

## Promoting Sustainable Farming Practices in Malawi

**Researchers:**

Ariel BenYishay

Mushfiq Mobarak

**Sector(s):** Agriculture

**Fieldwork:** Innovations for Poverty Action (IPA)

**Location:** Malawi

**Sample:** 168 villages

**Target group:** Farmers

**Outcome of interest:** Technology adoption

**Intervention type:** Fertilizer and agricultural inputs Information Insurance Social networks

**AEA RCT registration number:** AEARCTR-0001471

**Data:** Download from the MCC

**Research Papers:** Social Learning and Incentives for Experimentation and Communication

**Partner organization(s):** Malawi Ministry of Agriculture and Food Security , Millenium Challenge Corporation (MCC), World Bank , Yale Center for Business and the Environment

Many agricultural technologies with demonstrated productivity gains are not adopted by farmers. Without reliable and persuasive sources of information, farmers may hesitate to adopt new inputs and techniques. Researchers conducted a randomized evaluation to test the impact of leveraging social networks to disseminate information about two technologies, pit planting and “Chinese composting,” on farmers’ adoption of these methods. Providing performance-based incentives to peer farmers had the biggest effect on technology adoption. Additionally, incentivized peer farmers who more closely resembled village farmers were the most effective at increasing new technology adoption.

### Policy issue

Low productivity in agriculture is a pressing challenge in low- and middle-income countries. The 2008 World Development Report documented the limited growth in agricultural yields and productivity over the previous 40 years in Sub-Saharan Africa. This limited growth is often considered a direct effect of the fact that many agricultural technologies, with demonstrated productivity gains such as timely fertilizer, improved seed varieties, and composting, have not been adopted. Improving food security and agricultural incomes, therefore, depends in part on farmer adoption of these tools and techniques. However, learning about a new agricultural technology is difficult. Farmers need to know that the technology exists, something about its costs and benefits, and how it will interact with their current inputs and planting practices. Agricultural extension services attempt to overcome these information barriers through trainings, demonstration plots, and farmer field schools. Most agricultural extension services do not reach all farmers directly. Instead, most farmers will learn about a new technology through social learning. What is the most effective way to leverage social networks to promote the adoption of agricultural technologies?

## Context of the evaluation

A lush climate and rich soil make Malawi well suited for agriculture, which is central to the country's economy and national life. In 2011, the agriculture sector made up 31 percent of Malawi's GDP and employed more than 80 percent of its workforce. The main food crop is maize, grown by smallholder farmers. Over half of all farmers in Malawi operate below subsistence and only 20 percent of maize farmers produce a surplus and sell their product.<sup>1</sup> Most rural families have too little land to produce sufficient food and too little income to buy extra. According to some reports, a quarter of the population runs out of food only five months after the harvest, well before the next harvest.

The current agricultural extension system in Malawi utilizes government workers called Agricultural Extension Development Officers (AEDOs), employed by the Ministry of Agriculture and Food Security. AEDOs work with individual farmers and host village-wide field days. While AEDOs are officially responsible for about fifteen to 25 villages, this number is often larger in reality given the high number of AEDO vacancies. In July 2009, an estimated 56 percent of AEDO positions were unfilled.

Traditionally, farmers use a technique called ridging and some forms of composting to prepare land for farming in Malawi. However, farmers had low levels of knowledge on the two technologies promoted by this study: pit planting and Chinese composting. At baseline, only about 12 percent of farmers in the comparison group had heard of pit planting, and those who were familiar with the technology did not know enough to implement it. About 54 percent of farmers were familiar with composting, though only 7 percent had heard of Chinese composting specifically.



A group of farmers in Malawi learn about sustainable practices

## Details of the intervention

Researchers conducted a randomized evaluation to test the impact of providing incentives to different types of communicators to disseminate information about pit planting and “Chinese composting” on farmers’ adoption of these methods. While all 168 villages selected lead farmers and peer farmers, villages were randomly assigned to receive information about a new technology from only one of the three different communicator types:

1. *AEDO only*;
2. *Lead Farmer (LF) with AEDO support*: One LF per village who was identified as a literate community leader and an early technology adopter with access to resources;
3. *Peer Farmers (PF) with AEDO support*: Five PFs, similar to the average farmer in the village and with a willingness to try the new technology.

Half of all communicators in each type were randomly assigned to receive incentives conditional on farmer-knowledge (in the first year) and farmer adoption (in the second year). AEDOs could receive bicycles; lead farmers could receive a large bag of fertilizer; peer farmers could receive a package of legume seeds. The value of incentives could not exceed MWK 12,000 (US\$80) for any given communicator type.

Communicators disseminated information about two different technologies to improve maize yields: pit planting and “Chinese composting.” A group of 48 villages, which received no information about new technologies, served as the comparison group. Researchers administered exams after the first year to measure how well farmers knew the new technologies. In the second year, researchers observed farmer behavior during the agricultural season to measure the level of technology adoption.

## **Results and policy lessons**

Providing performance-based incentives to PFs had the biggest effect on technology adoption. Incentivized PFs more than doubled their efforts, resulting in a six fold increase in the number of farmers adopting the technology compared to villages with non-incentivized PFs. Results suggest that providing incentives may serve as a viable way to improve the effectiveness of diffusing information through social networks. Additionally, incentivized PFs who more closely resembled village farmers were the most effective at increasing new technology adoption.

*Communicator effort*: AEDOs and LFs who did not receive incentives were equally as likely to exert effort to disseminate information about the new technology. However, AEDOs without incentives were 10-12 percentage points more likely to hold dissemination activities than PFs without incentives, of whom 35-39 percent held at least one dissemination activity.

*Technology Adoption*: LFs and PFs who received incentives had personal technology adoption rates over 30 percentage points higher than LFs (about 49 percent adoption) and PFs (negative adoption) who did not receive incentives. In villages with AEDOs who did not receive incentives, pit planting adoption by village farmers was about 2 percentage points higher than in comparison group villages which had nearly zero adoption. With incentives, AEDO villages had pit planting adoption rates 5.5 percentage points higher than in comparison villages. However, in PF villages, the incentivized communicators had a larger effect on technology adoption (10.2 percentage point increase) than communicators without incentives (1.7 percentage point increase) when compared to comparison group villages.

The program cost about US\$167 per household for the pit planting technology and US\$65 per household for the composting technology. Based on estimated yield gains from adopting the technologies, households earned about US\$77 more from the maize harvest in the first year.

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1. Denning, Glenn, Patrick Kabambe, Pedro Sanchez, Alia Malik, Rafael Flor, Rebbie Harawa, Phelire Nkhoma, Colleen Zamba, Clement Banda, Chrispin Magombo, Michael Keating, Justin Wangila, and Jeffrey Sachs. 2009. "Input subsidies to improve smallholder maize productivity in Malawi: Toward an African Green Revolution." *PLoS Biology* 7 (1): 2-10.