2016 CLA CASE COMPETITION

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Case Story

This Case Story was submitted to the 2016 CLA Case Competition. The competition was open to individuals and organizations affiliated with USAID and gave participants an opportunity to promote their work and contribute to good practice that advances our understanding of collaborating, learning, and adapting in action.

Farmers' Query System: A Smartphone Application for Agricultural Advisory Services

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Credit: Dhaka Ahsania Mission.

What is the general context in which the story takes place?

Agriculture plays a significant role in Bangladesh's economy and livelihood. But one of the primary challenges of the country's agriculture ecosystem is the absence or limited presence of expert consultation in rural vicinities. Two of the departments under the Ministry of Agriculture, the Department of Agricultural Extension (DAE) and Agriculture Information Services (AIS), are working at the central and field levels to provide necessary extension services to farmers with the aim of increasing agricultural production. DAE employs a total of 14,500 public extension agents (called sub-assistant agriculture officers) to provide extension services to farmers at the field level. If the number of farming households is considered, the ratio of agents to farmers is very poor.

Considering this situation, in 2012, the USAID Agricultural Extension Support Activity project began implementation in Southwest Bangladesh, a Feed the Future zone of influence that is afflicted with poverty and increasing soil and water salinization that hamper agricultural productivity. One of the key activities of the project is to provide improved extension advisory services to smallholder

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farmers through an information and communications technologies (ICT) platform. To address the extension challenges, the project has developed the Farmer Query System (FQS), a smartphone-based application that provides farmers with agriculture advisory services.

What was the main challenge or opportunity you were addressing with this CLA approach or activity?

The main challenge faced by Bangladeshi farmers is reaching out to the right extension service provider when they face an agricultural problem. Due to lack of awareness and communication problems, establishing effective extension services seemed difficult. The FQS was developed to provide agricultural extension services to these rural farmers, especially smallholders and women, to reduce gaps between public extension agents and farmers. This smartphone application allows farmers, public extension agents, independent entrepreneurs, and infomediaries to place queries to agricultural experts, who then check the query in a Web dashboard and send responses to the sender's smartphone by a voice call or short messaging services (i.e., texts).

In 2014, 139 million people in Bangladesh owned a mobile phone; network penetration was almost 99 percent. The number of people who owned a smartphone was also rising. At present, more than 30 percent of the population owns a smartphone, as the price is increasingly becoming affordable. By taking this unique opportunity into inconsideration, an attempt was made to strengthen the country's agricultural extension system by empowering farmers and infomediaries with smartphones and training them about how to attain agricultural extension services through a mobile application.

Even though smartphone penetration with Internet is on the increase in Bangladesh, most of the project-supported smallholder farmers do not have access to a smartphone. However, in learning and adapting the new ICT tool, 227 beneficiary farmers who had interest and basic education, knowledge, and enthusiasm for operating a smartphone were initially selected for the project. These farmers received smartphones with the FQS application and provided training. Learning to use the application to make agricultural queries was not an easy task, but the instantaneous nature of the FQS, coupled with huge interest on the farmers' part, helped them adapt the new technology.

Describe the CLA approach or activity, explaining how the activity integrated collaborating, learning, adapting culture, processes, and/or resources as applicable.

The overall objective of FQS was to understand smallholders' demand for agro advisory support with respect to strengthening the existing agriculture extension system in the project areas. Through a needs assessment, the project tried to identify the extent of farmers' need for technology-driven agricultural extension support; make a complete map of the institutional structure and ICT infrastructure of government and private initiatives in agricultural extension service delivery; complete a behavioral map of farmers' and extension agents' use of ICT tools; and identify the potential scope of ICT innovations in agricultural extension support services.

To identify problems associated with agro advisory services for farmers, the project has gone through different methodologies and talked with relevant stakeholders to identify proper ICT solutions, including the Human Centered Design approach. First, a situational analysis was done on agriculture and ICT infrastructure. This entailed analyzing and understanding macro-environment factors that affect any decision and the micro-environment factors that affect the service. Next, the project conducted a policy paper analysis, a field-level investigation, and focus group discussions. The field-level study was conducted to identify and map stakeholders and users of the system; it entailed a series of discussion surveys and mapping of how information flowed from the field to researchers and from researchers to farmers. Third, in order to understand the views and opinions of the community (e.g., farmers, extension agents, input sellers, agriculture officers, director of agriculture extension, researchers), the study team undertook key informant interviews to collect information.

In 2014, FQS was launched based on the results of the needs assessment. This ICT solution allows high-quality and timely provision of remote agro consultations and solutions for farmers. Using the app, infomediaries collect farmers' queries and send the data to an agriculture expert, who reviews the information on a Web dashboard and sends recommendations and solutions to the local intermediary by text, a voice message, or a phone call that goes through an agriculture call center situated at AIS. Replies reach farmers within 6 hours. Basically, this is a business (service provider) to consumer (farmer) model that allows farmers, input sellers, and local entrepreneurs to act as infomediaries. FQS reduces the existing gap between a limited public extension workers and a large number of farm households in providing agro consultations. To date, 1,700 users (e.g., field-level public extension officers, lead farmers, input retailers, and call center agents) are using FQS at the rural level. A total of 32,000 agro consultations have occurred for 100,000 project beneficiaries and surrounding farmers. Furthermore, the FQS user base has increased due to popular acceptance by farmers and other stakeholders.

Were there any special considerations during implementation (e.g., necessary resources, implementation challenges or obstacles, and enabling factors)?

This CLA approach made the implementation successful because the project was implemented by three different organizations that were experts in their respective sectors. The lead partner, Dhaka Ahsania Mission, had field-level staff in place who had good relationships with the beneficiary farmers and extension officers. CARE Bangladesh, the project's technical partner, helped form the Farmer Producer Group and advised on resource mapping techniques. CARE also built the capacity of the farmers and extension officers on agro technology. Technology partner mPower had experience in designing innovative concepts for agriculture service delivery using ICT; its service design team, software development team, data analytics and visualization team were key to implementation. mPower uses the Human Centered Design approach to develop ICT applications: Staff talks with users and beneficiaries, then design the service based on the feedback of real users.

So, three types of expertise make the CLA approach successful: a field-level presence, formation of high-quality Farmer Producer Groups, and ICT application design. However, another important resource was the strong collaboration facilitated by signing of memorandums of understanding with DAE and AIS. DAE had field-level frontline staff as extension officers to support farmers, and AIS

provided the call center and a content database. This CLA took help from both of these government counterparts to implement the FQS concept.

At first, farmers and users took some time to adopt the FQS because smartphone-driven agriculture extension was new in Bangladesh. They were slow to access the application, but after training and support, they understood how to access the system, as well as the app's essence and usability. Users and farmers eventually asked the project to add fields and indicators that were missing in the first phase of software/application development. The ICT team incorporated the feedback where it was needed. The initial outcomes were positive. During the pilot, the project trained 90 different types of user users on FQS. Most of the users' feedback was helpful to the rollout. During implementation, different types of resources were needed, including financial (project funding), open-source software and database platform(s), software development expertise (project ICT experts), ICT training expertise, field-level presence, and buy-in from DAE and AIS.

The total ICT concept implementation—including designing and developing the software, ICT training, field implantations, and monitoring of the ICT tools—accounted for 9 percent of the total project budget. This included the cost of 12 ICT interventions, such as software development, videos, preparing the content database, trainings, and staff time and salaries.

With your initial challenge/opportunity in mind, what have been the most significant outcomes, results, or impacts of the activity or approach to date?

The FQS allows the administrator to track queries and responses through log-ins with user names and passwords. This ensures effective service delivery, transparency, and accountability.

To verify user acceptance and other impacts, internal and external studies were recently conducted on the use of FQS. For the internal evaluation, a statistically significant number of FQS users was selected and interviewed. More than 90 percent of respondents stated that the application was easy to use and provided a quick solution to agricultural problems. More than 95 percent of interviewed farmers reported that they applied the solution provided by agriculture experts, and that doing so increased their agricultural production and income.

In addition, the project recently collaborated with the Institute for Computing in Humanities, Arts, and Social Science, an international research body based at the the University of Illinois, to evaluate the FQS app. The study observed that 98 percent of the farmers using FQS trusted it as an information source for agriculture. A substantial majority of farmers (96 percent) who had used FQS reported that they had recommended it to neighbors. In terms of usefulness, 90 percent indicated that answers to their questions from the agriculture experts were adequate.

Furthermore, it was found that the use of FQS is no longer limited to project beneficiaries. Upon witnessing the benefits of the app, farmers shared it with their neighbors and fellow farmers, encouraging them to make use of it. So, FQS has been disseminated among non-project beneficiary farmers who own smartphones and showed interest in using the app to solve their crop production problems.

What were the most important lessons learned?

The most important lesson is that technology can fill gaps created by resource-based challenges, particularly human resource constraints. Because mobile network coverage is available almost everywhere in Bangladesh, the FQS is also available almost everywhere. Mobile handset penetration is also prevalent. So, it was easy to develop an agriculture extension solution using technology. One of the important lessons was that users will adapt differently to a new ICT device. The project ICT team observed that it took older public extension agents in the field longer to learn the process of using the FQS. In such cases, the project had to provide refresher training.

If anyone wants to implement an ICT-driven agricultural extension project, they should consider the context and location, because communities and societies adopt technology at different paces. Also, FQS did not work as well in areas with poor mobile network signals, which is why the project had to develop an alternative offline application that did not need a strong network connection.

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