-solution oriented approach which enables the entrepreneur to develop step-by-step

Source: <https://canvanizer.com/how-to-use/business-model-canvas-vs-lean-canvas>

Appendix 4

A list of some ICT hubs in ACP countries

Caribbean

Slashroots Foundation

Jamaica

Website: <http://www.slashroots.org/>

Email: hello@slashroots.org

The Community Hub Corporation

Barataria, Trinidad and Tobago

Website: <http://mycommunityhub.org/>

Email: info@mycommunityhub.org

info@helpinghands.com

Phone: (868) 222-8177

TMIL – Telesur Multimedia Innovation Laboratory

Paramaribo, Suriname

Website: <http://tmil.datasur.sr/info/index.html>

Email: info@tmil.sr

The Branson Centre

Jamaica

Website: <http://bransoncentre.co/caribbean/>

Email: info@bransoncentre.co

Phone: +1.876.632 5134

Caribbean Climate Innovation Centre (Jamaica/Trinidad and Tobago)

Website: <http://caribbeancic.org/>

Email: prinfo@src-jamaica.org (Jamaica)

mail@cariri.com (Trinidad)

Phone: (876) 927-1771-4 (Jamaica) /

(868) 662-7161/2 (Trinidad)

Startup Grenada

(government-supported/owned)

Grenada

Website: <http://startupgrenada.com>

Phone: 473-440-7011

National Centre for Technological Innovation (NCTI) (government owned)

St. Vincent and the Grenadines

Website: <http://www.svgncti.org/>

Email: office@svgncti.org

Phone: +1 784 485 6915

Eastern Africa

Outbox

Kampala, Uganda

Website: <http://www.outbox.co.ug/>

Phone: + 256 752 624 006

mLab East Africa

Nairobi, Kenya

Website: <http://mlab.co.ke/>

Email: info@mlab.co.ke

kLab

Kigali, Rwanda

Website: <http://klab.rw/>

KINU Hub

Dar es Salaam, Tanzania

Website: <http://www.kinu.co.tz/>

Hive CoLab

Kampala, Uganda

Website: <http://hivecolab.org/>

Email: info@hivecolab.org

Phone: +256 392 177 978

Buni Hub/TanzicT

Dar es Salaam, Tanzania

Website: <http://buni.or.tz/>

Email: brian@buni.or.tz

jumanne@buni.or.tz

IceAddis

Addis Ababa, Ethiopia

Website: <http://www.iceaddis.com/>

Email: contact@iceaddis.com

Phone: +251(0) 11 553 4776

C4DLab

Nairobi, Kenya

Website: <http://www.c4dlab.ac.ke/>

Email: hello@c4dlab.ac.ke

Phone: +254 705 047 432

iBizAfrica

Nairobi, Kenya

Website: <http://www.ibizafrica.co.ke/>Email: ibizafrica@strathmore.edu

Phone: +254 703 034280

iHub

Nairobi, Kenya

Website: <http://ihub.co.ke/>Email: info@ihub.co.ke**Habaka Madagascar Innovation Hub**

Antananarivo, Madagascar

Facebook: <https://www.facebook.com/habakamg/>Email: contact@habaka.org**Impact Hub**

Kigali, Rwanda

Website: <http://impacthub.rw/>Email: connect@impacthub.rw

Phone: +250 (0) 785 527 562

Southern Africa**mLab Southern Africa**

Pretoria, South Africa

Website: <http://www.mlab.co.za/>Email: derrick@mlab.co.za

Phone: +27 012 844 0240

BongoHive

Lusaka, Zambia

Website: <http://bongohive.co.zm/>Email: contactus@bongohive.co.zm

Phone: +(260) 97 867 2508

Western Africa**Woelab**

Lomé, Togo

Website: <http://www.woelabo.com/>Email: contact@woelabo.com

Phone: +228 93 54 08 26

EtriLabs

Cotonou, Benin

Website: <http://www.etrilabs.com/>Email: info@etrilabs.com

Phone: +229 20 21 64 43

+229 66 84 73 96

Wennovation Hub

Ibadan, Nigeria

Website: <http://wennovationhub.org/>Email: ibadan@wennovationhub.org

Phone: +234 (0) 90 900 02648

EcoHub Togo

Lomé, Togo

13 BP 129 Lomé

Tél. +228 98 49 42 42 / 90 17 49 72

Email : ecohub@ecohub.tgWebsite: <http://www.ecohub.tg/>**CIPMEN**

Niamey, Niger

Website: <http://www.cipmen.org/>

Phone: +227 20 35 11 02

+227 91 33 91 24

CTIC

Dakar, Senegal

Website: <http://www.cticdakar.com/fr/>Email: contact@cticdakar.com

Phone: +221 33 889 77 88

JokkoLabs (Senegal, Côte d'Ivoire, Gambia, Burkina Faso etc.)

Dakar, Senegal (headquarters)

Website: <http://dakar.jokkolabs.net/>

Phone: +221 33 827 38 31

Appendix 5

Supporting ICT innovations and entrepreneurship by youth in agriculture

This publication has been produced under the framework of CTA's Agriculture, Rural Development and Youth in the Information Society (ARDYIS) project. A key activity of the project is the AgriHack Talent Initiative, which supports ICT innovation and entrepreneurship in agriculture among young people aged between 18 and 35 years.

Co-designed with young people and partners from African, Caribbean and Pacific (ACP) countries, the AgriHack Initiative includes competitions to develop information and communication technology (ICT) applications for agriculture (hackathons) and the identification of existing applications and support to them through capacity building, mentorship and incubation of start-ups. Promotional and networking opportunities are also offered to the most promising participants, including through involvement in other CTA activities. One such activity is the Plug and Play events that showcase promising products to audiences attending key meetings.

AgriHack hackathons and incubations have been successfully implemented in Eastern, Southern and Western Africa and in the Caribbean. An all-ACP competition during which pre-selected start-ups presented their apps to the industry and investors (dubbed Pitch AgriHack) was run in 2016, with the final held in Nairobi in collaboration with the African Development Bank¹. So far, some 600 young innovators and entrepreneurs have been involved in the hackathons and start-up competition and more than 20 ICT hubs or institutions from 15 countries have been involved in the activities. The Initiative has engaged with ministries in charge of ICT and agriculture, regional organisations (including the Alliance for a Green Revolution in Africa, Caribbean Agricultural Research and Development Institute and the Southern African Confederation of Agricultural Unions) and the private sector (e.g. Microsoft and Telesur).

Successful apps emerging from the hackathons that are currently in use include MoBis (by Ensibuuko in Uganda), Farmdrive platform (by Farmdrive in Kenya) and CropGuard (by the Addis Alem Cooperative in Barbados).

In May 2015, ARDYIS won the United Nations World Summit on the Information Society Project Prize. Its blog competition (YoBloCo Awards) and the AgriHack Initiative were two of the activities highlighted on this occasion.

From 2016, CTA is focusing on the entrepreneurial side of the AgriHack Talent Initiative, with the emphasis on support to existing young start-ups, including (but not limited to) those created through past hackathons organised by CTA and other institutions. CTA looks forward to continue collaborating with entrepreneurship or business development institutions, farmer organisations, agricultural institutions, incubators, investors and other interested stakeholders. Collaboration opportunities can address piloting developed applications, capacity building, incubation for innovators/entrepreneurs and investment opportunities.

For more information contact lohento@cta.int and visit <http://hackathon.ict4ag.org> and <http://www.pitch-agrihack.info>.



Notes

About this publication

This Handbook provides a step-by-step roadmap designed to equip aspiring ICT entrepreneurs with the information and knowledge they need to start an ICT-based business in the agricultural sector, outlining key opportunities and challenges that will be encountered along the way.

Using real-life examples, it provides strategies and pathways for averting common mistakes faced by early-stage entrepreneurs. Topics covered include agricultural value chains and their stakeholders, ICT business challenges, effective business plans and models for designing, funding and scaling ventures.



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