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Interactive radio and video help researchers to engage with farmers

ICTs help researchers to gather information more effectively from the field

Building a multidisciplinary platform that links science with technology

Agricultural research and ICTs

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ICT Update

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Guest Editor

A two-way engagement

ICTs enable researchers and farmers to exchange information more easily, thereby narrowing the gap between the two groups.

As ICT technology continues to advance and become more pervasive thanks to falling prices, it is having a direct impact on the way in which agricultural researchers carry out their work. ICTs are enabling the results of agricultural research to be delivered to an increasing number of end users, some of whom are, in turn, suitably empowered by ICTs so that they can provide researchers with updated information on things such as the progress of their crops and the appearance of pests and diseases.

I have been working at CGIAR, a global partnership for research for a food secure future, for 10 years now. Initially considered unsuitable for the purpose, ICTs are now being applied to all parts of agricultural research in the development sector, connecting science with agricultural and rural change. The revolution that struggled to gain momentum has now been fully launched.

The shift to cloud computing cuts the total cost of scientific computing

Cloud computing

One of the biggest changes and steps forward I have recently witnessed is cloud computing. Cloud computing makes it possible to reconfigure general-purpose, online data centres by command to support any software application in minutes. It gives users access to hundreds of computers, while only having to pay for them on an hourly or minute-by-minute basis. The services are commercially viable as the costs related to the data centre can be shared among many users.

Commercial 'cloud providers' like Amazon, Google and Microsoft already offer such services, and some government-run research clouds exist. Cloud computing now offers the lowest-cost option for nearly all types of data centre computing. Indeed, cloud providers are already more cost-effective for high-performance computing, like video and image processing, bioinformatics, and most types of scientific data analysis.

Agricultural research centres, such as CGIAR's, have begun to subscribe to several cloud providers, which can be used at different times for different purposes. The shift to cloud computing will cut the total cost of scientific computing and also present new opportunities for international agriculture. Many organisations no longer need the capacity to purchase and operate a large number of computers themselves. Cloud-hosted computing facilities provide an incentive to share data among researchers, as users in any location or institution will be able to instantly access, analyse and interpret data without the need to move it to their own facilities.

Researchers with a moderately fast internet connection can now work with data and with other researchers regardless of where they are located. Researchers can also leave the results of a cloud analysis at the cloud data centre, creating the potential for reuse by others. When properly managed, this has the potential to enable new kinds of collaboration and project organisation. Cloud computing is providing a rare opportunity for research organisations such as CGIAR to 'turbocharge' their research efforts to

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➜ http://goo.gl/7Ik75

Ubiquitous networks and cloud computing
➜ http://goo.gl/1HqT7

Pilot radio project tunes in to what farmers have to say
➜ http://goo.gl/5gSHz

help smallholder farmers. This is an opportunity that must not be missed!

Wireless networks

Many researchers in the CGIAR system carry out their work at remote sites in developing countries. In the past, before the current global investment into communications infrastructure took off, many of these researchers would manually collect field data, transcribing and processing this data only when they returned to their laboratories or offices. As well as being time-consuming, this process naturally increased the risk of error.

Today, more and more researchers are able to access data sources remotely, using a wireless device such as a mobile phone, notebook or tablet. They can also gather field data using handheld data capture devices for immediate submission via the internet to a project data repository or for sharing with collaborators. Wireless technology saves them time, increases accuracy, improves collaboration and generally enhances overall efficiency.

Of course, we cannot talk about the growth of wireless networks without mentioning the mobile phone's increasing ubiquity in many developing countries, and not just in urban areas. The opportunities created by mobile telephony are not limited to receiving information. They make users active participants, contributors. This is nothing short of a paradigm shift. From early detection to participating in trials, phones are now used from the field to provide information, not only to receive it.

More and more smallholder farmers are turning to the mobile phone for the first time to connect to agricultural and information services, and markets. The declining cost of many wireless services, coupled with mobile phones that sometimes cost as little as US$10, is all it takes for some farmers to obtain information from extension services about the optimum time to plant their seeds, or the right way to keep pests at bay, or the best market in which to sell their produce. Some remote farmers are also using their mobile phones to facilitate research by providing scientists with information about the condition of their land and crops.

Radio

The increasing need for access to accurate geospatial data for application in a diverse range of development activities (agricultural, disaster, conservation, climate change and economic development) has resulted in the advent of Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS) technologies.

CGIAR researchers use GIS, sensors, and high-resolution satellite images to analyse soil fertility, moisture, and weather patterns and provide detailed maps of crops, enabling smallholders to plant seeds and apply fertiliser accordingly.

A recent radio project piloted by the CGIAR Research Program on Climate Change, Agriculture and Food Security in East Africa, in partnership with a local radio station in eastern Kenya, shows that farmers are increasingly demanding access to climate information from agricultural and climate change experts to improve their farming practices. They are also eager to learn more and be part of an evolving dialogue on how local communities, governmental organisations and research institutions can work together to increase farm productivity and reduce the impact of climate variability.

Through the project, a radio programme adopted a simple interactive approach, whereby the studio presenter and a guest expert engaged listeners on various pre-selected discussion topics. Interaction between the listeners and studio was aided by a lively feedback mechanism made possible through short text messages (SMS) and telephone calls.

A similar CGIAR project established a system for innovative knowledge sharing with regard to drought preparedness in the semi-arid tropics. Using advances in ICTs coupled with open distant-learning approaches, it provided globally dispersed communities of drought-related experts with the opportunity to come together virtually to help generate information and knowledge that could be locally applied by stakeholders.

Information modules on drought were delivered through a local community radio that delivered the information via satellite digital radio technology to rural communities in Niger, and established an internet-connected information hub that supports three village access points in India. It was a two-way engagement.

Decreasing unit costs, increased availability and accessibility of technologies have changed the way we do research, the way we connect our communities. I believe ICTs can 'turbocharge' communities into seeing that working together enables them to discover and put in place better, more sustainable solutions for a more food secure future. ◄

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NEIL PALMER / INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CIAT)

ICTs enable researchers and farmers to exchange information more easily. They have changed the way researchers connect to rural communities. ICTs also have enabled a two-way engagement in which ICT communities work together to discover and put in place better, more sustainable solutions for a more food secure future.

Promoting interactivity

ICTs can help researchers to interact with farmers. The challenge lies in finding a way of integrating traditional and new communication technologies to send agricultural and market information to farmers.

Agricultural research and ICTs

It is important that agricultural researchers' work is disseminated to as many end users as possible. ICTs are an important tool for doing this. Nowadays, different ICTs are used to communicate agricultural information to farmers. Radio broadcasting is the more traditional information channel for farmers in most developing countries. But the popularity of mobile phone services and applications have been rising in recent years. There are positive examples of using digital video for sharing agricultural information. Furthermore there is potential in the coming years for live streaming services for online platforms.

These technologies are mostly used separately, however, so an important question is how to combine mobile phone, radio, and video services in an integrated way to inform farmers about research-based production methods. Josh Woodard, project manager at the US-based non-profit organisation FHI 360, wrote a toolkit on interactive radio that is very closely tied to mobile services. 'Any approach to knowledge sharing needs to be multi-faceted, rather than singular in nature,' he says. 'Therefore I think that mobile phones, radio and video all can play a very complementary role and support the reinforcement of messaging towards farmers.'

For decades now, radio has been a dominant source of information for farmers in much of sub-Saharan Africa, with an estimated reach of between 80% and 90% of households. 'Yet for the most part,' Woodard says, 'traditional radio promotes a one-way flow of information from the broadcaster to the listener. This can be effective for the passive consumption of information, such as weather reports or price information, but is not necessarily the best medium to foster active learning, such as promoting changes in farming practices.'

Mobile chat platforms

By using new technologies that are closely related to mobile phone and internet it is possible to enhance the potential of radio as a powerful distribution channel beyond what had ever been possible. There are different ways radio stations can be interactive, like the facility of call-ins, call-outs, SMS, voice messages, interactive voice response, facilitated listening and web-based platforms. Mobile chat platforms such as Mxit, for example, present opportunities to facilitate listener-to-listener interaction. It allows one-to-one text messaging, along with group chats on web-enabled feature phones.

Researchers should be participating in this kind of interaction. They can reach farmers and answer their questions, but by participating in broadcasts researchers can benefit from receiving new information directly from farmers. There was a call for more farmer involvement in cutting-edge research studies at the GCARD2 in Punta del Este, Uruguay (South America), for example. The chairperson of the Global Forum for Agricultural Research (GFAR), Monty Jones, said during the conference, 'it is the farmers that are the centre of innovation. We must think with the farmers and not think for the farmers.'

Dominic Otieno Omolo, communications and knowledge management expert at GFAR, explains why. 'Several research studies are done without including farmers, who in the final analysis are the intended beneficiaries of the research results. There are growing voices to address this disconnect. And community radio presents an excellent opportunity for mutual collaboration between agricultural research and development experts and farmers.'

Omolo's experience is that there has been fruitful interaction between farmers and researchers as far as information sharing and technology transfer is concerned. What have been lacking, according to him, are sustained and focused approaches that place the farmer at the centre of research actions. 'More concrete interventions are needed in this direction,' he says. 'I personally think that it is also a question of capacity building and formation. Most knowledge institutes have recently started to incorporate communication in their curricula and hopefully the results of this will soon be seen.'

Research actions

There are several good examples. One of GFAR's constituent organisations, Foodnet Uganda (www.foodnet.cgiar.org), uses the radio as one of the means of communication to disseminate agricultural market price information. The African Farm Radio Research Initiative project launched in 2007 and funded by the Bill and Melinda Gates Foundation was implemented in Ghana, Malawi, Mali, Tanzania and Uganda. The project gathers, implements, evaluates and shares best practices for using radio-based communication strategies to enhance food security in rural Africa. It also offers radio broadcasters capacity-building and training services that aim to improve their programming for rural listeners.

Josh Woodard (jwoodard@fhi360.org) is project manager at the US-based non-profit organisation FHI 360

Dominic Otieno Omolo (dominic.omolo@fao.org) is communication expert. He has over ten years' experience working with FAO, the African Union and the Global Forum for Agricultural Research (GFAR).

EITAN SIMANOR / ALAMY

'Community radio presents an excellent opportunity for mutual collaboration between agricultural research and development experts and farmers'

The Organic Farmer has been actively involved in producing and disseminating ecologically sound information for farmers in Africa. In Kenya there is a radio programme that gives tips on organic farming and answers farmers' questions. It airs on Kenya Broadcasting Corporation's Kiswahili service every Thursday. And several years ago CTA produced five Rural Radio Resource Packs every year on a variety of topics related to agriculture and rural development that were re-packaged and broadcast by local radio stations in African, Caribbean and Pacific countries. A panel of experts from developing countries used the packs to submit material on diverse topics. The material was then compiled to produce CDs and brochures that were distributed among partner radio stations throughout Africa.

A step too far

Reaching small farmers in rural areas via live streaming initiatives through internet platforms is a step too far at the moment in most developing countries, but Woodard believes we may not be more than a few years away from seeing this. 'Already I know of examples of farmers taking photos with their phones of crops and sending them to experts for advice on topics such as disease and pest control,' he says. 'As video enabled phones and mobile broadband become the norm more than the exception in many of these communities, I think that you will see experimentation with live streaming video to connect farmers to experts.'

In Ethiopia, for example, Digital Green – a leader in low-cost video broadcasting – and Farm Radio International explore ways to complement each others' messaging services to farmers. 'I think the reason why we often do not see all of these working in unison is that the skill sets do not always overlap,' explains Woodard. 'For example, you may have someone who knows radio really well, but nothing about video or mobile. That becomes a challenge in terms of staffing and capacity.' Also, it can be difficult to coordinate all of these streams and their messaging, which can be intimidating for some practitioners.

Digital video in particular is advancing rapidly as a new tool to reach farmers. It all started with the launch of pocket camcorders like the Flip camera in 2007, and improvements in pico projector technology from around 2010 onwards have revolutionised how video can be used to disseminate knowledge to farmers. Prior to that, some organisations were hooking up televisions and DVD players to generators and driving them around rural communities to share videos. Now, they can literally put a pico projector in their pocket along with a small external speaker and create their own movie theatre anywhere by projecting onto a flat wall (or sheet).

Video projects

Research by organisations such as Agro-Insight and Digital Green shows that video does have a positive impact on yields and lowering the costs farmers incur when adopting new

Agricultural researchers should share their research results effectively to as many users as possible, also farmers. ICTs are an important tool for doing so. Available technologies now have been used mostly separately. But if mobile phone, radio, and video technologies are integrated farmers can receive research-based information and interact directly with researchers.

Related links:

Toolkits for practitioners:
interactive radio
➜ **http://ictforag.org/radio/**
low-cost video
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technology. The challenge with computer-based viewing is that the screen size is limited, so only a few farmers can watch at a time. The pico projectors can clearly project video from about one metre away – though this increasing all the time – onto a flat surface in a dimly lit setting. With a small external speaker, that is enough to share a video with about 30 seated people. Both the projector and speakers can be charged in advance and used in places without any access to electricity. And the purchase costs are under US$300, much less than the cost of a TV, DVD player, generator or the fuel that was used just a few years ago.

The camcorders built into mobile phones these days are of decent quality, and a few models even have built-in pico projectors. Woodward predicts that within the next few years there will probably be mobile phones with camcorders and pico projectors that are just as powerful as the camcorders and projectors sold on the market today. Woodard thinks, however, that this is only useful if farmers have already seen the videos on a larger screen. 'Otherwise, it is difficult to learn for the first time how to use an improved practice by watching it on a small mobile screen. Although with the expansion of mobile broadband, this might become more appealing as it would allow farmers to view videos on demand via the internet,' he explains.

Including researchers

Video can certainly play an important role in helping to share information with smallholder farmers. Extension agents and development workers are creating their own extension videos with farmers with easy-to-use pocket camcorders. 'We know from experience that in-person extension visits to farmers can be extremely effective, but they are also expensive. Video is the next best way to replicate that visual knowledge exchange, but at a fraction of the cost,' says Woodard.


DUSTIN ANDRES / FHI 360

He would like researchers to participate with video and radio makers to guarantee that information communicated to farmers is of the highest quality. Agro-Insight, for example, has worked together with other researchers, such as the International Crops Research Institute for the Semi-Arid Tropics. The organisation's role tends to be a bit more hands-on regarding the production of videos, which has its benefits in terms of quality. 'I think that the best examples of researcher involvement are in instances where they are developing videos together with local extension agents and farmers,' says Woodward. 'The researchers provide much needed content and accuracy, but the extension agents and farmers share in the storyboarding and production. When done well, this can be an inclusive process that increases local ownership and interest in the video content.'

By doing so researchers can be sure that they are creating videos that are relevant to their target audience. However, video can be a powerful tool for communication, but it can also be detrimental if it is used to disseminate inaccurate information or techniques. 'What I would like to see is more researchers involved in the development of messaging through content contribution and fact checking,' explains Woodward. 'Extension agents and other video content developers need quality and accurate information, which they may not always know on their own.' ◀

Weed identification tool

Weed identification in rice is like diagnosing a patient in a clinic: you can only think of a treatment once you know what the problem is. Once you know which weeds you are dealing with, you can design a good plan for their control. In a similar vein, AfricaRice coupled their database to a new weed identification tool that provides information on effective management to rice farmers. 'The tool works through a schematic image of a plant,' says weed scientist Jonne Rodenburg, 'where for different plant parts one can select shape, format, colour and other characteristics. By selecting characteristics for different plant parts the number of likely species gradually decreases. By narrowing down the options, the tool assists in identifying the species.' There are 187 species in the database. Selecting only the leaf shape, for example, narrows down the number of likely hits to 33 species. Selecting only the stem (hollow or filled) leaves 15 remaining possible species. Selecting the shape of the intersection of the stem (rectangular) leaves only one species a 100% match. The tool is freely available at http://www.afroweeds.org/idao/ and will become available as an app for smart phones and tablets and will also be disseminated in CD-ROM format.

Research-based advice for farmers

Based on information from soil samples in Africa, ICT tools have been developed to gather more specific information and disseminate research results to farmers by using text messages.

Agricultural research and ICTs

AfSIS is working on ICTs that should make it easier for agricultural researchers to gather, analyse, share and disseminate information and knowledge. Think, for example, of a survey toolkit for socio-economic and agronomic data collection or sensor software for laboratory data soil collection.

The African Soil Information Service (AfSIS) aims to serve African farmers by developing ICTs that gather relevant information, analyse it and translate it into valuable information that can be sent to end users by a text message service. Once information from the field has been collected and analysed, AfSIS can inform farmers of a certain crop's productivity. For example, they can inform the farmers that they have a potential of getting 40 bags of maize from one acre of land compared to the six or five bags they are currently getting by applying a certain number of kilograms of nitrogen, phosphorous and potassium fertiliser.

Also a survey toolkit for socio-economic and agronomic data collection has been integrated into the Google Open Data Kit. Similar tools for soil data collection have been developed, as well as sensor software for laboratory data soil collection. None these ICT tools has been branded or marketed yet.

However, four years of collecting and analysing thousands of soil samples by AfSIS created a comprehensive soil map of sub-Saharan Africa. Now AfSIS links the soil characterisation surveys to fertiliser nutrient use trials. The results obtained are used as part of a new text messages service to farmers, known as E-Farming.

The service is a joint effort between AfSIS and the African Soil Health Consortium (a project of CABI Africa) as well as a private company called FibreLink Communications that developed the SMS platform. In 2012 when the project started, messages were predominantly sent about maize. But since then content has been developed on five other crops: coffee, tea, beans, cassava and bananas.

Farmers can register to the service through SMS. They send the words 'Agric' or 'Agriculture' to the short code 5152 in Kenya. Once they do this, the system guides them through the registration process by asking them a series of questions: first, their county, crop of interest and whether they want information on soils, fertiliser application, agronomy, markets or pesticide use. After this their particulars are entered into a database so they can be sent content of interest. All participants sign and agree that each time they receive a message KSh10 (US$ 0.11) will be deducted from their accounts. All mobile phones are able to receive the messages through the existing GSM networks.

E-farming is a two-way messaging system where individual farmers can send very specific requests, to which AfSIS and FibreLink Communications respond on an individual basis. What is new, however, is the option of answering requests based on keywords that have been developed for different crops. This system is able to pick out information from an already developed database of voice messages, call farmers back, play their request and answer it.

In Kenya, 3,000 farmers have subscribed to E-Farming within the first year. Some farmers have increased their production three to four times by following the advice from the service. The evaluation of the service also shows that farmers in western Kenya had more of a preference for agronomic messages to enhance their maize farming. They were more interested in receiving soil and fertiliser recommendations and application rates than market-related or other kinds of information.

But it also showed that it is a challenge to keep the service affordable for very poor farmers, who sometimes are unable to load their phones with money to receive the text messages. Though farmers wanted to receive the information, they lacked the money in their phones to be able to get the messages. This means only a fraction of the farmers in the database could be reached rather than all registered farmers. The ideal situation would be to extend the service with even more precise, site-specific advice for boosting food production, based on AfSIS' soil maps.

The challenge is to keep the text message service affordable for the very poor farmers

Therefore, AfSIS is exploring the possibility of deploying the soil map on a mobile server platform, integrating that into a decision-support tool that helps to translate the soil properties into soil management and the right fertiliser application rates, amounts, timing and sources. It is also looking at the possibility of crowdsourcing for collecting information by using mobile data collection systems.

AfSIS has not yet reached the desired level of collecting information and directly relaying it to the farmers. Still after the information has been collected, it is subject to statistical analysis and interpretation before extracting the content that suits the farmers. But work is in progress to have algorithms that directly translate raw data into knowledge that is readily usable. Then AfSIS can collect the information onto the mobile servers and immediately dispatch it to the farmers. ◄

NEIL PALMER / CIAT

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SANDER MUILERMAN

Sharing local knowledge

Researchers now use ICTs to gather information more effectively from the field. ICTs also give them the possibility to help share knowledge in local communities.

Agricultural research and ICTs

Agricultural researchers are getting to the point where the advantages of using paper are no longer outweighed by the disadvantages of using advanced technology in a rural setting. The logistics of printing and distributing questionnaires, for example, can be time and resource intensive. Once the questionnaire is out in the field it becomes very difficult to make any changes or corrections to it, making it a rather rigid research tool, especially when managing unexpected outcomes.

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Digital survey

Smartphones and tablets are now used frequently in agricultural and rural research. However, in rural development settings simple and appropriate solutions are still recommended, according to Sander Muilerman, who works for the Institute of Tropical Agriculture (IITA) in West Africa. IITA did a baseline survey on occupational health and safety in 2012 among 420 adult cocoa farmers in Ghana without using paper. A parallel impact study using the same digital questionnaire targeted another 225 trained cocoa farmers.

No paper forms were used, only basic phones (and one GPS-enabled phone) equipped with a third-party Java application by three enumerators and a supervisor, with training on occupational safety and health. All phones were equipped with a special data SIM card, normally used in USB sticks for mobile broadband. This kind of SIM card only allows outgoing data connections, thereby effectively preventing misuse of credit by enumerators for calls or SMS messages.

Open questions

The enumerators were trained to focus on the farmers' answers and not on the predefined categories as such. For most questions respondents were asked to answer freely on an open question, after which the enumerator would not need to fit the answer exclusively under one

or more of the pre-defined answer categories. Answers that would not (fully) fit the predefined categories were recorded under the 'other' category and were subsequently recoded and introduced into the questionnaire through daily live updates, in order to improve speed and efficiency. The questions were never changed – only open-answer categories were added.

'This technique that allows open questions is very dynamic,' explains Muilerman, 'and at the same time kept the questionnaire's complexity down to a minimum for the enumerators in the field, who did not have to flip back and forth through a complex paper questionnaire, but could simply follow the flow of questions they were presented with.' All data were received by the lead researcher the same day.

An alternative approach is Computer Assisted Personal Interviewing, a similar methodology that uses laptops, netbooks or tablets as an interface during the interview process. With relatively highly trained enumerators this allows for even the most complicated and in-depth (multi-hour) household surveys to be administered with a maximum amount of support for the enumerator. It can, however, be rather complex to set up and manage, and is not advised in areas where electricity cannot be guaranteed. Whereas these kinds of interviewing techniques are mainstream in industrialised economies, they are generally ill-adapted to rural environments.

Mixed method research

Mobile phones can also be used because of other features and sensors available on smartphones: photos, GPS, multiple languages, audio, video, password, surface area measurement, compass reading, barcode, QR code, automated calculations, signature, slope, altitude and digital sketch. But it is not only technology that counts, according to Muilerman. 'Researchers need to think more about how to engage with farmers. Technology allows for more interactive and mixed method research – including with pictures, audio and video.' This is important for understanding agriculture as a complex system which, besides economic and ecological factors, also includes the social context of rural farming communities. Therefore, ICT projects in agriculture cannot be unidirectional or they may effectively devalue the traditional knowledge held by the farmers.

Using the same notion, scientists from the University of Plymouth in the United Kingdom, the Zurich University of the Arts in Switzerland, the University of Dar Es Salaam in Tanzania and the Swiss Federal Institute of Technology started a project in a village near the town of Bagamoyo in Tanzania. Their aim was to establish an open and participative research process in which local farmers use smartphones and a web platform to document their environment and the effects of climate change, and thus create a collaborative knowledge base that is useful for farmers, extension workers and researchers.

The project is called Sauti ya wakulima, "The voice of the farmers" in Swahili (www.sautiyawakulima.net). Five men and five women from the community take turns to share the two available smartphones, by exchanging them on a weekly basis. Whenever a farmer's turn to use the phone comes up, he or she has the task of using it to contribute content to the knowledge base. Farmers use messages, pictures and voice recordings to document their environment. A special application running on the smartphones makes it easy to capture the multimedia elements. It also integrates geographical information into the message, allows the addition of one or more keywords and sends all the elements to a web server, bundled together as an email message. By using pictures and voice recordings, farmers can portray a wide variety of objects, situations and persons, and complement visual evidence with their own spoken narrations.

Community archive

Farmers not only got together to exchange the phones but also to see and discuss the pictures and voice recordings that the group had uploaded during the week. There, they accessed the project's web page using a laptop computer with a mobile broadband connection. Juanita Schläpfer, from the University of Plymouth and Zurich University of the Arts, is one of the scientists on the project. 'Farmers used the smartphones mostly to interview other people. In these interviews, fragments of knowledge and even manifestations of creativity such as the invention of a shelling machine or experimentation with intercropping were revealed,' she says. The phones were also used to provide visual evidence of problems such as pests, plant diseases or the scarcity of water, and to advertise products or services.

In rural development settings simple and appropriate ICT solutions are recommended

The farmers found that documenting their practices and problems through interviews could lead to the creation of a shared, audio-visual knowledge base, which they could use for various purposes including learning, consulting of farming practices, promotion of farming inputs and even extending their social networks. 'They see the website's potential as a community archive, recording change over time,' says Schläpfer. The appropriation of the technology by the farmers has enabled them to generate their own content allowing them to become active producers rather than just consumers of media. This format has also allowed them to create a picture of their practices over a long period of time, something impossible for researchers to do unless they are living in the community.

The project's outcome, according to Schläpfer, shows how important it is for researchers, extension workers, local government and farmer communities to work together to face the challenges of producing food. 'By using ICTs, farmers should be encouraged to not only become users of mobile networks, but also to reshape their use to best suit their needs. This effort requires adequate training and the design of platforms that embrace open-source values,' she says. Therefore research projects based on ICTs should be designed in such a way that farmers are equally engaged to define the goals and to share outcomes together with scientists. ◄

Researchers today are using ICTs frequently to gather information. The logistics of printing and distributing questionnaires, for example, can be time and resource intensive. On top of this ICTs give them the opportunity to engage in innovative ways with local communities and help share their knowledge.

The right information at the right time

Multidisciplinary institutions need to develop, use and sustain ICT innovations for linking research, extension and markets, thereby bringing research into practice.

Agricultural research and ICTs

For a more food-secure world, it is imperative that millions of resource-poor small farms in developing countries significantly raise their agricultural productivity, are more resilient to shocks and seize opportunities to increase their incomes. To do so, farmers need to be able to access and effectively use the right information at the right time.

Public-funded agricultural extension, which played a key role in bringing research into practice during the green revolution, is often inadequate in terms of infrastructure and human resources to meet the needs of smallholder farmers. The development of ICTs now is helping extension become more efficient and farmer-friendly, with real-time advice.

Yet, despite many successful ICT pilot initiatives, reaching out to these farmers is still largely an unmet challenge.

To meet the challenge of providing smallholders in India and sub-Saharan Africa with information, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has opened a Centre of Excellence (COE) in ICT innovations for agriculture. The COE has developed many information systems, linking research, extension and markets. In south India, for example, ICRISAT provides internet-equipped village knowledge centres with up-to-date information on best farming practices, including climate adaptation methods, crop rotation, diversification and pest management for crops such as millet or sorghum. These platforms have helped around 46,000 farmers, including women, who live in 21 revenue villages in the Addakal Mandal in the Mahabubnagar district located in one of the poorest regions of south-central India become more food secure and resilient to drought.

Together with the Indian Institute of Technology, ICRISAT has also set up a knowledge-sharing platform enabling mediated voice communication, via mobile phones, between agriculture experts and farmers. The project is currently serving nearly 20,000 farmers in south India who regularly receive timely crop advisories from farmer knowledge centres (Krishi Vignan Kendras). Plans are currently underway to replicate and expand this voice message model across Asia and Africa.

Providing free web-based access to research is another priority for international research and development centres. Housing more than 5,700 research documents, including journal articles, conference papers, theses and monographs, an Open Access Repository launched by ICRISAT provides an easy interface for researchers, practitioners and web-connected farmers to use, build on and share research conducted at ICRISAT. Since its creation in May 2011 more than 144,000 documents have been downloaded by people from more than 70 countries.

ICRISAT uses the web-based KSI Connect platform to spotlight the most interesting research projects, the most cutting-edge research and the most fascinating stories at ICRISAT to both an in-house and a global audience. This platform also allows experts across the globe to share their project experiences and cutting-edge research activities contributing to global food security. With KSI Connect, all agricultural stakeholders now have direct access to the most knowledgeable technical experts and the latest scientific innovations in agriculture, without ever having to participate in onsite training or seminar programmes that interrupt their daily activities and travel schedules. Since its launch in July 2012 more than 100 videos have been hosted on this platform and the KSI Connect website receives more than 3,000 users every month.

The rise of new ICT devices such as tablets and smart phones will certainly create new opportunities for user-friendly information tools for better agricultural advice services and inform farmers about quality inputs and market access. They will also create job opportunities for info-entrepreneurs that can create crucial added value for farmers. Current research will provide insight into how a sustainable 'backbone communication network' can be developed to improve the quality and convenience of information (crop, market, weather and user's choice) dissemination to smallholder farmers and transparency within the value chains. To significantly scale up this 'knowledge to the poor' revolution, research, development and private sector organisations have to work together to develop new ICT innovations. ◀

NEIL PALMER / CIAT

ICRISAT's Center of Excellence in ICT Innovations for Agriculture provides a global platform for multidisciplinary institutions to come together to develop, use and sustain ICT innovations for linking research, extension and markets. Thereby bringing research into practice that contributes to a food-secure world.

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Related links

The Coherence in Information for Agricultural Research for Development (CIARD) movement
➜ www.ciard.net

Open Access Repository
➜ http://oar.icrisat.org

ICRISAT's web-based KSI Connect platform
➜ www.ksiconnect.icrisat.org

The Agricultural Model Intercomparison and Improvement Project (AgMIP)
➜ www.agmip.org

Handheld digital data collection

KoBoToolbox provides an integrated suite of applications for mobile digital data collection which you can use while conducting academic research on a large or small sample, monitoring and evaluating an aid programme or collecting a simple opinion poll.

KoBoToolbox is a mobile survey form that researchers can use to gather information through mobile devices. It works on an Android device. Forms can be sent out or completed in the field by researchers. There is no paperwork anymore, and the forms can easily be transformed into statistical programmes.

Agricultural research and ICTs

Building a digital survey form often presents technical challenges that require special programming skills and special equipment. The KoBoToolbox can help people overcome these challenges because it provides them with a flexible and easy-to-use toolbox for mobile digital data collection. In particular it helps researchers who collect data through face-to-face interviews for large-scale social science population surveys, for example. Switching to digital surveys can be especially helpful when there are many questions or complex surveys that require or disqualify other questions.

Skipping the traditional method of entering post-survey data speeds up the process of collecting and then reporting data. Though there is the added cost of equipment, the savings in the cost of data entry, man hours, printing and shipping paper surveys easily makes up for that, particularly in large scale surveys.

Building a digital survey form often presents technical challenges that require special programming skills and special equipment

KoBo's built-in skip logic, a kind of branching based on a Q&A format that avoids asking irrelevant questions, and data constraints mean that every question is answered in the correct order. Surveyors cannot move to the next question without giving a complete answer that fits within the required constraints, and they cannot go off-book by providing illegible or meaningless answers.

Timestamps and GPS-based location stamps enable the principal investigator to know where and when every survey was collected and how long the survey took. Because there is no data-entry step, the principal investigator can review daily data dumps, looking for errors or irregularities. Flaws in sampling or in the enumerator's methodology can be fixed in the field, before they become problematic.

So how is a KoBoForm set up? The toolbox contains four applications that are used together in a specific order. Once the survey for the research has been set up, you can use the KoBoForm application to create a form for collecting data in the field. You can open the KoBoForm Designer in your browser or download it onto your desktop and install it offline.

Before you begin working in the Form Designer, consider your research topic and what set of questions you need to ask to complete your research. You can create your survey entirely within KoBoForm, but it is recommended to start with a survey instrument in a Word document or Excel spreadsheet. Each individual question has a certain number of attributes so creating a spreadsheet in advance with the attributes in discrete columns will make it easier to develop the form.

KoBoForm has a log-in feature that enables the user to save his or her surveys offline. This, in turn, allows users to complete a survey in multiple sessions. You do not have to log in. Surveys and log-in information are only stored locally, never remotely. Sign up by clicking the 'Sign Up' button in the top-right corner. The next time you log in to KoBoForm, your previously saved surveys will be available in the main menu.

KoBoForm has a toolbar across the top, and two empty zones labelled 'Form Tree View' and 'Properties View'. By using the Main Menu users can open a 'New Form'.

The Form Tree View will show you the name of the form and the questions included in that form. The Properties View will show you information about the item selected in the Form Tree.

A detailed tutorial explaining what each attribute means and how it should be configured is available on the website www.kobotoolbox.org.

You will need an Android device to install KoBoCollect and use your survey. Using a USB cable, plug the Android into your PC. Mount your Android's SD card so that it is available in My Computer as an external drive, like a USB stick. Copy the survey from the location in which you saved it to your Android's SD card in the location /sdcard/odk/forms/. Using KoBoCollect, open your survey and collect some data. You can complete the form several times so that you have some data to work with.

Use the KoBoSync app built into the KoBoForm (or use the standalone version) to synchronize your data from your Android to your file system. The Post Processor will output a CSV file containing all the aggregated results of your collected data. The CSV is the terminal output of the KoBo system. You can use programs such as Excel, SPSS, SAS, or other statistical analysis software to analyse the data you have collected. ◀

Agricultural research and ICTs

Web resources

Research to Action


CIMMYT

Research to Action is a website catering for the strategic and practical needs of people trying to improve the uptake of development research. It is financed by the UK Department for International Development (DFID). It is a website for development researchers in general who would like to be more strategic and effective in their communications.
➜ **www.researchtoaction.org/**

Open access journals
Awareness about scholarly communication has increased in recent years. This development can be deduced from the growing number of open access journals and repositories, which are mostly supported by the scholar community. The Directory of Open Access Journals (DOAJ), for instance, currently has a database of about 8,300 journals, and has an even greater amount of papers published in open access repositories. Together, these form a much larger worldwide database.
➜ **www.doaj.org**

Mahider is the name of the International Livestock Research Institute's (ILRI) research publications and products repository. It is an index and repository of research outputs and publications produced or sponsored by ILRI. There are different themes, for example on biotechnology; markets, gender and livelihoods; people, livestock, environment; poverty, gender and impact.
➜ **http://mahider.ilri.org**

More than 1,000 journals can now be accessed for free through the Scientific Electronic Library Online (SciELO). SciELO is a Brazilian initiative based on a model for the cooperative electronic publishing of scientific journals on the internet. It was specifically conceived to meet the scientific communication needs of developing countries, particularly Latin America and the Caribbean countries.
➜ **www.scielo.org**

AgEcon Search is a free, open access repository of full-text scholarly literature in agricultural and applied economics, which includes working papers, conference papers and journal articles.
➜ **http://ageconsearch.umn.edu/**

Projects

Connecting African universities to the world
The UbuntuNet Alliance is helping to usher southern and eastern Africa's academic institutions into the internet age. It is doing this by promoting policies and practices that are drastically reducing the cost of internet access. Academics in 13 African countries are now connected with the world through UbuntuNet routers in London, United Kingdom and Amsterdam, the Netherlands. A regional network is in progress that allows African universities to communicate directly with each other without being routed through Europe.
➜ **www.ubuntunet.net/**

Agricultural extension animations
The University of Illinois in the United States has launched an initiative called Scientific Animations Without Borders (SAWBO) that has developed a number of agricultural extension animations. The prevalence of mobile phones makes it much easier for researchers to share information with practitioners. Moreover, researchers can record their own video or audio segments using nothing more than a computer, webcam and microphone with freely available software. These can be shared with practitioners who can include them in videos, radio segments or voice messages that they share with farmers.
➜ **http://sawbo-illinois.org/**

Open API


CIMMYT

The Knowledge Services Open API of the Institute for Development Studies (IDS) at Sussex University in the United Kingdom provides easy programmatic access to tens of thousands of thematically organised research documents that are freely available online. Organisations can use this API to access, repurpose and contextualise this research information to serve the needs of these organisations and their users, and support evidence-based policy making and practice. Data is published under the Creative Commons Attribution (BY) licence and can therefore be distributed, remixed and used to build applications for free.
➜ **http://api.ids.ac.uk/**

Development Research Uptake Management


ICRISAT

Development Research Uptake in Sub-Saharan Africa (DRUSSA) provides direct support to universities at the individual, institutional and systems levels to improve participation in and impact on policy and practice. It works with 24 sub-Saharan universities as they improve their capacity to manage the uptake of research by key stakeholders. In support of this, it provides a digital platform, DRUSSA Online. The five-year programme was established in October 2011. Central to this programme is the promotion Research Uptake Management (RUM), an emerging university management field with a practical, cost-effective and sustainable approach aimed at getting people to use research.
➜**http://www.drussa.net/**

Tweetable abstracts
Tweetable abstracts is a service that helps academics to translate their articles into catchy tweets. A tweet contains the article's novelty and/or main finding in less than 120 characters. If the article is published, this text will then directly be used to let Twitter followers know when and where it's available. Method is the name of the company that runs the service, and it currently has over 1,600 Twitter followers, most of whom are ecologists and evolutionary biologists.
➜**www.twitter.com and look for @MethodsEcolEvol.**

Myra Wopereis-Pura (mwopereispura@gmail.com) started recently as an independent consultant in the field of knowledge and agricultural development. Before she worked as director of knowledge and technology at the Forum for Agricultural Research in Africa (FARA). This Q&A was written from her position at FARA.

Slow progress in ICTs for African research

Agricultural research and ICTs

African agricultural research institutes increased their use of ICTs to gather, share and disseminate information and research results. However, progress is slow and researchers are still not equipped with the best devices or still lack the skills to use them effectively.

How important are ICTs nowadays for African agricultural researchers?

➜ In 2004, FARA's assessment of National Agricultural Research Systems (NARS) in Africa showed that 42% of African agricultural research institutions had weak information management capacities. 77% had unsatisfactory, unreliable and – if available – very slow internet connections in their institutions. Very few had the skills to access internet effectively. In 2012, FARA conducted another study in 15 countries to look into the capacities of NARS in information and knowledge management. Although the methodologies used were different, it showed that NARS capacities in ICT have improved but require further investment to be more competitive in a knowledge-based economy. The majority of the institutions now have access to internet (70%), although online resources are still limited. The study also shows that individual scientists use internet as their major source of information (70%), while 50% use printed publications as the secondary source of materials. Most African agricultural scientists rely on face-to-face interaction to conduct discussions with farmers and agribusiness. Only 10% of research institutions facilitate active online discussions to interact with their stakeholders. Therefore, although there is greater awareness of how ICTs are used in research, ICT infrastructure and policies within each institution are still limited.

NEIL PALMER / CIAT

Are agricultural researchers sufficiently aware of the opportunities that ICTs can give them to gather information from the farmers?

➜ There is still limited use of ICTs in research due to bandwidth problems in research institutions. Only very few institutions can actually hold teleconferences, and only 23% can actually contribute to radio programmes, while there is increasing but still limited recognition that SMS can facilitate their service delivery to farmers. Crowdsourcing is still very limited within research institutions in Africa. Their ICT capacities to process weather data (19%) and modelling (13%) remains limited as well. But most of research institutions increasingly recognise the importance of investment in information and knowledge management. Most have to expand their perception of working beyond media when discussing ICT.

How can ICTs improve multidisciplinary research?

➜ ICTs can change people's perceptions that sharing information is a privilege, while instead it should be common practice for all scientists. Scientists should be evaluated on how much information they've shared with other colleagues through formal and informal mechanisms. FARA facilitates information sharing among scientists through online and physical interaction. Dgroups are used as a virtual platform for FARA members between the Triennial General Assembly and agriculture science week. The next agricultural science week is going to be held in Accra, Ghana in July 2013. It will gather interdisciplinary discussions on the theme 'Africa feeds Africa through science and innovation'. Communities of practice per thematic expertise could be further promoted, engaging scientists, extension, farmers, agri-business and policy makers. The FARA online network (http://dgroups.org/fara-net) has been used by FARA's stakeholders to discuss unmoderated at least 14 topics of major concerns across disciplines.

What are the biggest challenges for researchers to use ICTs more effectively in Africa?

➜ Skills of individuals, institutional policies and budgetary allocations are the biggest challenges in ICT. An informal survey showed that most of research institutions allocate only 0.02%-0.05% of their annual budget to information and knowledge management. 60% of those who participated in that survey indicated that database management, content management and ability to publish are major gap in their capacities. While 34% of the institutions who participated in the survey indicated that they don't have an ICT policy.

What is FARA doing to promote the use of ICTs among agricultural researchers?

➜ FARA has a dedicated programme on 'improving access to knowledge and technologies'. This is one of its four major support programmes to its stakeholders.

Only 10% of African agricultural research institutions facilitate active online discussions to interact with their stakeholders

Within this programme is the project called regional agricultural information and learning systems (RAILS). The objectives of RAILS are to improve information and knowledge management in at least 34 countries in Africa, mainly by advocating for greater investment by institutions and governments, increasing capacities, and providing space for lesson learning through online and face-to-face discussions. It has an online platform to share agriculture innovations across the continent (www.erails.net). Recently it trained young professionals in 11 countries to facilitate information sharing between farming communities and experts. It uses the question-and-answer service system of the www.runetwork.de as the tool to facilitate the documentation and give farmers access to specific and local questions encountered on a daily basis. ◀


JOHN NJIF

Farmers sell to Fiji hotels

In Fiji farmers with access to mobile phones will now be able to use an application on their devices to sell their products. Finding the best buyer for their products was always a hassle for these farmers. The app, called Fiji Makete, is not only providing farmers with a platform to connect them with potential buyers, it also allows farmers to access information about market prices for their cash crops and weather conditions. To access the menus on the phone, customers dial a certain number and get a menu with options like sell, buy, weather, registration and more. If farmers choose the 'sell' option, for example, a list of offers will be sent to them in a text message. The service is a cooperative effort between Digicel Fiji, F1 Mobile Solutions and the Fijian government, and it was implemented with the assistance of the International Trade Centre. The Fijian government in particular developed a strategy for the marketing of fruits and vegetables, with a focus on import substitution through increased local production and the supply of the tourism sector. The Fiji Makete app should make it easier for farmers to sell their fruits and vegetables directly to hotel chains across the islands. Therefore the stakeholders for the Fiji Makete project include the Fiji Islands Hotel and Tourism Association.
➜ Source: Fiji Times http://goo.gl/MjdVm

More ICT news from Africa in 2012

oAfrica, which provides weekly African ICT news, performed a quick unscientific audit to check which countries had the greatest online news representation on its website in 2012. The audit revealed interesting information about ICT developments in Africa. Not surprisingly, South African tech stories stole the show, producing more headlines than any other African nation. Kenya and Nigeria were close behind. Countries like Zimbabwe, Ghana, Egypt and Uganda were also in the top tier in terms of African ICT news representation. Still, the majority of African nations lack the necessary media exposure to attract greater regional or international attention to tech developments. However, media outlets all over the world are covering more African ICT stories than ever before, according to oAfrica. And tech communities in many African countries are becoming more influential and successful. In many cities, it is social media and the blogs – not news websites – that report on grassroots ICT advancements.
➜ Original article http://goo.gl/Ft6qG

NCHENGA

Engaging in the Kenyan elections

Kenya's next general election will be held on 4 March 2013. The outcome of the most recent general election, in 2007, fuelled violence across the country. So all eyes will be on the country in March. According to Google, however, the internet is playing a major role in transforming the way citizens participate and engage in elections across Africa. Kenyans are resorting en masse to the internet to find information about the elections, the political parties and all the candidates. So Google took the opportunity to launch a Kenyan election hub as one of its projects to support the upcoming election. The aim is to help empower Kenyans by improving access to useful information on the upcoming elections. Google wants to make it easy for voters to find information and make their voices heard. It has partnered with the Independent Electoral and Boundaries Commission in Kenya to provide open source technology to power their online voting tools, including registration confirmation (either online or via SMS), mapping the polling stations and a developer API. It has also launched the Kenya Elections Hub, which is a portal where voters, journalists and campaigns can easily track election news, trends and information.
➜ Read the original article http://goo.gl/QIAS1
➜ Google's election hub www.google.co.ke/elections/ed/ke

ICTs improve poultry farming

LIVESTOCKCRSP

In Tanzania´s Kitunda region poultry farmers benefit from the use of internet and ICT services to get access to information on diseases, market prices, poultry selection, breeding, nutrition, refrigeration, preservation and most other poultry farming-related issues. Farmers received extensive trainings from the Tanzania library Service Board to improve ICT skills and in particular to learn how to use applications for mobile phones and computers including the potential benefits of the internet. The confidence to use the internet as an information source was always one of the main constraints for the farmers. The trainings help them to be more confident in using ICTs. However, like most such ICT projects, there is not a well-established ICT infrastructure, nor enough working capital.

➜ Read the full story http://goo.gl/zALaU

Money from the diaspora

THE REBOOT

Figures released by mobile phone operator Econet in Zimbabwe show that at least US$100 million has been moved from the country's urban centres to rural areas through its service EcoCash. EcoCash is Econet's wireless mobile money transfer service and has been opening up new economic possibilities for people in rural areas who up to now have struggled to see money circulate to them. According to the company liquidity is still a problem because when people receive money via EcoCash, they can find it difficult to get the cash from local agents. Econet is solving this problem by getting traders to accept payment in EcoCash. Econet is close to introducing a new platform for people in the diaspora to send money back home. Zimbabwians outside the country struggle to send money to their families. The new platform will make it possible to send money from anywhere in the world at a fraction of the current cost. Money from the diaspora is key to fuelling economic growth in Zimbabwe, but much of it goes into the pockets of middlemen and never makes it into the country. Econet believes that a cheaper and faster solution would double or treble the amount of money entering the country from the diaspora.

➜ Original article http://goo.gl/NM72A

Prospects of the African mobile market

Consultancy firm Deloitte and GSMA, the association of worldwide mobile operators, released a report in November 2012 on the state of mobile phone markets in sub-Saharan Africa. Governments in the region continue to liberalise the telecommunications sector. And growth and liberalisation have caused remarkable growth in the mobile market.

Mobile internet traffic is expected to take off after 2013 in all regions except Central Africa. Still, spectrum allocations in Africa for mobile internet are half that of the United States or the European Union.

As of 2012, 31 African countries had 3G services – up from 25 the previous year. Licenses have been awarded in many other African countries, but service has yet to begin. 3G penetration is expected to grow from 4% in 2012 to over 16% in 2016. In contrast, 4G penetration is anticipated to grow from zero to the same 16% or 17% by 2016. Accelerated 4G growth is expected around the year 2014.

Smartphone penetration is currently very low, even in mobile markets considered mature by African standards. In five years' time, the percentage of Tanzanians, Kenyans and Nigerians using smart phones is expected to grow from 5% to 20% or 30%. The majority of South Africans may well have access to smart phones by 2017.

The report identifies some challenges and constraints for the further development of mobile markets in Africa. First access to harmonised spectrum is critical. The availability of mobile spectrum is essential for the successful development and operation of mobile broadband. However, the amount of spectrum allocated to mobile services in Africa is currently among the lowest worldwide, with some countries allocating as little as 80MHz and many between 200MHz and 300MHz to mobile services companies. Other constraints are high taxation and non-transparency in regulatory regime.

➜ Read the report http://goo.gl/tvNQf

JOBTRAVELLING

100 % mobile coverage in Burkina Faso and South Africa; 46% in Mali and 50% in the Central African Republic. http://goo.gl/tvNQf

3.8 mobile operators per country on average in sub-Saharan Africa. The largest countries have between 3 and 6 operators. http://goo.gl/tvNQf

40 % per year growth expected in the number of smart phones sold in sub-Saharan Africa by 2017. http://goo.gl/tvNQf

Promoting entrepreneurship through social media

Olawale Isaiah Ojo (lawaleojo@yahoo.co.uk) is a young professional in agriculture and agribusiness. He is tech savvy and uses social media to promote agribusiness development through his firm Agropreneur Nigeria. He is also a social media consultant for numerous organisations across Africa.

In April 2011, I noticed that young people were generating a lot of traffic on the social networks, but often they really were not doing anything particularly beneficial for themselves or their environment. So I decided to use this medium to reach out to young people in my country Nigeria by helping them to learn about the opportunities that would open up for them if they were to pursue careers in agriculture. Specifically, I wanted to encourage them to explore the entrepreneurial side of agriculture, i.e. see agriculture as a business.

Agropreneur

I therefore set up a social media outlet for my enterprise. This involved opening a Facebook group and blog (www.agropreneurnaija.blogspot.com) for these young people where they could hold discussions among themselves, access information and share experiences. I then went a step further and opened a Twitter account (www.twitter.com/agropreneur9ja) to draw information from other organisations and attract young visitors to my group, blog and other websites that provide them with important information and guidance.

Internet services in Nigeria are expensive, so I enjoy using my Blackberry to do research on the web, especially the RSS feeds I have subscribed to. I identify materials that are useful to me and my organisation, and then use my USB dongle or visit an internet cafe to share this information using my PC. I monitor many research bodies, institutes, corporate bodies and those in the private sector who have information about my niche market, agribusiness. These organisations include CGIAR, CTA, FAO, IFAD, FARA and YPARD and a host of others.

I subscribe to their newsletters, follow them on Twitter, like their pages on Facebook, read policy briefs and download publications. After gathering all this information I filter it and choose the information that fits my audience. It is important that I do this because there is a lot of information and there are many opportunities out there. It is essential that I provide credible and reliable information.

I am always particular about learning from others, so I have found it helpful to engage my audience. This has really proved fruitful in my use of Twitter as it serves as a feedback mechanism. Followers have asked questions, made enquiries on how to start up agribusinesses, where and how they can gather the needed training for themselves to specialise in a specific aspect or other.

My experience from my participation in the GCARD2, as a social reporter, impressed on my mind how important and far-reaching social media can be in promoting awareness, inclusion and capacity building. The things I learnt proved helpful thereafter as I used social media to publicise the 'Cool to farm' workshop series, which is one of my organisation's initiatives. There were also live tweets which enabled those not present in person to enjoy the event's proceedings.

AFRICA MEDIA ONLINE / ALAMY

Olawale Isaiah Ojo uses social media to inform the youth about agricultural entrepreneurship. Twitter, for example, serves as a feedback mechanism. Followers have asked questions, made enquiries on how to start up agribusinesses, where and how they can gather the needed training for themselves to specialise in a specific aspect or other.

HootSuite

I have found social media tools especially helpful. They enable me to schedule my posts. I use HootSuite to put up posts both on Twitter and Facebook. Thus I prepare information for posting way in advance on my PC when there is no internet service and then schedule it for posting at times when I would not be available. It saves me time and money.

There are lots of constraints to using ICT and social media in Nigeria, including power, poor infrastructure by the communication provider and the cost too. However, it also brings with it many opportunities to get young people thinking about how they can come up with solutions for the agri-sector without totally depending on the government.

By and large – aside from opening up opportunities and information for me – my use of social media has helped me to have a realistic view of the development that ICT use can bring to the agricultural sector. Transformation can only occur once young people, who are open-minded, curious and quick to adapt to change, have access to ICT and social media.

I have very keen interest in young people in rural areas, and one of the challenges that comes along with this is the fact that they do not have access to the internet like young people in the city. So I look forward to a future where young people can have e-centres where they can use the internet. A future where young people remain in rural areas to run productive farms and still return home to their internet enabled mobile phones and tablets to check up on updates and information related to their area of expertise. A future where ICT use has made agriculture trendy and cool. This is one essential way to stop the rural–urban migration trend that is keeping so many rural young people away from agriculture and therefore also agribusiness. ◀

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