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The effect of demonstration plots and a warehouse receipt system on ISFM adoption, income and yield of smallholder farmers: an evaluation of Malawi's Anchor Farm Model

Programme overview

Agriculture accounts for 35 percent of Malawi's gross domestic product and employs 90 per cent of its rural population. However, close to 51 per cent of the population engaged in agriculture live below the poverty line. Low agricultural productivity is the result of dependence on rain-fed farming, high transportation costs, low uptake of improved farm inputs, insufficient extension services, inadequate credit, missing input and output markets, and weak farmer organisations.

The Clinton Development Initiative's Anchor Farm Model (AFM) employs a multi-pronged approach to increase agricultural production, income and food security by promoting the adoption of yield-enhancing integrated soil fertility management practices (ISFM), particularly for soybean. The programme, which is funded by the Alliance for a Green Revolution in Africa, will focus on assessing the impact of a subset of interventions, including access to input credit, demonstration plots[1] (with a focus on rotation, fertiliser and inoculation of soy) and the warehouse receipt system.[2] In addition, it will attempt to increase the cost-effectiveness of demonstration plots by exploring the role of mobile phone messages and sole-managed plots. The evaluation will also collect extensive soil data, thereby providing input into the analysis to establish fertiliser recommendations for the area.

Despite its potential benefits and widespread promotion, ISFM adoption remains low. Demonstration plots have emerged as a potential cost-effective alternative. However, the warehouse receipt system offers farmers access to credit and an opportunity to engage in intertemporal arbitrage, thus helping to alleviate the credit and market imbalance during the critical post-harvest period.

Primary evaluation questions

1. What is the effect of adding reminder messages to the initiative's traditional farmer-club approach? What is the effect of an individual-managed demonstration plot by the club leader as opposed to the group-based approach?
2. What is the conditional yield as a function of soil properties, climate and characteristics of the farmer, the farmer's household, the farmer club and the village? What is the remunerative potential of ISFM technologies for smallholder farmers?

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[1] Demonstration plots are a defined area within the village where a new concept is shown to farmers. For comparison, they are often located next to a plot that follows standard agricultural practices.

[2] The warehouse receipt system allows farmers to store agricultural produce, such as coffee or grains, and receive a receipt that clearly notes the quantity of produce stored.

Impact evaluation overview

This impact evaluation is funded as part of 3ie's Agricultural Innovation Thematic Window. 3ie conducted a scoping exercise that identified existing evidence and where there are gaps in the evidence base. The analysis and consultations during the exercise identified the need for more evidence on the effectiveness of interventions in four areas: (1) interventions that promote communicating effectively with farmers; (2) ones that promote adopting more productive technologies; (3) ones creating markets, and (4) ones strengthening value chains. All funded studies in this thematic window focus on programmes in at least one of these four areas and address one or more associated priority questions, of which this study will address this one:

• What combinations of ISFM technologies are most cost-effective in increasing agricultural productivity and smallholder farmers' incomes?

While multi-pronged agricultural programmes are increasing in Africa, there is little evidence on how various components interact with one another and what combination of services is most cost-effective. The study will address this critical knowledge gap and provide information on the relative cost-effectiveness of input credit, demonstration plots and the warehouse receipt system. Findings from this evaluation will provide important lessons for agricultural development in other low-income countries similar to Malawi.

Methodology and identification strategy

Each of the 250 villages will be randomly assigned to one of five groups: (1) receive input credit only; (2) receive warehouse receipt system only; (3) receive a combination of demonstration plot and input credit; (4) receive a combination of demonstration plot, input credit and warehouse receipt system; and (5) the control group. The credit sub-treatment and the credit component of the demonstration plot treatment will be introduced later in the study. The study also uses qualitative methods, such as structured and semi-structured interviews and focus group discussions. The qualitative research will provide information on programme constraints, if any; factors determining farmers' participation decisions; farmer dynamics in farmer clubs; and the programme's socio-economic effects on farmers and their families. The information will be useful in designing context-appropriate questionnaires and interpreting quantitative findings.

Heterogeneity analysis

The study will investigate the role of credit access, human capital and labour availability, land and asset ownership, risk and time preferences and soil type, including fertility and texture, on observed impacts. Special attention will also be paid to impacts on female-headed households, who often face more labour and cash constraints than their male counterparts. In addition, the study will also assess intra-household heterogeneity, including intra-household labour and consumption effects of introducing a new crop and new production methods.

Timeline

Start: June 2014
Baseline report: May 2015
Midline report: May 2016
Draft final report: November 2018
End: February 2019