Issue 74
October 2013

ICT Update

a current awareness bulletin for ACP agriculture

http://ictupdate.cta.int

ICT solutions should be 'inclusive' and support rather than exclude farmers

ICTs should be integrated into daily operations in order to become effective tools

An enabling environment for ICTs could enhance the impact of agricultural programmes

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ICT Update issue 74, October 2013.

ICT Update is a bimonthly printed bulletin with an accompanying web magazine (http://ictupdate.cta.int) and e-mail newsletter. The next issue will be available in December 2013.

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With thanks to FAO for distributing ICT Update through e-Agriculture (www.e-agriculture.org)

http://ictupdate.cta.int

Introduction

This issue of *ICT Update* is completely devoted to the ICT4Ag conference being held between 4–8 November 2013 in Kigali, Rwanda. The conference hopes to be a milestone in promoting the application of ICTs in the agricultural sector with particular emphasis on inclusive value chains, enabling policies and advancing innovation.

The organisers of the ICT4Ag conference have designed the event to be highly interactive. It kicks off on Monday 4 November with a Plug & Play day, which will showcase the latest technological innovations in the field of ICTs for agriculture. Participants will be given the opportunity to try out the latest mobile applications, Web 2.0 and social media tools, and discover how they can make these tools work for them in their agricultural activities. The pages Plug & Play in this issue (see pages 10, 16 and 22) is a selection from that day's demonstrations.

The main conference will take place from Tuesday 5 to Thursday 7 November. The presentations are divided into three streams:

- Stream 1: Emerging innovations in ICTs supporting agricultural rural development;
- Stream 2: Capacity strengthening and stakeholder empowerment for improved livelihood and engagement in ARD and related agricultural processes; and
- Stream 3: Enabling environments for the agricultural sector to maximise the benefits from ICTs.

To give readers an idea of what to expect at the conference, this issue of ICT Update features three two-page articles by each of the three stream organisers (see pages 6, 12, 18). The authors briefly describe the specific theme of their stream and what they hope to accomplish in it.

Each of the conference streams, in turn, features a number of sessions. The session formats vary widely, from traditional presentations to world cafés and fishbowl sessions to market stalls and booths, workshops and field trips. Each stream article is followed by a one-page interview (Q&A) with a session organiser in that particular stream (see pages 9, 15 and 21). The sessions topics include the mobile money revolution, women's access to ICTs and broadband strategies.

Overwhelming response

The ICT4Ag conference organisers received an overwhelming number of submissions from interested parties working in the field of ICT4Ag. Unfortunately, time constraints in the conference schedule meant that many of these interesting proposals did not make it onto the programme.

Following each stream article and session Q&A, therefore, are two pages briefly summarising a selection from the over three hundred submissions (see pages 8 and 11, 14 and 17, and 20 and 23).

If this issue of *ICT Update* is a 'pre-conference' edition, then the next issue, number 75, can be described as a 'post-conference' one. It too will be completely devoted to the conference in Kigali. Among other things it will review the conference proceedings and feature articles based on interviews with the three stream organisers to find out whether their expectations were met and what lessons have been learnt.

For those unable to attend the conference, *ICT Update* will be running a conference blog so all interested parties can follow proceedings as they unfold. ◄

Mark Speer (mark@contactivity.com) is editor of *ICT Update*.

ALAMY/BENEDICTE DESRUS

Digital springboard for inclusive agriculture

This issue presents an overview of ICT applications in agriculture on the occasion of the CTA-sponsored conference on ICT4Ag held in Kigali, Rwanda on 4–8 November 2013. The issue's guest editor is Michael Hailu, director of CTA.

ICT4Ag: setting the scene

Goodluck, a 35-year-old farmer who lives near the town of Maseno in Western Kenya wakes up in the morning and switches on his smartphone to check the weather forecast, the day's market prices for his crops and any announcements from the authorities that might be important for his business and his cooperative. Just before leaving for his farm, he suddenly remembers that he had heard about a new pest outbreak in the area on the radio the previous night. He wanted to talk to his input supplier, Kahilu, about it later in the day and sends him a quick SMS to arrange for a meeting. He also reminds himself that he should get in touch with the farmers' helpline to find out if they have any update on the pest outbreak.

After scanning the bar code on his cows' ears and sending the data to the national disease surveillance system, Goodluck opens his Facebook to see if there is any news from the farmers' federation which he is a member of. At the farmers' federation, Emily is responsible for communication and social media. She has just posted a message on Facebook promoting the video on poultry farming that she uploaded on YouTube the day before. Emily is a member of various e-discussion lists and knowledge management portals where she has posted well-crafted messages. To ensure maximum visibility for the video, she has carefully bookmarked the video, sent out several tweets - many of which have been re-tweeted - and made links to additional informative materials she found on the AgResearch portal. She was pleased that her effort was paying off as several people have left encouraging messages about the video on her Facebook page. She is also eager to make sure that the farmers messages calling for support to local poultry production reach the policy makers. In passing she notices a new tweet by the minister of agriculture on the value of computers for rural communities. She wonders if she should post him a

message – he seems to want to hear from people like her.

From consumers to producers

This hypothetical example shows a picture of the new Africa. The digital revolution is transforming peoples' lives, both rural and urban. The way they work, socialize and network, how they look for and share information and the manner in which they conduct their daily businesses, have changed dramatically. Africa's mobile telecoms sector is growing at a faster rate than anywhere else in the world. Mobile devices are transforming markets. Increased access to data networks and the internet, constant innovation, ease of use and decreasing costs are fuelling this growth and opening up a new world of information to millions of people.

ICTs are a springboard to opportunities, giving a voice to the voiceless and leaving no smallholder behind

Web- and mobile-based technologies that support interactive dialogue and multimedia communication - commonly referred to as social media - have led to substantial change in how individuals, communities and organisations communicate.

With social media, the way knowledge is generated and shared has also changed dramatically. Knowledge is getting sourced from crowds and not just experts. Static data has been revitalised with the advent of instant visualisations and infographics, portraying the issues more attractively and grabbing the viewer's attention. Groups of agriculturalists are coming together, working on common problems, interests and aspirations. They are collaborating online to generate thematic maps and online applications to monitor events, track commodity prices or the spread of pests and diseases.

iCow, MFarm, Esoko and other successful initiatives demonstrate that rural entrepreneurs cannot afford to miss out on the opportunities that the digital revolution offers. Equally, any government serious about boosting food production need to stay up-to-date with the latest developments and enabling policies, if only to keep up with its farmers. Moreover, if we are to transform agriculture in Africa to ensure food security and drive economic growth, we must take full advantage of ICTs to boost entire value chains.

Empowering the agricultural sector

CTA is using the ICT4Ag conference to showcase how ICTs are truly empowering agricultural producers, processors, traders and other actors in the value chain. Indeed, ICTs are a springboard to opportunities, giving a voice to the voiceless and leaving no smallholder behind. Our conference will explore the exciting possibilities and rapid developments taking place in this field (see box).

More than 400 people will be attending the conference to discuss issues under three themes (see pages 9–11 for more details):

- Emerging innovations in ICTs supporting agricultural rural development
- Capacity strengthening and stakeholder empowerment for improved engagement in ARD and in related policy processes
- Enabling environment for the agricultural sector to maximise benefits from ICTs.

The first stream on emerging innovations will include topics such as: the identification of mobile and ICT solutions, apps and innovations; the changing architecture of agricultural extension and rural advisory services in the age of ICTs and mobile technologies; and the use of ICTs to enhance and monitor agricultural processes, boost access to markets and facilitate agribusiness.

The second stream on capacity strengthening and stakeholder empowerment looks at ICTs as enablers of communication and the exchange of information and resources among value chain actors; the empowerment of the youth through ICTs for efficient and effective ARD; and gender mainstreaming through ICTs for efficient and effective ARD activities. There will be contributions that examine capacity building models and approaches and how we can monitor the impacts of ICTs on ARD projects and programmes.

The third stream on enabling environments will look at agricultural policies, ICT policies, e-agriculture policies and their accompanying strategies. It will also discuss ICT and facility infrastructure, such as electricity, markets and roads, and explore multistakeholder and public-private partnerships and some of the new technologies and business models being developed to improve access to ICTs.

I look forward to welcoming those of you who will be at this exciting event and hearing from those of you who participate remotely. We will publish some of the outcomes of the conference in the next issue of *ICT Update* in December 2013. ◄

Michael Hailu is director of CTA – Technical Centre for Agricultural and Rural Cooperation ACP-EU in Wageningen, the Netherlands.

Purpose of the conference

ICTs are among the most effective drivers for agricultural growth and transformation in the African, Caribbean and Pacific regions. In this context, the ICT4Ag event will be a key milestone in promoting the application of ICTs in the agricultural sector with particular emphasis on inclusive value chains, enabling policies and advancing innovation.
This high-level event is an unparalleled learning and networking opportunity where delegates will:

- exchange ideas on the solutions to the key challenges facing the widespread adoption and use of ICTs in agriculture in developing countries;
- share latest ICT innovations in agriculture and rural development;
- share experiences and lessons and connect with existing communities of practice;
- review relevant research and emerging technological developments;
- debate approaches and methods best suited for measuring the impact of ICT4D projects;
- foster relationships which could lead to future entrepreneurial partnerships;
- enable participants to network, collaborate and exchange knowledge within the scope of their activities or businesses; and
- develop strategies to ensure greater appropriation of ICTs by women and youth so they can play an active role in advocacy and agriculture value chain development.

Emerging innovations in ICTs

The conference will help to address the 'inclusive' component of ICT4Ag, or the idea that no one will be left out. It is imperative that emerging innovations support rather than exclude stakeholders in the agricultural sector.

ICT4Ag: setting the scene

A vast number of ICT solutions have emerged in recent years that support the agricultural value chain, including mobile applications. Because there are suddenly so many, a concerted effort needs to be made to monitor their impact. However, very little is being done to bring together the ongoing discussions, initiatives and investments aimed at improving the use of ICTs in agriculture, and this means that many of the stakeholders in the value chain are being excluded. This stream with 12 conference sessions aims to identify new and emerging ICT solutions and assess why they have great potential or why they are likely to fail.

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Inclusive ICT4Ag

The sessions in this stream will help address the 'inclusive' component of the conference theme, or the idea that no one will be left out of the value chain. The discussions on emerging innovations will be held in the context of their purpose to support stakeholders, not to isolate them. As a result, by the end of the conference, innovations in support of the entire range of beneficiaries – from agricultural researchers, input suppliers, agricultural extension officers and other intermediaries, to farmers, traders, processors, transporters of the goods, policy makers and consumers – will have been clearly identified. Donors, application developers, intermediaries, investors, and users can consequently fully promote these innovations and put them to effective use.

There are a number of components missing in the agricultural value chain that have not been addressed by the submissions received for this stream. For example, there has been no specific proposal regarding the use of ICTs to manage post-harvest losses. The stream will address some of these questions separately, for example why are some of these components missing and why do so many innovations and apps target market information but focus less on post-harvest management or access to input? We hope to encourage app developers, investors and policy makers to look for ways of filling the missing gaps.

The sessions in this stream will also explore some interesting trends that have emerged with the new innovations and applications for agriculture, such as commodity-specific apps (iCow, mFisheries, etc.), market information ICT platforms (MFarm, Cellbazaar, etc.), and data-gathering platforms for policy decision making (iFormBuilder, Magpi, etc.). Others have taken a more holistic approach and designed programmes that integrate a number of these apps to help the value chain function to the fullest of its ability, for example the Grameen Foundations' Community Knowledge Worker (CKW) programme. We also expect participants – users, value-added service providers, programme designers, extension officers and others – to critically analyse the advantages and disadvantages of these trends and to inform future initiatives in this area.

Today, most information is still designed for use on desktops, so the next challenge is how to get the right information in the right format to farmers with mobile phones


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Formatting and delivering

The question of how to format and deliver knowledge in the context of mobile technologies will also be discussed. With the changing architecture of information sharing, it is important that stakeholders fully understand the users and their needs while developing and producing innovations. We have reached the point where users, whether farmers or traders, actually own these gadgets themselves, such as mobile phones. A mere decade ago, these gadgets were centrally located, in community telecentres, for example for the entire community to use.

Mobilising and customising

The challenge now is how to effectively mobilise and customise knowledge in the right format for mobile phones. Today, most information is still designed for use on desktops, rather than mobile phones. So the next challenge is how to get the right information in the right format to farmers with mobile phones.

This stream will document some of the emerging ICT innovations for agriculture and how they are being used along the value chain. It will explore how apps are geographically distributed and what gaps need to be bridged. It will also discuss the need for holistic solutions versus specific mobile applications in different parts of the value chain. Some of the specific areas addressed in the sessions of this stream include ICT innovations that support challenges related to livestock, fisheries, climate change, access to financial services, market information, trade, agricultural data, and sustainable agricultural development. ◀

Presentations at plenary sessions

Why the hype?
By Michael Nkonu, mAgri Programme, GSMA
The mobile agriculture industry has grown enormously over the past few years, with a broad range of mobile services and products now available for the agriculture sector. Mobile operators and others recognise the largely untapped opportunity for growth in rural areas, more success stories are emerging and the mAgri industry is set to continue growing.

Access, infrastructure, network, penetration
David Bergvinson and Paolo Pier, Bill and Melinda Gates Foundation (BMGF)
The explosion of mobile services has strained the networks and quality is very poor. There are now approximately 22m SIMs in use and 1m new SIMs each month. Ethiopia Telecom has announced a 3-year agreement with Huawei and ZTE to develop 3G network in both urban and rural areas – expanding to cover 70% of the land area and to serve 40m subscribers by 2015.

A text message away: ICTs as a tool to improve extension?
Maximo Torero, International Food Policy Research Institute (IFPRI)
The accelerating adoption of ICTs all over the world provides a great opportunity. The penetration of cellular phone technology is largely non-discriminatory – that is, even smallholder farmers with low-technology farms can increase their revenue by using ICTs. Taking advantage of these opportunities depends on connectivity, capability and relevant content.

Selected submissions

ICT4Ag: setting the scene

Crowdsourcing and yield gap monitoring

With an anticipated world population of 9.1 billion in 2050, feeding the world population without affecting other natural ecosystems is going to be a major challenge. Closing the 'yield gap' on currently available agricultural lands is one of the approaches being explored to improve food security. A yield gap can be expressed as the difference between a benchmark potential yield and the actual yield level. Detailed yield gap analysis at the farm level is required to estimate these gaps and their causes. Crowdsourcing is one of the innovative bottom-up data collection approaches available that would allow farmers to provide detailed data for a yield gap analysis.
➜ www.yieldgap.org

LINEAIR/JERBMY JOWELL

FLICKR/USAID

Smart ICT Africa project

The overall goal of this IFAD-supported project is to help smallholder farmers in Africa to make informed decisions in managing their land and water resources better. The next generation of ICT services has the potential to provide detailed crop and plot-specific information and advice – even to smallholders in remote areas of Africa. They do this by converting the complex information available on web platforms into short and accessible mobile-based SMS messages in local languages. Timely weather, irrigation and flood advice can help to save in inputs, improve productivity and reduce vulnerability to flash floods.
➜ www.smartict-africa.com/en

Integrated ICT solutions

Individual farmers can operate a profitable business with well-organised farm records. Production, transaction and market data need to be fully integrated into market information services, however, if they are to drive economic growth and benefit individual farmers. Moreover, the ICT solutions themselves will not work in isolation – they too need to be integrated to reach wide audiences and to maximise returns in the investment. For this purpose, FIT Uganda has developed a 3-way market information ICT application that works with both mobile and offline data collection services to collect, analyse and disseminate production, transaction and market data.
➜ www.fituganda.com

LINEAIR/RON GILLING

FLICKR/FUTUREALTALS.COM

SMS platform in Zambia

Mobile phone solutions (especially SMS platforms) have made it easier for small-scale farmers in rural Zambia, where 60% of the population lives, to carry out agribusiness activities. Zambian small-scale farmers generally have the ability to produce food and breed quality herds. However, they are not guaranteed a market for their produce. The Zambia National Farmers Union's SMS information system for marketing and trading is helping farmers in rural areas to find markets for their produce and better prices in their regions. This came at the right time as the government is no longer buying all the crops and livestock produced by farmers, especially now that maize marketing subsidies have ceased.

Mobile money revolution

ICT4Ag: setting the scene

Mobile money is seen in some quarters as the next big innovation in finance. What exactly is mobile money?
➜ Mobile money uses the cell phone to send, receive and store economic value.

How is mobile money different from other innovations, such as microfinance?
➜ Microfinance was the last big innovation in finance. When Mohammad Yunus pioneered the Grameen Bank in 1976, nobody believed microfinance institutions (MFIs) could be commercially sustainable. But there was hope in the model's ability to provide lending to the very poor, so donors helped to set up MFIs around the world.

While everybody will benefit, the people who live at the base of the economic pyramid have the most to gain from mobile money

The organization I work for, ACDI/VOCA, established a dozen MFIs, with USAID support, that have disbursed more than US$1 billion in loans to microenterprises, smallholders and rural families. Once it was clear that MFIs were commercially sustainable, the private sector stepped in to expand financing. Donor-financed and now privately financed MFIs have served more than 154 million clients worldwide but fall far short of serving the 2.5 billion adults that are unbanked. This is because we can't build a physical MFI or bank in every community that needs one.

Mobile money leverages an investment that an increasing number of poor people around the world already have made – a cell phone – in order to bring banking services, including savings, transfers, loan disbursements and repayments, directly into the home. It can extend financial inclusion into even the most remote areas. According to the International Telecommunications Union, we now have more worldwide mobile subscriptions than there are people in the world! About 39% of those in the developing world have mobile subscriptions, a number that's rapidly rising.

Who, specifically, stands to benefit from mobile money?
➜ While everybody will benefit, the people who live at the base of the economic pyramid have the most to gain from mobile money. The long-term value of the phone for communication, safe storage and transfer of money means people will make substantial sacrifices to save to buy a phone.

This is so important because it means we now have a self-financed infrastructure that extends all the way into the household. Now that we have this robust infrastructure there can be multiple value-added applications such as mobile money, m-agriculture, m-health, m-education and more. The use of mobile money will transition the base of the pyramid from informal, non-transparent, inefficient economic activity to formal economic activity.

What's a good example of a mobile money innovation that is already being used?
➜ There are numerous examples in this brand-new industry. The most often cited example is M-Pesa in Kenya. M-Pesa is a joint venture between Safaricom and Vodafone. In agriculture, Zoona is a third-party platform in Zambia that started with the cotton value chain. Both M-Pesa and Zoona received support from DFID (UK Department for International Development) and USAID, respectively, at their formative stages. Opportunity Bank Malawi leveraged mobile finance for their agriculture loan portfolio. SmartMoney is another third party that is serving agriculture sectors in Tanzania and Uganda. Agricultural mobile finance helps to reduce side-selling and administrative as well as security costs while increasing efficiency, farmer productivity and transparency of economic transactions.

Who make up the 'ecosystem' that's needed to ensure mobile money can be successful?
➜ There are currently 190+ mobile money platforms worldwide with many more in the pipeline. The ecosystem of participants can include mobile network operators, card payment providers, financial institutions, solution providers, third party providers and others.

This industry is all about business model innovation. With very few exceptions the 190+ platforms are based in the urban city centres. As the industry looks to expand into rural areas in pursuit of nationwide penetration they are coming to realise they don't know how to deal with illiteracy, financial illiteracy and lack of trust. Therefore, business model innovation in rural areas must embrace NGOs and other development implementers that are more adept at dealing with these challenges.

By aligning the mission-driven objectives of the non-profit development sector with the profit objectives of the private sector we might be looking at mobile finance doing for the base of the pyramid what the commercial banking sector did for the industrial revolution! ◀

REUTERS/MIKE HUTCHINGS

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Related links

ACDI/VOCA
➜ www.acdivoca.org/site/id/home

M-Pesa
➜ http://en.wikipedia.org/wiki/M-Pesa

Zoona
➜ www.zoona.co.za

SmartMoney
➜ www.smartmoneyproject.org/index.html

ICT4Ag: setting the scene

fhi360
Using low-cost video technologies, agricultural development practitioners can create and disseminate visual information demonstrating improved practices, create training videos, capture growth and change for monitoring and evalution purposes, and share success stories. Advances in portable, rechargeable projectors also enable these videos to be shared far off-the-grid. Qualified extension agents are expensive to train and maintain, and it costs money to travel from village to village. Field days and demo plots also face many of the same challenges. Using video, organizations have the opportunity to bring the field to the farmer, instead of the farmer to the field.

➜ **www.ictforag.org/video**

mFisheries
mFisheries is a suite of open-source mobile and web applications for small-scale fisheries. It was developed at the University of the West Indies with International Development Research Centre support and comprises the following: a virtual marketplace, an application which displays market prices using open data and the 'Got Fish Need Fish application' which, in real time, connects agents in the fisheries value chain; navigational tools such as a GPS logging and retrieval application; at-sea safety tools, such as S.O.S and location tracking; and training companions including audio podcast tips relating to safety at sea, fishing methods and quality assurance.

➜ **http://cirp.org.tt/mfisheries**

Farming Instructor
Farming Instructor is a mobile app that provides online and offline agricultural information in the form of text, speeches and animations to farmers and their communities. The application aims to encourage young people and other groups to pursue a career in agriculture as a means to self-employment. This app enables users to access key info related to agriculture and share and comment on other farming tips they know. It consists of text (written tips from farmers all over the world that can be shared), speeches (all of which are converted to sound for users to listen to) and animations (displaying the tips using easy-to-follow animated steps).

➜ **www.mvigour.com/FarmingInstuctor.html**

FarmerConnect
FarmerConnect delivers personalised agricultural extension services and text and audio information in local languages to smallholders and women farmers who otherwise do not have access to or cannot comprehend information from traditional sources. FarmerConnect hosts a one-stop marketplace for agricultural communities, including service seekers, service enablers and service providers. The FarmerConnect platform is cloud-based and mobile-enabled and requires no technical knowledge. The platform has been in service since July 2012, currently has 278 registered users, 20 current users, and serves over 10,000 farmers.

➜ **www.farmerconnect.org**

GeoLive
GeoLive is a participatory web-mapping application designed at the University of British Columbia, Canada. A flexible and extendable framework to facilitate communities' ability to capture, manage and communicate their own spatial data, the map acts as a medium through which registered users can share their own multimedia information and experiences about a specific place. GeoLive offers a range of distinct functions: it allows multiple users simultaneously to contribute data to a map; it features tiered access; and it allows administrators to access and download project datasets and re-purpose them using other database software, such as GIS.

➜ **http://geolive.ca**

TRAC FM
TRAC FM is a software platform used by media and non-profit organisations to amplify the voices of citizens, track reports and collect opinions. It enables citizens to participate in meaningful public debates through interactive radio shows and SMS. Building on the success of a vibrant radio talk-show tradition in Africa, TRAC FM provides a unique and easy-to-use software tool for radio stations. This enables established FM stations to involve their listeners in a data-driven and interactive debate and transforms citizens from passive listeners to active participants, contributing to a more transparent society and an open public debate.

➜ **www.tracfm.org**

M-Shamba
M-Shamba is an interactive platform that provides information to farmers through the use of a mobile phone. M-Shamba uses various mobile phone features, including cross-platform applications usable in both smart and low-end phones, and SMS to provide information on production, harvesting, marketing, credit, weather and climate. It provides customised information to farmers based on their location and crop and animal preference. Farmers can also share information on various topics with each other. M-Shamba is currently being used by 4,000 rice farmers in Kenya to help them adopt new technologies in rice farming.

➜ **www.mshamba.net**

ICT4Ag: setting the scene

Tuning in to turn off climate change

LINEAIR/FLORIAN KOPP

By relying on existing infrastructure, passion and knowledge, Developing Radio Partners (DRP) works with partners and local radio stations around the world to improve the delivery of content and development of material. One of its projects is a collaboration with the Africa Climate Policy Centre in Addis Ababa, Ethiopia, in which two stations from each of the five African regions have joined forces in a year-long climate change project, building upon a similar project in Zambia and Malawi. The first workshop already started in Addis Ababa in October 2012.
➜ http://developingradio.org/projects.html

Farming Instructor

Farming Instructor is a mobile app that provides farmers with online and offline agricultural information in the form of text, speeches and animations. This application was designed to encourage young people in particular to follow their passion for agriculture as a means of self-employment. Farmers can use the app to access key agricultural information and share any farming tips they know as well. All written speech is converted to sound so users can listen to the information. To use this app's speech feature, users need to download the Text to Speech Engine from the Google Play store.
➜ http://developingradio.org/projects.html

Farmerline

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Smallholder farmers, who feed one third of humanity, are an important part of the food security solution. A lack of communication between smallholder farmers and others in the value chain, however, has harmed farm productivity. Farmerline reaches any kind of phone and offers both SMS and voice interaction. The tool's users don't need to know English, own a smartphone or download an application. Farmerline provides a web-based solution that can be instantly accessed by anyone with internet access in any country. It can be easily used in all sectors and languages – no technical knowledge or hardware investment are required.
➜ http://farmerline.org

Local knowledge 'cloud'

Many of the rural poor in developing countries are illiterate, off-grid, far from government extension workers and lack access to important agricultural information that would enable them to make informed decisions and improve their livelihoods. A wide range of undocumented local knowledge in these areas is gradually lost across generations. This knowledge could be collected and further developed by an innovation network of community knowledge works and then archived in a cloud for wider use by hard-to-reach rural farmers.
➜ www.grameenfoundation.applab.org

LINEAIR/PAUL SPRINGETT

CAADP's new media tools

The Comprehensive Africa Agriculture Development Programme now has an African-owned network of agricultural journalists, who recently took an e-learning course in Web 2.0 sponsored by CTA, FAO and UNITAR. The network also uses social media tools, such as LinkedIn, Twitter and Facebook, audio-visual and photography platforms, Google products, blogs, online newsletters and online mapping tools. These new media tools help network members, who are based in different countries, to collaborate remotely and are transforming the way that agricultural stories are being reported.
➜ www.scoop.it/t/nepad-caadp

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IICD

Capacity strengthening and stakeholder empowerment

ICTs are powerful tools for accessing information, facilitating communication, improving decision making and improving the outreach development programmes. However, to achieve their full potential impact ICT solutions need to be integrated into daily operations.

ICT4Ag: setting the scene

ICTs can strengthen the capacity of individuals, organisations and institutions in different ways. They can act as tools for accessing information and facilitating communication, improving informed decision making on the part of individual farmers and farming communities. They can also provide solutions to improve the effectiveness and outreach of organisations working to support the agricultural sector. Unfortunately, there are many examples of ICT solutions with real potential to address critical agricultural needs and opportunities that did not strengthen – as hoped – farming communities' capacity to enhance household incomes and improve quality of life. This raises a key question: can ICTs really help to enhance the capacity of individuals and organisations working in agriculture to improve their positions and income? And if so, how?

Change agents working in ICT-for-agriculture, however, know that for ICT solutions to be effectively integrated into daily operations and be used to achieve the desired actions and outcomes, two crucial angles need to be explored:

- individuals and farming communities need to acquire new skills to be able to access, filter and transform new information into meaningful knowledge, and
- key organisations with extensive institutional relationships in the agricultural sector need to create an

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environment in which there is ample, affordable access to ICTs supported by policies, laws and social standards that encourage to use the opportunities that ICTs provide.

Perhaps most importantly, capacity building efforts that accompany the design, introduction and uptake of ICT solutions and services – if done correctly – contribute significantly to how individual farmers and professionals working in agricultural services perceive their ability to influence decisions and create change. This new outlook, in turn, increases their self-confidence and their motivation to improve their own functioning as well as that of the organisations they work in.

Individuals in farming communities and professionals working in agriculture-related organisations often say that they experience a sense of empowerment when they discover that ICTs enable access to learning opportunities, that illiteracy, that low levels of formal education are not necessarily barriers to acquiring new knowledge or exchanging knowledge with others, and that new forms of networking and community building reduce a sense of isolation. This greater sense of opportunity and choice is a powerful psychological resource and a key factor for influencing people's capability to shape their own life.

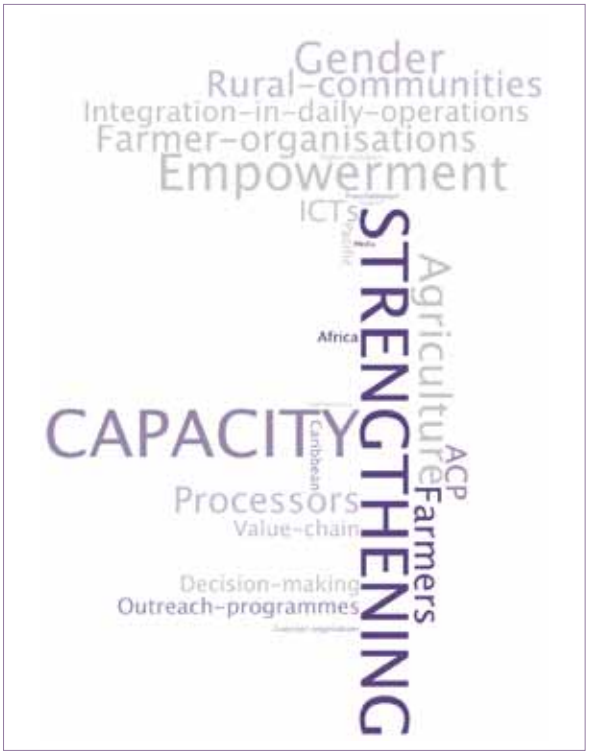
Value chain development relies heavily on how different actors in the agricultural sector interact in their institutional environments and on their capability to represent and communicate their interests. The outcome of several interventions in value chain development in recent years shows that bottom-up approaches - with inexperienced farmer organisations - unfortunately are often only marginally successful, while the involvement of experienced private firms and large farms can tribute to success. These interventions, however, did not specifically show that vulnerable smallholder farmers, especially women, benefitted from them.

The international development community, and specifically the ICT-for-agriculture community, now needs to explore how, and under which conditions, the use of ICTs can help inexperienced farmer organisations become stronger, more reliable players in the value chain. After all, these organisations are often the ones that organise and represent vulnerable smallholder farmers. Increase the incomes of large groups of smallholder farmers and providing them with long-term social benefits can only be achieved by enhancing the operational effectiveness and outreach of these organisations and increasing the number of individual and organised farmers that takes part in value chains.

Another key area that needs to be addressed is improving the position of women in value chains – especially smallholder women farmers and primary processors. Here too, ICTs can be used to enhance the production and marketing of typical 'women's products' or to create non-traditional work opportunities for women. It would be useful to review what has worked well and what has failed in efforts to get women, men, youth and the elderly to use ICTs, and which capacity building strategies work best for particular groups of individuals. The findings should encourage change in the agricultural sector and promote the growth of gender-inclusive agricultural enterprises.

The 'Capacity strengthening and stakeholder empowerment' stream at the ICT4Ag conference in Kigali, Rwanda will provide an opportunity to explore, and hopefully answer, many of the questions that emerge from the field. With so much experience in the room, we hope to identify strategies and approaches for introducing and using ICT-enabled solutions that have a proven track record and have stood the test of time. Think, for example, of empowering individuals and grassroots organisations, improving the position of women and motivating young people to engage in profitable farming activities.

The individual sessions in this stream will explore the role that ICTs can play in improving and strengthening an organisation's internal capacity to achieve its goals and mission. They will attempt to discover which factors, approaches and activities are critical for success, which obstacles have been encountered, how they have been overcome and which previously held assumptions have been proven wrong. The conference will bring together practitioners, support organisations, policy makers and technologists in a unique opportunity to review past experiences and identify approaches and ideas that have high potential to solve remaining impediments to positive change. ◄



Presentations at plenary sessions

Strategies for increasing access to both technology and meaningful content
Phil Abrahams, CAB International (CABI)
Providing information that is both highly relevant and actionable is key to making a mobile agro-advisory service valuable to farmers and therefore driving adoption. This means creating content that is highly localised, aligned with regional agricultural calendars and markets and presenting it in appropriate language through the right medium.

Revisiting extension with the changing architecture of information: CTA's perspectives
Benjamin Kwasi Addom, Technical Centre for Agricultural and Rural Cooperation (CTA)
CTA's experience with extension services was consolidated through its 2011 conference in Nairobi. A number of lessons have been learned that highlight the systemic approach to extension, and calls for identification of the various components of an effective extension service. The catalytic role of ICTs in extension must be recognised.

Leveraging technology and social networks to amplify agricultural extension
Rikin Gandhi, Digital Green
Digital Green trains rural communities to produce videos of farmers, by farmers, and for farmers to exchange best agricultural practices that can boost farm productivity and improve nutrition. This approach has been found to improve the efficiency of existing government and NGO extension systems by a factor of ten, per dollar spent.

Selected submissions

ICT4Ag: setting the scene

ICT revolution in the Pacific

ICT innovations have generated many success stories in the Pacific. Farmers from the Sigatoka Valley in Fiji use mobiles to discuss market prices, which saves them time and transport costs. Farmers receive alerts to move their cattle to safer ground during downpours. Payments are directly transferred using mobile technology, and farmers can collect cash from agents in their area. This has been very effective with Taro buys in Fiji, especially dealing with middlemen in remote locations. Similarly, farmers in Tonga have used mobiles to report pest infestation to agricultural officers, which has led to the opening of plant health clinic in Tonga.
➜ www.spc.int

FLICKR/WORLD BANK

LINEAIR/HEINE HEINER

Access Agriculture

Access Agriculture offers a video- and audio-sharing platform for agricultural R&D staff, service providers, extension agents, communication professionals and representatives of farmer organisations to see what training videos are available. Users can also request new language versions. The videos are all designed to support sustainable agriculture in developing countries. Access Agriculture was formally established in 2012 following a strongly expressed demand from service providers at earlier CTA conferences (in Brussels in 2010 and Nairobi in 2011, for example) to establish an authorative website for agricultural training videos.
➜ www.accessagriculture.org

Gelico

Gelico, or Online Management of Agricultural Cooperatives, is a database that lists farmers, their plots, their cooperatives and their products in order to provide them with online marketing opportunities. This platform is coupled to a website that offers space for the promotion of agricultural cooperatives. Project Gelico was awarded the Special Jury Prize at the first startup weekend in Abidjan in 2012. The Chamber of Agriculture in Côte d'Ivoire supports this initiative as it endeavours to establish a system to identify, manage and monitor cooperatives online.

REUTERS/LUC GNAGO

ALAMY/DOMINIC HARCOURT-WEBSTER

Information access for rural girls in Ethiopia

Rural girls in Ethiopia – where there is a high rate of early marriage – have traditionally lacked information on livelihood alternatives, family planning, contraception and safety from sexually transmitted diseases such as HIV/Aids. Yet recently access to information has improved and has enabled them to confront their predicaments. Radio, TV and word of mouth are the main sources of information. Though Ethiopian girls have indicated their mobile phones, the church and the mosque, print media and satellite TV as sources of information, in rural areas word of mouth is still a powerful conveyor of information, much more so than in urban areas.

Women's access to ICTs

ICT4Ag: setting the scene

Why is improving women's access to ICTs critical for agricultural development?

➜ In many developing countries, such as Uganda, agriculture is the main source of livelihood for a large portion of the population – particularly for those in rural areas where the majority of women are based. Women also form the greater part of the agricultural labour force – even though they often do not own the land they till.

It is generally accepted that timely and accurate information, for example on weather conditions, good farming practices or market prices can go a long way to help farmers increase productivity. This can be done through farmer extension services, true, but in rural areas such services may be out of reach or be irregular, so it is extremely important to make use of ICTs. Given women's role in agricultural development, it is thus important that women are given access to use ICTs to improve their productivity and overall livelihoods.

More women than men lack access to appropriate and affordable ICTs, and as long as that is the case women will remain marginalised

LAKSHMAN NADARAJA

What would happen if we did not improve access?

➜ According to FAO, the agricultural output in developing countries can be increased by 2.5% –4% by giving male and female farmers equal access to productive resources such as seeds, fertilisers and technology. More women than men lack access to appropriate and affordable ICTs, and as long as that is the case women will remain marginalised. Women are a potentially huge income base, but this potential will remain untapped as long as the gender gap continues to widen and a large number of women remain unable to undertake economic activities including active participation in all sections of agricultural value chains.

What measures need to be taken to ensure improved access?

➜ A number of questions need to be addressed. While access to ICTs for women is a key issue, so is affordable access. For example, programmes can be aired via radio and made interactive by offering women farmers the opportunity to call in or SMS the show. This assumes, of course, that these farmers have access to a radio set or a mobile phone, and that they are in a region that is adequately covered by a telecommunication network, and also that they are able to purchase airtime to call in or SMS.

These programmes would have to be conducted in a language that is easily understood by women in the local community. It's also important that the technical jargon is translated into locally relevant terms. The radio programme would also have to be conducted at a time when women farmers are most available to listen to the programme and participate in it.

The measures that need to be taken therefore have to address at least the following questions: do women have access to radios and mobile phones? Is there a network nearby, and are programmes being conducted in local languages? These measures need to be addressed in order to make ICT access a reality for women, whether rural or urban, whether educated or not, and whether mobility is constrained or not.

What are the challenges in terms of social expectations and roles?

➜ Social expectations and roles often tend to confine women to their homes or private spaces, which deprives them of access to public ICT points – keeping in mind that they may lack ICT tools of their own. Moreover, women are largely based in the rural areas, which mean that they live in areas with limited access to ICT infrastructure (or the energy required to regularly power up their ICT equipment). Even in places where women could potentially go to public access points or indeed have their own phones, they have less disposal income to spend on ICT use.

Indeed, some studies have shown that women spend a greater percentage of their income on communication that would be considered 'affordable' communication. Women have necessarily taken on multiple roles in society, so having to find the time to go out and search for information is likely to end up becoming just another item on a long to-do list, especially if this information is out of the way or otherwise not readily accessible.

And what are the challenges in terms of women's educational status, and limited time and resources, for example?

➜ The education and literacy levels of women are generally below that of their male counterparts. As a result, when literacy is a requirement in order to make effective use of an ICT tool, which is generally the case, or when literacy in English or another 'foreign' language is necessary, women's lower literacy and education levels place them at a distinct disadvantage. It also means that women may tend to opt for voice-based solutions, which may have an impact on the bandwidth and cost required for a given service, compared to an SMS-based service. Improving literacy among women and improving their education are essential to improving women's position in society. ◀

Dorothy Okello (dokello@wougnet.org) is a senior lecturer with the Department of Electrical and Computer Engineering at the College of Engineering, Design, Art and Technology, Makerere University, Kampala, Uganda. She is the founder the WOUGNET, the Women of Uganda Network. Established in 2000, the network's mission is to promote and support the use of ICTs by women and women organisations in Uganda.

Related links

Female farmers and the use of ICTs for agriculture in Uganda
➜ http://goo.gl/Oa1OwC

WOUGNET, Women of Uganda Network
➜ http://wougnet.org

Plug & play

ICT4Ag: setting the scene

Mlouma
Mlouma is a web and mobile service that enables farmers and the agri-food industry to sell or buy agricultural products based on informed decisions. Its mission is to provide reliable information to agricultural producers and agro-industries in real time. Producers submit harvest information (product, quantity and price) via the web or SMS, and this information is then visible to the world via the Mlouma's website. Buyers consult offers posted on the website and place an order when they find a product that interests them. Once both players reached an agreement, the delivery can be made.

➜ **www.mlouma.com**

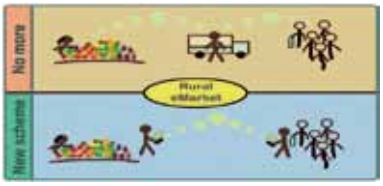
CropLife
Unscrupulous entrepreneurs produce counterfeit pesticide packaging and fill it with inert product, sell inferior grain as quality seed and palm gravel off as fertilizer. No-one has managed to make any real headway in reducing this illegal trading. IFDC staff members have designed a simple counter-measure in partnership with CropLife. The special label consists of a Holospot® combined with a barcode and scratch-off label, carrying a unique pack-specific number, which is submitted as SMS queries to a local short code, for example '6799', that delivers an authentication message within seconds. The pilot resulted in an overall increase in market share of 19% for products with e-verification.

➜ **http://goo.gl/RtE6zO**

DARAL
DARAL ('cattle market' in Wolof) is a web and mobile application that addresses issues faced by breeders in Senegal, such as livestock diseases and theft. The main challenges facing authorities are the lack of identification marks on animals for identifying stolen livestock, the widespread existence of illegal cattle slaughterhouses and the lack of an early warning system. DARAL provides a nationwide registry for breeders and their livestock; a nationwide alert system for breeders via SMS; a platform for raising breeders' awareness regarding livestock diseases and best sanitary practices; and a billing system for all transactions taking place in the marketplace.

➜ **www.coders4africa.org**

Rural e-market
Access to markets is a proven way of increasing the incomes of smallholder farmers in rural areas in Africa. The use of appropriate ICT solutions can improve transparency and access to market information and transform the livelihoods of rural populations. But still there are many regions in Africa that don't benefit from these new technologies because of illiteracy, poor connectivity or the inability to find an affordable and flexible solution. Rural e-market provides market information via smartphones, tablets or computers and has been specifically developed for poor rural African conditions. Rural e-market is multilingual, easy to use and, most important of all, affordable.



➜ **www.etsena.net**

Agrosim
Agrosim is a tool that supports decision making in agricultural projects. It focuses mainly on data collected on site and accurately represents the state of a given crop in its different development phases. It is an 'event simulator' able to anticipate the quality and quantity of crop productivity based on input data related to seeds, soil, the climate, geography, macro-economics and community demographics. Designed for all platforms (local, web, smartphone and Android phones) and equipped with artificial intelligence to meet the needs of this increasingly demanding industry, Agrosim is a flexible and portable application for all professionals working in the agricultural sector.
➜ **www.agrosim.saleka.com**

Esoko
Esoko is Africa's most popular mAgric platform for tracking and sharing market intelligence. It has a range of apps to suit anybody's needs. Esoko links farmers to markets with automatic market prices and offers from buyers and disseminates personalised extension messages based on crop and location. It profiles customers, farms, events with powerful handheld survey forms and monitors field activities in real time with simple and affordable SMS polls. It tracks logistics like stock counts and truck deliveries and provides early warning messages about climate issues or disease outbreaks. Esoko is a totally customisable comprehensive platform backed up by a unique deployment team.

➜ **www.esoko.com**

VirtualBank Africa
VirtualBank Africa has two products. Their flagship product, a remittance solution, makes it more convenient for Africans working in the diaspora to send money back home, at the same time reducing the cost of doing so to zero. It does this by providing the local recipient of the remittances (i.e. money sent from a foreign country) with a prepaid card, which can be funded from any supporting bank in any country. Their second product makes it easy for anyone to start collecting payments on their website no matter what they are selling. This is particularly useful in the African market where e-commerce is relatively young because most African countries do not have payment gateways.

➜ **www.virtualbank.co.zw**

ICT4Ag: setting the scene

Camera traps for animals

LINEAIR/M. DELPHO

Lebialem Highlands is located in Western Cameroon and constitutes a transitional zone of rainforest and forest savannah. This eco-regional feature makes it extremely rich in wildlife. Species include the forest elephant, the cross river gorillas and the Cameroon-Nigerian chimpanzee. For four years GPS has been used to monitor the status of primates and large mammals. Data from GPS is used to produce spatial distribution maps of both animal and human activity. Camera traps were introduced in 2011 for the same purpose and this improved knowledge on the ecology of the animals.
➜ www.erudef.org

Women, computer science and agriculture

FLICKR/WORLD BANK

Empowering women with ICT skills and tools is a prerequisite for sustainable food production in Africa because women make a major contribution to agriculture. Women involved in 'computer science for agriculture' need to 'think big' in terms of using computer science technologies to improve agricultural processes. To drive forward the empowerment of women through ICTs, several questions need to be explored. What specific ICT skills do women in the agricultural sector need so that they can effectively contribute to the industry? What are the experiences globally in the area of building women's capacities in ICTs to improve agriculture?
➜ www.scinnovent.org

Gendered nature of agriculture

FLICKR/USAID

The gendered nature of agriculture research, extension and farming not only shows how important it is to consider women in the decision-making processes in global agricultural development, but it also suggests that their involvement is likely to increase despite the stereotypes. So for men and women to benefit from the modern value chain, public and private approaches to agricultural research, development and extension that involve more women have to be considered. Women's involvement should extend beyond farming and must also include research and extension so women can also promote ICT4Ag and inclusive agriculture in Africa.
➜ www.wougnet.org

Innovative e-agriculture in Ghana

The Foresight Generation's e-agriculture project aims to build on an initiative launched by the Ministry of Youth in Ghana to provide training in innovative ICT tools for agricultural purposes. It aims to reduce unemployment among the youth and improve food security in Ghana. Their initiative has three clear aims: first, the effective deployment of innovative and user-friendly ICT applications for sustainable development. Second, the use of ICT tools in agriculture in Africa to create employment among recent graduates. And third, to improve the ICT infrastructure and train young farmers in Africa.
➜ http://app.farmerline.org

FLICKR/WORLD BANK

PGIS tool for sustainable development

Participatory GIS, or PGIS for short, is a functional tool which contributes to the empowerment and governance of communities that have been marginalised in decision-making processes concerning the development of a region. PGIS optimises planning, spatialised agricultural and livestock activities in a region, in line with sustainable development, providing validity to the process. PGIS can recover and preserve the history and traditions of a community, both in the productive and the cultural sector. This tool was used in the Tolima Department in Colombia, for example, to map and create a 3D model of a marginalised community that was under threat from an industrial mining enterprise.

LINEAIR/DAVID LARSEN/AFRICANPICTURES.NET

Creating an enabling environment

ACP agriculture is yet to benefit fully from the potential of ICTs. New approaches are needed to ensure the systematic use of ICT solutions, and to create an enabling environment in which ICTs could enhance the impact of agricultural development programmes.

Ifidon Ohiomoba (iohiomoba@fara-africa.org) is acting director, Access to Knowledge and Technologies at FARA, the Forum for Agricultural Research in Accra, Ghana, and project manager of the FARA project PSTAD, Promotion of Science and Technology for Agricultural Development in Africa.

ICT4Ag: setting the scene

The emergence of ICTs in the development process has witnessed great transformations in various sectors of many economies. ICTs have done a great deal to boost the exchange of information and knowledge through such platforms as the mobile phone, which is regarded today as the largest distribution platform. Broadband internet connections have improved knowledge exchange among individuals, institutions and even governments. From banking and industry, to education and governance, ICTs have provided employment to individuals, reduced the cost of transactions, improved the time of service delivery and generally enhanced efficiency, transparency and good governance.

In most ACP countries, the agricultural sector is yet to benefit substantially from ICTs. This is irrespective of the dynamic developments in ICTs and their continuous evolvement, which generates new opportunities every now and then. Whatever the impact ICTs may have had on agriculture, such as TradeNet in Ghana on market price dissemination in West Africa, and the recent e-wallet for fertilizer distribution in Nigeria, they were expected to generate more benefits for the sector as a whole, and as such they remain islands of success.

The main cause for this lack of success, however, is down to the failure to put into place a systematic approach to using ICTs so they would have a more comprehensive impact on agriculture. The World Bank observed in 2007 that if

legal frameworks were in place, banking and payment services provision through mobile phones could introduce many more people into the formal financial system. Today, this is happening in many countries – M-Pesa by Safaricom in Kenya is leading the way in Africa, for example. This is an illustration of what an enabling environment can do so that ICTs equally benefit everyone in the agriculture sector.

Whatever the impact ICTs may have made in agriculture, they were expected to generate more benefits for the sector, and as such they remain islands of success

What is an enabling environment?

An enabling environment for ICTs in agriculture in ACP countries is one in which both policies and practices, and infrastructures and general investments are favourable for ICTs to thrive and positively contribute to agricultural improvements. These are some of the crucial questions:

- What policies have been provided in these countries to enable ICTs to play effective roles in agriculture development?
- What are the levels of investment in mobile communication, and mobile and broadband internet access, especially in rural areas, that will make it easier for ICTs to make viable agricultural improvements?
- What skills do citizens have that will enable them to take advantage of ICTs for the development of agriculture?
- What agricultural business plans are being developed to stimulate the interests of young ICT professionals to invest their time, intellectual and other resources in agriculture?

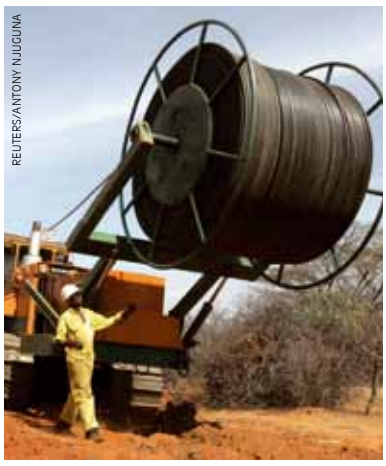
These are the perspectives that will create an enabling environment for the efficient delivery of effective ICTs tool for the agricultural sector.

During the ICT4Ag conference, this stream on 'enabling environments' will provide participants with the opportunity to share ideas, experiences and proposals on how to create enabling environments in terms of policy, infrastructure, learning skills, using apps and e-cooperation between sectors – think, for example, of e-agriculture and e-commerce, e-agriculture and e-banking, e-agriculture and e-governance – so that ICTs can make a greater impact as they transform the agricultural sector.

The conference needs to be a platform for eliciting and exchanging information, ideas and proposals that will enhance the capacity of rural people to access and use knowledge, skills, and materials and truly benefit from ICT tools. And in doing so, the conference should generate different solutions that address the needs of the different target groups in agriculture and along agricultural value chains.

With this in mind, the eight sessions of this stream will be organised in different forms, such as a discussion group, a world café and an open space. It is hoped that this will facilitate the accomplishment of three objectives:

- develop a clear understanding of the environmental challenges facing the use of ICTs in agriculture;
- develop appropriate guidelines and concrete proposals for reinforcing, transforming and developing communities of practice in the use of ICTs application for agriculture at various levels (continental, regional and national); and
- harness expertise and develop adequate arrangements for reinforcing work in ICT4AG at all levels. ◀



REUTERS/ANTONY NJUGUNA

Presentations at plenary sessions

Scaling up and sustainability
Judith Payne, United State Agency for International Development (USAID)
Far too few ICT applications related to agriculture are sustainable without on-going donor funding and have scaled up to the millions of poor smallholder farmers that could benefit. Lessons learned from USAID's experience in the design and implementation of two ICT for agriculture related public-private partnerships will be shared.

Putting the horse in front of the cart: A strategic approach to designing ICT-supported extension
Andrea Bohn, Modernising Extension and Advisory Services (MEAS)
It is easy to get very excited about certain ICT applications on their own, but this will go nowhere. ICTs are a part of the extension process and are most effective if combined with established good extension practice. For extension and ICTs to be effective, the service has to be client-focused.

Who is winning?
Bashir Jama, Alliance for Green Revolution in Africa (AGRA)
Improving access to advisory services is essential for achieving Africa's Green Revolution. Because of the ever-lower costs and ubiquity of ICTs such as mobile phones and the networks needed to connect them, new avenues have been opened, offering crucial information to farmers, fishermen, small traders and business people. Indeed, this is a win-win situation for all.

ICTs for agricultural extension: where we are & how to move forward?
R. Saravanan, Associate Professor, GFRAS/Central Agricultural University
ICTs are complementing conventional extension systems in coping with the emerging challenges in agriculture. Experiences from tele-centres, knowledge portals, mobile phone and social media applications from developing countries indicate that integrating ICTs along with pluralistic extension and agriculture value chain activities is crucial for realising the potential of ICTs in extension.

Selected submissions

ICT4Ag: setting the scene

e-Afghan Ag

Four out of every five Afghans live in rural areas, one in four is a nomad, and three out of ten can't read. Can an on-line ICT tool really help such people? e-Afghan Ag, an internet-based resource, provides credible, relevant information to those helping farmers in Afghanistan. In its short life, e-Afghan Ag is available on five different mobile devices and has more than 10,000 unique users, with more than 50,000 downloads. It has developed over 500 demand-driven fact sheets on 27 different crops, six types of livestock, and on farming topics like irrigation, postharvest and watershed management. The 'Ask the Expert' feature with 24-hour turnaround can be accessed by anybody in the world.
➜ http://afghanag.ucdavis.edu

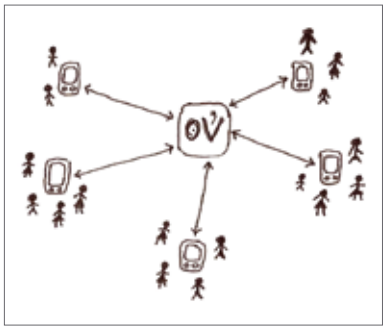
ALAMY/TRAPPE

ICT in Agriculture Sourcebook

Published in 2011, the ICT in Agriculture Sourcebook addresses mainstreaming ICT in 14 sub-sectors of agriculture. It provides a global audience with lessons learned, guiding principles and hundreds of examples and case studies on applying ICTs in smallholder and resource poor agriculture. Subsequently, the World Bank partnered with FAO and the e-agriculture community to see how ICT can be used to improve agricultural development agendas. The forums seek to identify good practices, new techniques and applications. They also provide a unique environment for networking among ICT4Ag practitioners. Hosted online, thousands have been able to participate in these forums.
➜ www.ictinagriculture.org

ojoVoz initiative

Socially excluded communities can empower themselves socially by gaining access to open communication media platforms to make their voices heard. The ojoVoz initiative has provided such platforms to groups of smallholder farmers in Tanzania, helping them to further develop their capabilities to socialise, communicate their knowledge and reveal their challenges and concerns to local authorities and researchers. Smartphones and a web interface have enabled them to collaborate in the creation of online community memories that are not only a valuable testimony of their culture, but also a potential platform for the open exchange of knowledge about agriculture and related socio-economic issues.
➜ www.sautiyawakulima.net/researchrspage/2



REUTERS/ZOHRA BENSEMRA

Online inventory technology for agriculture

The purpose of this initiative is to provide the agricultural community with an online inventory of technologies useful in agriculture. The inventory should offer software and application developers a platform for their products and also provide the agricultural community with a place where they can find various software solutions for agriculture. Decision makers, software and application developers, and the agriculture community would stand to benefit from the platform as the inventory provides information that is relevant to the interests of all parties. The platform page will carry general product information with a detailed description of the programs.
➜ http://goo.gl/wvGv9u

Broadband strategies

ICT4Ag: setting the scene

Everyone agrees that ICTs are important for agricultural development. But the level of access in ACP other countries varies. What are some of the reasons why access to internet is often poor in rural areas?

➜ It mostly has to do with the fact that it's difficult for internet companies to make a profit, or even break even, in rural areas with the model they are comfortable using. The best situation for an internet provider's bottom line is a dense concentration of high-income individuals. In this scenario, people can afford to pay not just for basic connections, but high-value ICT services.

This drives up revenues. And since people are geographically concentrated many of them can be reached with the same infrastructure, minimising network costs. Rural areas present the opposite scenario: citizens are generally poorer, driving down revenues, and because they are more spread out the companies need to provide more infrastructure to reach them, driving up costs. In the end that math doesn't work out and networks are not deployed.

What new technologies and new business models are being developed that could provide affordable connectivity in rural areas?

➜ There are several new radio technologies that drastically lower the cost of providing internet in rural areas, and hence make it more likely that a company can profitably offer access. A good example is the 'small cell'. This is a scaled-down version of the technology currently used on standard 3G cell towers. It can handle less traffic and has a much smaller broadcast range, but it can be run on solar power and reduces capital cost by up to 80%. This can be a good option for rural areas where demand is likely to be less, and where people concentrate in small villages.

Another new technology, or class of technologies, involves the use of 'TV White Spaces'. These are the spectrum gaps between TV channels. When TV broadcast channels were originally allocated, buffers of empty spectrum, or 'white spaces', were left between channels to ensure that they didn't interfere with each other. But the size of the buffers was determined based on technology that is now several decades old. Due to technological advances, these white space gaps are now too big, and other signals can safely be broadcast through them. It is now possible to broadcast a WiFi signal a very long way – up to several hundred miles – very cheaply using these white spaces. This has important implications for rural internet access.

Are there examples of business models that have already been introduced, and have they been successful?

➜ Indeed there are, but many are still new and coming onto the market. Altobridge, an Irish company that manufactures small cells, has had several successful pilot deployments in rural areas, and at the conference we'll hear about their partnership with Orange in Niger. TV White Spaces are an even newer idea, but deployments are already underway throughout Africa. We'll hear about an ongoing initiative in Kenya called Mawingu at the conference.

Not all successful business models for rural internet rely on new technology, however. One that has proven successful in many areas is for the government, or a company, to serve as an 'anchor tenant'. In this scenario, the two parties agree that if the internet company offers service, the anchor tenant will buy enough connectivity to make the venture profitable for the internet company. Residents in the surrounding area then benefit from the new connectivity infrastructure.

What is being done at the policy level to support the introduction of new business models?

➜ Well, public policy tends not to support a particular business model over another. It can offer incentives to use small cells, or it can authorise operators to use TV White Spaces, but that's about it for picking particular business models. What policy can do effectively is ensure that the enabling environment – in terms of both infrastructure and regulation – does not contribute unnecessarily to the cost of providing internet service.

In some countries, this means that policy is restricted to things like ensuring local governments don't try to tax fibre-optic cables that run through their land. In other countries, it means much more. An example is coordinating investors to put up the money to build fibre-optic cables in locations with limited internet. Some governments even build the cables themselves. Something that most governments offer is a subsidy program, called a Universal Service Fund, that helps make companies' operations in rural areas profitable.

An emerging trend is to develop and implement National Broadband Plans or Strategies, which take a holistic view of the problem and coordinate resources across ministries to bring connectivity to rural residents. These plans coordinate supply incentives with demand creation, regulatory streamlining and pilot projects in multiple sectors. They can be difficult to implement though, and we'll hear about a few of them at the conference. ◀

ALAMY/TOM GILKS

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Related links

Altobridge
➜ **www.altobridge.com**

Mawingu
➜ **www.mawingu.org**
➜ **www.icow.co.ke**

mFisheries
➜ **http://cirp.org.tt/mfisheries**

MFarm
➜ **http://mfarm.co.ke**

iFormBuilder
➜ **www.iformbuilder.com**

Grameen Foundation's Community Knowledge Worker programme
➜ **www.grameenfoundation.org**

ICT4Ag: setting the scene

CIALCA training videos
CIALCA (Consortium for Improving Agriculture-based Livelihoods in Central Africa) offers a number of technical innovations for banana farmers in Central Africa. For out-scaling these innovations CIALCA makes available comprehensive training packages to development partners. These packages include training videos in local languages that maximise farmer learning and impact. These ready-to-use videos have been validated by CIALCA and can be shown in the field using a laptop and a pico-projector. Knowledge retention is ensured by the provision of hard-copy factsheets and saving soft-copies of the videos on partner laptops, and on video-capable mobile phones.

➜ youtube.com/CIALCAafrica
➜ www.cialca.org

Mobile Agribiz
Mobile Agribiz is a web and SMS-based app that connects farmers to buyers, and helps them to obtain necessary agriculture information. Mobile Agribiz helps farmers decide when and how to plant crops using climate and weather data, and to select the best crops for a given location based on available market informantion. Farmers can easily connect with potential buyers by sending SMS messages with their phone number and information on products, prices and quantity they are selling. Mobil Agribiz plots this information onto digital maps enabling buyers to see where the products are located before making a connection with the farmer.

➜ www.mogribu.com

iCow
iCow is a trustworthy SMS based information and education platform. The service helps small scale farmers increase their productivity by giving them access to pivotal information. iCow is very simple to use and is not reliant on smart phones. It consists of three flagship features (several more are developed and wait to be released). Fist, Mashauri, iCow's educational component with health, diet and nutrition information. Second, Kalenda, a comprehensive gestation calendar that can be customized to each individual heifer. And third, a 24/7 accessible database with contact information of all registered vetinary doctors in the area.

➜ www.icow.co.ke

Group Certification Management
GC Management is a new software programme that supports smallholder groups under contract farming with the management of their internal control system. All internal inspection procedures and farm data are administered and managed by an efficient database. GC Management helps producers to simplify the implementation of their internal control systems; ensure compliance with international food production requirements and standards; improve the organisation's administration and documentation; increase product integrity; and improve the communication between the organisation and various business partners.

➜ www.group-certification.com

SBC4D
SBC4D's agriculture business-matching service is a mash-up of mobile, radio and web platforms that enables farmers in the developing world to use ICTs for direct access to new market opportunities independently of their literacy level, their language or their phone. It uses innovative voice technologies that allow all farmers to use the platform directly without intermediaries. It also has specific modules to connect with community radio stations and mobile money systems. It is currently deployed by ITC in Kenya, in cooperation with KACE, and in Fiji with FCLC. It is built on top of an open-source package developed as part of the EU-funded VOICES project.
➜ www.sbc4d.com/product-services/ict-agriculture

amAgriculture
amAgriculture is an analytical tool for agri-businesses that want to understand underlying business trends, cut costs, and mitigate risk. This app includes the following features: agricultural input and output data collection and management; transactional data tracking from agents' transactions with farmers in cooperatives and associations, including mobile money transfers and data export capabilities in MS Excel. In addtion amAgriculture offers a push&tpull SMS system for agents and farmer communities and online/offline capabilities making the system very robust in frontier market contexts where telecommunications network reliability is variable.

➜ http://accessmobile.it

Next2 Geo-Social SMS App
Next2 provides a service that includes an auction where for buying and selling farm products and provide information from organizations and businesses that support farmers, using SMS keywords. In addition, organizations and businesses that want to disseminate information among farmers can easily do so by creating SMS keywords through their Next2 account. And last but not least, Next2 provides an open data platform aggregating local information collected by farmers for researchers and policy makers to analyse and use for evident-based decision making. Next2 uses SMS, mobile web and simple feature phone applications that are standard features of any mobile phone.
➜ http://m.next2.us

ICT4Ag: setting the scene

Understanding your users

LINEAIR/SHEHZAD NOORANI

access.mobile, Inc. (AM) offers enterprise software for high growth frontier markets. AM's customisable mobile technology solutions enable cost-effective collection, retrieval and analysis of data for their clients. With the increasing interest in technology in Africa, even amongst the rural poor, the acceptability of mobile applications is immensely appealing. Their task is to ensure that the software developed meets the end-user's needs in a way that will clearly benefit all parties involved. They have an android version for amAgriculture and are developing Windows and iOS as well. The devices previously used were Tecno-T611 for amAgriculture and Mi-fone Mi-Q502 for amHealth.

Waste recycling info by phone

FLICKR/SUPERFANTASTIC

Most mobile phones are cheap and have camera, video and audio options. For over five years, waste recycling info has taken pictures and videos of composting on these types of phones in their house in Thiès. Although the images are not sharp, they clearly portray the composting process. The project aims to show the composting process via a short video and photos and thereby build the capacity of professionals in agriculture regarding the treatment of household waste, the recycling of plastic, and the identification of worms and beetles, as well as major pests. This information is stored, processed and sent via mobile phones to agricultural advisors.

Community Informatics

ALAMY/AGE FOTOSTOCK

Community Informatics – using ICTs for the socio-cultural, socio-economic and service needs of communities – could be a useful tool for addressing food security and rural livelihood. To this end, a cross-sector framework for linking ICT for development actors, grassroots communities, academia, policy makers and media is critical and was the basis for a study on the operational context of a Community Informatics Network for Africa. The findings show that there are initiatives closely related to a CI-approach, e.g. telecenters, living labs, digital villages and community information centres, but most were not designed to engage communities in policy processes.
➜ http://goo.gl/F5FQmB

Web 2.0

Web 2.0 has come a long way in addressing ICT4Dev challenges, and can go a lot further. The Busoga Rural Open Source and Development Initiatives (Brosdi) has incorporated information & communication management in its training sessions and uses the value chain concept to teach users how to identify different players in the chain, realise their input and find ways to maximise their involvement. The results are amazing. If asked whether Web 2.0 is a blessing for ICT4Dev initiatives, the answer would confidently be 'yes'. Add to this that the job has only just begun.
➜ www.brosdi.or.ug

FLICKR/LUDWIG GATZKE

Rural e-market

Three problems facing farmers in Africa are poor access to markets, dishonest intermediaries and lack of information on produce prices. These problems could be solved by developing a simple, friendly, affordable and effective tool that would help farmers, farmer organisations and their supporters across continents to access market information and prices, and give them the ability to sell and buy products. Farming & Technology for Africa has developed such a tool and initiated partnership talks to launch it. What remains is to develop the organisational structure that will support this initiative once launched.
➜ http://goo.gl/ySeshN

LINEAIR/JORGEN SCHYTTE

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