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Digital information channels in the Rwandan potato value chain



- In brief:**
- The potential of Information and Communication Technology (ICT) to provide smallholder farmers with useful agronomic and market information is widely heralded.
 - Mobile phones can offer much richer modes of communication sharing, but in many parts of the world limited digital literacy, use of smart phones, and poor data connectivity can constrain this potential.
 - This brief examines the introduction of a platform that enables Irish potato farmers in Rwanda to access interactive and dynamic content on feature phones at zero cost.
 - Overall, usage rates of the platform remained low, even after repeated attempts to engage and train more farmers. Most uses of the platform consisted of examining weather forecasts, and there was little interest in the interactive chat features offered by the platform.
 - The authors draw out three important lessons worth considering in the context of these results.

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Research overview

Developing countries face several challenges in modernising agricultural value chains. Not least of all the high unit cost associated with connecting a vast and remote population of small-scale growers to useful agronomic and market information.

Information and Communication Technology (ICT) is one of the avenues to potentially improve both productivity and market performance in the sector. In theory, ICT can help, collect and transmit essential information about, for and between growers in ways that can improve or supplement conventional extension services at scale and at very low unit costs.

Most large-scale implementations of ICT among growers, however, have been limited to phone call based interactions or the “pushing” of simple, concise bits of market-related or (tailored) agronomic information (through SMS or Interactive Voice Response tools), likely because the vast majority of growers only possess feature phones with limited functionality.

This project accompanies the introduction of a sophisticated digital platform into the Rwandan Irish Potato (IP) value chain that will enable the digitisation of all market sales and complex forms of communications between growers, agronomic experts and buyers. The platform utilises the N-Frnds USSD-based technology, which enables functionality usually designed for smart phones to be usable on feature phones, including the formation of simple social networks, with only minimal cellular network access (without need for mobile data).

The study assesses farmer uptake and how the farmers make use of various functionalities offered by the platform. The objectives of the study were:

- a. To gain an in-depth perspective on the types of information most sought by farmers
- b. The nature of communication between growers
- c. The nature of communication between growers and experts on agricultural related issues.

If use of the platform is high, the ability to observe all communication on the platform will enable us to gain in depth insights into these areas. The study also seeks to understand the impacts of various forms of communication (uni-directional vs. interactive, 1-1 vs. group, and the nature of the group) on the take up of improved inputs.

The first phase of this project has established the infrastructure - platform design and coding - for continued training of farmers by Nfrnds (a company that specialises in supporting emerging markets) and observation of the resulting communication in ways that will support our research agenda. It has also allowed us to draw preliminary findings about the extent to and the manner in which farmers make use of the platform.

Policy motivation

The vast majority of the world’s two billion smallholder farmers receive little to no high-quality agricultural advice. Developing country governments employ over one million agricultural extension agents but ratios of farmers to extension workers are high, transport budgets are often inadequate, and training, management, and accountability of extension workers is often abysmal. This advice is important as studies suggest that modest changes in agricultural practices can substantially improve productivity and profitability.

Mobile phones create enormous potential to improve agricultural extension because they allow farmers, input suppliers, and experts to interact at very low cost. Digital extension platforms can also

allow experts to retain and organise data on farmers and customise advice. They can also allow farmers to communicate with a larger network of farmers. Research has shown how valuable such communication can be in disseminating improved practices, but also that it can be constrained by logistical, geographical or even social reasons (Aker, 2011; Fafchamps and Minten, 2012; Cole and Fernando, 2018).

The potential of ICT to provide valuable advice to farmers has already been demonstrated in a number of studies, but most interventions to date are based on uni-directional transmission of SMS. There is little indication that farmers make use of more interactive platforms that enable them to share information with experts in order for advice to be tailored to their specific needs. For digital extension to achieve impact comparable to traditional extension (when properly administered), such interactive engagement is crucial. This is also true of communication between farmers.

In Rwanda, Irish Potato (IP) is an important cash crop, with nearly 1 million Rwandan households growing 2.3 million tons annually (USAID, 2015). This study examines the introduction of a digital platform into the IP sector. Digital platforms are an area that both government agencies and development organisations in Rwanda have shown an interest in. The Rwandan government's goal is to register all 100,000 IP growers in the country into the platform. The observation of registered farmers' use of the platform will help assess whether interventions that focus on the design and dissemination of such platforms are indeed worth pursuing.

Preliminary findings

- To date, despite registering and training about 1500 farmers, only about 20% of farmers have made any use of the platform.
- Daily usage levels remain low, at about 40 per day.
- The most popular functionality offered by the platform is access to weather forecasts.
- Chat functionality received only 20% of usage, as did other interactive features specifically designed for this project, such as interactive pest identification.

There could be several possible reasons for this rather low usage. First, farmer demand for interactive communication might be low. This could stem from the particular design of a USSD platform like the one under study, which is not as easy to use as popular chat functionality on smart phones. It could also reflect a broader lack of interest among the population of interest. It is also possible that more intensive training and engagement may be needed to overcome limited digital literacy and stimulate interest by farmers.

Policy discussion

During this preliminary stage of the study, widespread usage of the platform was not achieved. So rather than prescribe recommendations we draw out three important lessons worth considering in this context.

- Even ICT platforms which seem to offer valuable information to farmers may not be seen as such by the farmers themselves. This gap could reflect a misunderstanding of farmers' actual information requirements. But since the platform was designed in large part in response to discussions with farmers' groups about the types of information they need, this is not our preferred explanation.

- Another potential explanation for low usage of the Nfrnds platform may lie with differences in user-friendliness and ease between the USSD based platform created by Nfrnds, as efficient as it is, and smart phone based applications. If this is the case, it suggests that either more proactive training is needed to increase usage of such platforms, or that a more promising strategy for digital interactions with farmers may need to be based on the rapid spread of smartphones among the population of interest.
- Users also seem to have a preference for different types of information. Users of the N-frnds platform make much more use of weather forecasts than any of the other types of information offered by the platform, including pest identification, the availability of inputs, and general information on cultivation. To the extent that these preliminary findings reflect farmers' real interests, it suggests that governments should place more emphasis on providing increasingly accurate and long-term weather forecasts to farmers.

References

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