

Mobile Phone-Based Agricultural Extension in India

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Avaaj Otalo staff explains mobile phone advice service to farmers in Gujarat, India

Fieldwork: Centre for Micro Finance (CMF)

Location: Surendranagar district, Gujarat, India

Sample: 1200 cotton farmers

Timeline:
2011 to 2012

Partners:
Australian Government Overseas Aid Program (AusAID)
Development Support Center (DSC)
United States Agency for International Development (USAID)

We examine the role of management in agricultural productivity, by evaluating a mobile-phone based agricultural advice service provided to farmers in India. Demand for advice is high; and advice changes practices, increasing yields in cumin (28 percent) and cotton (8.6 percent, for a sub-group receiving reminders). Information spreads, as non-treated farmers with more treated peers change practices and lose less to pest attacks. Though willingness to pay for the service is low, the value of the information externality exceeds the subsidy that would be necessary to operate the service. We estimate each dollar spent on the service yields a \$10 private return.

Question de politique: Agricultural productivity varies dramatically around the world. Though India is the second largest cotton producing country globally, it ranks 78th in terms of cotton yields. While lack of access to credit, poor

infrastructure, and missing insurance markets may contribute to productivity differences, suboptimal agricultural practices may also be to blame. In an effort to spread information about new agricultural practices and technologies that can improve productivity, many governments in the developing world fund large-scale agricultural extension programs. The traditional agricultural extension model consists of agents visiting farmers individually or in groups to demonstrate agricultural best practices. Failures of information distribution regularly handicap this model: limited transportation makes rural communities difficult to reach, irregular meetings make timely information difficult to provide, and generalizable programs and information may not apply to local contexts. Can low-cost information and communications technologies address these failures, thereby increasing knowledge and adoption of more effective farming practices?

Cadre de l'évaluation: The Government of India spent US\$60 million on public agricultural extension programs in 2010, yet a series of surveys in 2009 and 2010 reveal variable success across regions, with as many as 51.2 percent of farmers citing public agriculture extension staff as a main source of information in one region and as few as 7 percent in another. In the absence of experts, farmers often rely on word of mouth, generic broadcast programming, or agricultural input dealers.

As of 2015, around half of all Indian farmers (120 million) were estimated to have a wireless subscription. The cotton farmers who participated in this study were, on average, 46 years old, had approximately four years of education, and owned roughly six acres of land. Nearly all farmers planted cotton, while some also grew smaller amounts of wheat and cumin.

Détails de l'intervention: In partnership with the Development Support Centre (DSC), an NGO with substantial experience delivering agricultural extension services, researchers evaluated the impact of offering farmers free agricultural information via mobile phones on their agricultural knowledge and practices. From a sample of 1,200 cotton-farming households, researchers randomly assigned households to one of three groups:

1. *Mobile phone:* 400 households received access to agricultural advice via mobile phone.
2. *Mobile phone and traditional extension:* 400 households received mobile phone advice and a single, annual 2.5 hour traditional training session on DSC premises.
3. *Comparison group:* 400 households were offered neither mobile phone-based agricultural advice nor traditional extension services.

Of the 800 intervention households, researchers also randomly selected 500 participants to receive bi-weekly reminder calls to take advantage of the offered services.

In August 2011, intervention group households received a free two-year subscription to the mobile phone-based technology, Avaaj Otalo (AO). This service allowed farmers to call a hotline, ask questions, and receive responses from DSC staff agronomists experienced in local agricultural practices. Callers could also browse DSC responses to other farmers' questions and respond to questions, themselves. In addition to AO access, these households also received weekly

information and tips via automated voice messages.

Researchers conducted a baseline survey in June and July of 2011, a midline survey in August 2012, and an endline survey in August 2013. These surveys gathered information on farmers' AO usage and agricultural practices.

Résultats et conclusions politiques: Results were nearly identical for farmers who had access to mobile phone-based agricultural advice and those who also received traditional extension, so researchers framed results in terms of a "combined" intervention group that included both parties. They found that offering mobile extension services proved to be a cost-effective mechanism to nudge farmers towards more productive agricultural practices.

Take-up and usage of AO: Over the two-year intervention period, around four-fifths of intervention households called into the service and, on average, households made 22 total calls. Intervention farmers were also generally more likely to report using mobile phones to gather information (such as weather forecasts) and make decisions. Researchers found that a farmer's education and income did not affect the likelihood of using AO, but wealthier farmers did use AO more than poorer farmers.

Input decisions: Intervention group farmers purchased more of the recommended seed and fertilizer varieties, but did not become more knowledgeable. Treated farmers were 5.3 percentage points more likely than the comparison group (a baseline of 86.9 percent) to purchase recommended seeds, an effect bolstered further by reminder text messages. Intervention also increased the likelihood that farmers purchased recommended fertilizers. Though intervention group farmers altered their agricultural practices, their knowledge of basic agricultural practices did not improve, suggesting that this service functioned in an advisory, rather than educational, role.

Sowing and productivity: Farmers with access to AO services increased cumin yields by 48 kilograms per acre (28 percent) from a base of 172.5 kilograms per acre. Over the program's two-year duration, household profits for the intervention groups were more than US\$200 (16 percent) greater than those of the comparison group. There is also some evidence suggesting that intervention group farmers shared information with their peers, since some non-intervention

farmers with close ties to those in the intervention group were more likely to plant cumin and less likely to lose crops than households with fewer intervention group connections.

Cost-benefit analysis: Over the course of a two-year AO subscription, each farmer experienced, on average, a profit increase of approximately US\$215. Providing this subscription cost US\$20 per farmer, suggesting an overall return of around US\$10 for every dollar invested in the program. Since farmers likely shared information, there may be additional returns enjoyed by practice-improving peers.

Related Papers Citations: *Cole, Shawn, and Asanga Nilesch Fernando. " 'Mobile'izing Agricultural Advice: Technology Adoption, Diffusion and Sustainability." Harvard Business School Working Paper, Cambridge, April 2016.*

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