Financial Incentives Encourage the Adoption of Conservation Agriculture in Ghana
Abstract

Conservation agriculture (CA) is a farming system that can improve soil health and reduce erosion risk. Despite its potential, however, adoption of CA remains low due, in part because costs are immediate while payoffs are relatively long-term. In northern Ghana, researchers examined whether providing short-term financial incentives and information about peers’ experiences with CA or conventional practices impacted farmers’ decisions to adopt CA. Incentives increased farmers’ adoption of CA practices, but there was no overall impact of information sharing on a farmer’s CA adoption.

Policy Issue

As temperatures in Sub Saharan Africa rise, rainfall patterns are becoming more unpredictable and intense. As a result, growing seasons become shorter and the proportion of arable land shrinks.[1] Farmers also contend with soil degradation, which reduces the quality and the capacity of the earth to produce healthy yields over time.[2] These challenges can significantly threaten farmers’ productivity.[3] CA has been proposed as a strategy to mitigate the effects of climate change and soil degradation. Through a set of practices, CA increases soil organic matter to improve water retention and soil nutrients, allowing farmers to maintain on-farm productivity while protecting soil structure. However, because the positive effects on production can take up to ten years and require significant additional and upfront investments for weeding application and labor, smallholder farmers may be hesitant to take on these costs. As a result, CA adoption rates tend to be low in the region.

Interventions have promoted CA practices in low- and middle-income countries (LMIC) farming communities but most findings are based on observational studies, rather than randomized evaluations.[4] This study aims to contribute to the literature by rigorously evaluating the role of incentives on stimulating adoption of CA. In addition, extensive research exists on how peers can influence technology adoption through information sharing.[5] This study builds on the literature by examining how information sharing impacts adoption of technologies with delayed profitability.

Evaluation Context

As climate change continues, rainfall in Ghana is more unpredictable, putting smallholder farmers—who primarily rely on the rain to nourish the soil and their crops—at risk. This is particularly the case in the north where scarce and inconsistent rainfall has had a negative impact on crop production, poverty rates, and malnutrition rates.[1] The Ghanaian government and partners have promoted CA practices in the north to mitigate climate change and soil degradation.[2] One of these practices is minimum soil disturbance, in which farmers directly seed or input fertilizer into the soil without using tilling equipment to reduce soil erosion and enhance water infiltration.[3] In the part of northern Ghana where this intervention takes place, farmers who had adopted or were familiar with CA practices noted
that they had the least experience with minimum soil disturbance.

**Details of the Intervention**

Researchers partnered with the Ghana Agricultural Sector Investment Program (GASIP) and International Initiative for Impact Evaluation (3ie) to examine whether short-term financial incentives and information about peers’ experiences with minimum soil disturbance (MSD) and conventional practices impacted farmers’ decisions to adopt MSD.

A total of 1,328 farmers in 66 farmers organizations participated. In the intervention, they made real-life decisions on whether to adopt MSD over ten rounds to simulate medium-long term aspects of practicing conservation agriculture. Each round served as an agricultural season. Prior to each round, farmers could select MSD or conventional practices and were presented with the fixed costs they’d pay for each choice, the probability of rainfall during that season, and the value of their “harvest” that season—which depended on the practice they chose and the rainfall outcome. Payoffs were equivalent to a day or two of local wages.

To measure whether farmers would be more willing to adopt MSD if they were incentivized, researchers randomly divided the farmers into the following groups:

- **Incentives:** Two-thirds of farmers were eligible to receive an additional payment if they adopted MSD within the first four rounds.
- **No incentives:** One-third of farmers would not be eligible to receive additional payment to adopt MSD within the first four rounds.

In conjunction with examining the impact of incentives on MSD adoption, researchers measured whether farmers would be more willing to adopt MSD within the first four rounds if they heard about another hypothetical peer farmer’s experiences. This consisted of information about whether the peer farmer had practiced MSD or conventional practices in the long term or had recently switched, as well as the peer farmer’s earnings in the previous round. The farmers were randomly divided equally into the following groups:

- **Peer information:** Farmers received information about a peer’s experiences with MSD and conventional practices.
- **No information:** Farmers did not receive information about a peer’s experiences with MSD and conventional practices.

**Results and Policy Lessons**

Incentives increased farmers’ adoption of MSD practices by 7.6 percent. There was no overall impact of peer information sharing on a farmer’s MSD adoption.

**Effects of incentives on MSD adoption:** Adoption rates for MSD in the incentive group were higher across all rounds than in the no incentive group.

Incentivized farmers increased adoption of MSD practices by 7.6 percent over non
incentivized farmers, were 8.3 percentage points more likely than non-incentivized farmers to experience the production gain from MSD (12 percent increase), and 7.4 percentage points less likely than non-incentivized farmers to return to conventional practices after adopting MSD (22 percent decrease).

**Effects of peer information sharing on MSD adoption:** Information sharing about peers’ experiences did not affect MSD adoption overall. However, evidence suggests that sharing information about a peer’s long term positive experiences with MSD increased a farmer’s adoption.

**Sources**


