Video-Mediated Agricultural Extension to Increase Technology Adoption Among Farmers in Ethiopia

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Sector(s): Agriculture

Sample: 30 woredas (districts); 2,345 households in 342 kebeles

Target group: Farmers Extension agents

Outcome of interest: Technology adoption

Intervention type: Digital and mobile Extension services Information

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Partner organization(s): Ministry of Agriculture (MoA), Ethiopia, Digital Green, Gates Foundation, United States Agency for International Development (USAID), CGIAR

Conventional agricultural extension models are designed to help farmers make decisions to adopt recommended technologies. However, research demonstrates that extension often does not effectively deliver customized, relevant, and timely information [1]. Researchers conducted a randomized evaluation to test the impact of a video-mediated extension approach on the uptake of technologies recommended by the Ethiopian Ministry of Agriculture. The video-mediated instruction increased uptake through improved access to extension and farmer knowledge but did not improve crop yields. Targeting spouses in addition to heads of households with the video approach increased spouses access to extension services and knowledge of the recommended technologies but it did not further increase technology adoption.

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The slow adoption of new agricultural technologies contributes to lower productivity among small-scale farmers in Sub-Saharan Africa compared to other regions of the world. To help farmers adopt these technologies, many governments use extension models typically delivered through the Ministry of Agriculture. Conventional extension models use public agents who visit farmers individually or in groups to demonstrate agricultural best practices, like sharing the optimal amount of fertilizer use. However, research demonstrates conventional extension often does not effectively deliver customized, relevant, and timely information.

One way to improve the delivery and reach of traditional extension programs is through information and communications technologies (ICTs), such as mobile phones, videos, and text messaging to tailor recommendations to farmers' needs at relevant times during the agricultural cycle. Could incorporating instructional videos into extension services increase the uptake of recommended technologies and agricultural yields? Does delivering extension to women, who usually do not take part in

programming, increase the use of recommended technologies?

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Agriculture forms the majority of Ethiopia's economy, accounting for more than 35 percent of the country's GDP in 2017 [2]. Agriculture also serves as the major income source for around 75 percent of the country's population.

Ethiopia's agricultural extension system is one of the largest in Africa. Through its extension program, the government uses Development Agents (DAs), public agents trained to provide advice and training to farmers, reaching more than 75 percent of Ethiopia's 17 million farm households. The program primarily targets household heads (typically men) through their development groups, semi-formal administrative structures that are comprised of 25–30 farm households, are designed to provide community members with access to extension services, and serve as a grassroots forum to discuss local development issues. While women play an important role in agriculture in Ethiopia, contributing 29 percent of the country's agricultural labor force, they have limited access to extension services. Despite the program's wide reach, agricultural yields and technology adoption remain low in Ethiopia.

In 2014, the Ministry of Agriculture, in partnership with Digital Green, a global development organization, developed customized videos for DAs to feature during extension sessions to improve the extension system's effectiveness. The 10-15 minute videos each addressed specific aspects of agricultural technology and provided localized examples of farmers' uptake often at a particular time in the crop calendar. DAs paused the videos throughout the extension sessions to answer questions and provide additional details.

The program expanded its operations in 2017 to cover 68 woredas, the local term for district or county, in four Ethiopian regions: Amhara, Oromia, Southern Nations, Nationalities, and Peoples (SNNP), and Tigray. In 2017, farmers who participated in the program typically managed about 3.7 parcels of land and cultivated Ethiopia's three main cereal crops: teff, wheat, and maize. These households consisted of about six members, on average, of which 90 percent were headed by men, and mostly depended on farming to generate income.



Video-mediated extension services in Ethiopia.

Photo Credit: Digital Green

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In partnership with Digital Green and Ethiopia's Ministry of Agriculture, researchers conducted a randomized evaluation to test the effect of adding video instruction into existing extension services on farmers' uptake of three agricultural technologies: row planting, precise seeding rate, and urea top/side dressing. Researchers selected 30 woredas that were not yet fully served by Digital Green. Within each woreda, researchers then randomly assigned 350 kebeles, the lowest administrative unit in Ethiopia at which level extension services are organized, to one of three different groups, serving a total of 2,345 farm households:

1. *Video group (764 typically male farmers)*: DAs screened informational videos during regular extension sessions.
2. *Video plus spouse group (789 farmers and their spouses)*: DAs screened the same videos as in the "video group" during regular extension sessions for both the farmer and their spouses. As heads of households were primarily male, women were also exposed to the agricultural technology in this group.
3. *Comparison group (792 typically male farmers)*: DAs led group discussions during regular extension sessions covering the same content as demonstrated in the videos. This group was not shown the videos.

Researchers carried out the intervention in the 2017-2018 and 2018-2019 seasons and collected data through household surveys in 2018 and 2019 to understand the uptake of the three agricultural technologies and their impacts on yields. To better understand the mechanisms driving technology adoption, researchers also measured access to extension services and farmers' awareness and understanding of the recommended technologies. Lastly, researchers measured any differences between the two intervention groups to identify whether involving farmers' spouses further increased technology uptake.

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Incorporating video instruction into extension services increased the uptake of row planting, precise seeding rate, and urea top/side dressing technologies. Targeting spouses in addition to heads of households with the video approach did not result in higher technology adoption.

Adoption of technology: In the first year of the study, farmers' uptake of the three recommended agricultural technologies increased by six percentage points from a base of 64 percent (a ten percent increase). In the second year, uptake rates remained consistent. Researchers suggest that this sustained uptake was driven by higher attendance at group discussions featuring the video and a better understanding of the recommended agricultural technologies.

There was no additional increase in technology uptake with the involvement of spouses, which, as researchers note, may be attributable to male household heads typically controlling the decision-making on agricultural technologies. The intervention did, however, increase access to extension services and knowledge of the recommended technologies among women.

Attendance and knowledge: Farmers in the video-mediated groups were 17 percentage points more likely to have had direct contact with a DA in the first year of the study than farmers who attended the conventional group discussions (a 40 percent increase). Farmers in the video-mediated groups also scored 1.35 percentage points higher on a knowledge test than those in the comparison group, who scored on average 40 percent (a three percent increase) in 2018. However, the increase in scores did not persist in 2019. Researchers note that the videos were able to deliver technical content consistently, thereby reducing oversights that may have occurred through the work of an extension agent. Furthermore, the local farmers featured in the videos may have served as role models encouraging farmers to adopt promoted technologies.

Agricultural yields: Despite higher uptake, agricultural yields did not increase for either the standard video-mediated approach or the group that also reached spouses, potentially due to errors in self-reported farmer data.

Taken together, these results suggest that video instruction is an effective ICT tool to increase the uptake of agricultural technologies and improve the effectiveness of extension programs. Rather than replacing conventional extension services, video instruction can complement existing services through targeted advice to small-scale farmers.

The implementing partners, the Ministry of Agriculture and Digital Green, used the evidence to develop a new program called Digital Agricultural Advisory Services (DAAS), which facilitated the scale up of the video-mediated extension approach and other ICT channels such as Interactive Voice Response (IVR) systems. Other regions and development partners also used the evidence to introduce video instruction in their extension activities.

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1. Abdul Latif Jameel Poverty Action Lab (J-PAL). 2023. "Agricultural information and extension services." J-PAL Policy Insights. Last modified September 2023. https://www.povertyactionlab.org/policy-insight/agricultural-information-and-extension-services.

2. World Bank. "Agriculture (% of GDP)." The World Bank Group. Accessed July 27, 2023. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=ET.