The Effects of Integrated Soil Fertility Management in Burkina Faso

Researchers:

Adrien Bouguen

Markus Frölich

Estelle Koussoube

W. H. Eugenie MAIGA

Sector(s): Agriculture, Gender

Fieldwork: Innovations for Poverty Action (IPA)

Location: Burkina Faso

Sample: 1,800 farmers

Target group: Farmers Rural population

Outcome of interest: Technology adoption Women's/girls' decision-making Gender attitudes and norms

Intervention type: Extension services Fertilizer and agricultural inputs Information Sustainable farming

Partner organization(s): Groupe de Recherche et d'Action pour le Developpement, Alliance for a Green Revolution in Africa

In Burkina Faso, as in many sub-Saharan countries, farmers struggle with low crop yields. Most established techniques to increase agricultural productivity rely on the use of technologies like fertilizer, but these inputs are expensive and inaccessible to many farmers in the region. An alternative approach that integrates labor-intensive farming practices like innovative field preparation or planting techniques may be better suited to rural African areas where labor is abundant and physical inputs are hard to access. Researchers are evaluating the effect of farmer training program that highlights a balanced approach combining chemical fertilizers with labor-intensive agricultural practices on cowpea farmers' yields in Burkina Faso.

Policy issue

Low agricultural yields are a key challenge facing sub-Saharan countries. Low adoption of technologies like chemical fertilizers and improved seeds is a main reason for such low agricultural performance,[1], as farmers in sub-Saharan Africa face major constraints to adoption.[2] An alternative to promoting "capital-only" farming practices that rely exclusively on these technologies is an approach called Integrated Soil Fertility Management (ISFM), in which chemical fertilizers are used in conjunction with labor-intensive techniques such as field preparation, innovative planting techniques, and organic fertilizer usage. Labor-intensive approaches like ISFM may be better-suited to settings like Burkina Faso, where labor is more readily available than capital for many farmers. This project examines whether an ISFM training program for cowpea farmers in Burkina Faso leads to adoption of better farming practices and ultimately to greater yields.

Context of the evaluation

Agriculture is a significant part of Burkina Faso's economy, accounting for 78.4 percent of the country's employment in 2006.[3], However, low agricultural productivity is a widespread issue-for instance, cowpea producers in Burkina Faso reportedly produce an average of 500 kgs per hectare, which is only one third of the crop's potential yield.[4], Addressing this productivity gap is a

major priority for the government of Burkina Faso.The Groupe de Recherche et d'Action pour le Développement (GRAD), a consulting firm, is implementing ISFM in Burkina Faso's Sanmatenga province with funding and research support from Alliance for a Green Revolution in Africa (AGRA). The program is designed for cowpea farmers belonging to local "farming organizations" (FOs), networks of about twenty farmers who all grow the same crop. The ISFM program will work with volunteer farmers in each FO to disseminate ISFM technologies and methods. In Burkina Faso, cowpea is predominately grown by women,[5] so this evaluation will also provide evidence on gender inequalities in agricultural decision-making.



Women and children tend to planted vegetable garden in Burkina Faso.

Photo credit: Gilles Paire, Shutterstock.com

Details of the intervention

Researchers are partnering with GRAD to study the effects of an ISFM training program on agricultural yields. Researchers will also study the diffusion of ISFM practices-that is, whether and how community members spread successful agricultural techniques through word of mouth.

The team will survey 99 FOs in the Sanmatenga region for this evaluation. In each FO, members will select one farmer to be a "demonstrator" who is willing to conduct a demonstration of ISFM on part of her land. In forty randomly-assigned FOs, the demonstrator will work with GRAD to implement both traditional farming practices and ISFM practices within their demonstration areas.

Demonstrators will organize field visits for fellow FO members to learn about the techniques of ISFM and to observe their effects at different stages of crop growth. In these forty FOs, GRAD will further disseminate information about ISFM techniques via study trips, flyers and brochures, video programs, and radio broadcasts.

In the 59 comparison group FOs, demonstrators will not receive training on ISFM techniques, and GRAD will not carry out any dissemination activities.

In each FO, researchers will survey eighteen farmers including the demonstrator, for a total sample of 1,800 farmers. To evaluate the impact of GRAD's ISFM training on demonstrator farmers' production, researchers will compare yields between treatment and comparison demonstrators' fields. In addition, researchers will compare yields between the traditional and ISFM plots within each treatment demonstrator's field. (This is not experimental evidence, but will provide supporting information on the efficacy of ISFM.) Finally, researchers will compare the farming practices of the non-demonstrator farmers in treatment and comparison FOs to measure the diffusion of ISFM techniques from the demonstrator to other farmers within her FO.

Results and policy lessons

Study ongoing; results forthcoming.

---

1. Duflo, E., Kremer, M. & Robinson, J. 2008."How high are rates of return to fertilizer? Evidence from field experiments in Kenya." American Economic Review 98(2): 482-88.

2. Duflo E., Kremer M., &Robinson J. 2011. "Nudging Farmers to Use Fertilizer: Theory and Experimental Evidence from Kenya." American Economic Review 101 (6): 2350-90.

3. International Labor Organization. 2017. "Employment in agriculture (% of total employment)." ILOSTAT database.

4. GRAD. 2015. Baseline Study "Scaling-out Integrated Soil Fertility Management Technologies to Improve Smallholder Farmers Livelihood in Burkina Faso (SISFeM)."

5. Koussoubé, E. "Gender Norms and Selection into Farmer Organizations." Unpublished Manuscript, DIAL, 2015.