Beyond the hype

Mobile phones and the web to improve agricultural value chains

The ICT4Ag project

CTA's ICT4Ag project (2014–15) enabled seven organisations in Africa and the Caribbean to develop, test and promote information services for small-scale farmers and fishers, traders and lobbying groups.

Key recommendations

- **Understanding users' needs** requires intensive interaction with potential clients before designing the app. Pilot testing can fine-tune the app and introduce it to the users.
- **Simple or fancy?** Many users still lack a smartphone needed to display graphics, but have a "feature phone" that can send and receive text messages. Offering a text-based service is cheaper and easier than developing and maintaining a graphical interface.
- **Face-to-face promotion and training** familiarise users with the app and help build a large client base. In the medium term, however, user fees are unlikely to sustain such services; they will still depend on other sources of income, espcially donor funds.
- **Partnerships** are vital – both as a source of data to analyse and disseminate, and for support in promoting the app among clients.

A SMARTPHONE IS A wonderful thing. This miniature computer in our pockets is changing the way we live, how we get information and communicate with each other. Each phone comes loaded with "apps" – programs that do specific things, like finding out how much something costs (and buying it), sending photos to friends, finding our way in an unfamiliar town. And if we don't have the right app, we can easily download one with a couple of taps on the screen.

Mobile phones are already surprisingly common in many parts of the developing world, and they, and the network of cables and transmitter masts that are needed to carry all that data, are spreading fast. The service in many places is still patchy and intermittent: people have to climb the nearest hill to get a signal. Many still have basic mobile phones that allow simple text messages and voice calls, rather than the latest smartphone with a colour screen and the latest gizmos. But both mobile phone services and the availability of smartphones are improving, and quickly.

Such miracles of technology are already changing the lives of millions of farmers in the developing world: they can now call an input dealer in town to order supplies, negotiate prices with traders, and transfer money, all without stepping outside their own thorn-bush fence.

Amid all the enthusiasm surrounding mobile phones, let us not forget that more "traditional" internet services, reliant on the "old" technologies of computers and the internet, also have huge potential. Desktop or laptop computers are more powerful and flexible, and have bigger storage capacity, than mobile phones; connected to the internet, they can deliver far greater amounts of information. And they can be used for things that are hard to do on a tiny screen, such as create information materials and manage complex datasets.

But much of the potential to use these technologies for agricultural development remains unrealized. Farmers, fishers, traders and other rural entrepreneurs have not been able to use them to boost their productivity and profitability. There are three problems. Sometimes the apps and information do not yet exist: they have not been developed. Sometimes the apps (or the information they purvey) are not yet sufficiently refined for the

intended users. And sometimes the potential users have not yet heard about them or learned how to use them.

ICT4Ag

The CTA project **Information and communication technologies for agriculture**, or ICT4Ag, dealt with all three problems. Implemented in 2014–15, it consisted of two components.

■ **Building viable delivery models for ICTs in agriculture** supported five organizations in Africa and the Caribbean, most of them at the proof-of-concept stage in developing their services. The organisations developed or refined apps, pilot-tested them, trained collaborators and partners, and produced content to disseminate.

■ **Apps4Ag learning opportunity** supported two organizations, both in Africa, to expand the number of clients using apps that had already been developed. The CTA support enabled these organisations to introduce their app to clients and train them how to use it.

The first five organisations were selected through competitive bidding. The last two were chosen based on existing partnership relations as well as the thematic focus of these apps (Table 1).

Details of the seven projects are given in separate sheets in this series. This sheet looks across the projects and summarises what we can learn from them. For a more in-depth look at some of the issues, see CTA (2015).

CTA support

For most of the projects, CTA's support has been a valuable but fairly minor part of the development effort. In most cases, the app already existed; CTA has supported further development (Syecomp) or redesign (University of the West Indies), pilot testing (eLEAF) and demonstrations of the app or and training of partners or clients. For Yam Pukri, CTA support enabled the development of its website and populating it with information to make it useful for users.

Showing agricultural extension officers how to use a handheld GPS device to capture farm data: Syecomp, Ghana

Table 1. Projects supported through ICT4Ag

Organisations	Sector	Service, type	Value chain stage — Pre-production	Production	Postharvest	Target groups — Small-scale producers	Large-scale producers	Others[1]	Main income sources	CTA support	Key achievements
Group I — Building viable delivery models for ICTs in agriculture											
Syecomp Volta Value Chain Coop Union, Ministry of Food & Agriculture **Ghana** agricinghana.com, syecomp.com	Private	**eFARMS** Farm mapping	■				■		Free initial service, pay for add-ons Development grants Consultancies, contracts	App development Demonstration Promotion	Over 400 farmers' fields have been mapped New app developed Partnerships developed with providers of satellite data and value-added services
eLEAF Hydraulics Research Centre **Sudan** www.eleaf.com/	Private	**FieldLook** Irrigation advice		■		■		■	Trial. Potential income from subscriptions	Pilot testing of service	44 pilot farmers saw an average 60% increase in wheat yields and a rise in water-use efficiency
RONGEAD Chigata **West Africa** www.nkalo.com	NGO	**N'kalô** Commodity prices, market advice		■	■	■		■	Development grants, sponsorship, media articles. 2% from subscriptions	Collaborators training Content production	Over 8,000 producers trained Information disseminated to ~50,000 stakeholders Networks built to support sustainability of the service
Univ of W Indies **Trinidad & Tobago** cirp.org.tt/mfisheries/	Public	**mFisheries** Navigation, weather, SOS, prices, tips, boat tracking	■	■	■	■		■	Development grants	App redesign Promotion	App redesigned and freely downloadable for some Caribbean countries Stakeholders engaged
Yam Pukri Fédération des Unions et Groupements et Coopératives Maraichers du Bam **Burkina Faso** agripol.faso-dev.net/	NGO	**Agripol** Lobbying	*Policy*	*Policy*				■	Development grants	Website development Partner training Information generation Content production	Government lobbied on key issues Lobbying of NGOs to use local raw materials Farmers database developed
Group II — Apps4Ag learning opportunity											
Ensibuuko Technologies Allied Savings & Credit Coop Society **Uganda** ensibuuko.com	Private	**MOBIS** Mobile banking	*Financial services*	*Financial services*		■		■	Fees, grants	Training clients	25 facilitators trained 1,500 smallholders trained in mobile banking Greater awareness of MOBIS app
Farmerline Mennonite Econ Dev Associates **Ghana** farmerline.org	Private	**Mergdata** Weather, farming tips, prices	■	■	■	■			Subscriptions, licensing of software, development aid	Training clients	500+ smallholders (including women) trained More visibility for Mergdata app Partnership with international NGO

[1] NGOs, credit organisations, traders…

Business models

The business model canvas (Osterwalder and Pigneur 2010) is a convenient way of representing and analysing business models followed by companies, NGOs and government agencies. The canvas consists of nine fields, starting in the centre (❶ Product or service, see box below). Clients and how the enterprise relates to them are covered on the right side of the diagram (❷❸❹); the activities, resources and partnerships used to create the product or service are on the left (❺❻❼). Financial aspects are at the bottom (❽❾).

Most of the CTA support in the ICT4Ag project has focused on attracting new clients and training them how to use the app – part of the client relationships field in the canvas (❸).

❶ The product or service

Types of functions

The projects cover a range of different applications, from farm mapping to lobbying, and from production advice to information on prices and marketing (Figure 1). The most common type of information (supplied by four of the seven apps) is **production advice**: farming or fishing tips. For some this is generalized advice applicable to a wide range of farmers or fishers. In the case of eLEAF's FieldLook, however, the advice is tailored to each client ("irrigate next Tuesday") and depends on a sophisticated analysis of data from various sources, georeferenced for a particular farm.

Business model: The example of Syecomp

Syecomp provides farm mapping and other location-based services ❶ to farmers and cooperatives ❷ so they can qualify for organic certification and bank loans. It maintains relationships with these customers through face-to-face training, text messages and the Syecomp website ❸. It provides its services to clients through face-to-face interactions in the field, as well as via emails, WhatsApp messages and phone calls ❹. The key activities needed to provide the service include geospatial analysis through on-farm mapping, supplemented with the analysis of satellite images and research findings ❺. It uses a range of resources to do this, including GPS equipment, satellite data and specialist staff ❻. Important business services and partners include extension officers and cooperative staff who enrol the farmers ❼. Syecomp provides the mapping service for free, but clients must pay for a printout and for additional services. Much of the funding has come from research consultancies, bespoke training and development projects ❽. The costs are mainly for staff, transport, communication and promotion ❾.

❼ Business services and partners	❺ Key activities	❶ Product or service	❸ Customer relationships	❷ Clients
Extension officers Cooperatives Exporters Government Ministry of Food and Agriculture Commercial farms International organizations	Geospatial analysis Satellite image analysis Agricultural research E-farms platform **❻ Key resources** Advanced global positioning system gadgets Satellite data Specialist staff Computers, printers, stationery Vehicle	Farm survey and mapping Satellite image analysis Agricultural research Blogging	Training SMS Website Blog **❹ Channels** On-field Emails WhatsApp Phone calls	Commercial farms Smallholder farms Cooperatives (certification, bank requirement) Researchers Exporters NGOs

❾ Costs	❽ Income
Staff (co-financed) Transport Communication Promotion	Free mapping, fees for printouts and additional services Research consultancies Bespoke training International development projects

Three of the apps provide **price information and market advice**. RONGEAD's N'kalô app focuses on the marketing of a few cash crops; it offers specific recommendations such as "sell your cashew now because prices are falling". Both Farmerline's Mergdata and the University of the West Indies' mFisheries give price information and general marketing tips, but do not risk making specific recommendations on where or when to sell. It is interesting to note that the providers feel they have to offer marketing advice to help farmers understand the current price trends.

Two of the apps, mFisheries and Mergdata, offer **weather updates** in addition to their other services. Like prices, weather information has to be updated frequently if it is to be of any use, so the two functions tend to go together. eLEAF's specific advice on when to irrigate is based on an analysis of the weather forecasts.

The other three apps focus on just two functions. Syecomp's eFARMS app generates **farm maps** that the farmer can use to get a bank loan or organic certification. That means that each client is likely to use Syecomp's services just once, rather than continuously (as with, say, price and weather information). That is a problem for Syecomp if it aims to earn revenue from its service, especially as it offers its basic mapping service for free. It is trying to deal with this by offering additional location-based services, such as links with potential suppliers. It charges a fee for premium services such as printouts of the maps or crop yield forecasts.

Yam Pukri's **lobbying** website, Agripol, is the only one of the seven apps that is not mobile-based. It offers two main services: information that can be used for lobbying, and links to other organizations to facilitate a **coordinated** lobbying effort.

Ensibuuko's MOBIS app offers two types of services, aimed at different sets of clients. It enables farmers to **transfer money**; and it enables savings and credit cooperatives to **manage the deposits** that their members make.

Simple or fancy?

When designing an app, there is a temptation to try to add more and more functions to it: not just price and weather information, but also production tips, advice on first aid, mapping, tracking, etc. This has the advantage that the app becomes more flexible and attractive for users. But it also has disadvantages: the app may become more difficult or daunting to use, or the individual functions may not be designed in an ideal way.

mFisheries illustrates this risk: of the seven apps, it has the widest range of features, but uptake by its intended clients has been very limited. Few of the fishers who the app is intended for own a smartphone or know how to use one. Indeed, the University of the West Indies has taken to distributing subsidised smartphones to users in order to kick-start adoption. A smartphone with GPS

Figure 1. Functions of the apps in each project
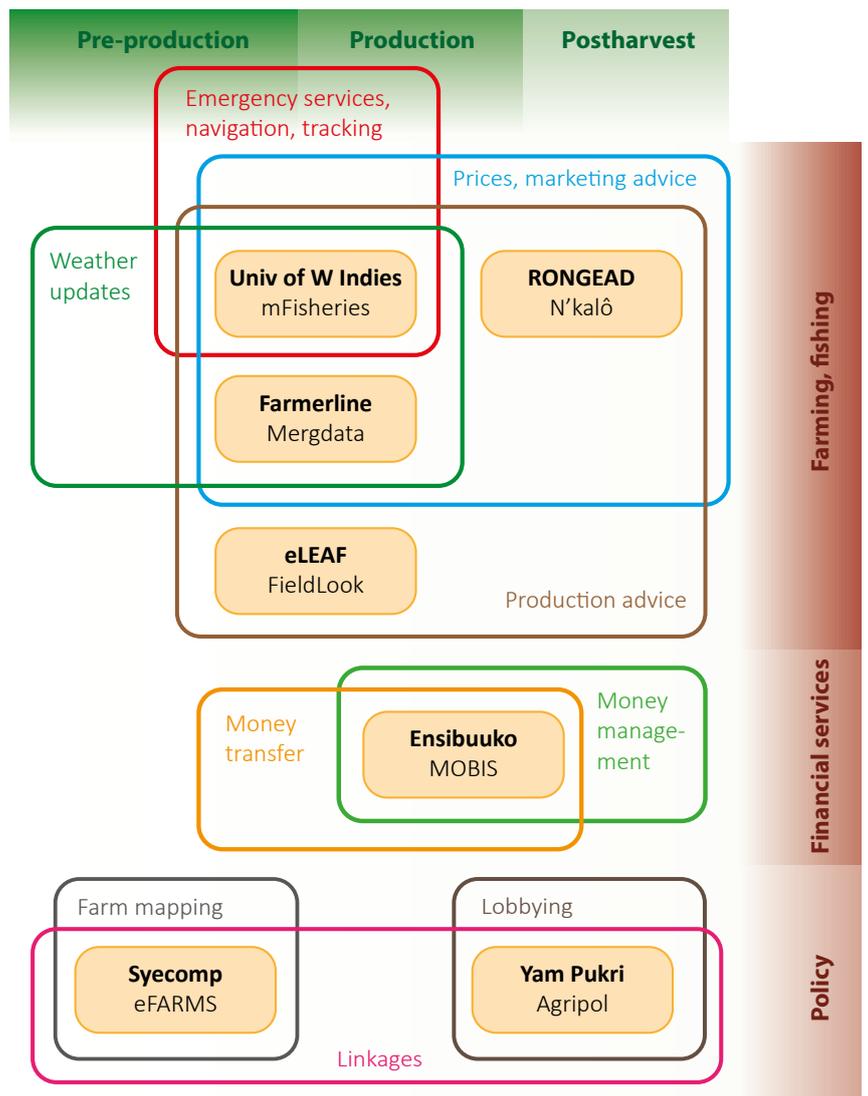
capabilities is needed to permit functions such as navigation – a vital feature for fishers at sea. It seems likely that mFisheries is a few years ahead of its time: when fishers have become familiar with smartphones, they will adopt it more readily.

RONGEAD, Farmerline and eLEAF have taken the opposite approach. Many of their clients have "feature phones" with simple displays that can show only text. Many are illiterate. So they have designed their apps to deliver information via simple text or voice messages.

Converting needs into solutions

The link between an expressed need, such as help with certification (Syecomp) or the ability to call the coastguard in an emergency (University of the West Indies) and the resulting app may not be obvious, at least to the farmers or fishers involved. It is unlikely that a farmer would come to Syecomp and request an app do produce an online map of her farm. This is a frequent issue in rural development, or indeed in marketing: seemingly simple problems rarely have simple solutions. They involve a great deal of research, analysis, development and testing before a suitable solution is found. There is always a risk that the solution is too complex,

technical or expensive to be useful. But to be successful, the solution must be simple enough for the users to understand and use, and it must be obvious how it will solve their problem.

Developing ideas

Various approaches exist:

- Find out in detail what the clients' needs are, then develop a solution to fulfil those needs.

- Create a prototype, then test it. If there is demand for it, enhance it; if not, adapt or drop the idea.

- Develop an application based on a vision, and then adapt it to suit the situation.

- Start off by automating a familiar process, then innovating and improving on it.

An app is unlikely to be perfect straight away: it must undergo a series of tests and revisions before it can be released. This is an iterative process, with the app evolving over time. Involving the clients in the adaptation process helps improve understanding of their needs. Sometimes the users themselves innovate in how they use the app; it can then be refined to build on this functionality.

eLEAF's FieldLook app sends regular text messages tell farmers in Sudan's Gezira irrigation scheme when to water their crops

❷ Clients

Identifying clients and needs

The first stage in developing an app includes identifying your clients and needs, working out the broad type of product or service that will fulfil those needs, doing market research, and defining the product more precisely. It is unimportant which comes first: the idea, or the clients. Some organisations have an idea and then look for clients who are interested in it. They then adapt the idea to suit the clients' needs. Other organisations identify a need among a set of clients, then look for ways to solve that need.

In general, the seven organisations felt they knew their clients well and had identified their needs correctly, either because they already had worked with them for a long time or because they had conducted a thorough needs assessment. In at least one case, the organisation was responding to farmers' requests for assistance: farmers in northern Ghana asked Syecomp for help with certifying their farms as organic.

The limited uptake of the mFisheries app shows that the University of the West Indies' assumption that they knew the clients was incorrect. After the first few months, the mFisheries team therefore re-strategized to engage users and other stakeholders. It devoted much of the CTA project period to establishing networks, understanding the clients' needs and getting their buy-in into the app. This was complicated by the desire to scale the app to serve other countries. But one size does not necessarily fit all. What works in Trinidad and Tobago may not work in Belize: the situation and clients are different.

Small-scale producers

Six of the apps are aimed at small-scale producers (Table 1). One (Syecomp's eFARMS mapping app) is also aimed at commercial producers.

Intermediary organisations

Five of the apps are also intended for various intermediary organisations and other stakeholders: NGOs, credit organizations, traders, irrigation managers, fisheries managers, etc. They use some of the same features and information as the producers (such as price and weather updates).

One of the apps, Yam Pukri's Agripol, is aimed exclusively at intermediaries in the development process, such as NGOs. That makes it possible to use computers rather than mobile phones as the main delivery method (few farmers have computers; most intermediaries do). The audience determines the channel.

Intermediary organisations may be able to pay part of the costs of providing the service. There are two main patterns for this: cooperatives and farmers' association may subscribe on behalf of their members, and NGOs and other development organizations may sponsor subscriptions out of their project

RONGEAD provides market information on a variety of cash crops to farmers and traders in West Africa

funds. This has two big advantages: it is easier to collect fees from a few larger clients than lots of individuals, and a bulk arrangement ensures that the service reaches a large number of clients (especially if the NGO helps with the training and promotion). But it also has a disadvantage: when the project funding finishes, the number of subscribers may shrink rapidly because the individual farmers are not used to paying for the information they have so far received for free.

New types of clients

It is important to identify the right set of clients – but to realize that others might also benefit. Syecomp realised that other farmers might also be interested in its mapping services, and for reasons other than just organic certification. Fortunately, its eFARMS app is designed to be flexible enough to deal with this new set of needs.

Multiple types of clients

If an app has multiple types of clients, it is possible to offer additional features especially designed for each group. mFisheries, for example, has a feature designed for use by the coastguard; if a fisher presses the SOS button on his phone, it sends an alert to the responsible coastguard, along with information on the boat's location. eLEAF offers irrigation advice to individual farmers, and consolidated data on soil moisture, crop growth and water needs to the management of the Gezira Scheme.

One of the attractions of having different client groups is that some of them may cross-subsidise the others. Agrifood firms, for example, may be willing to pay significant amounts for hard-to-get data; the income can be used to cover the costs not only of gathering and analysis of the data, but also of supplying them to smallholders who are less able to pay.

Dealing with multiple clients can bring problems. Yam Pukri, for example, would have found it a lot easier to deal with a single client for lobbying, rather than trying to reconcile the interests of several groups.

❸ Client relationships

Serving small-scale producers is fraught with difficulties. They often live in remote areas and are illiterate, unfamiliar with technology, lack smartphones, and unwilling or unable to pay for information. Merely getting them to hear about the service can be a challenge, let alone getting them to try it out, subscribe and pay for it.

Reaching scale

A strategy based on individual subscriptions or user fees must rely on trying to get large numbers of individuals to sign up to the service. That is what the CTA support for several of the organisations focused on.

Reaching scale is vital if a service aimed at smallholders is to be economically sustainable. But many organisations that provide information and communication services aimed at such users underestimate the challenges involved. They tend to focus rather on the production side of the business: gathering and analysing data and developing the app, rather than the marketing side (working with clients and promoting uptake). They typically underestimate the time, cost and effort needed to familiarize potential users with their product; indeed, many clients will not have realized they had a problem that needed a "solution".

Recruiting methods

Given that all seven of the products offered by the projects were information in electronic form, it is striking that all relied on face-to-face communication for client recruitment and training. This is unlike social-media apps such as Twitter or Facebook that rely on individuals recruiting their friends, and users learning how to use the app on their own. The spread of such apps depends on potential users already having a smartphone and being familiar with how to use it.

The seven products are not yet at this stage. Many of the small-scale producers do not have a mobile phone (or a smartphone), and there does not yet exist a significant number of enthusiastic users of the app who might act as evangelists. That means that active face-to-face recruitment and teaching are

necessary to build up a client base. Electronic communication still cannot replace the human factor.

Other mechanisms to build and maintain client relationships were traditional media (radio, newsletters and town criers (common in West Africa), as well as partners such as NGOs and government agencies.

Training

Training is necessary for several reasons. Many clients are unfamiliar with smartphones, so have to learn how to use both the equipment and the software. Illiteracy is often a barrier: reading text messages and even the most visually-oriented graphical interface takes literacy skills. Overcoming suspicion and reluctance to try out new ideas require hands-on demonstrations. And seeing is often believing: it is much easier to convince someone of the value of a new idea if they can see it and work it themselves.

Lack of funds for marketing

The lack of focus on marketing translates into a lack of funding for this type of activity. Training, workshops, field days, road shows and other face-to-face interactions are time-consuming and expensive, require skilled and motivated staff, but reach relatively small numbers of people. They can only be viable if participants at these events are sufficiently convinced to start using the app themselves, and if they in turn persuade and teach their friends and neighbours to do so too – so creating a snowball effect.

Several of the projects used radio and other mass media to promote their products. But they could do more. The role of the mass media is not to teach people how to use an app, but to familiarise them with the idea and to make them receptive to trying it out.

Amanda Suraj (centre) of the University of the West Indies training fishermen in Trinidad and Tobago how to use the mFisheries app

❹ Channels

It is easy to confuse what is the main product produced by the organisations. In all cases, it is not the app or website they develop and maintain, but rather the **information** that people can get from it. This is analogous to the music industry: what users want is not a **carrier** (a vinyl record, a CD, a website or audio streaming service), but the **content** – the music itself. The carrier, or channel, can be upgraded, redesigned, or transformed into another medium, without affecting the content. Similarly, the content (the price data, weather information or production tips) can be updated and revised without changing the carrier.

Apps

The main channel the projects used for serving clients was via their app or website. This is unlike the case with "normal" products such as a bag of rice or a bar of soap, where the distribution channel is a separate physical entity: a shop, market stall or delivery van. The organisations expended a lot of effort in developing and tweaking their apps to make them easy to understand and use.

Other media

But the same content can also be distributed via other channels. Several of the organisations did this, especially if they wished to serve different client groups. RONGEAD, for example, supplies information not just via its N'kalô mobile phone app (to farmers), but also via newsletters (to buyers, processors and exporters).

❺ Key activities

The main activities performed by the seven organisations to provide their services have been developing the software, gathering and analysing information, and coordinating with partners. As stated above, much of the effort has gone into these activities, and perhaps not enough into the marketing aspects.

Gathering data

The data and information used by each of the organisations come from various sources:

■ Information generated by the **organisations themselves** or by collaborators: Syecomp maps the farms it surveys; RONGEAD gleans information

One of the images used in Yam Pukri's "Buy Burkinabè" campaign in Burkina Faso

from its network of correspondents on value chains; Yam Pukri collects the contact details of actors in the agricultural sector; eLEAF uses soil-moisture data supplied by the Gezira Irrigation Scheme.

■ Information from **users** of the app, such as Ensibuuko's MOBIS mobile money system, or the tracking information generated by the University of the West Indies' mFisheries app.

■ Information gathered by **third parties**, including the government, such as price data and weather forecasts.

■ **Satellite**-based information, such as the vegetation imagery used by eLEAF and Syecomp.

Adding value

The organizations add value to these data in various ways:

■ **By presenting the data in a convenient, easy-to-use form.** To find today's price, a farmer does not have to visit a market or dig through a spreadsheet on a computer in a distant office. A few taps on a phone keyboard is enough.

■ **By collating single datasets and revealing trends.** Information on today's price is useful. But is the price rising or falling? Is it higher or lower than last year? The answers are much more useful than a single number.

■ **By collating data from several sources.** Several of the organisations bundle data from several sources: the mFisheries app from the University of the West Indies offers weather forecasts, price information, navigation data and first aid tips, all from different sources. Some apps take this a step further, by creating new information from these different datasets. Syecomp, for example, marries farm maps with satellite imagery; eLEAF combines data from satellites, meteorological stations and field measurements.

■ **By making recommendations.** The most valuable type of information, from the user's point of view, is a recommendation: like "irrigate next Tuesday" from eLEAF, or "sell your cashew" (from RONGEAD).

Pilot testing

Pilot testing is important to discover two things: will an app work in a field situation, and what do the potential clients think of it (and will they use it). Several of the organisations pilot-tested their apps with CTA support: Syecomp, eLEAF and Yam Pukri. In all these cases, the app was new or had been redesigned.

It is important not to treat the pilot testing merely as a demonstration of the software. It is necessary to check for problems with the software itself (what works in the office may not necessarily work in the bush or out at sea), and to watch carefully how the users interact with the app. This should show where and how the app needs to be revised to make it function better and be more readily accepted.

❻ Key resources

Building a team

A strong team is needed to create and market a successful app. This includes not just the software specialists who write the code, but also managers, marketers, trainers, data-gatherers, analysts, etc. For most of the seven

Ensibuuko uses traditional media such as flip charts to explain mobile banking to potential clients
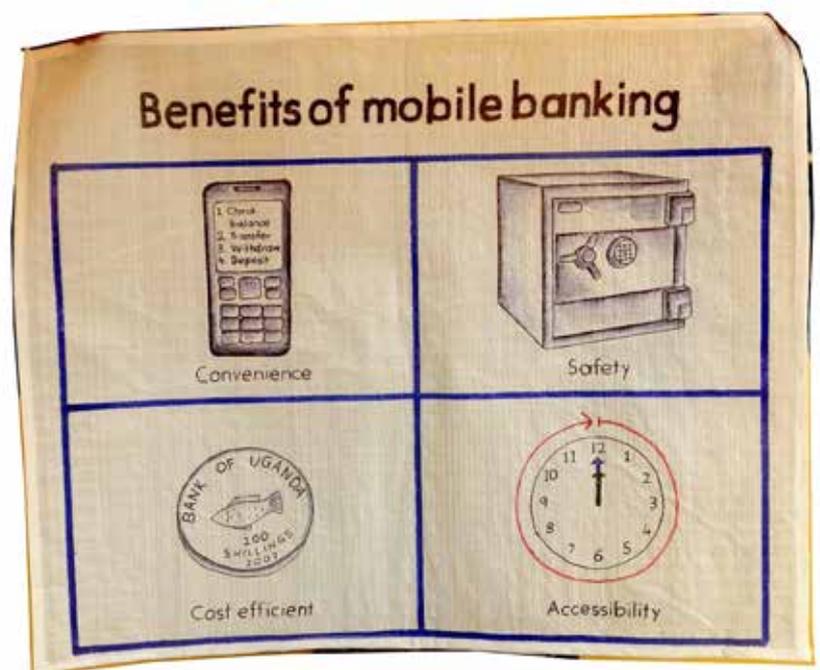
organisations, talented and dedicated staff are the most important human resource they have – more important than software, data or organisation.

But it can be difficult to attract and retain skilled staff – especially the developers who can tweak the software. This was particularly a problem for the University of the West Indies, where turnover rates have been high.

❼ Business services and partners

Partners have been vital to the success of all the projects. They have included mobile network operators, industry associations, government agencies, extension services, development organisations, farmers' groups, value chain actors (such as traders and processors), savings and credit cooperatives, research institutions, and lobbying groups. They help in developing the app, gathering data, mobilising and educating clients and persuading them to use the app, and in raising funds or covering costs. Having the right set of partners is essential: too many, and the process become unwieldy; too few or the wrong ones, and it is impossible to get decisions made or the work done.

Educating partners

It is important that the partners understand enough of the technology to be able to contribute ideas and offer constructive criticism. That means that educating and training the partners is important. Extension workers cannot promote an app if they do not know how to use it or cannot answer farmers' questions. A farmers' association may need help to take full advantage of the resources on Yam Pukri's lobbying website.

The government

The government is a potential source of support in terms of finance, data (much of which is collected by government bodies) and staff (extension staff can help promote an app). That makes it necessary to work closely with relevant government institutions, and to identify key individuals within (or close to) government who can act as champions.

❽ Income

Gaining sufficient income to cover the costs (and perhaps to make a profit) is a problem for many organizations that offer mobile and internet services in rural areas of developing countries.

Women do much of the farming in Ghana, so Farmerline holds special training courses to introduce them to its Mergdata agricultural information service

An increasing number of farmers and fisherfolk now have smartphones. The ICT4Ag project has shown how they can be used to boost production and livelihoods
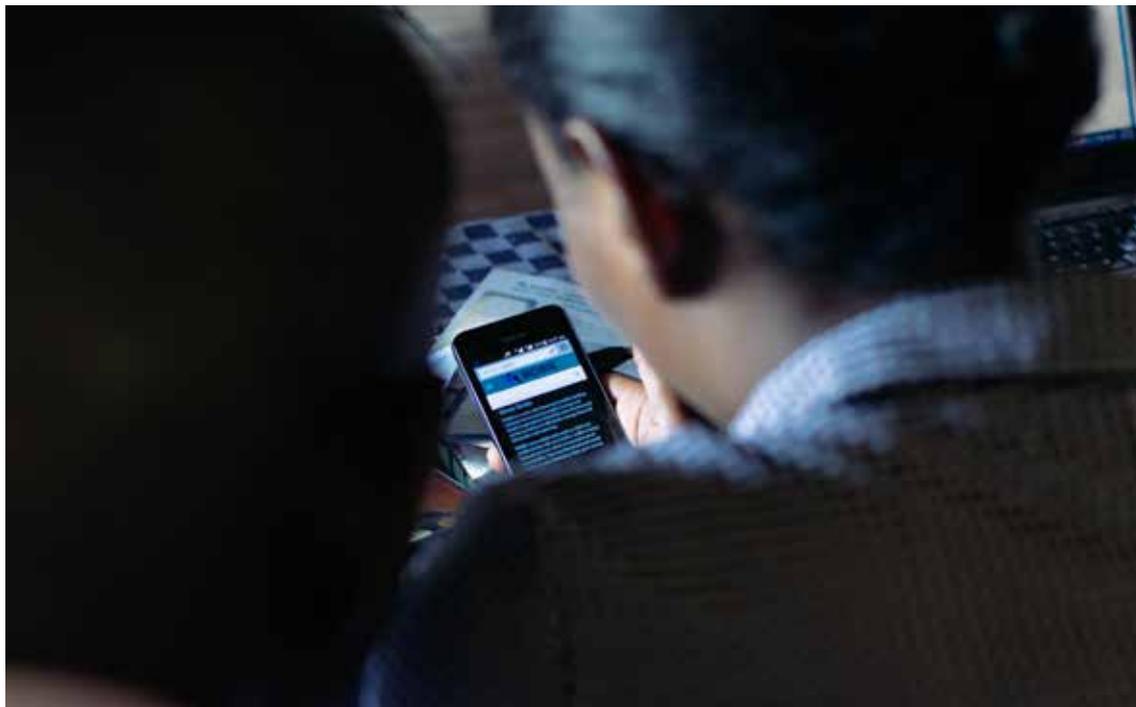
Advertising and subscriptions

Advertising and subscriptions are the main sources of income for internet firms in the developed world. But these are problematic in the developing world, especially for enterprises that develop apps for small-scale rural users. Such users are reluctant (or unable) to pay for information services, even if they promise a clear economic benefit. And advertisers do not find such users an attractive audience. Among the seven projects, subscriptions and user fees accounted for only a small percentage of the income generated, and none of the project holders mentioned advertising.

Development aid

Such enterprises have to be creative and rely on a wider range of income sources. The major source of income for all has been development aid – organisations such as CTA, bilateral and multilateral donors and international NGOs. Such donors are often willing to cover the initial costs of developing and rolling out a service, but not the recurrent costs of implementation.

Subsidies from other income streams

Some of the organisations subsidise their information provision by engaging in related work that is paid for, such as writing press articles (RONGEAD), and implementing consultancies and contracts (Syecomp). Others are able to subsidise the costs from other sources (University of the West Indies). Farmerline licenses its software to other users. RONGEAD generates income from companies in the sector it is working in: possible because it deals mainly with high-value cash crops. Syecomp has adopted a "freemium" model: it offers certain services for free, but charges for premium services such as printouts and updates. Several of the organisations cover part of their costs through agreements with their mobile network providers.

❾ Costs

Personnel

Labour costs have been the main financial outlay for most of the projects. This is not surprising: information products do not require buying expensive raw materials, big outlays for equipment or heavy transport

costs. Rather, the costs can be measured in terms of the labour needed to gather and process information, develop software and train users. These are skilled jobs, so the workers need to be paid well or they will look for jobs elsewhere.

Other costs

Other costs include equipment, communication (such as fees charged by mobile operators), marketing, training, transport and data (such as purchasing satellite imagery).

Cutting costs

Many of these costs are fixed: it takes the same amount of staff time to produce an information bulletin for a single user as it does for a thousand. That means that efforts to balance costs and revenues must focus on increasing revenues rather than cutting costs.

Nevertheless, it is possible to reduce costs in various ways. One is to reduce the scope and ambition of the app or service. RONGEAD, for example, distributes information to clients who have simple mobile phones. This means it can avoid the expense of having to develop and maintain a fancy graphical interface for its app.

Another way to reduce costs is to trim the costs of data gathering. Many market-data providers rely on armies of data-collectors at markets and border-crossings. RONGEAD has a network of informants – but it does not pay them in cash. Rather, it pays them in the form of information. RONGEAD itself has just one paid specialist in each country it serves.

Sustainability

Who sustains?

All seven projects face a problem with sustainability. Two of these are institutional in nature.

■ The University of the West Indies lacks the capacity to commercialise the mFisheries app, and there is no obvious partner who can take it over. Commercial providers are unlikely to be interested because of the low

Creating, launching, promoting, maintaining and updating an information service is expensive. Providers must find sustainable ways to cover their costs
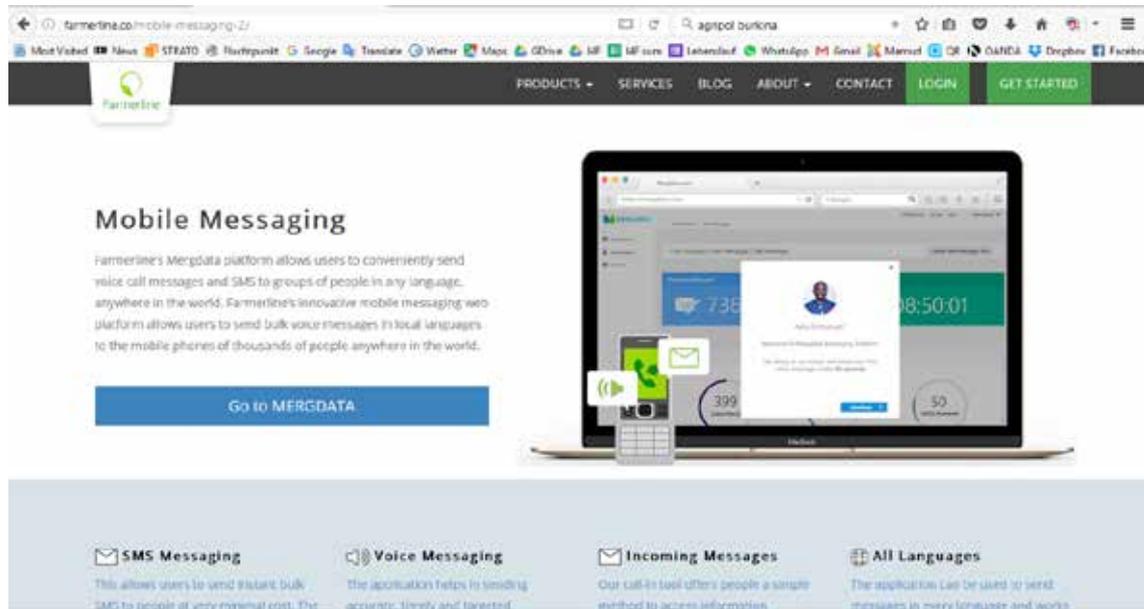
potential to make money; fishers' associations lack the business expertise and orientation for such a project. Perhaps the governments in the region – in the form of the coastguard or ministry of fisheries, can be persuaded to take the lead.

■ eLEAF's irrigation-advice app has huge potential to raise yields in Africa's largest irrigation scheme. But its future depends on the ability of the scheme management and the Hydraulics Research Centre (eLEAF's partner) to continue and expand the work done so far.

The other five projects face sustainability problems that are economic rather than institutional in nature. They are all run by commercial firms, or by NGOs with a long-term commitment to the area and topic. But the apps do not yet generate enough revenue to cover their costs, and for one (Yam Pukri's Agripol website), there is no mechanism for it to do so.

Weaning off support

Despite these innovative solutions to increasing revenue and cutting costs, it remains difficult to see how the services can wean themselves off development support. For some, it is possible that the government

may step in: in Sudan, for example, it is the national interest that farmers in the Gezira Irrigation Scheme produce high yields. It may be possible to persuade the government to subsidize the costs of eLEAF's irrigation advisory services, making them free, or nearly free, at point of use.

An alternative is to try to build up a large client base as quickly as possible. If each user pays a small fee, and if enough users subscribe, it may be possible to generate sufficient funds to support the service. This was a rationale behind much of CTA's support, especially for the client training run by Ensibuuko and Farmerline.

Further reading

Acknowledgements

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CTA Technical Briefs document experience and learning in topical issues of interest to the ACP agricultural development community. They are intended as a practical guide for people involved in an issue professionally or for people with a strong interest in the topic.

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