

ICT Update

a current awareness bulletin for ACP agriculture

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<http://ictupdate.cta.int>

CTA's **Hansjörg Neun** outlines the impact of ICTs on rural development

Tidiane Seck of ADIE on the importance of accurate information for farmers

Brian Richardson of Wizzit describes developments in mobile banking



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Editorial

ICT Update started in 2000 as a bimonthly web bulletin featuring short summaries of web pages with news and information on ICTs for agricultural development. At that time, because of the limited web access in most developing countries, CTA also distributed the bulletin in its entirety by email and in print. CTA's partners could retrieve the included web references by email, using so-called web2email service providers in Europe and North America.

organizations that were using ICTs to provide services to farmers and their families. ICT Update asked these organizations to tell their own stories, to explain why they had chosen the ICT applications they used, and to share their successes and the challenges they faced.

Over the years, ICT Update has featured programmes and initiatives of agricultural extension services, rural healthcare centres, banking and microfinance institutions, local radio

A chronicle of ICTs in agriculture

Access to ICTs gives farmers the chance to improve their incomes and increase food security. Since December 2000, ICT Update has reported on the many ways rural communities in have adopted and adapted technology to fit the environment where they live.

In this special 50th issue we look back at almost nine years of chronicling the progress of many ICT projects and trends in ACP countries and the contributions ICTs have made to agricultural and rural development.

In early years of this century the international development community strongly believed that ICTs could boost socio-economic development in ACP countries and would connect them to the ever faster globalizing markets. Agencies such as the ITU, UNDP and UNECA, the World Bank and other donors and international NGOs dominated the ICT for development agenda and launched many programmes to promote knowledge sharing, collaborative networking and e-commerce via the internet in ACP countries. And, because in most of these countries connectivity was poor or non-existent, these organizations invested heavily in 'first mile' access solutions that ranged from low-Earth orbit communication satellites to community telecentres in rural areas.

Local organizations

Since 2000, ICT Update has followed the international ICT debate, but it has been much more interested in local

stations, weather stations, and many more. Most of them did not have adequate access to the internet but used other ICTs, including mobile phones, handheld computers or digital personal assistants (PDAs), smart cards, CD-ROM, geographic information systems (GIS), Global Positioning System (GPS) devices, digital TV and radio, radio-frequency identification (RFID) devices, imaging and acoustic technologies, and of course the web, web 2.0 and email-based programmes.

Often, these initiatives used several ICTs in combination and proved that they could be powerful tools for enhancing agricultural and rural development. They also demonstrated that ICTs could be used at the grassroots level, putting technology in the hands of local organizations and the communities they serve.

Mobile services

Certainly one of the most spectacular technological developments in ACP countries in recent years has been the proliferation of the mobile phone. In 2000 it was unthinkable that mobile phone providers would develop their small, patchy networks into today's nationwide networks. With their




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ICT Update is a bimonthly printed bulletin with an accompanying web magazine (<http://ictupdate.cta.int>) and email newsletter.

Each issue of ICT Update focuses on a specific theme relevant to ICTs for agricultural and rural development in African, Caribbean and Pacific (ACP) countries, and includes feature articles and annotated links to related web resources and projects. The next issue will be available in October 2009.

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international connections, these networks now form part of the growing global mobile communication market.

Basically, the mobile phone is a handheld communication device designed not just for telephony, but as a platform for a wide variety of services. Therefore, the pioneer mobile phone providers actually paved the way for many successful ICT-based services for rural communities in ACP countries. Local entrepreneurs easily recognized that, as in the North, everyone in developing countries would also want to have a mobile phone and that many could actually afford to buy one. This realization spurred them to develop mobile services specifically designed to meet local needs and to function under local conditions.

In December 2002, ICT Update featured Manobi, Africa's first multi-modal phone service that pioneered the use of mobile phones for getting up-to-date market information to farmers in remote areas, and tailored to their needs. Ever since, ICT Update has followed the growing number of mobile services in ACP countries, and has featured initiatives such as Wizzit, South Africa's first 'mobile bank' for the unbanked, and Celpay's 'mobile

wallet', a payment service by mobile phone in the Democratic Republic of Congo and Zambia. ICT Update has highlighted many other uses of the mobile phone in agricultural and rural development projects. The feature article in this issue reports on the wide variety of mobile phone services in ACP countries covered by ICT Update over the past nine years.

Digital assistance

Another string of ICT applications that has inspired many practical solutions for problems faced by development organizations has involved the use of the Global Positioning System (GPS), often in combination with remote sensing technology, geographic information systems (GIS) and the mobile phone. Originally developed by and for the US military, GPS technology had long been used for navigation by planes, ships and cars.

But, the GPS application that attracted the attention of local entrepreneurs and practitioners in ACP countries was a small, handheld device that had been designed to enable explorers and rescue workers to determine their exact geographical position. This GPS receiver became

immensely popular among hikers, cyclists and surveyors and is now being mass produced for a global consumer market and already widely available in developing countries.

As early as May 2003, ICT Update featured a story from French Guiana reporting that GPS receivers had been installed in ultralight aircraft for use in the fight against the carambola fruit fly (issue 11). Soon, many other stories about this device began to emerge. Today, in many areas of the Sahel, pastoralists are using GPS with GIS-based maps and mobile phones to discuss with other groups of livestock herders the availability of fresh pastures and water supplies, and to decide where they should graze their cattle in order to prevent overgrazing (issue 15).

In Botswana, traditional hunters and expert trackers use GPS to gather information about local wildlife. Once downloaded onto a solar-powered PC, the data can be displayed in the form of maps, tables and graphs which are used in the design of game management programmes (issue 28).

Influence

In Guinea in West Africa, meanwhile, fishermen have traded in their

Web2mail (TechTip, ICT Update issue 10, February 2003)

Web2mail is a system to deliver web pages by email. The tool can be useful for anyone with limited web access.

To obtain a web page, an email containing the link to the webpage to be retrieved is sent to a so-called web2email server, which fetches the web page and sends it back, again by email.

Web2email services were promoted in the late 1990s and early 2000s. Their real potential was never realized because their functioning was regularly frustrated by spam attacks.

→ [http://ictupdate.cta.int/\(issue\)/10](http://ictupdate.cta.int/(issue)/10)

submachine guns for GPS receivers in an attempt to combat foreign trawlers poaching in their traditional fishing grounds (issue 16). In Jamaica, the Forestry Department is using GPS devices to determine the extent of the encroachment into forest reserves (issue 19). In DR Congo, the technology has enabled Mbdendjele Pygmy communities to work together with international logging companies to protect their forest and its resources.

But possibly the most profound impact of handheld GPS devices has been felt by farmers and their communities seeking formal title to their land. Examples include programmes that are attempting to address territorial disputes (Somaliland, issue 17), to demarcate the boundaries of common lands (issue 42), to gather local knowledge and encourage local participation in natural resource management projects (issue 27 on participatory GIS), and to experiment with the rapidly developing practice of precision farming (issue 30).

Over the years ICT Update has described many exciting projects that used ICT applications other than those based on mobile phones and handheld GPS devices. There have been several reports, for instance, on communities that are using the camcorder to show to the 'outside world' their environment and livelihoods as they see and experience them. In combination with other ICT applications, such as YouTube and mobile phone messaging, the camcorder has become a powerful tool for organizing local advocacy campaigns, in particular for groups

that hope to gain international support (issue 34).

Other technologies include the radio-frequency identification (RFID) cattle tracking systems that have been introduced as far afield as Botswana and the Pacific island of Vanuatu, in order to comply with the European Union's traceability requirements for meat imports (issues 15 and 32). Or the combination of digital cameras, personal digital assistants (PDAs) and GPS used by Fruiléma, a Malian fruit exporters' association, to gather data from farmers in order to meet international export standards. This information is then published on the web to inform supply chain partners as well as consumers (issue 47).

Enterprising

From the perspective of subsequent development policies and approaches, the recent proliferation of locally developed ICT applications represents a unique phenomenon. Directly after ACP countries gained independence in the 1950s and 1960s, the former colonial powers embarked on substantial development assistance programmes. Technology transfer was key in their assistance, based on the simple assumption that since technology had brought industrial development to their own countries, it would also produce socio-economic development in their former colonies.

The failure of this so-called 'great technology transfer' had a lasting impact on the thinking of the development community, and its legacy is still felt today. Until recently, any trace of technology, let alone technology transfer, was banished from international development policies. Technology as a tool for development did not feature in the 'basic needs approach' (1980s), or sustainable development policies (1990s).

In the Millennium Development Goals, technology, or ICTs, is mentioned only in passing. In the national development plans of most ACP countries, technology as a tool for development is mentioned in footnotes, if at all. In fact, in terms of their 'technology readiness' levels, ACP countries were totally unprepared for the ICT revolution of the late 1990s, and for the efforts of the international community to connect them to this revolution by improving rural connectivity and promoting

the internet for agricultural development.

Over the last decade, however, local entrepreneurs and practitioners in ACP countries have found this connection in a rather unexpected way. Some of them rolled out national mobile phone networks. They could do so because the national phone companies with their stifling monopolies of telecommunication markets were kept at bay; and by offering prepaid phone cards they could offer mobile services to everyone, even the poor. Others followed by developing new services to be delivered via the mobile phone. They could do so because mobile phones have three unique features: they are 'unpack-and-use' devices (no need for training manuals), their interfaces are user-friendly and intuitive, and they are cheap.

With more than 200 stories, with substantial online resources with annotated links to related projects, relevant documents and other information, ICT Update has chronicled the evolving uses of ICTs by development organizations in ACP countries. Its online archive has become a seemingly inexhaustible resource with inspiring accounts of creativity, inventiveness and local entrepreneurship. The archive also details many lessons learned in using ICTs for agricultural and rural development, the challenges that lie ahead, and the success that can be expected.

In the 1990s, Africa One was an ambitious project to roll out a fibre-optic cable around the African continent. Finally, in July 2009, the \$600 million, 17,000 km undersea cable came ashore in Kenya, bringing broadband internet access to East Africa. Entrepreneurs are already exploring opportunities in the profitable IT services and business process outsourcing sector, and the first call centres have already opened their doors.

By connecting Africa to the global knowledge economy, the cable will provide an enormous boost not only for capitals but also for the rural areas. This time, thanks to the entrepreneurs who pioneered mobile and other ICT services, Africa is far more 'technology ready' than it was 10 years ago. ICT Update will continue to chronicle these innovations for agricultural and rural development in ACP countries and beyond. ■



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enabled services such as call centres and outsourced industries.

The growth of mobile telephony and related services continues to amaze. Mobile financial services, of the type championed by M-Pesa in Kenya and Wizzit in South Africa, are predicted to be worth US\$ 5 billion in 2010. And mobile extension services are starting to enter the mainstream with ventures such as Nokia's Life Tools and the Grameen Foundation's AppLab services in Uganda. The fact that rural farmers

significantly. The unstoppable proliferation of mobile phones has been fundamental to this growth in services. Another other key factor is the favourable technical environment which has led to the increased power, diversity, affordability and availability of devices. This, together with the spread of web 2.0 tools and applications, has provided opportunities for greater efficiency and effectiveness in organizations working for agricultural and rural development throughout the world.

These are indeed exciting times to be working with ICTs for development. There is no shortage of devices, applications and tools to use, and so providing many possibilities to move seamlessly from an online to an offline world. Given this abundance of riches, it becomes ever more urgent that we work more closely together and share experiences, exploiting ICTs to tackle the pressing issues of the day especially the impacts of climate change on food security and agriculture.

I believe the developments that I have touched on do represent a great opportunity for improving rural livelihoods and greater participation in the social and political sphere. From an ICT for development perspective, it is important that these benefits are shared equitably to avoid digital exclusion and a situation of 'haves' and 'have nots'. New technologies are often seen as disruptive and do alter the status quo (witness the turmoil in the publishing and media industries in coming to terms with the new landscape). However, it is not a blank slate where we have to start from scratch and rewrite the rule book.

Taking a 'people first' approach, by concentrating on capacity building and education, ensuring appropriate regulation and ethical practices and dealing with infrastructural issues as they relate to rural communities, the benefits of the new technologies can be available to all. ICT Update contributes to this process. Over the last 50 issues, it has chronicled the development and growth of ICTs in ACP countries and their use and adaptation at the local level when used in agricultural and rural development. While the future might be uncertain, the opportunities are great and ICTs will continue developing at an incredible rate. ICT Update will certainly continue for another 50, 100 or more issues – who knows? We have just to ensure that it is for the benefit of agriculture and the rural poor. ■

Interesting times in ICTs

This 50th issue of ICT Update magazine comes at a time of many interesting developments. On 23 July 2009, broadband internet access was brought East Africa thanks to the Seacom undersea cable which now links Kenya, Uganda, Tanzania, Mozambique and South Africa to high-speed networks in Europe and India. By 2010, 21 countries in the East Africa will become connected thanks to the Eastern Africa Submarine Cable System (EASSy). This will have a great impact in a region otherwise dependent on expensive and sometimes unreliable satellite links to the internet. Bandwidth costs will be slashed with cheaper telephony, stimulating businesses and the growth of IT

are now being directly targeted is surely evidence of a sea change in attitudes towards supporting rural communities and of the transformative power of ICTs used for development.

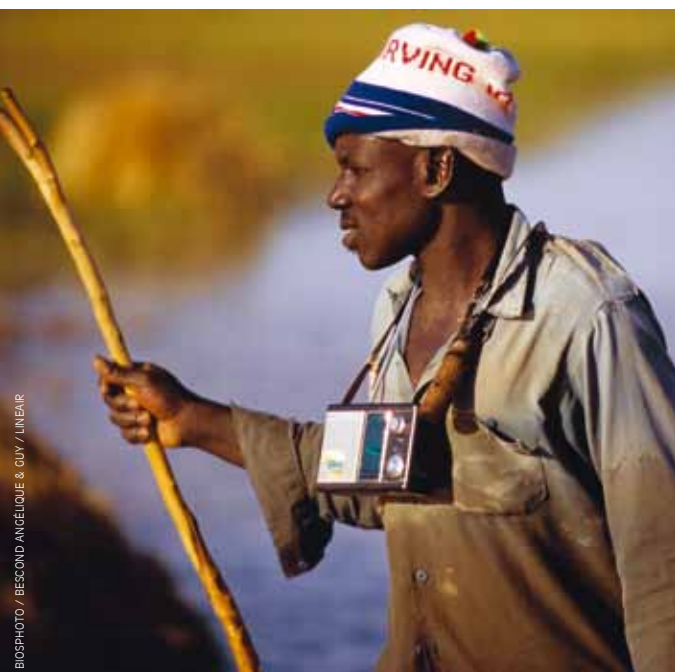
I believe we are currently witnessing 'technology leapfrogging' in action where, in spite of a lack of basic infrastructure, the possession of a mobile phone and access to the services it offers are transforming lives. And ICT innovation continues seemingly unchecked, breaking barriers to human knowledge and education, breaking barriers to participation and social inclusion, breaking barriers to economic opportunity by giving the possibility of equitable benefits for all.

The information tsunami unleashed by Google, blogs, wikis, Twitter and a host of other social media have, in a remarkably short time, profoundly changed the way we access and share information. For an increasing proportion of the world's population, these online resources are becoming indispensable to their daily lives.

Equality

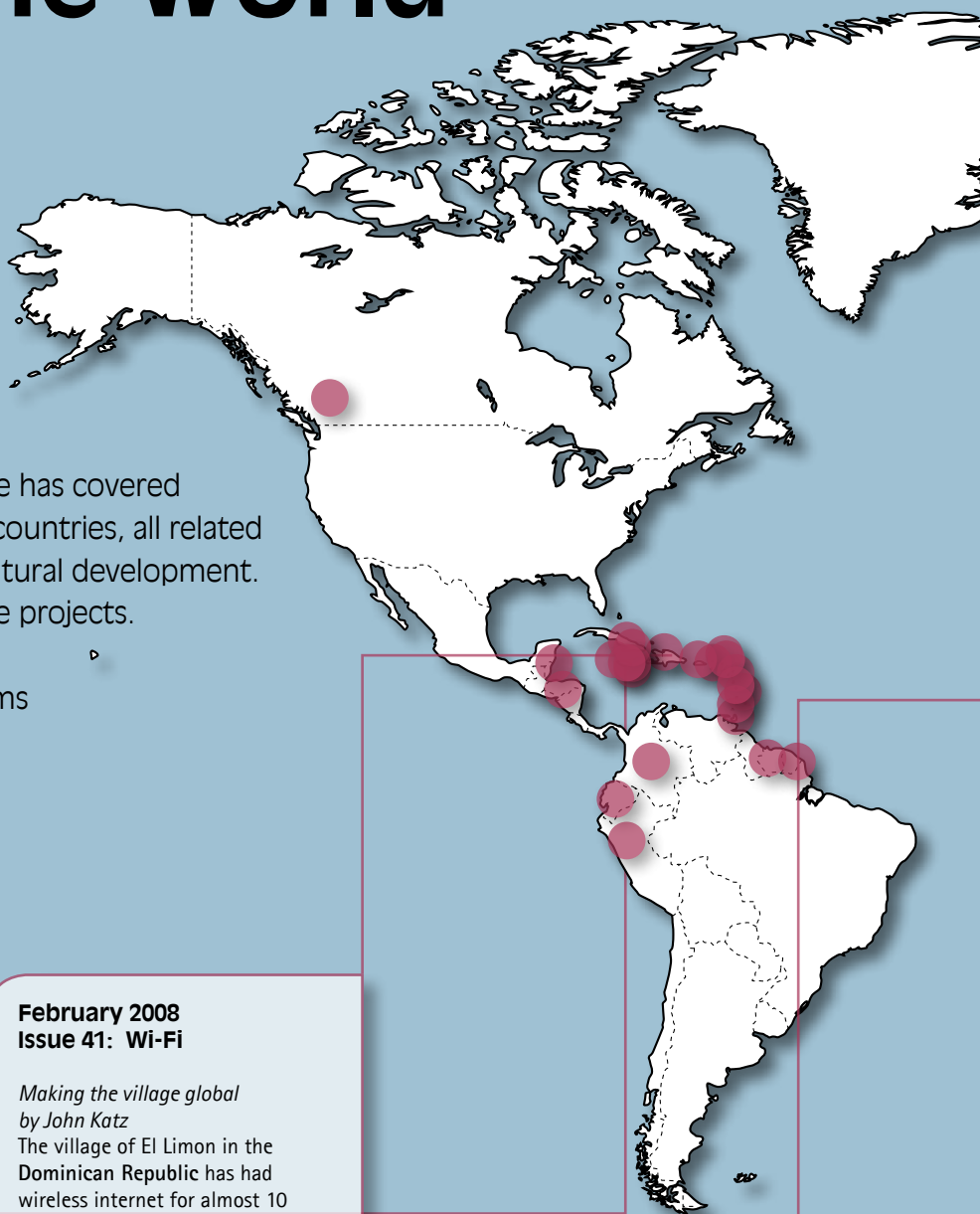
In the area of participation, web tools and services (especially social media) have led to an increasingly animated public sphere. For civil society organizations, the internet and mobile telephony have offered a new medium of political mobilization and participation. And we only have to think of the key role that social media played in the 2008 US Presidential elections, and the role of Twitter in the recent Iranian elections, to realize that times have indeed changed.

Meanwhile, the development of e-services offers an increasing number of opportunities to improve the economy of rural communities



ICT Update reporting around the world

In the 50 issues since 2000, ICT Update has covered almost 200 projects in more than 60 countries, all related to the use of ICTs for rural and agricultural development. The map highlights just a few of these projects. For more details see <http://ictupdate.cta.int/en/maps/items>



February 2008 Issue 41: Wi-Fi

*Making the village global
by John Katz*

The village of El Limon in the Dominican Republic has had wireless internet for almost 10 years. The system continues to expand and have a major impact on the education of young people living there.

July 2005 Issue 26: Traditional plants

*Software for natural products
chemistry
by Robert Lancashire*

The success story of the JCAMP-DX Data Viewer, a computer program developed in Jamaica being used by organic chemists worldwide.

November 2004 Issue 22: Youth and ICTs

*The Yam Pukri youth forum
by Sylvestre Ouédraogo*

A youth forum on the internet is broadening the horizons of young people throughout Burkina Faso.

June 2006
Issue 32: Traceability

From pen-and-paper to RFID tracking

by Janette James

The island of **Vanuatu** is set to become only the second country in the world to operate the National Livestock Identification System (NLIS), the Australian tracking system for cattle that is compatible with EU traceability requirements.

September 2006
Issue 33: Urban agriculture

Kigali's experiment in e-procurement
by Vasant-madhav Shenoy

In some areas, mobile phones and the internet are connecting urban farmers to markets. This article investigates plans for an 'e-procurement' project between Kigali and Rome.

March 2004
Issue 16: Fisheries

Promoting sound fishing practices
by Margot Collett

Researchers in **South Africa's** Great Fish River project are using acoustic telemetry to help in the design of conservation strategies for the estuary's fisheries.

January 2004
Issue 15: Livestock

PAHIS: Pacific animal health information

by Alexandre Fediaevsky

The Pacific Animal Health Information System (PAHIS), a database and decision support system issued on CD-ROM for veterinary officers across the Pacific region.

A recent World Bank report noted that mobile phones were 'the single most powerful way to extend economic opportunities and key services to millions of people'. The report added that in the next few years almost all new customers connecting to mobile phone networks will come from the rural areas of developing countries. They will join the 3 billion people in the South who already use a mobile phone.

In little more than a decade, mobile phones have become the clear technology of choice for communication. SMS (short message service) in particular has become an extremely important way to send and

farmers more easily, making it feasible for them to set up cooperatives that can explore new markets and sell their products to bigger buyers.

Positive feedback

Market information services are now helping farmers in ACP countries by delivering the information they need to build their businesses. Over the years, ICT Update has reported on several initiatives that have continued to innovate and develop their services.

As early as November 2002 (issue 9), Daniel Annerose described how the Senegalese company, Manobi, delivered market information to

through a network of franchised market resource centres (MRCs). The centres provide KACE with up-to-date market data, which is then distributed via SMS to farmers. The MRCs also offer on-site internet, email and phone facilities.

Also in Kenya, DrumNet operates a network of information access points or 'info-kiosks' that offer marketing, financial and information services for farmers. Each info-kiosk is equipped with an internet connection, a computer and mobile phones, and is connected to a hub in Nairobi. There, information from around the country is aggregated in a central database and is

The many uses of mobiles

Over the years, ICT Update has covered the many ways in which mobile phones are used to promote agricultural and rural development. The technology has proven so useful that it is likely to remain a popular method of information delivery for some time to come.

receive information. These short and simple messages are convenient and affordable and, perhaps most important, they are (usually) free to receive.

Another advantage of SMS is that it is possible to set up a system to deliver messages automatically to a large number of people at the same time. This is difficult to achieve with voice messages, which also cost more and rely on the fact that the person receiving the call must have their mobile phone switched on and connected to the network at the time the call is made. SMS is, therefore, an ideal way for organizations and businesses to reach their target audiences, whether they want to sell bank services, promote safe sex or share commodity prices, but especially if they want to get a message across to people with limited or no access to the internet.

Farmers are now far better placed to receive accurate market information on their mobile phone. Small producers no longer have to accept the first price they are offered; with access to up-to-date market information, they can negotiate to try to get a better deal. They can also communicate with other

farmers. 'Manobi has developed a system that collects data in real time and makes use of internet and mobile technologies to follow the daily price fluctuations and deliveries of produce to markets.'

Seven years later, Manobi is still delivering agricultural market information throughout West Africa. 'Throughout every step of production farmers need information on a whole range of topics from access to credit and supplies (seeds, pest control, fertilizers), to contact with extension services, pricing details, processing and packaging,' said Annerose in 2009. 'If a company can provide this information and can help farmers generate more income then they will have extra money to pay for the communication services.'

Like Manobi, the Kenya Agricultural Commodity Exchange (KACE) realized that farmers need more than simple market information; they need to connect to other businesses involved in bringing their products to market and to consumers. In other words, the farmers need to become part of the market supply chain. KACE helps to link farmers, companies and markets

then distributed to the info-kiosks and to the farmers by SMS.

Similar services are currently operating elsewhere in East Africa. These include the Farmers' Information Communication Management (FICOM) project, which began by supporting dairy farmers in Uganda, and FoodNet, which delivers market information via mobile phone and FM radio broadcasts.

In West Africa, BusyLab, a group of Ghanaian software developers, launched TradeNet (now known as Esoko), a service that allows farmers to send SMS messages advertising their products. The messages are published on the web and are sent via SMS to subscribers who may be interested in those products. The advantage of this service is that the information reaches a broad audience – anyone with access to the internet – thus encouraging cross-border trade between neighbouring countries and even other continents.

The National Association of Agricultural Producer Organizations of Côte d'Ivoire (ANOPACI) also uses the TradeNet system and distributes market prices on radio and on information boards in local markets.



With care

SMS is also used widely by organizations to deliver health information to rural communities. In April 2009, ICT Update reported on how the Praekelt Foundation, a South African technology company, has developed a way to use the space available in 'please call me' (PCM) messages to deliver targeted health information. PCM is a messaging service where someone can send a free text message asking the recipient to call back. Because a PCM uses only 40 of the 160 characters allowed in a text message, Praekelt developed SocialTxt, which adds messages of up to 120 characters to fill the unused space.

Also in the context of healthcare, the Netherlands Organization for Applied Scientific Research (TNO) has developed a device that holds a mobile phone in position on a microscope. Using the phone's camera function, it is possible to take a picture of a microscope slide (with a sample of malaria infected blood, for example) and then send it via MMS (multimedia messaging service) to a specialist laboratory for analysis and diagnosis. The laboratory then delivers the results

to the same camera phone in the form of an SMS message.

But while SMS is proving to be a very useful and cost-effective method of providing market and crop data, it also requires that users have some level of literacy, and sometimes knowledge of a language that is not their mother tongue. Communication by voice, especially if you can talk in your own language, has many advantages.

Complex and detailed crop production methods or pest control procedures, for example, cannot be explained in the short space available in a typical SMS message. More detailed information has to be delivered in other ways. Radio broadcasts can be a very effective means of explaining detailed processes to many people at the same time. But if a particular radio programme talks about maize harvesting, it doesn't really help the farmer who needs to know how to control a fungal infection in tomato plants.

Language

In December 2007, ICT Update reported on the Banana Information Line, a pilot project in Kenya to provide

farmers with specific information as and when they need it. The farmers could call a number and, via a voice-activated menu, listen to a recording giving the specific information they needed, in either English or Kiswahili.

That initial experiment led to the development of the National Farmer Information Service (NAFIS) where farmers can now call a dedicated number to get advice on the best ways to grow a wide range of crops (maize, tomatoes, mangoes and chillies) or to raise livestock (cattle, poultry, goats and bees). While a phone call is more expensive than a text message, farmers have the advantage of being able to get the right, detailed advice at the moment they need it. The same information is also available on the web, so that farmers can access it from a telecentre, for example. They can then print out the information they need to read later and to share with other producers.

In South Africa, the Shuttleworth Foundation, together with the private telecommunications company, Dabba, and a host of other partners, have launched the Village Telco project. The team has developed a basic, low-cost

Related resources

Manobi Development Foundation

Promotes the use of ICTs for rural economic development.

→ www.manobidevelopmentfoundation.org

Kenya Agricultural Commodity Exchange (KACE)

Collects and delivers agricultural market information for Kenyan farmers.

→ www.kacekenya.com

DrumNet

A project of Pride Africa providing business support services to smallholder farmers.

→ www.drumnet.org

FoodNet

A market research network for East and Central Africa.

→ www.foodnet.cgiar.org

Esoko (formerly TradeNet)

A software platform that delivers market data via the web, email and SMS.

→ www.esoko.com (www.tradenet.biz)

National Association of Agricultural Producer Organizations of Côte d'Ivoire

ANOPACI uses Esoko to deliver market information in Côte d'Ivoire.

→ www.anopaci.com

Praekelt Foundation

Designs and develops digital media products.

→ www.praekeltfoundation.org

Netherlands Organization for Applied Scientific Research

An independent Dutch research and development institute.

→ www.tno.nl

National Farmer Information Service

Provides agricultural and livestock information to Kenyan farmers via the phone and on the web.

→ www.nafis.go.ke

Village Telco project

A broad partnership of experts working to develop a village telecommunications system.

→ <http://villagetelco.org>

Fantsuam Foundation

Delivers microfinance and ICT services in rural Nigeria.

→ www.fantsuam.org

Connect Africa

Supplies public phone systems to rural communities throughout Africa.

→ www.connectafrica.net



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wireless router – which they call a ‘mesh potato’ – into which customers can plug a POTS (plain old telephone service) telephone. The router connects to a local wireless network and the telephone signal is carried to a central hub, often in a nearby internet café. Customers can therefore use an ordinary telephone, which is much cheaper than a mobile phone. The business model for the mesh potato system encourages entrepreneurs to develop their own local telephone network in areas where a mobile network doesn't yet exist.

The Fantsuam Foundation in Nigeria is also helping to bring telephone services to rural communities. But rather than mobile phones, the organization uses voice over internet protocol (VoIP) technology for their ZittNet network. Customers can buy a simple plug-and-play system, called ‘VoIP in a box’, for around US\$50. They then plug it into their computer and connect to the network to call other ZittNet customers for free, or buy pre-paid airtime vouchers to make use of the local mobile network to call fixed-lines and other mobile users.

Similarly, Connect Africa is setting up payphones in remote parts of Zambia through satellite telephone providers, Iridium Satellite and Thuraya. The real innovation in this system is that it uses zinc-air batteries, which are much cheaper and easier to maintain than normal lead-acid batteries, and means that the payphones can even serve areas where there is no mains electricity supply. And, of course, the spread of mobile

phones has also made it possible for people in rural areas to access financial services such as money transfers, savings accounts, credit and insurance (see page 11 for more on mobile banking).

Getting smart

The next major development in the use of mobile phones for agricultural and rural development will be the continued growth of ‘smartphones’, such as the Blackberry and iPhone. These devices can access the web over 3G (third generation) wireless networks, which provides greater bandwidth to deliver data and voice services. Smartphones can also access the internet via local Wi-Fi networks, such as those installed in many offices and homes.

These devices are becoming extremely popular throughout Europe and North America where most people have access to a computer to surf the web and send email. There is also a huge potential for smartphones to supply web services to areas where it would be too expensive to install broadband cable networks. These are early days, but there are signs that smartphones will be useful to many people in ACP countries.

A recent Unicef report showed that more than 7 million Nigerians are now browsing the web on their mobile phones. In Nigeria, the number of web pages accessed with Opera Mini, a mobile phone browser, increased by nearly 1700% between January and September 2008. But other figures from Opera Mini show that South Africa and Egypt lead the way in mobile web adoption in Africa, followed by Kenya and Nigeria.

Almost all major computer hardware manufacturers now produce small, and steadily cheaper, laptops, also known as netbooks. Many projects are promoting netbooks, especially in education, but perhaps future discussions will not be about whether to use small laptops or mobile phones. It's likely that future developments will make use of both technologies.

It would make sense, for example, if mobile phones and computers had compatible operating systems, allowing users to run the same software and applications on both devices. Integration of technology is surely the most sensible way to reach rural areas and connect with the millions of people who could make such a system economically viable. ■

An industry in development

In many ACP countries, mobile banking services have expanded rapidly, giving millions of people in rural areas access to financial services without the need to ever visit a bank.

When mobile phones started to become popular in Africa, people quickly realized that they could use their prepaid airtime credit instead of cash. Rather than use the credit to make calls, a user could transfer the same amount via a text message. The receiver could then use that credit to top up their own airtime, or even transfer it again to a shopkeeper, for example, in exchange for goods. The system wasn't perfect - a percentage of that credit was often deducted as government sales tax - but it did show that people needed a system for transferring small amounts of money. There was demand, and the market responded. The result was mobile banking, also known as m-banking.

A few banks and mobile network operators (MNOs) were first to supply mobile banking services. In April 2007, ICT Update reported on one of the frontrunners in the business, a South African company called Wizzit. The company began offering mobile banking services in 2004 operating as a division of the South African Bank of Athens Limited, and has continued to expand ever since.

'When we first started many big banks said that mobile banking would

never work,' says Wizzit's founding director and CEO, Brian Richardson. 'No one would accept making payments on their phone, they said. But there has been a complete u-turn since then, and now almost every major bank in the world has its own mobile banking service or is in the process of evaluating the possibilities of introducing one.'

And, he explains, customer demand continues to drive expansion in the sector. 'As people became comfortable buying airtime they started looking at what other services they could get access to,' Richardson says. 'The first step was to provide the customer with the possibility to make banking transactions, to send and receive payments from one account to another. Once that was established, we then looked at other services including savings accounts, loans and insurance policies. All of these services can now be offered over the phone.'

In fact, mobile banking customers can now open an account, start saving, secure a loan and an insurance policy without ever having to enter a bank branch. Removing the need for customers to travel long distances has been crucial to providing financial services to those living outside the main towns and cities.

'If people in rural areas are to have any chance of having access to banking, then the banks have to go to them, not wait until they come to the banks,' says Richardson. 'The technology makes that possible as mobile phones are used for so much more than just a means of communication. The phone has become a tool to do so many things, and people are comfortable using them. Mobile banking simply makes use of that tool.'

But while many have welcomed the spread of mobile phones for giving rural communities better access to banks, Richardson is disappointed that the cost of the technology is still beyond so many people. 'Five years ago when we were first starting in this business, I was looking around for a mobile phone costing about US\$20, which I would consider to be a reasonable, affordable price. Despite

the fact that there is a massive market for mobile phone handsets, and that everyone says they're getting cheaper, it's still not possible to buy a handset for less than US\$20. The prices haven't come down to a level that would make them affordable to the rural poor.'

Competition

Richardson is still positive about the continued growth of mobile banking. 'People in rural areas are now in a better position to open a bank account than they were two years ago. As long as the companies supplying mobile banking services don't start telling customers that they need a new phone or they have to upgrade or change their network, but make use of what they already have, then people will trust the services they are offered.'

With increased competition coming from MNOs and other major banks, even Wizzit, one of the first companies to offer mobile banking, needs to assess its position on a regular basis, and to look at how it can continue to meet customer demands.

At the moment it is the mobile banking businesses operating in Africa that are learning and innovating more than anywhere else. And as the industry continues to mature, Richardson believes these companies will only improve, and offer better services to their core customers: people with low and irregular incomes.

'The governments of many emerging economies now realize that providing banking services is an effective way to alleviate poverty. As many countries work their way through the current financial crisis, there is probably no better time to explore different banking models. Wizzit does provide a different model, but it isn't only about technology, or even mobile banking. The most important thing is to think about is how we can offer financial access to people on low incomes in a way that is affordable and convenient.' ■

Read the ICT Update article in issue 36, April 2007
[http://ictupdate.cta.int/en/\(issue\)/36](http://ictupdate.cta.int/en/(issue)/36)



JON HRUSA/ANP

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issues of ICT Update

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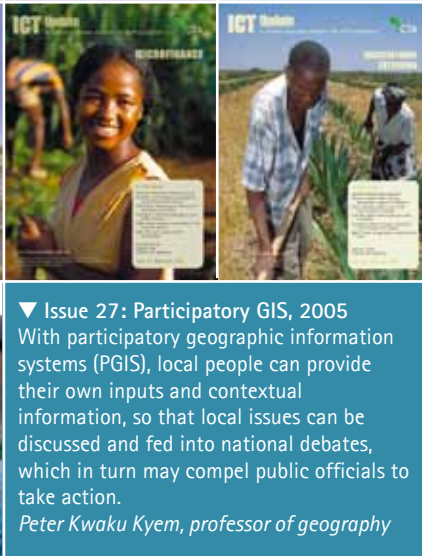
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▲ Issue 10: Rural connectivity, 2003
There are tremendous opportunities for the development of sustainable community access in Africa. Governments have started to draft new, nationwide telecentre programmes to be implemented in partnership with the private sector, or at least using business-oriented models.
Gaston Zongo, formerly of Acacia Initiative



▼ Issue 36: Financial services, 2007
Pessimists who claim that ICTs will only increase the divergence between rich and poor countries are misinformed. While ICTs should not be seen as a panacea for all development challenges, there is clear evidence that support for this sector produces tangible dividends.
Adam Rogers, UN Capital Development Fund



▼ Issue 27: Participatory GIS, 2005
With participatory geographic information systems (PGIS), local people can provide their own inputs and contextual information, so that local issues can be discussed and fed into national debates, which in turn may compel public officials to take action.
Peter Kwaku Kyem, professor of geography





▼ Issue 18: Mainstreaming ICTs, 2004
Terrestrial telecom infrastructures provide the cheapest means to connect to the internet. But, it will take at least another 10 years before they are in place in the rural areas of Africa. Wireless internet via satellite is the most promising option to meet immediate needs.

Mike Jensen, ICT for development advisor



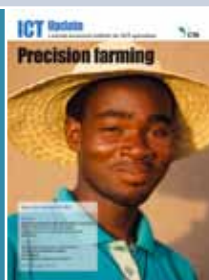
▼ Issue 20: Agrometeorology, 2004
ICTs can be very useful and we must make maximum use of them, but when it comes to the provision of agricultural services to poor and marginal producers, indigenous technologies and local innovations must be our starting point as they represent the existing limitations best.

Dr Kees Stigter, agrometeorologist



▼ Issue 39: Web 2.0, 2007
There's so much good stuff out there. Web 2.0 has remarkable tools and they're only going to get better, but I think it takes the NGOs and people who understand the challenges of rural development to get their hands on this stuff and shape it according to their needs and interests.

Andrew Keen, author and broadcaster





HANNELE COETZEE/AFPN/PH

A time of technological change

ICTs have gone through incredible changes in the last decade, but innovation is not only driven by manufacturers, it often comes from individuals adapting technology to suit local needs.

Case study

The 40th anniversary of the Apollo 11 Moon landing was an occasion to marvel. Sending men to the Moon was an extraordinary achievement for those pioneers in 1969, given how primitive some of the technology seems by today's standards. The average desktop computer these days is far more powerful than those used at the Apollo mission control. We are still enthralled by (or alarmed at) the pace of technological change, despite the difficulty of predicting what direction it will take.

Since ICT Update was launched in December 2000, the technological landscape has changed markedly, and not always as expected. Then, the

dominant paradigm was the potential of the internet for rural development, to the extent that the terms 'ICT' and 'the internet' were used interchangeably. What could not be predicted back then, of course, was that in developing countries mobile phones would eclipse the internet in popularity and as a platform for e-services, thanks to technological developments (and market liberalization).

The decade has seen the proliferation of a wide range of devices of increasing technical capabilities, coupled with falling prices, greater overall connectivity thanks to infrastructure roll-outs and evolving wireless communications, the advent of cloud or grid computing and the arrival of participatory, social and inclusive web applications as evidenced by web 2.0.

Mobile phones are the undoubted success story of the last 10 years. They have contributed substantially to

reducing the digital divide, something that other ICTs – including personal computers (PCs) and the internet – have been unable to do. Once used just for making calls, the mobile phone is now a multipurpose tool – a texting device, camera, music player, calculator and web browser. With a growing range of applications, mobile phones will become even more versatile and multi-faceted.

Importantly, in many ACP countries, mobile phones provide access to a wide range of services, notably financial services (issue 36) and market information systems (issue 47). Most of these services are text/SMS-based due to poor and expensive connectivity and the lack of useable web content. Given the recent growth of mobile telecoms markets, especially in Africa, together with cheaper handsets, lower operating costs and lower taxation, it is likely that in many countries broadband

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internet access will be delivered through mobile phones, and offer more web-based services.

Connections

While PCs may have been upstaged by mobile phones, there have been significant developments in mobile computing (laptops, netbooks, etc.), largely inspired by the pioneering work of the One Laptop Per Child Foundation and its ground-breaking XO ('\$100') laptop. This is a good example of where a development-oriented initiative has changed the wider technological landscape. Since the appearance of the XO laptop, there has been a rush to develop cheap, slimmed down laptops and netbooks.

The web itself underwent something of a revolution following the dot.com crash of 2001. With web 2.0, there has been a shift away from building websites, to organizing the web around people and their relationships. This has resulted in the popular web-based social networks, social media, social bookmarking and crowd-sourcing, to name but a few. Relationships have also been also factored into web searching, with relevancy scores based also on social value (e.g. ratings or referrals).

This focus on using digital media for networking is not particularly new. One only has to look back to the pre-web days of the 1980s and 1990s to appreciate the popularity of bulletin board systems and commercial services such as CompuServe, and later to the use of Internet Relay Chat, ICQ and Instant Messenger for issuing status updates (now called 'tweets'). Nevertheless, digital media for networking only really became part of mainstream culture with the advent of web 2.0, which itself was underpinned by the huge expansion of capacity brought about through cloud and grid computing.

Perhaps we are all still coming to terms with the changes ushered in by the web 2.0 revolution and the abundance of free or low-cost tools, applications and information resources now available online. With the popularity of RSS feeds and micro-blogging services such as twitter, there is even evidence that the web is becoming a real-time stream of information snippets, shared thoughts, status updates, pictures and videos. These tools allow people to participate in events on a grand scale – recall the influential role of twitter following the 2009 Iranian presidential elections.

Connectivity has always been a problem in developing countries. One of the most significant advances in the past 10 years has therefore been the evolution of wireless technologies that allow a variety of devices to connect to and communicate with each other and share resources, and even access to the internet. Of particular interest have been WiFi for wireless networking (issue 41), Bluetooth for personal networks, mesh networks, and the standards and protocols that provide mobile broadband internet access (e.g. WiMAX, 3G).

Convergence

Access to broadband internet is a distant prospect for many developing countries, but in the meantime effective local connectivity will become a reality. This will inevitably boost the development of locally maintained and shared information resources, supplemented with downloaded internet resources, and complementary media to support rural development such as telecentres and community radio.

These developments are significant. One consequence of the web 2.0 trend to move the desktop (including applications and data) from the PC to the internet is the problem of connectivity. Along with developments for local networking, efforts are now focusing on creating applications that work seamlessly online and offline, which will be enormously useful in developing countries where poor internet access is a daily reality. Examples include Google Gears, Adobe Air and Microsoft Silverlight.

To an outsider it seems that the development of ICTs has been driven

by rounds of 'lumping and splitting'. The appearance of the PC in the 1980s heralded in an era of 'splitting': resources that had been stored on a central mainframe or mini-computer and accessed through dumb terminals were entrusted to stand-alone PCs, which became popular in the home and offices.

The need to share resources and to communicate drove the development of PCs being networked in client/server environments in the 1990s, resources being 'lumped' together on one or more central servers. The lumping of data and applications into gigantic, internet-based server environments grew apace with web 2.0 and cloud/grid computing, evidenced by the appearance of slimmed down netbooks.

In spite of recent developments such as the undersea cable bringing high-speed internet access to East Africa, most developing countries are still a long way away from an entirely online world as promised by applications such as Google Wave. In the meantime, as the distinction between terms such as 'mobile phone' and 'laptop' has become blurred, we have seen the emergence of a broad range of cheap laptops, netbooks, smartphones, mobile internet devices and ingenious geo-localizable gadgets that connect to each other and, above all, help people connect.

Years ago, we marvelled at the Moon landings and what was possible with the technology then available. Today, we marvel at the resourcefulness of people in appropriating and adapting complex technologies at the local level, something that ICT Update will continue to follow. ■



The Voices of Africa for Sustainable Development (VOA4SD) project is working to combat rural poverty by bringing technology to remote areas of Kenya. The project began in early 2007 with the Mbambe Rural Resource Management Programme, in the village of Lwanda in Bungoma district, near the border with Uganda. We set up a computer centre equipped with four Inveneo solar-powered computers, two 80 watt solar panels and a small modem.

Unfortunately, amid the violence that followed the national election in early 2008, one solar panel and the modem were lost, bringing the project to a standstill for several months. The violence in Western province forced the evacuation of project staff and volunteers from the area. But this was

reached out to local schools, providing training to 26 teachers on how to manage their student records, and given ICT training to a further 36 village schoolteachers.

Now that we had a successful project underway in a rural village, we wanted to test the how effective the project's approach would be in a poor urban area. So, in August 2008, the VOA4SD offices, including the volunteers, moved to Likoni, a town on the outskirts of the port city of Mombasa. There, we intended to conduct research and then to work with community-based organizations (CBOs) in the area.

Urban trial

Likoni is a ferry ride from Mombasa, and is the site of an extensive slum

the US government had still not processed the relevant paperwork, and US funding was not a real option, we decided to approach the private sector.

Once the fibre-optic cable is established in Kenya, many companies will be looking to sell bandwidth to new customers in the rural areas. In order to reach the maximum number of people, VOA4SD has teamed up a number of private enterprises that are already applying new inventions and innovative approaches to reach Kenyan youth. The project has adopted a social enterprise approach to business.

VOA4SD has undergone a radical transformation in recent months. The team came up with a concept for a prototype vehicle – a mobile classroom, cyber cafe and digital

When persistence pays off

ICT Update reported on the Voices of Africa project in rural Kenya as part of the web 2.0 issue in October 2007. Despite some difficult times, the project continues to help women farmers in the area.

not the end of the Mbambe programme.

We reopened the computer centre – minus the solar panel and modem – in June 2008, and restarted the computer training courses for villagers. So far, we have trained more than 120 women to use technology to improve their lives, and many of them have already put the centre's resources to productive use. Some are now using spreadsheets to compile their farm inventories, for example, or to draw up lists of vulnerable children in the area who need support. Others have set up their own small school where the teachers make use of the information available online.

The original group of women who we trained in ICTs were empowered to establish a nursery school, called the Mbambe Academy, where the students receive weekly computer lessons. And the Mbambe computer centre has

area that has risen from the ground in the last 15 years. The Likoni area has been regularly affected by tribal violence since 1997. As the local economy slowly collapsed, more and more youth looking for opportunities have arrived with hope in their hearts, but often end up living in small shacks or one-room apartments.

The VOA4SD project team first began to network with CBOs and youth groups, and decided to build a Youth Information Empowerment Centre. For almost a year the team continued to look for funding. The project applied for more than 20 grants, but all were unsuccessful. Then, just one day after the landing of the fibre-optic undersea cable at Mombasa, three armed gangsters broke into the VOA4SD office and stole everything in sight. All equipment, files, photos ... everything was gone.

The project then faced some hard decisions. Should it leave the country? Move to Tanzania? Or keep on fighting? After a meeting with the US ambassador, the organization decided to seek new investors and to build a social enterprise company that would raise funds for VOA4SD's projects. But

media centre, all in one – to bring ICTs to rural communities, called the Mobile Information Centers Empowering Youth (Mickey). A number of private sector partners will participate in building this new invention.

On the road

Each Mickey will be equipped with a GPS unit so that people can take images with their coordinates and upload them to the web using Google Maps. Miceys are mobile local content generation factories. They will provide all the tools for content development, including a digital camera, a video camera, and high-speed Internet access. Community-based organizations will also be able to generate content for local dissemination, making it accessible to those whose literacy is limited. The content will focus on development issues such as HIV/AIDS, health, income generation and sustainable agriculture.

A large proportion of the content generated will be posted to the VOA4SD website, which is currently undergoing beta testing. The website began as a simple idea to create a

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forum where young people could write articles about development, but as the organization has grown, the concept for the website has changed. The modified website is currently in development. It is being designed using open source software; a content management system, called Drupal, and CiviCRM to keep a track of customer data.

We plan to set up a user database, introduce new bloggers, and create blogs focusing on issues such as HIV/AIDS, health, income generation, sustainable agriculture and peacebuilding. The project will unveil the new website and the Micey prototype at the 2009 Forum of the Global Alliance for ICTs and Development (GAID), ICTs and Innovation for Education, in Mexico in September, as the winners of the World Summit Youth Award in the category 'Education for All'.

The Micey mobile classrooms will be used to teach villagers about various community development issues and computer skills, beginning with the web. Rather than teaching static applications we will focus on how to use online web 2.0 tools. The seven basic packages will be replaced

by Google Applications online. For teachers and CBOs we plan to teach how to search for content, build curricula and teach online. This will boost both the education levels within communities and will build a market for the internet.

We hope to provide access to knowledge all over the country. In rural areas, courses will focus on skills development and the practical application of technology. Like the projects at Mbambe and in Likoni, we will focus on collecting information within communities and from the internet, and then on teaching to meet the needs of the people.

The Micey will be a big attraction with its computers, solar panels and internet access, we will be able to learn more about what people want, and assist them in finding the information they need. But more important is the content that the youth will be able to generate themselves. With web 2.0 tools and the internet we have a golden opportunity to bring knowledge to those who have been long deprived of access to information and, by doing so, increase the prosperity of the country. Just as in the United States,

where 20% of national GDP comes from the knowledge economy, Kenya could follow suit. And it will have to if it is to meet the objectives of Vision 2030, the country's national economic blueprint.

Prospects

The future of the Kenyan youth is in ICTs for sustainable development. In order to have the greatest impact, the technology must be diffused throughout the country. Most people with computer knowledge have had to migrate to the city to be able to improve their skills and find employment. It is critical that we are able to diffuse these technologies into the rural areas and the slums if ICTs are to make a difference. What we need is the commitment to the endeavour, and the will to see it through.

There may be tough times ahead for Kenya, but if we are able to empower the people, the violence that has cost so much in the past may be a thing of history. ■

Read the ICT Update article in issue 39, October 2007
[http://ictupdate.cta.int/en/\(issue\)/39](http://ictupdate.cta.int/en/(issue)/39)



HANNELE COETZEE/WPVI/HH

What the web will bring next

Internet technology is evolving rapidly. ICT Update reported on projects using web 2.0 applications in 2007, but the next generation of web services is already available.

Feature

Whereas web 2.0, known as the 'social web', concentrated on individuals being able to create and share their own content, the main focus for the new generation of internet services is collective intelligence. Developers are now producing applications that can gather information from a variety of user-selected sources and deliver it to one dedicated site or even a single web page.

A more recent development is collaborative network software, which allows a selected group of individuals to access documents and collated information. This type of application, such as Google Docs or Zoho, has been specially designed to allow groups of people to collect and share data. Any member of the group can edit and add

information, which is then immediately accessible to everyone else in the group.

This might sound like the definition of a wiki, but there is a difference. The new collaborative network applications automatically pull data from a variety of sources around the web, enabling users to develop mashups (combinations of web applications) to fit their specific needs. Other benefits of collaborative networks are that members can synchronize data across computers, and they can share multiple files and edit documents that are instantly available to all the other members.

In the cloud

Unlike traditional database programs, the data in a collaborative network

application are not stored on any one computer hard drive. Instead, the information, even the application itself, is more likely to be hosted on a server computer far removed from any of the users. In effect, the data are stored on the internet, often described in this context as the 'cloud'. And an increasing number of applications now make use of cloud computing.

It is, for example, possible to use online applications, many of them free, instead of programs installed on a computer. Examples include the popular email accounts, such as Yahoo!, Hotmail and Gmail. Subscribers to these services don't need an email program but can send and receive messages online.

More recently, applications like Google Gears, Adobe AIR and

Microsoft Silverlight have been bridging the link between traditional desktop software and the web, by making their online applications available even if the user is offline. Microsoft will also launch a web version of its Office software in early 2010.

Among the major advantages of using software in the cloud, the applications are free and are not dependent on the computer operating system. They work with Windows PCs, Apple Macs and Linux computers (for Silverlight a third-party version, Moonlight, is available for Linux users).

There are, of course, disadvantages to using online applications and storing data online. Regardless of how reliable the service is, or how reputable the hosting company, things can go wrong and it is possible for the application to be temporarily unavailable or even to lose data. Many of the popular email hosting applications have also been out of action for several hours due to maintenance work or server problems.

Keeping it real

Web 2.0 tools have certainly made it easy for people to create and publish and share information online. More and more people are producing content on a regular basis through, for example, simple status updates on social networking sites. Consequently, this steady stream of extra content has led to increased demand for instant updates. A message posted on Twitter (called a tweet), could be out of date by the time it is picked up by a search engine, since it cannot search and index the entire web every moment of the day. Even RSS feeds, a means of distributing updated information from a website, are not instantly available on feed-reading applications (such as Google Reader or FeedReader) but are refreshed perhaps only a few times an hour.

To meet this demand for information as it happens, a few 'real-time' applications are now available, but at the moment most are aimed at aggregating details from social networking and bookmarking sites such as Facebook and Digg. The major search engines are now working to incorporate content as it is created, and there are already a few examples, such as Notify.me and OneRiot. Twitter's own search function also provides real-time results.

Straight answers

Developers of search engine technology are also working to make their products understand 'natural language'. At present, most search engines only produce lists of websites based on keywords but they cannot deliver a specific answer to a question as they are unable to understand the complexities of human language. The idea is to get search engines to understand the true intention of the search.

Wolfram Alpha, however, does go one step further and tries to provide a direct answer. Strictly speaking, Wolfram Alpha isn't a search engine but a computational knowledge engine. The difference is clear from the results it produces. Type in 'mobile phones Africa' and it provides statistics, graphs and a map showing the distribution of mobile phones throughout the continent.

Other recently launched search engines that try to understand natural language are Bing and Kosmix. Many of these applications use semantic technology to link user requests to the most relevant sites. There are several different types of semantic web technology to make this possible, but most of them work by defining and indexing information on the web so that similar content can be linked and made available to users.

Getting into semantics

One example of a semantic web application is Zemanta, which can be installed as an add-on in a regular browser. When the user is writing a blog post or even an email, Zemanta will try to understand the words as they are being typed and suggest relevant videos, photos, keyword tags and links.

But all these new developments are useless if there is no access to the internet. Connectivity remains a major problem for millions of people in ACP countries. But the technology to deliver the internet is developing just as quickly as internet technology. The prices of hardware, including mobile phones and laptop computers, are falling steadily. And with the many enthusiasts committed to developing innovative solutions to bring ICTs to rural communities, it is easy to be optimistic. It might not be too long before any smallholder farmer is able to contribute to and benefit from this growing web of collective intelligence. ■

Related resources

Cloud computing

Google Gears

→ <http://gears.google.com>

Adobe AIR

→ www.adobe.com/products/air

Microsoft Silverlight

→ www.silverlight.net

Moonlight

→ www.go-mono.com/moonlight

Zoho

→ www.zoho.com

Search engines

Bing

→ www.bing.com

Kosmix

→ www.kosmix.com

Ask.com

→ www.Ask.com

Hakia

→ www.Hakia.com

TrueKnowledge

→ www.TrueKnowledge.com

Wolfram|Alpha

→ www.wolframalpha.com

Real time search

Notify.me

→ www.notify.me

OneRiot

→ www.oneriot.com

Twitter

→ www.twitter.com

RSS feed readers

Google Reader

→ www.google.com/reader

FeedReader

→ www.feedreader.com

Semantic

Zemanta

→ www.zemanta.com

Faviki

→ www.faviki.com

see TechTip on page 23 for examples of collaborative network applications.



Research has shown that women in Uganda are three times more likely than men to be aware of and to use information and communication technologies (ICTs). Women are also the main customers of Uganda's many privately owned computer training centres, often as a means to improve their secretarial training – a stereotypical role for a woman – by learning elementary computer skills.

But few women own or manage any of these private ICT business centres. Although support from the country's Rural Communications Development Fund has contributed to the spread of

promote their work on the internet. The websites would be a useful tool for making contacts, forging partnerships, fundraising, and marketing services and crafts. Initially, WOUGNET's own website provided the core of internet activity for members, and it still contains the profiles of many local women's organizations plus information on various related topics and projects in Uganda and around the world.

Debate

Over the years, the website has continued to develop and, using web

The organization's electronic mailing lists provide a useful forum for discussing issues related to the use of ICTs for development, gender and human rights. Messages posted on the lists reach a wide audience and often stimulate debates among policy makers, parliamentarians, NGO staff and donor agencies. Some lists, such as those of the Women's Movement and the task force of the African Protocol on Women's Rights, are administered by network members, and the issues raised there are often used in advocacy campaigns.

Through the Citizen Journalism in

Digital opportunities for change

Since 2000, the Women of Uganda Network has been developed a wide range of initiatives to improve access to ICTs for women farmers and entrepreneurs.

ICT facilities and services to less privileged areas, far fewer women have benefited from these projects than their male counterparts. If women continue to be excluded from the benefits of ICTs, including being able to use them to improve their social and economic status, then they are likely to become further marginalized as members of their communities.

In May 2000, several women's organizations in Uganda came together to set up the Women of Uganda Network (WOUGNET), a non-governmental organization to promote the use of ICTs among women. WOUGNET's vision is of a society in which women use technology to share information and to tackle local and national issues collectively in an effort to promote sustainable development. At present, the organization has more than 90 women's organizations as members, the majority of which are in urban areas and districts where there is some internet access.

One of WOUGNET's first activities was to develop a web design programme for members so that they could create their own websites and

2.0 tools, has become an interactive site for members to share information on many subjects, including ICTs for development, gender and human rights. The site also contains details of initiatives launched by the government and other agencies, as well as relevant news stories. WOUGNET now hosts a number of other websites, including the Kubere Information Centre website and the Women in Business Portal, which are becoming increasingly important sources of information on agricultural production and entrepreneurship, respectively.

Africa project and other training courses, WOUGNET has equipped some of its members with the skills to use web 2.0 social networking tools such as blogs, wikis, RSS feeds, social bookmarking and media sharing sites. Other courses cover how to write articles, develop audio and video productions and to publish online. This initiative is aimed at encouraging civil society organizations to use and interaction with a variety of media in order to help them maximize their communication strategies and get more from their research.



Janet C Achora (jachora@wougnet.org), senior information officer, and Berna Ngolobe (bngolobe@wougnet.org) at Women of Uganda Network (www.wougnet.org)



Remote

In an effort to reach out to members and individuals easily and quickly, WOUGNET uses SMS (short message service). The organization has experimented with a number of different methods of sending messages to large groups of people, including BulkSMS, a web-based application for distributing SMS messages to a group of local subscribers, and FrontlineSMS, a package that can be used to receive and send SMS messages to many mobile phones from a single computer.

With the Enhancing Access to Agricultural Information project, which targets rural women farmers in northern Uganda, the organization uses SMS in combination with a number of other technologies and media including a website, community radio broadcasts and an information centre, the Kubere Information Centre. The project uses this range of technologies to deliver agricultural information to women farmers to help them improve productivity, as well as to provide regular, up-to-date market data to enable them to reach new buyers and thus increase their incomes. SMS messages generated by the participating organizations are translated into the local language, Luo, and sent to the farmers. The women are also able to use the SMS services to contact agricultural experts for advice and to share details about other available information sources.

Not all of WOUGNET's activities are web-based. The organization has expanded its efforts to include women who have no access to the internet. In partnership with the Uganda Communications Commission, for example, they now hold regional ICT seminars for girls in eastern, northern and western Uganda. They have also recently received support from the NEPAD-Spanish fund for the empowerment of women, to support and improve the incomes of women entrepreneurs in three districts of Uganda - Ibanda, Apac and Mukono. And WOUGNET is now a regional coordinating office for the Dimitra project, which helps people in rural communities to develop their ICT skills.

These are just a few examples of how WOUGNET works to improve access to, and the use of, ICTs while also helping to develop and advocate for workable ICT policies. Since its inception in 2001, and that first article in ICT Update in 2002, the organization has grown, and is now implementing a three-year strategy to ensure that it can continue to support women and women's organizations as they apply and further innovate with all the ICT tools available to them. ■

Read the ICT Update article in issue 8, October 2002
[http://ictupdate.cta.int/en/\(issue\)/8](http://ictupdate.cta.int/en/(issue)/8)

Participants of the WOUGNET Lango forum on e-Agriculture.

Related resources

bulkSMS

A web application to send and receive one or more SMS messages over the internet.
 → www.bulkSMS.com

FrontlineSMS

A low-cost method of sending multiple SMS messages to mobile phones from a single computer.
 → www.frontlinesms.com

How to use FrontlineSMS

An ICT Update TechTip on how to install and use FrontlineSMS.

→ [http://ictupdate.cta.int/en/Regulars/TechTip/\(issue\)/47](http://ictupdate.cta.int/en/Regulars/TechTip/(issue)/47)

International Women's Day

IWD is an international day celebrating the economic, political and social achievements of women around the world.
 → www.internationalwomensday.com

16 Days of Activism against Gender-Based Violence

This international campaign, from the Centre of Women's Global Leadership, runs from 25 November to 10 December each year and calls for the elimination of violence against women.

→ www.cwgl.rutgers.edu/16days/home.html

Ugandan Women in Business

This is a web portal for women entrepreneurs that offers useful business information and opportunities for marketing and selling their products.

→ www.wib.or.ug

Kubere Information Centre

KIC is a resource centre based in the town of Apac in northern Uganda which uses a variety of ICTs to provide agricultural information to women farmers.

→ <http://kic.wougnnet.org/new>

Citizen Journalism in Africa

CJA helps civil society organizations to use online and offline sources to publish stories, lobby decision makers, network and share knowledge.

→ www.citizenjournalismafrica.org

Dimitra project

This project uses ICTs to develop the skills of people in rural communities, particularly women, to improve food security and sustainable development.

→ www.fao.org/dimitra/home/en/

Computing in the cloud



HENRY T. KAISER/HH

There are many advantages to using applications hosted on the internet, in the 'cloud', rather than traditional software programs. They are available anywhere there is an internet connection, they are often free, and they are accessed only when needed. Organizations with limited resources, or limited hard disk space, no longer need to buy and install software that will be seldom used. Since these applications are available through a web browser, they work regardless of the computer's operating system, and many can be used offline.

Cloud computing enables anyone to contribute and share information. You can invite colleagues and partner organizations to collaborate in compiling and editing documents. In some cases, a group of people can work on a document at the same time while the application synchronizes the data across all the users' computers. The following are just a few examples of the new generation of web-based applications. (for details see page 18).

Collaborative networks

Google Docs

For word processing, spreadsheets and presentations

Sign up for a Google Docs account with your email address and a password. You can then upload a file stored on your computer or open a new document and work in the browser.

Sharing: Invite others to view and edit the document either while you are working on it, or from the homepage, which gives an overview of all your files. Click 'share' and add the email addresses of the people with whom you want to collaborate. You can also set the 'permissions' to allow people to edit, view, or invite others to collaborate.

Google Docs can also provide a web address if you want to make the document public. You may publish the document as a web page, send it as an email attachment or, from the homepage, 'export' it to your hard drive as an html, pdf, Word or plain text document. It is also possible to export a presentation as a PowerPoint file (ppt) and spreadsheets as xml files.

Offline: It is possible to work offline with Google Docs when using the Chrome browser or, if you use another browser, click 'offline' in the top right-hand corner of the screen. This will install the Google Gears application plus all the documents onto your computer. Any changes you make offline are synchronized when you reconnect to the internet.
<http://docs.google.com>

Zoho Docs

For word processing, spreadsheets and presentations

You can sign up for a free Zoho Docs account, which has a 1 gigabyte data limit (more space is available for US\$3 per month).

Sharing: Other people sharing your account must also sign up for a Zoho account, but the process is very simple. One advantage of Zoho is that several people can edit a document at the same time (these sections are labelled 'read only' while they are working). You can also chat in real time with other members who are logged on.

Zoho Docs works in a very similar way to Google Docs; click 'open' or 'new' to open a document, but then click 'edit' to start working on it and save to the same formats and Google Docs.

Offline: The offline mode is available only for Zoho writer, the word processing application, which also makes use of Google Gears, which you have to download and install on your computer.
www.zoho.com

Swirrl

For word processing and storage

Sign up for Swirrl with your email address, and choose a unique web address for your documents (e.g. swirrl.com/yourname). When you receive a 'welcome' email, follow the link and add your screen name that others in your group will see, and your real name (which only the administrators will see) and then choose a password. Create a new document by clicking 'make a new item', add a name and click 'create'. Note that you can only edit text documents in Swirrl. You can also upload a document from your computer by clicking 'upload a file'. Give the file a name, click the browse button, and upload it from your computer. You can store up to 20 MB with the free package.

Sharing: When logged onto the Swirrl homepage, click on 'manage users', then 'invite new users' and enter the email

addresses of anyone you would like to share the file with. They will then be sent an email with instructions on how to access your file. Your colleagues can edit online any of the text documents you create in Swirrl and can communicate via 'announcements'.

Offline: Documents created in Swirrl can be downloaded, but any uploaded files can be edited only after downloading them.

Blogging

Maneno

Maneno ('words' in Swahili) is a new blogging platform developed for bloggers in Africa. The platform is quick to load, even on slow connections. It is currently available in English, Spanish, French, Portuguese and Kiswahili. Other African languages will be added soon.

Register online, then login, go to the admin section and click the 'write a new article' button at the top right to start blogging.

Sharing: Maneno is an ideal application if more than one person will contribute to the blog. In fact, you don't even need your own blog but can join and contribute to any one of the established blogging networks, including the popular Community Content (<http://communitycontent.maneno.org>) and BarCamp Africa (<http://barcampafrica.com>).

Offline: If you have a slow internet connection you can download and install a small application that allows you to

write blog posts while offline, ready to be published when you reconnect to the internet.

www.maneno.org

Image editing

There are several online photo and video editing applications, but to upload and work on the material you will need a fast broadband connection.

Splashup

With this free application you can edit, resize, enhance and add effects to digital photos. There is no need to register – simply click the button 'jump right in' on the homepage. Go to 'file' to 'open' an image on your computer; start a 'new' file; or 'capture' a photo directly from a webcam.

Sharing: Registering with Splashup lets you open and save photos to/from Flickr, Facebook, Picasa, and other photo-sharing sites, or from any web address, or store them on your Splashup account.

Offline: By downloading Splashup Light, a small program with fewer editing options, you can also work on your photos offline.

Aviary Phoenix

Aviary offers a full range of image editing tools, and allows you to make screenshots. Type <http://aviary.com> before a web address (e.g. <http://aviary.com/http://ictupdate.cta.int>) and the page loads with a selection of Aviary's editing tools so that you can select and save a photo of the site. <http://aviary.com>

JayCut

A video editing application that is still in an early beta stage of development, JayCut offers unlimited data upload with comprehensive, easy to use editing tools. You can also save completed videos directly to Facebook and MySpace. <http://jaycut.com>

A word of caution

While web-based applications have their advantages there are also some important disadvantages. They can, for example, take up more bandwidth than a desktop program. It is often quicker, and less expensive, to download your emails using a program like Thunderbird, rather than accessing them via Gmail or Yahoo Mail. But the most obvious drawback is that if your data is stored online you will not be able to access it when offline. You may have a reliable internet service provider who offers a fast broadband connection 24 hours a day, but even the most dependable services can break down from time to time.

Similarly, even if you have no problem with your internet connection, but the company storing your data may have maintenance or server problems, and could be temporarily or even permanently offline. This has already happened with the social bookmarking sites Furl and magolia. Furl offered users up to 5 GB of storage space, but many of them lost their data when the company was taken over by a rival, and a data corruption problem in 2009 meant that many users lost files. ■



HOW JONES / ALAMY

Related links

Go2web20

This website gives a comprehensive list of web 2.0 tools, grouped according to purpose, e.g. collaboration, e-learning, business or management, with summaries of each one.

→ www.go2web20.net



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Technology (ADIE). As for the farming community in particular, we know how vital it is for farmers' to have market information.

With 'time-to-market' (T2M), an innovative system developed by Manobi, farmers can get the prices of produce from the markets in Dakar sent directly to their mobile phones. Manobi agents gather and post the prices. Any middleman who goes to the countryside for supplies for the markets will now be dealing with a farmer who has up-to-date

serving the public at large and the education sector. That raises two problems. First, these devices tend to wear out quickly or become obsolete. Second, there is the question of how to dispose of the worn out devices, which we are not really in a position to do.

Given the current world crises (in food, oil supplies, etc.) and the instability in many ACP countries, the priorities are still health, education and agriculture, much more than advanced technology. In spite of all that, a great deal of effort is being made in to improve the situation, and hopes are high. In all our countries, access to the internet is becoming increasingly desirable, and almost everybody now has a mobile phone.

Finding the right balance

From your own experience, have you seen how ICTs can improve farmers' livelihoods?

→ ICTs are not yet in general use in Senegal. We aim to get to that stage by the end of 2010, through the National Local Development Programme (PNDL) and a range of partnerships supported by the State Agency for Information

information and is in a strong position to negotiate.

If producers feel they are being cheated, they can always take their produce to the market themselves. This system, which can be directly accessed by farmers, enables them to increase their earnings. Unfortunately, it is limited to certain geographical areas and to two modes of production only: market gardening and fisheries.

The introduction of ICTs affects other sectors too: education, registration of births and deaths, land measurement, but above all health and good governance, and we have a key partnership in these two areas with UNDP, the Canadian International Development Agency (CIDA) and Dakar University.

In the past ten years there has been a rapid expansion in the use of mobile phones. Why have they proved such a success in Africa?

→ Because they meet people's needs so well. Africans don't write, they talk. And they like to communicate. And mobiles offer a way of solving various economic problems such as travel and transport, information and trade. So much is done on mobiles these days. This is why Africa has such a high rate of market penetration for mobiles, at 50% (the same as all the European countries together). I think it will be up to 80% in two or three years.

Every day, the devices get smaller, less expensive and more easily available. How has this phenomenon affected the ICT policies of African governments?

→ It has had very little effect, because the devices are still relatively expensive. What we are seeing instead is an increasing tendency to use second-hand devices, which are arriving in containers and are used to equip public offices, as well as

Does this give rural people access to more information, or is it just that they have more ways of accessing the same information?

→ They do have access to more information. In Senegal, the Ministry of Telecommunications and Information Technology has opened 'community multimedia centres' in rural areas. These centres act as a kind of rural cybercafé, where people can access national and international news and also listen to community radio stations which only broadcast local news. These are extra media resources, in addition to the traditional sources of radio and television, which are also available, of course.

How can farmers be sure they are getting good, reliable information?

→ I don't think there's much we can do about this. It's a problem of global governance of the internet, and that calls for global solutions. Whether you live in town or in the country, the solutions must be the same for everyone, nobody must be hurt or be given special advantage.

What factors are limiting the expansion of rural ICT programmes?

→ First of all, the lack of access to sufficient bandwidth. There's no point having the internet if it takes ages to download anything! Some projects do raise this issue, such as the O3B consortium which, as its name indicates, is aiming to connect the 'other 3 billion' by bypassing the usual access providers.

But the question which I think is more fundamental is the impact of ICTs on sustainable management in our countries. I think the farming world will only have a future if it can strike the right balance between the technical decisions farmers make and the management of energy supply. ■

