Increasing Investment in Agricultural Inputs: Evaluating the Impact of Village Input Fairs in Mali

Villagers browse products at a vendor's stand during a Village Input Fair in Mali. © 2019 IPA

Abstract

The absence of markets for agricultural inputs ("ag-inputs") like fertilizers is a main feature of rural agricultural systems in Mali. In partnership with IPA Mali, the National Union of Agro-Input Dealers, and Soro Yiriwaso, researchers conducted a randomized evaluation to measure the impact of varying the timing of input purchases and the up-front payments required, as well as access to credit, at Village Input Fairs (VIFs) on farmers' decisions to buy and use agricultural inputs. VIFs organized in the post-harvest period and with credit access had significant positive effects on farmers' demand for inputs, input adoption, and household agricultural labor supply.

Policy issue

In Mali, farmers are unable to purchase adequate quantities of fertilizer or acquire the recommended stocks at optimal times to maximize crop growth, limiting farm productivity. Inputs such as water, labor, seeds, fertilizers, or insecticides can be costly, and farmers often have to travel long distances to reach markets to purchase them. Farmers' demand for inputs is affected by access to credit, the timing and location of input availability.

RESEARCHERS
Andrew Dillon, Nicolò Tomaselli

PARTNERS
Union of Agro-Input Dealers (UNRIA), Soro Yiriwaso (Implementing Partners)

COUNTRY
Mali

SECTOR
Agriculture

STUDY TYPE
Randomized Evaluation (RCT)

SAMPLE
140 villages (approximately 8,400 households)

TIMELINE
2017-2019

On the supply side, ag-input dealers would like to increase their fertilizer sales, but do not serve rural communities due to business constraints, high transportation costs to reach remote areas, and a lack of information about farmers' demand for their product.

The most effective way to solve this "last-mile" market access issue for farmers and ag-input dealers in rural areas remains an open question. This evaluation examines the roles that market timing, liquidity and contract design have on farmer input demand and productivity.

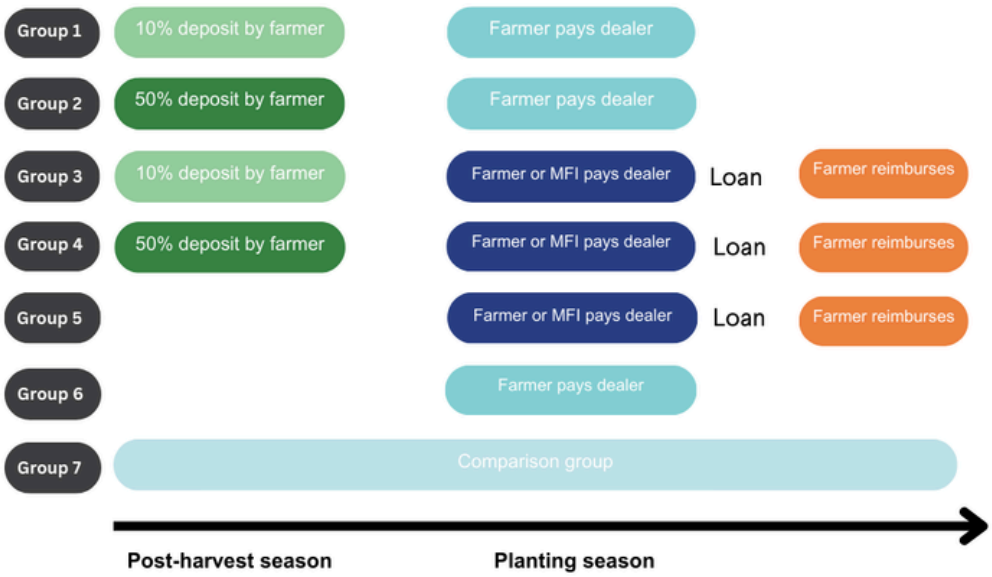
Village Input Fairs (VIFs) are markets created directly in rural villages that bring together input dealers, farmers, and microfinance institutions. VIFs are one-day fairs where farmers can purchase any inputs in any quantity directly from dealers. The National Union of Agro-Input Dealers (UNRIA) is the primary national association of ag-input dealers that provides access to inputs—including fertilizer, improved seeds, pesticides, and equipment—for small-scale farmers and plays an active role in agricultural policy. For the average smallholder farmer, fertilizer prices in Mali are relatively high compared to other parts of Africa. [1] However, farmers often have limited access to credit to cover the costs. Soro Yiriwaso—a microfinance institution—is sometimes present at these fairs to offer them credit.

Details of the intervention

In collaboration with Soro Yiriwaso, UNRIA, and IPA Mali, researchers conducted a randomized evaluation to measure the impact of varying the timing of input purchases and the up-front payment required, as well as access to credit, on farmers' decisions to buy and use agricultural inputs at Village Input Fairs (VIFs). The intervention was implemented in four regions: Sikasso, Koulikoro, Kangaba, and Bananba. Arable land is widely available in these regions, but the nutrient content of the soil is generally very low. Researchers randomly assigned 140 villages to one of seven groups, comprising 20 villages each. Six of the seven groups had an input fair, while the remaining group served as the comparison group and did not. The input fairs across the six groups that had them varied in their timing, in the availability of credit, and in the up-front payment required in a forward contract.

When the VIF was organized during the post-harvest season, farmers were required to pay an up-front deposit as a percentage of their purchase order, which acted as a commitment mechanism to secure the inputs. Farmers were either asked to make a 10 percent deposit on their purchase, a "soft" commitment, or were asked to make a 50 percent deposit, a "hard" commitment.

RESEARCH DESIGN AND INTERVENTION GROUPS



[1] Sanga, Udita, Amadou Sidibé, and Laura Schmitt Olabisi. 2021. "Dynamic Pathways of Barriers and Opportunities for Food Security and Climate Adaptation in Southern Mali." World Development 148 (December): 105663. https://doi.org/10.1016/j.worlddev.2021.105663.

Farmers were required to pay the remaining balance at the time the ag-input dealers delivered the inputs in June. If farmers reneged on their purchase, the deposit paid at the VIF was given to the ag-input dealer.

During VIFs organized during the planting season, these fairs operated as spot markets with direct sales to farmers.

Of the six groups that had VIFs, farmers in three were offered credit by Soro Yiriwaso at the input fair.

Results and policy lessons

Overall, village input fairs increased farmers' input demand, input adoption, and household labor supply relative to the comparison group, except when the fair was held both during the planting season and without access to credit (Group 6).

Market Demand

Households in villages receiving the intervention were aware of the organization of the input fair, but not all villages participated in them. During planting season, all villages (100 percent) participated in spot markets. After harvest, fewer villages joined markets with forward contracts—between 45 percent and 80 percent. The most popular post-harvest market was the one with a "soft" commitment in the VIF (group 1), where 80 percent of villages participated.

Input Demand

Researchers measured demand for three fertilizer products: urea, diammonium phosphate (DAP), and nitrogen, phosphorus, and potassium (NPK). Demand for fertilizer increased, with increases across the VIF groups ranging by 23 to 28 percent for DAP from a mean of USD$ 66-81 before the intervention. For urea, demand increased by 20 to 28 percent from a mean of USD$ 20-29 before the intervention when credit was offered. Farmers' demand was higher for DAP than urea and NPK, likely because farmers perceive soil nutrient deficiencies to primarily be driven by phosphorus rather than nitrogen. However, providing market access through a spot market in the planting season (Group 6) had no significant effect on input demand relative to the comparison group.

Input Adoption

Although fertilizer and pesticide use were high before the intervention—with 85 percent of households using fertilizer and 87 percent using pesticides—VIFs increased usage by 9.5 to 13.7 percentage points when credit was offered. The increase was driven primarily by urea adoption rather than DAP or NPK adoption. This result suggests that making village markets supplies marginal farmers who would otherwise be denied market access.

Production and Marketed Surplus, Crop Choice, and Labor

Changes in input demand associated with the VIFs, regardless of the contract terms of input purchases, could not be associated to increases in the total value of household agricultural production after one agricultural season. VIFs also did not lead to a change in crop portfolio substitution. Household labor supply did increase in the VIF groups relative to the comparison group. These effects were primarily found for planting (25-34 labor days) and weeding (30-36 labor days).

Policy lessons

Village Input Fairs are a helpful tool for rural farming communities. They create markets for farm supplies in areas where these markets were missing before. By bringing suppliers and farmers together, these fairs address the lack of access to resources. During the evaluation, VIF costs have been estimated at USD$ 100 per fair, suggesting that promoting input market development with VIFs is cost effective. The study also highlights that the VIF model leverages private sector actors by building the private sector rather than competing directly with local ag-input dealers. Researchers are also exploring strategies to increase farmer profitability, increase take-up and input purchases consistent with agronomic recommendations. Informed by the results of this study, researchers are scaling a version of the VIF in Mali and Ghana. The chosen bundle for scaling includes the Village Input Fair organized in the post-harvest period, with 10 percent commitment device, and access to credit offers.