



ICT APPLICATIONS AND AGRICULTURAL INPUT SUPPLY COMPANIES: HIGHLIGHTS FROM AFRICA

INTRODUCTION

This is one of a series of briefing papers developed by the FACET project to help USAID missions and their implementing partners in sub-Saharan Africa promote information communication technologies (ICT) within their agriculture development programs, including Feed the Future.

This briefing paper presents the results of an assessment carried out to identify, document and share examples of ICTs that are being used by African agricultural input supply companies to better manage their distribution networks and provide important products, services, information and technical support to their farmer clients.

The assessment was carried out between June and September 2012, and included field visits to Kenya and Zambia to interview agricultural input supply companies. This resulted in the identification of a number of ICT applications being used by these companies to improve operations and provide benefits to farmers.

The paper includes a description of agricultural input supply companies, selected ICT applications they are using, and the impact these applications are having both on their operations and with farmers they sell to. It also includes implications for donor programs and ways to facilitate the integration of ICTs by targeted companies.

AGRICULTURAL INPUT SUPPLY COMPANIES

Agriculture input supply companies provide goods and services to farmers such as seeds, fertilizers, herbicides, pesticides, soil testing and crop spraying. They provide these through a network of distributors and retailers that often reach thousands of farmers. The goods and services they provide can help farmers to achieve greater yields and improved quality crops—leading to greater income and food security.

Input supply companies have incentives to provide good quality products, services and information to as many farmers as possible. Companies that market new seed varieties or fertilizers, for example, have incentives to organize demonstration plots and host farmer field days to demonstrate the efficacy of their products and provide farmers with technical information on the correct use of the products. They also have incentives to conduct research into new and more productive varieties and to tailor their products and packaging to the needs of different farmers.

In most cases input supply company objectives align well with those of development programs. For these reasons it makes sense to encourage them in improving their operations and building their capacity to provide important products, services, and technical information to farmers. ICT applications can assist with this and

allow the companies to implement new strategies that were not possible before.

DISTRIBUTION NETWORKS

To reach large numbers of farmers input supply companies need effective distribution networks. Typical networks include several “levels” such as distributors, agro-dealers and rural agro-agents. While centralized distribution from the company is important, a wide network of decentralized locations provides direct access to large numbers of farmer clients. ICTs such as those described here are being used to effectively manage and reduce the transaction costs associated with agent networks. In many cases, companies would be unable to sustain these networks (and reach marginalized farmers) without these ICT applications. In particular, networks of rural agro-agents allow input supply companies to expand their reach to remote and hard to reach rural areas. These agents, once trained by various companies, can serve the role of both salesperson and extension advisor to local farmers. A successful agent can bring in new clients, create brand loyalty with farmers, and help ensure that products are used correctly and successfully by farmers.

ICT applications can help input supply companies to expand and improve efficiencies at all levels of their distribution network. In particular, they can help the

companies overcome the cost and challenges involved in establishing and managing rural agent networks.

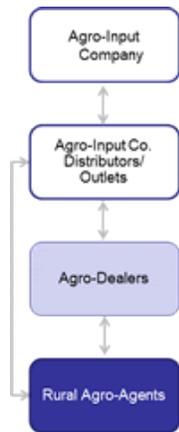


Figure 1: Example of distribution network

INCORPORATING ICT

The FACET research team found that agricultural input supply companies are using ICT applications in a variety of ways to improve the products, services, and support they provide to farmers. Using mobile phones and SMS, for example, they have been able to expand their distribution channels to more remote rural areas and offer products and services to farmers that were not available to them before. Software applications are allowing the companies to establish and manage rural agent networks that facilitate farmer access to products, services, and technical support. Pre-paid vouchers and mobile banking applications are helping farmers to place orders, and pay for agricultural inputs and services without traveling long distances. This includes the ability to prepay for inputs at times of the year when they have cash on hand, and ensure that the inputs will be there when they need them. Companies can now also offer promotional coupons that are tracked and managed by computer database systems to provide farmers with incentives to try out new and improved products. ICT is also making it more cost effective for

companies to provide needed services to farmers such as soil testing and to provide agronomic advice (to ensure they understand the correct use of the companies' products and avoid poor implementation).

ICT APPLICATIONS BEING USED BY AGRICULTURAL INPUT SUPPLY COMPANIES

This section highlights some of the ICT applications being used by agricultural input supply companies that were interviewed in Kenya and Zambia. They include:

- Electronic prepaid vouchers for input purchases
- Customer information websites and SMS systems
- ICT to facilitate crop insurance
- Mobile banking to facilitate payments for inputs
- Discount coupons to reward rural agents and promote sales
- Applications to expand and manage rural agent networks

A short description of each ICT application follows, along with a discussion of the impact that the application is having on both farmers and the company. More detailed information on many of these applications can be found online.¹

Electronic Prepaid Vouchers for Input Purchases

[MRI Agro](#) in Zambia is using an electronic prepaid voucher system that enables farmers to pre-pay for inputs. This system was developed by Zoona, a Zambian company that develops and offers electronic financial transactions systems).

Through this system MRI is able to increase pre-orders of their hybrid

¹ Profiles are available at: <https://communities.usaidallnet.gov/ictforag/document-library/ict-and-ag-profiles>

maize seeds and other inputs by selling prepaid cards to farmers. As an incentive to use the prepaid cards, farmers are offered a 10% discount on input purchases. Each prepaid card contains a code that is electronically registered at the point of purchase, together with the farmer's unique national identification and mobile phone number. Upon registration, the network sends the farmer an SMS that validates the purchase and notifies them of the date and location where the inputs can be picked up.

Prepaid vouchers can help input supply companies to increase sales during the period that farmers/customers have resources available. The electronic registration of farmers' prepaid vouchers and their profile also enables companies to compile a database of customers for targeted SMS-based marketing, information and product promotion. Participating retailers can benefit by stimulating sales during traditionally slower periods. Farmers benefit by purchasing seeds at a discount and by gaining assurance that they will have the seeds they need during the planting season.

Customer Information Websites and SMS Systems

The Kenyan input supply firm Farmchem sells seeds and fertilizers through a network of distributors. To help increase sales and customer loyalty, the company has developed [Angaza Mkulima](#), a customer information website and SMS communication system to provide valuable information to farmers. To date, over 50,000 people have registered for the service. Of those users, 80% access the system via a mobile SMS messaging feature. Both the website and the SMS messages provide a wide variety of information to farmers such as farming tips and strategies, locations of authorized

retailers, and product updates and pricing. Input supply distributors can access the system to place orders directly with the company, and Farmchem employees can generate reports to provide useful demographic information for sales and distribution.

Through the Angaza Mkulima system, registered farmers and other individuals have access to relevant information on inputs and production. It is also beginning to provide Farmchem with useful information about their customers that can be used to improve products, technical support, and marketing efforts based on customer preferences.

ICT to Facilitate Crop Insurance

[Kilimo Salama](#) is a micro-insurance program designed specifically for Kenyan maize and wheat farmers to allow them to insure their farm inputs against excess rain and drought conditions. A partnership between the Syngenta Foundation for Sustainable Agriculture, UAP Insurance, and Safaricom, Kilimo Salama was established in March 2009 and distributes insurance policies via local stockists, agro-vets, and microcredit officers.

ICT plays a key role in managing Kilimo Salama. Policy registration is completed by scanning a barcode using a specially developed mobile phone application which sends a message to a cloud-based server. Farmers pay for the insurance using M-PESA and then access information about their policies by sending SMS messages to an automated system. Solar-powered weather stations collect the weather data. At the end of each growing season, they are automatically compared to an index based on historical weather data. If the season's rainfall is 15% above or below the average, the insurance

payout owed to client farmers is calculated and sent via automated mobile payment. There is no "claims" process, and they do not send agents to visit the farms of clients.

Mobile Banking to Facilitate Payments for Inputs

M-PESA is one example of a mobile phone-based payment system that can be used to facilitate input payments.² M-PESA customers can use the system's broad network of retailers across the country to deposit and withdraw to their M-PESA accounts.

Customers can use the system to make cash withdrawals, purchase items such as agricultural inputs, pay bills, receive salary payments, or purchase mobile phone credit. In exchange for providing this convenience, the retailers receive a commission, which can become a significant source of income. Input supply companies, agro-dealers, distributors, and farmers in Kenya (where M-PESA is prevalent) can all find advantages as it allows transactions to take place electronically thereby making transactions more convenient and reducing the risks of handling cash.

The M-PESA system is a form of "branchless banking" meaning that users, especially in rural areas, save significant time and money by not having to make the trip to larger urban centers in order to get cash or perform transactions at a traditional bank location. Agricultural input supply companies enjoy similar benefits of not having to physically get payment from farmers in person or deal with the paper trail and

² For more information on mobile finance options, read '[Key Lessons for Mobile Finance in African Agriculture: Three Case Studies](#)' and '[Using Mobile Finance to Enhance Agriculture in Africa](#)'.

potential issues inherent in using a cash payment system.

Using ICT to Combat "Fake" Agro-Inputs

Counterfeit agricultural inputs are a wide-spread problem in many African countries. Combating this problem is high on the agendas of input supply companies but tracking inputs from factory to farm often proves difficult. KEPHIS, the Kenya Plant Health Inspectorate Service, provides an SMS service to help diligent farmers verify that seed they have purchased is from a licensed input dealer. The farmer sends an SMS containing the dealer's license number to the KEHPIS system and receives an response confirming the agro-dealer's status. The service is available for users of Kenya's Zain and Safaricom mobile networks and the only cost to farmers is the cost of the outgoing SMS.

IFDC and CropLife are also currently piloting a mobile authentication service using scratch labels affixed to crop protection products (i.e. pesticides) and SMS verification system in Uganda that informs consumers if the inputs they have purchased are fake or genuine. If successful, they plan to expand the service to cover seeds and fertilizers as well.

Discount Coupons to Reward Rural Agents and Promote Sales

Some farmers are more comfortable travelling to agro-dealers to purchase inputs rather than giving their trust and money to local rural agents that represent input supply companies. To address this issue and support their agents, [Plant Agrichem Services Ltd.](#), a major input supplier in Zambia, devised a system by which

the company's rural agents offer farmers discount coupons for specific products. This allows the agents to deepen their relationship with farmers and also to provide them with technical advice. It also allows the agents to get credit for the sales they make and provides an opportunity for the company to promote new or special products. The company uses a custom-built database to collect information such as input purchases per farmer, rural agent sales and commissions, sales per agro-dealer, and farmer demographic information. That storage of information is then used consistently to improve product marketing.

The goal of the discount system is to increase incentives for rural agents and motivate them to market inputs to larger numbers of smallholder farmers. It is designed to increase their income and make sure they are paid for hard work. Product discounts and timely technical extension advice (offered by the rural agents that distribute the coupons) also spurs farmers' interest and sales. The database developed by Plant Agrichem to administer the discount coupon scheme is an effective tool to monitor and manage the performance of all their rural agents. Without this, the discount coupon system could not work effectively. The improved efficiency of commission payments helps to increase product sales and improve the commitment and enthusiasm of rural agents. The discount coupon system also provides transparency and builds trust between input supply companies and their network of agents.

ICT Applications to Expand and Manage Rural Agent Networks

Because rural agents are widely dispersed and often located in hard to reach areas, management of these

networks can be difficult and expensive. A variety of ICT applications are being used by input supply companies to address this issue and manage and expand their rural agent networks. Input supply companies in Zambia such as Plant Agrichem and Minelands are beginning to use rural sales agents as a means of promoting their products and services with farmers in more remote rural areas. By identifying, training, and providing incentives to individuals in rural areas that can represent their company, sell their products, and provide technical support to farmers in the use of those products, input supply companies are tapping into new markets. Several examples follow.

Electronic payment of agents

Coordinating commission and salary payments for a large number of widely dispersed agents can be difficult. By incorporating electronic payment services (now offered by several local banks) input supply companies, such as Omnia Fertilizer in Zambia are able to quickly and reliably pay their agents through direct deposits to their bank accounts.

SMS-based product ordering

Traveling to and from distribution outlets to place orders can be expensive for agents, so input supply companies such as MRI Agro in Zambia now allow agents to place orders by SMS. Such systems save significant time and money. They also create electronic records of the transactions that can provide information such as agent identification, location, products and quantity requested, and any special requests.

Mobile payments by farmers

There are inherent risks in a system where cash payments are handled by multiple people as in a rural agent network. These risks are being

reduced through the introduction of mobile payment systems such as M-PESA. By allowing farmers, agro-dealers and distributors to transact electronically risks are reduced, financial transparency is improved, and agents can focus more on product marketing and farmer training.

Database and tracking systems

It can be difficult for a company to manage large numbers of agents and monitor sales. To address this challenge, companies like Plant Agrichem use database systems to record agent activity and customer sales information. With this information, they can quickly identify sales trends and recognize successful agents. Some companies are using off-the-shelf software applications while others are developing customized systems.

Agricultural Input Market Information Systems

[AMITSA](#) is a regional agricultural input market information system that provides in-depth technical information about agricultural inputs for farmers and agro-dealers on its free website. Up-to-date pricing data is also available on agricultural inputs from the nine participating countries (Burundi, Kenya, Malawi, Mozambique, Rwanda, Swaziland, Tanzania, Uganda, and Zambia).

AMITSA is managed by IFDC with support from the East Africa Community and the Common Market for Eastern and Southern Africa. It also has partnerships with numerous trade associations, regional programs, ministries of agriculture, and NGOs.

IMPLICATIONS FOR USAID AND DEVELOPMENT PRACTITIONERS

The most promising way for donors and practitioners to be involved is to help to buy down the risk that companies face in developing and experimenting with these applications—with the responsibility for implementation lying with the companies themselves. The research conducted for this briefing paper has shown that there are a variety of emerging ICT applications that can help agricultural input supply companies to improve the efficiency of their operations as well as their ability to provide important products, services, and technical information to farmers. It is important to note that most of the applications described in this paper are being used by the companies on their own, without the support of a donor program. They are using them because they have commercial incentives to develop good products, provide useful information to farmers, promote brand loyalty, and improve their distribution networks. In order to promote this kind of ownership and sustainability, donor programs need to make sure to engage input supply companies in a participatory dialogue in which the companies themselves determine the ICT applications that make sense for them. If a donor program pushes an ICT solution that companies do not need or see value in, then it is less likely to succeed.

Cost Share, Facilitation, and Technical Support

Donor program cost shares should be strategic in nature and ensure that the companies are committed to, and making a substantial investment in, proposed initiatives. A typical strategy should support costs related to research and development, exposure visits, testing, and training. A strong strategy would not

generally support salaries of company employees, working capital, or fixed assets as this form of cost share can create the wrong incentives and/or dependency situations). Donor programs can also provide support by assisting the companies to think through and analyze the costs and benefits of new ICTs. In addition, they can facilitate the integration of ICTs by inviting input supply companies to propose their own ideas and strategies for developing and integrating ICT into their operations. This can be facilitated if needed by presenting different ICT opportunities to interested companies and/or by facilitating exposure visits for companies to see how ICT applications are being applied in other countries or locations. Ultimately, however, it is the input supply companies themselves that need to decide which, if any, ICT application makes sense for them.

Once companies have identified, or become aware of, ICT opportunities the donor program can solicit their proposed ideas and strategies using a pre-determined application format referred to as an “Invitation for Application” (IFA). The IFA describes the donor program’s objective of encouraging input supply companies to invest in new ICTs that they might otherwise not invest in on their own or take a long time to do so (due to high investment costs and risks). It then presents the conditions of participation in the program and describes the kinds of technical and cost share support that can be provided to help companies reduce the risk and cost of developing, experimenting, or implementing new ICT applications or systems.

Use of question guides to facilitate ICT integration

Donor programs can also play an important role in supporting ICT

integration by developing “question guides” that present input supply companies with the critical questions they need to ask, and decisions they need to make, before introducing a new ICT into their operations.

General Questions

- What role will the ICT play in your operations?
- What will the set up and recurring costs of the ICT application be?
- What cost savings or new sales will the ICT generate?
- How will you train your staff and distribution network in the use of the ICT?

Additional questions can be developed based on the specific ICT application in question. This requires research into the proposed ICT to ensure that questions are appropriate (and to enable the facilitator to provide insights and suggestions as needed). When completed, the question guide can be used by donor program staff to facilitate a strategic planning exercise with the input supply company. This approach allows the company to develop and define their own approach for developing or integrating the ICT.

Forging agreements for ICT development

Once a company has identified the specifications of the ICT it wants to develop and their proposed strategy for doing so the donor program can establish a Memorandum of Understanding (MOU) that describes in detail all aspects of the support the donor program will provide. MOUs are important as they define the roles and responsibilities of both the company and the donor program. Well defined agreements promote successful collaboration and help avoid misunderstandings among the parties involved.

CONCLUSION

Over the next few years new ICT tools will likely emerge that will provide added and cost-efficient benefits to both input supply companies and farmers. As smartphone technologies improve, for example, and as the phones become cheaper and coverage expands, new applications will emerge allowing farmers to share pictures or videos of their crops and access technical support directly from input supply companies. New innovations in mobile banking technologies will provide increasing options for farmers to purchase inputs.

The International Rice Research Institute's [Nutrient Manager for Rice](#), is already providing tailored input information for rice farmers in China, the Philippines, and Indonesia through both mobile and web applications. They also have plans to expand into West Africa in the future, although it is uncertain exactly when this will occur. More advanced technologies, such as those that are currently available for large commercial farmers, may also become affordable for small scale farmers as well. One example of a more advanced input management system is Monsanto's [Integrated Farming Systems](#), which uses a database system that can prescribe inputs for a specific farm field to maximize yield.

There will also continue to be a space for third party providers of mobile and web applications aimed at agribusinesses, including input suppliers. One such example is the recently launched [mFarms](#) platform in Ghana, which provides a number

of subscription-based tools that input suppliers and agro-dealers can use to improve efficiencies. Although currently only available in Ghana, if this type of subscription-based, modular platform proves successful it will likely expand—or be replicated—elsewhere.

While all of the applications highlighted in this paper have shown promise, it is important to remember that ICT is a tool, not a panacea, and not all solutions fit all business models or contexts. In addition, the landscape is changing so rapidly that it is important to do your own research on how ICT continues to be used, both effectively and poorly, by input suppliers. Although some of the companies highlighted here developed their own systems, the number of off-the-shelf, customizable solutions continues to grow. It is rarely necessary to reinvent the wheel or to develop from scratch.

In addition, even small, 'resource-lite' technologies have the potential to yield significant returns for companies and farmers. Embracing technology can enable input supply companies to improve products and services and make them available to a larger number of farmers. There are also opportunities to adapt and adopt ICT applications that are already on the market but not currently being utilized in agriculture, so look out for promising applications from other sectors as well. All told, technology can indeed be a powerful partner and catalyst in the effort to promote high quality and affordable agricultural inputs to all farmers in Africa, including those marginalized and smallholder farmers at the "base of the pyramid."

This series of papers is supported by USAID's Fostering Agriculture Competitiveness Employing Information Communication Technologies (FACET) project under the Financial Integration, Economic Leveraging, Broad-Based Dissemination and Support Leaders with Associates award (FIELD-Support LWA). It was written by Action for Enterprise. FACET offers on-demand field support to help missions with the challenges of using these ICT interventions in agricultural development. To learn more about field support options, contact Judy Payne, ICT Advisor, (jpayne@usaid.gov).

RESOURCES

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The Economist, "[Let us in: Mobile money would transform even more lives in poor countries if regulators got out of the way](#)" (August 25th, 2012)

Action for Enterprise and Judy Payne, "[ICT Applications for Distribution and Supply Chain Management in sub-Saharan African Agriculture](#)" (December 2010)

[Blog post on MRI Agro's discount coupons](#) (August 2011)

Farmchem's [Angaza Mkulima website](#)

[Kilimo Salama's website](#)

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