



USING ICT TO ENHANCE MARKETING FOR SMALL AGRICULTURAL PRODUCERS

INTRODUCTION

This is one of a series of briefing papers developed by USAID's FACET project to help USAID missions and agricultural development practitioners (including non-governmental organizations, the private sector and other implementation partners) in sub-Saharan Africa identify appropriate and effective information and communication technologies (ICT) for agriculture value chain interventions—including Feed the Future projects.

Specifically, this paper focuses on how ICT solutions can empower agricultural producers by improving their marketing capabilities, with an emphasis on smallholder farmers. ICT solutions can increase efficiencies and improve competitive dynamics in agriculture, which can raise agricultural productivity and incomes, and increase food security. While we understand that smallholder farmers face many constraints in terms of productivity and market access that may need to be addressed before tackling marketing, any increasing number of farmers and farmer groups are trying to market better. This paper is meant to help practitioners figure out if, and if so, when, ICT might be useful to those ends.

First, this paper defines agricultural marketing and the ICT solutions currently being developed and deployed. Next, a set of guiding questions provides a framework for analyzing expansion strategies. Trends to consider in designing, deploying and scaling new ICT solutions for marketing in agriculture are then highlighted.

The research, which was conducted in February and March 2013, is based upon

interviews with agricultural value chain participants including development practitioners, NGOs, farmers, cooperative union representatives, traders, and emerging technology entrepreneurs operating in sub-Saharan Africa.

AGRICULTURAL MARKETING DEFINED

Marketing is defined as the process of identifying, communicating with, and maintaining relationships with buyers of a producer's products to directly affect volume, value and timing of sales. Marketing activities enable a producer to find new buyers, build and maintain relationships with current buyers, and access market research to manage supply, anticipate demands and establish prices. Agricultural products discussed range from staple to high-value crops; however, there is an emphasis on cash crops that are marketed by smallholder producers and provide income to support rural households.

Larger-scale participants in sub-Saharan African agricultural value chains such as commercial farmers, traders, wholesalers and exporters often have well-developed marketing functions operating in these areas. Smallholders, however, are still very limited in their marketing capabilities. Often they are individual households who depend upon just one buyer, and have little access to price or other demand-related information and little power to negotiate. Cooperative unions and outgrower schemes are designed to organize and empower smallholders and these are often conduits for delivering scaled solutions

to smallholders and are referenced in this paper.¹

ICT SOLUTIONS TO ENHANCE MARKETING

The ICT 'solutions' in question range from voice calls, SMS, and information delivery platforms to integrated market facilitation systems. These include donor, NGO, government and private sector-backed programs—some focus on one community or crop, others expanding regionally and globally. Devices used may include basic phones, smartphones, tablets and other customized ICT software and/or systems. Given its rapid growth, there is a special emphasis in this paper on mobile technology, which is revolutionizing agricultural markets end-to-end.

Many larger scale value chain participants are already using ICT to streamline and enhance their marketing functions, ranging from using social networks to complex customer management tools. The focus of this paper, however, is on technologies that create opportunities to empower the smallholder farmer who has only nascent access to technology and until recently had little chance of direct connection with markets beyond his or her local contacts.

ICT solutions offer the opportunity to enhance smallholder marketing in the following ways:

Finding new buyers

Identifying additional buyers and having multiple buyers available is advantageous

¹ For more information on ICT and outgrowers, read [ICT-enabled Outgrowing Operations: Highlights from Africa](#).

to producers. New buyers may be willing to pay a higher price, may wish to buy higher volumes of product and/or may offer other terms of trade favorable to the producer such as better timing or product demands that are more in line with what they produce. Smallholders, however, often deal with one or at most a handful of buyers who either pick up directly from them or who convene at small local markets. Some smallholders are organized into cooperative groups that interact with buyers on their behalves; however, these are still small scale and have less capability than their larger value chain partners.

Basic voice calls have already empowered smallholders by expanding their immediate communication networks to be in contact with a wider circle of potential buyers. A study in Benin has showed that using mobile phones facilitates transactions and provides producers access to relevant, timely information, allowing them to sell at a higher price improve their income.² Beyond voice, however, current ICT solutions offer limited access to new buyers for smallholders, though several systems promise greater benefits in the future. Integrated farm management solutions plan to offer capabilities to connect with new buyers (see Farmbook and mFarms described below), though buyer identification is secondary here to the data management function. Google Trader is designed to support this function and is ostensibly targeted at large, mid- and small-sized agricultural producers with web access, but there is little evidence to date that there is consistent or sustainable usage. [MFarm](#) has also developed a mobile platform to enable collective sales that is being rolled out in Kenya.

Anecdotally, there is some evidence of agricultural producers finding new buyers through global social networks. Through Alibaba.com (the Chinese business-to-business portal), one Ethiopian honey exporter located a

² A.B.E.A. Adégbidi. (2012) [Impact of ICT use on access to markets of pineapple smallholder farmers in Benin.](#)

Chinese buyer, arranged a site visit and hosted the buyer, then successfully completed a volume sale. This honey exporter sourced his product from hundreds of small farmers who benefitted from the sale. However, this is just one example, and does not yet represent proof of the model on a larger scale.

One of the main challenges is the trust factor that must be overcome for buyers to turn to new ICT-enabled forums as an alternative to their relationship-based trade. In addition, there are often not accepted or understood grading standards for many of the agricultural products that smallholders produce, meaning that buyers often do not know the exact quality of the crop until they see it for themselves. Until a sufficient level of trust and quality standards within these forums is established, it may be necessary for providers or organizations encouraging the use of these services to serve as an intermediary or broker.

Using market information to obtain higher prices and manage sales

Dozens of ICT solutions are being launched in developing countries worldwide to deliver market information to small farmers.³ Pricing is the most widely shared information with other information provided including weather, crop advisory, fertilizer availability, and updates on government schemes. Studies have shown that using ICT to deliver this type of information can benefit smallholder farmers by raising their bargaining power and increasing their incomes (by enabling them to better manage their inventories and negotiate for fairer prices), reducing price dispersion (variation in prices which creates market inefficiencies) and by reducing year-to-year price variations (stabilizing risks).⁴

³ Although slightly dated, the USAID Briefing Paper 'Using ICT to Provide Agriculture Market Price Information in Africa' provides an overview on the topic.

⁴ K. Asenso-Okyere, and D.A. Mekonnen. (January 2012) [The Importance of ICTs in the Provision of Information for Improving Agricultural Productivity and Rural Incomes in Africa](#), UNDP Regional Bureau for Africa.

Although the ultimate sustainability of the models is still unproven in the long term, there have been some measurable benefits to small farmers.⁵ Interestingly, the benefits do not appear to be uniformly applicable to all types of market information. For instance, a randomized control trial of 1,000 farmers using Esoko's market information service in Ghana found that farmers received between 7-11% increases in the price of yams, but no noticeable price increase for maize, cassava, or gari.⁶

One of the most immediate benefits of ICT solutions to smallholder farmers is in reducing transport and logistics costs of obtaining market information. Personal travel is traditionally the most common method of obtaining market information. For example, rather than having to walk miles to a local market to meet a trader, farmers can make a voice call to establish whether price and quantities demanded for a product that day are worth the travel effort. A study in Niger, for example, found that an average trip for an agricultural laborer to a market located 65km away can take 2–4 hours roundtrip, as compared to a two-minute call, which translates to cost savings of US\$0.50 per trip (assuming daily wage of \$US1).⁷

It is important to recognize, however, that more research is needed to explore exactly when and how access to market price information benefits smallholder farmers. While there are clearly examples of benefits to farmers in specific cases, development practitioners should tread carefully before assuming that access to this information alone is sufficient to farmers' obtaining higher prices.⁸

⁵ Zoltner, J. and Steffen, M. (2013) [An Assessment of Market Information Systems in East Africa.](#)

⁶ NYU. (2013) [Market Information Systems for Rural Farmers Evaluation Of Esoko MIS – Year 1 Results.](#)

⁷ J. Aker. (2010) [Mobile Phones and Economic Development in Africa.](#)

⁸ For another perspective on the benefits of mobile-delivered market price information, check out [The Myth of Market Price](#)

Better traceability, compliance with quality and safety standards

Commercial buyers (exporters and/or wholesalers) find it challenging to source from smallholders, as compliance with quality and safety standards are often compromised, either through a lack of defined or accepted standards, or because farmers do not even know they exist. Issues most often relate to communication, transport, packaging, processing and logistics. Cooperative unions or outgrower arrangements provide organizational platforms to address these challenges. Some of these entities are now using ICT solutions to further enhance management and quality control.

One example of an ICT solution is Farmforce, which was launched by the Syngenta Foundation for Sustainable Agriculture in Kenya in May 2013. Farmforce is a mobile-phone based software solution to manage smallholder outgrower schemes that has been piloted in Asia, Africa and Latin America to date.⁹ While not centrally a marketing tool, some of its features can be used to help farmers indirectly improve their marketing ability. The tool manages the growing activities of hundreds or thousands of smallholder farmers, and at the same time provides all the documentation, traceability, and compliance with the required standards. The system enables distributors and exporters to partner commercially with smallholder farmers. Field agents of exporters will use the system to update their records and monitor quality standards, which improve planning and can protect smallholders from market disruptions. For instance, export demand for Kenyan French beans and peas recently dropped suddenly by 25 percent when the World Trade Organization put Kenya on the watch list due to high pesticide residue levels; because of this, exporters stopped buying from about

[Information: Mobile Phones and Epistemology in ICTD](#) by Jenna Burrell and Elisa Oreglia from UC-Berkeley's School of Information.
⁹ [Case Study: farmforce](#), GSMA Mobile Development Intelligence, 2013.

50,000 small farmers. A tool such as Farmforce could enable better quality control and avoid such disruptions in the future.

Better production management and data analytics for smallholders

Beyond provision of information, ICT solutions are providing better farm management and data analytics solutions to improve marketing capabilities. On a basic level, one cooperative union manager in Senegal reports that he uses a simple ICT solution where he aggregates and analyzes yield data collected by SMS (and also in person) from his farmers using Google Docs on his solar-powered tablet. Armed with this data, he is better able to negotiate with buyers and follow through on his orders.

The [mFarms](#) platform (not to be confused with MFarm in Kenya) is a recently launched web-based application in Ghana that coordinates production to better fit marketing needs. The system connects agents and farm managers through photographs, logs and the location of farm activities via GPS to monitor and manage workflow. It also contains a search and query facility, where users can find the locations of farmers, buyers, input dealers, warehouses, haulage companies, sources of credit, and other service providers to efficiently develop business relations.

In another example, Farmbook is an application that Catholic Relief Services is currently in field testing in Zambia, Zimbabwe, Madagascar and Malawi. The solution enables field agents to help farmers plan their businesses and locate buyers more effectively in four primary ways: i) enabling collective sales, which increases their bargaining power; ii) tracking costs to assess profitability of marketing strategies; iii) upgrading production to meet marketing needs; and iv) cataloging results from one season to improve marketing activities in subsequent seasons.¹⁰

¹⁰ CRS. [FarmBook Business Planning Tools webinar](#), February 13, 2013.

Note that many of these types of solutions require a significant upfront investment and training, so practitioners should explore simpler, off-the shelf options if they are available (such as the Google Docs example).

IMPLICATIONS AND CONSIDERATIONS FOR DEVELOPMENT PRACTITIONERS

Given the relatively nascent nature of many of the ICT solutions that are being used to improve the agricultural marketing of smallholders, it is important that practitioners consider a range of questions before engaging with any one solution. The following *Guiding Questions* were developed to support practitioners in the decision making process when exploring ICT solutions to enhance smallholder-focused agricultural marketing activities. Most providers will tell you that their solution is the right one for you; these questions will enable you to find out if it actually fits both your project needs and those of the farmers you are working with.

Value - is there a demonstrated value-add to users of the proposed ICT solution?

In order for a solution to be sustainable, users must understand and be empowered to act upon the value-add that they can gain. [Connect4Change](#), a Dutch-based consortium of NGOs, is building The Farmers Market Information System in Ethiopia which is working directly with farmers to understand how to create value. "According to our research among our target groups, farmers and farmers' organizations are willing to pay if the information is relevant and accurate," explains IICD regional manager Olaf Erz. A tool that can be used to assess and identify target user value is [USAID's Customer Insights Toolkit](#), which can guide ICT solution implementers in identifying and quantifying opportunities. One pitfall to consider is that farmers are often used to receiving agricultural information services for free as a public good from the government or donors, so even if the value is demonstrated, it may be difficult to change their behavior

to pay for a type of service that they are accustomed to receiving for free.

Behavior Change - what behavior changes are required for the users to integrate the solution into their business cycle?

Adopting new ICT solutions will require farmers and other value chain actors to change their behaviors. This can be difficult as many of their operations rely on relationships and systems that have been in place for decades. For instance, agricultural traders generally already have a network of contacts that they trust for a reliable price and it can take a lot to be convinced and build trust in a new system. New methods have been developed to address behavior change and technology adoption which can identify barriers to success such as power issues, literacy limitations, preferences, relative priority of features, and help to design effective solutions.

'Human-centered design' (or 'user-centered design') is one method that focuses on the needs, wants, and limitations of end users at each stage of a product or service life cycle to drive design, rather than forcing users to change their behavior to adapt to a new system. Dr. Hendrich Knoche and computer scientists at the Swiss Federal Institute of Technology in Lausanne (EPFL) are using this method to develop ICT solutions for marginalized farmers in India.¹¹ IDEO's [Human-Centered Design Toolkit](#) is another resource that describes a design process for interventions and supports them in activities such as building listening skills and running workshops. GSMA's mAgri team, in partnership with Tigo Tanzania, introduced another method called usability testing, which tests users' experiences with a mobile-enabled agricultural service Tigo Kilimo. Instead of a traditional focus group model, the tester interacts directly with individual users.¹²

¹¹H. Knoche, PR Sheshagiri, and J. Huang. (2013) [Human-Centered Design for Development](#).

¹²M. Ashrafuzzaman. (2013) [Lessons from our first usability test of an mFarmer service in Tanzania](#).

Technical Literacy - do users have the knowledge and skills to successfully use the solution?

Not having the literacy of ICT tools has prevented many users, especially rural farmers, from accessing pricing information and other potentially useful tools. One solution that is addressing this barrier is Connect4Change's ICT trainings which have been conducted for Farmer Marketing Organizations in five rural towns of Ethiopia and focus on basic computer skills as well as mobile use, such as how to efficiently use text messaging as a market research tool to acquire accurate and current price information.

Syngenta Foundation's Rose Goslinga, who is launching smartphone-enabled agricultural insurance products across Africa (for more advanced small and medium farmers), has one suggestion for bridging the skills gap needed to use their agricultural service by emulating easy-to-use music downloading apps; she explains "SMS tools require little training, but expecting a farmer to install an app relies on him knowing how to do this from some other activity. That said, the new generation of farmers definitely know how to download a song, so if app developers can make apps as simple and attractive as that, it could work."

Gender - what are implications for gender dynamics?

Evolving market systems can cause a disruptive shift in power dynamics at both the community and the household level, which must be considered. While implementing the USAID/Vodacom partnership to deliver mobile-enabled agricultural services to smallholders through the Connected Farmer Alliance in Kenya, Mozambique and Tanzania, which will reach 500,000 smallholder farmers, the Director of the program consulted the GSMA Development Fund's mWomen program about the potential effects on gender balance within a household, which they have studied extensively. The GSMA mWomen program's [Research Toolkit](#) guides practitioners in identifying these issues with a focus on mobile technology access and use. Previous research, for

instance, found that women acquiring a substantial increase in income that they control can make their spouses uneasy and shifts the decision-making powers within the house.¹³

Ownership - have farmers or other target end users invested, or demonstrated convincing will to invest their own resources (time, data or income) in the solutions?

One way to involve farmer stakeholders and incentivize them to integrate into the system is to design a solution that enables them to contribute content or provide services themselves; this way, they are invested in the system, and also other farmers are more likely to trust information from their peers, therefore bolstering trust in the system. For example, the Swiss Agency for Development and Cooperation is funding an SMS-based project between the Ecole Polytechnique Fédérale de Lausanne, the Indian Institute of Science in Bangalore, and an Indian NGO, the Chennakeshava Trust, in which participating farmers provide data.¹⁴ "It's about 20% delivery of information, such as weather and prices," says Hendrik Knoche, the project developer. "The rest of the information shared is based on data entered by the farmers, on the varieties they sow, their use of fertilizer, irrigation, spraying, harvesting, and selling, including the price achieved."

Replicability - is this model specific to a particular geographic area or agricultural sector?

Certain ICT solutions may only be appropriate for a narrow scope of geography or agricultural sector. Time will tell what the most appropriate scopes for agricultural ICT solutions will be. For now, the most promising models appear to focus regionally (such as in sub-Saharan African or India specifically). However, requirements between different agricultural products vary considerably as well: for instance, high-

¹³ Another relevant resource is the USAID Briefing Paper: [Gender Mainstreaming in ICT for Agriculture](#).

¹⁴ Caspar van Vark. (November 2012) [Empowering farmers through SMS Mobile phone services](#), The Guardian.

value horticulture has different needs for transport and logistics than commodity traders of staple foods. Implementers should examine the dynamics of their market to identify key factors that will drive usage and effectiveness of solutions and understand that a successful model in one market may not necessarily transfer well into another context.

Simplicity - are there free or off-the-shelf alternatives?

Practitioners should consider that there may be simple and free technology solutions available that are preferable to developing complex new proprietary systems. For instance, in Senegal, one agricultural value chains project trains aggregators who manage groups of farmers, to track prices and yields by gathering data from farmers via SMS, then assembling the data into excel, which is managed on solar-powered tablets. As the project manager explains, instead of relying on a custom technology, which may have bugs, using Google Docs' cloud-based spreadsheets, they have the best programmers in the world (Google programmers based in California) maintaining their system, so it is extremely reliable.

LOOKING AHEAD: TRENDS TO WATCH

Technology penetration and usage continues to evolve rapidly in sub-Saharan Africa, from urban centers all the way to the most remote villages. While many have yet to reach rural farmers, technology expansion and a new generation of users is likely to result in the integration of ICT solutions to the most remote and basic levels of agricultural production in the coming decade, if not years. Practitioners should consider emerging trends to create sustainable, long term solutions.

Smartphones

Smartphones could be a true breakthrough technology for smallholder farmers, as even simple apps can be used to enhance their marketing capabilities considerably beyond the capabilities of basic feature phones. For farmers, many of whom are not literate or numerate, the visually-driven smartphone interface

may prove more accessible and usable. As previously mentioned, EPFL is designing a new smartphone interface for farmers in India (many of whom are illiterate) to share ideas and vital information applying user-centered-design.¹⁵ Innovations include a 'touch screen reader' which provides audio on all screen entries and the mix of pictures, icons, numbers and text—with supporting audio. In another example, the [GSMA mWomen Design Challenge](#) stimulated new thinking on user interfaces for resource-poor women in the developing world (many of whom work in agriculture). This year's winner, the Sahel Shake, is an Android-base user interface design for low-literacy contexts that improves the usability of overly complex phone features, offers a highly visual contact management system, and integrates voice and icons into SMS communication.

Smartphone penetration estimates vary widely with some showing up to 20 percent in Africa (including North Africa).¹⁶ According to Strategy Analytics, the rate of growth in upcoming years in Africa will be almost two times higher than the global average; in South Africa, smartphone penetration is expected to exceed 50 percent in 2017, while Nigeria and Kenya will have 29 percent and 28 percent.¹⁷ In February 2013, Microsoft released a smartphone specifically for the African Market, the Huawei 4Afrika.¹⁸ In October 2012, Samsung, one of the major producers of smartphone, also announced plans for a major push on smartphones in sub-Saharan Africa.¹⁹ However, since smartphones have yet to reach rural farmers at scale, implementers will want to continue to ensure that any mobile solution they use

¹⁵ K. Banks. (June 2012) [Mobile Learning: How Smartphones Help Illiterate Farmers in Rural India](#), National Geographic.

¹⁶ [Nigeria leads smartphones penetration in Africa](#), November 2012.

¹⁷ [Sub-Saharan Africa Mobile Observatory 2012](#), GSMA, November 2012.

¹⁸ See the [Microsoft 4Afrika Initiative](#)

¹⁹ [Samsung To Double Mobile Penetration In Africa](#), Ventures, October 23, 2012.

to target smallholders is also feature phone compatible.

Going social

Though ICT-enabled social networks are not yet usable at the smallholder level and mostly require access to smartphones or computers, these trends are worth observing as they are beginning to reach to the lower ends of the income spectrum and into more rural areas. Global social networks like Facebook, LinkedIn and Twitter are expanding in sub-Saharan Africa; networks of African origin are growing as well, such as Eskimi in Nigeria and Mxit in South Africa have millions of users. Tencent's WeChat and WhatsApp offer a cheaper alternative to SMS messaging (WhatsApp costs \$0.99 per year and currently has between 250-300 million users in 131 countries worldwide), enabling free messaging between smartphones. Twitter is fast becoming a political gathering tool, with many African political figures interacting with constituents via the network. Facebook Zero, the text only mobile version of Facebook is also opening up social media to newer users. In the first 18 months since it launched in June 2010, median Facebook user growth in Africa grew by 165%.²⁰

There are already several examples in India of uses social media to organize and empower small farmers. Small tea growers in West Bengal India launched a website last year and linked it with Facebook and Twitter to connect growers directly with international buyers.²¹ In another example, turmeric farmers in Maharashtra's Sangli district used Facebook's Mobile Messenger to organize themselves and avoid a potentially calamitous price crash due to oversupply. They were able to reach thousands of turmeric farmers and successfully carried out a temporary

²⁰ oAfrica. (January 28, 2012) [Facebook user growth rates in Africa \(June 2010 – December 2011\)](#).

²¹ Facebook Page: [Jalpaiguri District Small Tea Growers Association](#)

boycott of the local auction until prices returned to a satisfactory level.²²

Though rural farmers do not yet participate at scale, urban and younger users are adopting these platforms quickly and eventually social networks will begin to have a larger impact in the rural areas as well.

Youth and agriculture

According to the World Bank, 200 million youth between the ages of 15-24 make up 20 percent of the population, and 37 percent of the workforce.²³ This younger generation will be the leaders in introducing and scaling new technologies into African agricultural systems which has the potential to empower rural farmer's to market their products more effectively. In fact, there is already anecdotal evidence of youth teaching their older relatives how to integrate technology systems into their families' farms.

Unfortunately, the trend is that youth are migrating to urban areas and away from rural farming, with the African urban population expected to rise by 0.8 billion to reach 1.2 billion by 2050.²⁴ To counter this, the [Amiran Next Generation Farmers Initiative](#) in Kenya, which launched in 2011, plans to entice a group they call the new generation of "Facebook farmers" with promises of high incomes and profits, using colorful advertising and a branding message that farming is "cool." It has created a smallholders greenhouse kit, which has been installed in 250 schools countrywide and is targeting 6,500 secondary schools in its first phase.²⁵

²² [Farmers using Facebook to discuss prices and plan strategy](#), Economic Times (India), February 10, 2012.

²³ Julius Agbor, O. Taiwo and J. Smith, [Sub-Saharan Africa's Youth Bulge: a Demographic Dividend or Disaster?](#) Foresight Africa, Brookings Institution.

²⁴ [World Urbanization Prospects, the 2011 Revision](#), United Nations Department of Economic and Social Affairs.

²⁵ See [Amiran Kenya Ltd](#) web site

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 Megan O'Donnell. 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).

Catalyzing innovation

Donors and private sector partners have developed several mechanisms to catalyze innovation. Vehicles such as USAID's Development Innovation Ventures and the GSMA's mFarmer and mWomen Challenge funds provide seed funds stimulate innovation. USAID's mSTAR Mobile Solutions Technical Assistance and Research (mSTAR) program leverages mobile technology to improve development outcomes by funding innovative research and development programs. Practitioners should keep apprised of innovation in agricultural ICT solutions by accessing these communities and resources.

CONCLUSION

ICT presents unprecedented opportunities to empower smallholder farmers by strengthening their capabilities in marketing their products. Despite these opportunities, it is worthwhile reinforcing the fact that there is no single, best ICT solution for all circumstances. Also, although we often use the phrase 'ICT solution', technology is not *the* solution on its own, but rather a tool that can be used to help you better achieve your objectives. As an increasing number of smallholder farmers expand their networks through ICT, those with the most refined marketing skills will likely reap more benefits than those without. Providing technical assistance on marketing skills to farmers, therefore, will continue to be important.

While this paper presents a framework for development practitioners to evaluate, plan and deploy impactful ICT interventions to facilitate smallholder marketing, it does not provide all of the answers. Those answers will vary by context, which is why asking the right questions as outlined in this paper is so important to the process.

RESOURCES

Tools & Partners

GSMA [mWomen Research Toolkit](#)

IDEO's [Human Centered Design Toolkit](#)

USAID's [Customer Insights Toolkit](#): Enhancing Value Chain Development through Customer Research

[USAID's mSTAR Program](#)

Research

The World Bank, [Module 9: Strengthening Agricultural Marketing](#), ICT in Agriculture Sourcebook, 2012.

[ICT Uses for Inclusive Agricultural Value Chains](#), Food and Agriculture Association, 2013

[Using ICT to Overcome Constraints in the Agriculture Value Chain](#): Emerging Trends in Ghana, IFDC Ghana, IGI Global, 2013

DISCLAIMER

The views expressed in this publication do not necessarily reflect the views of the U.S. Agency for International Development or the U.S. Government.