The Impact of Farmer-to-Farmer Training on Agricultural Productivity in Uganda

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Sector(s): Agriculture

Fieldwork: Gaplink

Location: Uganda

Sample: 3,122 farmers in 627 villages

Target group: Farmers

Outcome of interest: Technology adoption

Intervention type: Extension services Training

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Low agricultural productivity and limited adoption of new agricultural technologies by farmers are key development challenges across Sub-Saharan Africa. Researchers evaluated the impact of a farmer-to-farmer training program on Ugandan farmers' knowledge and use of improved dairy farming practices, as well as dairy production and revenues. Overall, the farmer-to-farmer training program improved farmers' knowledge, productivity and revenues.

Policy issue

While agriculture employs more than half of the labor force and contributes on average 15 percent of GDP in Sub-Saharan Africa, [1], countries in the region face significant agriculture-related development challenges. Despite generally low levels of agricultural productivity, farmers tend not to adopt new agricultural technologies. One possible reason for limited technology adoption is that farmers may find it difficult to learn about new technologies on their own. Many governments invest in agricultural extension services to share information about new agricultural technologies with farmers. However, traditional extension services have not consistently had an impact on farmer behavior and tend to reach only a small number of farmers. Can training volunteer Farmer Trainers (FTs), who then disseminate information about agricultural technologies to other farmers, increase the coverage and impact of agricultural extension services?

Context of the evaluation

In Uganda, almost 70 percent of the labor force is involved in agriculture,[2], but in 2012 less than one in four agricultural households had ever received agricultural extension services. Of those who had received agricultural extension services, more than 80 percent were male-headed households.[3] In addition to low coverage, extension services in Uganda have historically been low-quality and poorly monitored.

The East Africa Dairy Development Project (EADD) is a program that aims to lift smallholder dairy farmers in Kenya, Uganda, and Tanzania out of poverty by boosting their milk production. One component of the program is a farmer training program in which the World Agroforestry Center (ICRAF) trains volunteer "Farmer Trainers" on multiple strategies to improve feeding of their dairy cows. ICRAF instructs these Farmer Trainers (FTs) to train other farmers in their villages on the use of improved feed practices through demonstration plots and lessons. The farmer training program is complementary to the other components of EADD, which include investment in cooling tanks for milk and veterinary services.

The farmer training program was implemented in Uganda's Busoga region, which is predominantly agricultural and forest land cultivated by smallholder farmers. These farmers primarily focus on producing staple and cash crops like maize, cassava, and sweet potatoes, and engage in dairy farming as a side activity. Before the intervention, farmers in the region had limited knowledge on best practices for feeding dairy cows.



Farmers with milk jugs in front of the Buikwe Dairy Cooperative.

Photo credit: Buikwe Dairy Cooperative

Details of the intervention

In partnership with ICRAF, researchers conducted a randomized evaluation to test the impact of the farmer training program on farmers' knowledge and use of improved dairy farming practices, as well as dairy production and revenues. In December 2014, the research team recruited one FT from each of the 627 villages where the program was being rolled out. The research team

then used a public lottery to assign each FT to either the treatment group, who would be offered the farmer trainer program beginning in 2015, or the comparison group, who would be offered the program beginning in 2017 (after the conclusion of the randomized evaluation).

A second public lottery allocated FTs from the treatment group to either the standard program alone or some combination of three program variations:

1. Standard program: FTs in the standard program received an initial two-day training by ICRAF staff on the production and use of high-value animal feeds and feeding best practices. In addition, ICRAF staff shared advice on how to train other farmers and asked FTs to organize training sessions in their home villages. FTs also received three "refresher" trainings over the course of the two-year program.
2. Linkage variation: FTs who were assigned to the linkage variation received vouchers to pay for supplemental visits by trained extension agents. This variation was meant to increase the amount of training available to FTs.
3. Needs assessment variation: FTs in the needs assessment variation received an additional one-day training every six months, during which they were taught how to conduct needs assessments with their trainees and develop individual action plans for each farmer. This variation was meant to tailor information to the needs of each individual trainee.
4. Signpost variation: FTs in the signpost variation received a metal signpost to display at their front gate. The signpost included the name of the FT, his or her phone number, and space for the FT to write the number of training sessions they held and the number of trainees each month. This variation was meant to encourage FTs to hold more trainings, either because farmers would know how to request additional trainings or because the FTs could publicly share their success.

Researchers collected information on farmers' feeding practices, dairy production, and revenues before the program began, one year after the program started, and at the end of the program. They also conducted supplemental focus groups and interviews before, during, and after the program to gain more in-depth information on how the program was implemented and how farmers viewed the program.

Results and policy lessons

Two years after the original FT training, both FTs and farmers in villages with trained FTs had increased knowledge of improved feeding practices and had adopted improved feeding practices, resulting in higher levels of milk production. Overall impacts were larger for trained FTs than for other farmers in their villages. The linkage and signpost variations both increased the impacts of the program on FTs' and farmers' productivity; the needs assessment variation only improved FTs' knowledge.

Impact on knowledge: FTs who received training from ICRAF scored 56 percent higher on a test measuring their knowledge of feeds and feeding practices than comparison group FTs (who had not yet received the training). FTs were able to pass on some of this knowledge; farmers who lived in villages with trained FTs scored 10 percent higher on the test than farmers in comparison villages.

Impact on farming activities: Farmers in villages with trained FTs reported using slightly more technologies than farmers in comparison villages; the trained FTs themselves increased the number of technologies used by more than half (from an average of 9.15 technologies among comparison FTs to 13.85 among trained FTs). Trained FTs also increased their expenditure on feeding practices.

Impact on production and revenues: Both farmers and trained FTs in treatment villages seem to have produced more milk than those in comparison villages, although the average effects are not statistically significant. Both the signpost and linkage variations increased farmers' milk production by 20 percent over the FT training without these additions. Trained FTs experienced increased dairy revenue, but the farmers in their villages did not.

In sum, these results show that the program increased the knowledge of trained FTs, who were able to transfer some knowledge to farmers. Farmers and FTs were able to adapt their agricultural practices to include new technologies, resulting in increased milk production. Adding a signpost to encourage additional trainings, as well as establishing links to official extension agents, increased the impacts of the program. Taken together, these results suggest that a farmer-to-farmer training model can be an effective approach to agricultural extension, especially when reinforced by an existing formal extension system.

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3. Uganda Bureau of Statistics (UBOS). 2012. *Agricultural Sector Gender Statistics Profile*. Kampala: UBOS. https://www.ubos.org/wp-content/uploads/publications/04_2018Agriculture_Sector_Gender_Statistics_Profile.pdf