

Researchers

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Timeline

2017-2019

Study Status

Results

Study Type

Randomized Evaluation

Sample Size

140 villages (approximately 8,400 households)

STUDY SUMMARY

The Impacts of Rural Finance and Commitment Mechanisms on Agricultural Input Decisions in Mali



Smallholder farmers in low-and middle-income countries (LMICs) face numerous constraints to adopting potentially transformative agricultural inputs such as limited supply that drives up prices and lack of access to finance to purchase these inputs. Research suggests that input fairs may alleviate these constraints. In Mali, researchers established village-level input fairs where farmers could purchase inputs for their farms from secondary agricultural suppliers and measured how differing purchasing requirements impacted demand for inputs, market sales, and agricultural outcomes. Results showed that more farmers took up input purchase contracts when initial deposit requirements were low, leading to higher market sales. Market sales further increased when credit was made available with these contracts.

Policy Issue

Global fertilizer prices have risen by 30 percent since the start of 2022, reaching the highest they have been since 2008, and are expected to remain high for the foreseeable future. As a result, smallholder farmers in LMICs may find it difficult to purchase bags of fertilizer for their farms because they are prohibitively expensive. A lack of modern fertilizer to nourish their crops can in turn prevent farmers from increasing their productivity and profitability. Evidence suggests that rural input fairs organized by secondary agricultural suppliers can provide smallholder farmers with opportunities to purchase fertilizers and other important inputs that they otherwise wouldn't have access to.

Extensive research exists on the factors that contribute to low technology adoption, but almost exclusively related to the demand side. This study contributes to the growing literature on the supply side by analyzing the effects of village level input fairs held by secondary suppliers and microfinance institutions for farmers to purchase inputs and increase investment in the context of Mali.

Evaluation Context

In southern and western Mali, many smallholder farmers contend with low technology and input adoption, limiting the potential for profitable on-farm investment. One of the contributing factors to this is poor transportation infrastructure and distribution network. Prices for inputs like fertilizers increase significantly due to high transport costs, which account for nearly one-third of the price. The



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COUNTRY
Mali

PARTNERS
Soro Yankoro, National Union of Sellers of Agricultural Inputs of Mali (UNISA)

PROGRAM AREA
Agriculture

TOPICS
Access to Finance, Access to Markets, Commitments, Incentives, Rural Finance, Technology Adoption

TIMELINE
2017-2019

The Impacts of Rural Finance and Commitment Mechanisms on Agricultural

Input Decisions in Mali

Abstract

Smallholder farmers in low-and middle-income countries (LMICs) face numerous constraints to adopting potentially transformative agricultural inputs such as limited supply that drives up prices and lack of access to finance to purchase these inputs. Research suggests that input fairs may alleviate these constraints. In Mali, researchers established village-level input fairs where farmers could purchase inputs for their farms from secondary agricultural suppliers and measured how differing purchasing requirements impacted demand for inputs, market sales, and agricultural outcomes. Results showed that more farmers took up input purchase contracts when initial deposit requirements were low, leading to higher market sales. Market sales further increased when credit was made available with these contracts. The intervention is now being scaled to reach approximately 600 thousand farmers across Mali.

Policy Issue

Global fertilizer prices have risen by 30 percent since the start of 2022, reaching the highest they have been since 2008, and are expected to remain high for the foreseeable future.^[1] As a result, smallholder farmers in LMICs may find it difficult to purchase bags of fertilizer for their farms because they are prohibitively expensive. A lack of modern fertilizer to nourish their crops can in turn prevent farmers from increasing their productivity and profitability.^[2] Evidence suggests that rural input fairs organized by secondary agricultural suppliers can provide smallholder farmers with opportunities to purchase fertilizers and other important inputs that they otherwise wouldn't have access to.^[3]

Extensive research exists on the factors that contribute to low technology adoption, but almost exclusively related to the demand side.^[4] This study contributes to the growing literature on the supply side by analyzing the effects of village level input fairs held by secondary suppliers and microfinance institutions for farmers to purchase inputs and increase investment in the context of Mali.

Context of the Evaluation

In southern and western Mali, many smallholder farmers contend with low technology and input adoption, limiting the potential for profitable on-farm investment.^[4] One of the contributing factors to this is poor transportation infrastructure and distribution network. Prices for inputs like fertilizers increase significantly due to high transport costs, which account for nearly one-third of the price.^[5] The agricultural market is dominated by small-scale secondary input dealers due to an underdeveloped private sector, which can translate into variations in supply, prices, and quality of inputs.^[6]

The National Union of Agro-Input Dealers (UNRIA) promotes the supply of domestic market inputs like fertilizer, improved seeds, pesticides, and equipment by organizing input fairs in cities and secondary towns for farmers to attend and purchase these inputs for their farms with the help of credit provided by microlending institutions like Soro Yiriwaso.

Details of the Intervention

Researchers partnered with the National Union of Agro-Input Dealers (UNRIA) and Soro Yiriwaso to establish village-level input fairs where farmers could purchase inputs for their farms from agricultural suppliers.

The intervention occurred in Sikasso, Koulikoro, Kangaba, and Banamba in western and southern Mali between 2017 and 2019. Researchers varied when the input fairs took place and for when purchases could be ordered, whether a farmer paid a 10 percent upfront deposit or a 50 percent upfront deposit for an input purchase contract, and whether credit was offered. They then measured how these variations in input fair organization impacted sales, farmer demand for input purchase contracts, farmers' input use decisions, and crop choice and yields.

A total of 140 villages participated in the intervention. The villages were divided randomly into the following groups:

1. **Post-harvest input fair with 10 percent deposit and loan:** 20 villages attended an input fair after the previous season's harvest. An interested farmer had to pay a 10 percent deposit on the input purchase the day of the fair. The balance could be paid by the farmer or with a loan, which would be activated upon delivery of the inputs at the beginning of planting season.
2. **Post-harvest input fair with 10 percent deposit and no loan:** 20 villages attended an input fair after the previous season's harvest. An interested farmer had to pay a 10 percent deposit on the input purchase. No credit was offered to pay the balance.
3. **Post-harvest input fair with 50 percent deposit and loan:** 20 villages attended an input fair after the previous season's harvest. An interested farmer had to pay a 50 percent deposit on the input purchase the day of the fair. The balance could be paid by the farmer or with a loan, which would be activated upon delivery of the inputs at the beginning of planting season.
4. **Post-harvest input fair with 50 percent deposit and no loan:** 20 villages attended an input fair after the previous season's harvest. An interested farmer had to pay a 50 percent deposit on the input purchase. No credit was offered to pay the balance.
5. **Planting season input fair with loan:** 20 villages attended an input fair at the beginning of planting season. The purchase value of the inputs was either directly paid by the farmer or became a loan. If it became a loan, the microcredit institution made the payment directly to the ag-input dealer after executing the credit contract with the farmer.
6. **Planting season input fair with no loan:** 20 villages attended an input fair at the

beginning of planting season. The purchase value was directly paid by the farmer. No credit was offered.

7. **Comparison group:** 20 villages did not attend an input fair of any kind.

Results and Policy Lessons

Market sales increased significantly when input fairs were organized with 10 percent deposit amounts compared to fairs with 50 percent deposit amounts. The availability of credit for contracts with 10 percent deposit amounts further increased market sales by US\$ 63, increasing fertilizer purchased by 140kg at market prices.

Farmer take-up of contracts with credit and without credit: Credit pushed more farmers to conclude transactions as it increased their purchasing power. In the post-harvest input fair with 10 percent deposit requirements, credit increased farmers' participation rate by 16 percentage points while credit increased farmers' participation rate by 11.1 percentage points in the planting season input fair.

However, credit had no effect when deposit requirements were high. In the 50 percent deposit post-harvest input fairs, participation, number of transactions, and transaction value were all statistically similar when no credit was offered with high deposit requirements.

Village take-up of input purchase contracts: 70 to 80 percent of villages that attended input fairs with 10 percent purchase deposits took up the input contracts with ag-input dealers. 45 to 70 percent of villages that attended input fairs with 50 percent purchase deposits took up the input contracts with ag-input dealers.

All villages attending the planting season input markets participated.

Input use: Increased access to inputs in turn improved farmers' agricultural investment. Fertilizer application intensified for all villages attending the input fairs except the villages offered 50 percent purchase deposit without credit (Group 4).

In the season following the post-harvest 10 percent deposit input fair, villages increased their urea and DAP fertilizer use by 14.2 percentage points and 17.4 percentage points, respectively. Credit did not have an impact on input usage.

Villages attending fairs at the start of planting season with credit availability increased the area of their urea fertilizer usage (also known as the extensive margin) by 8.2 percentage points and villages without credit increased the area of their urea fertilizer usage by 14 percentage points.

Farmer crop choice and yield: The increase in fertilizer availability and application did not lead to farmers diversifying their crop portfolio. For all villages attending input fairs, crop value per hectare increased between ten and twenty percentage points more than the comparison group.

Sources

^[1] John Baffes and Wee Chian Koh, "Fertilizer prices expected to remain higher for longer," *World Bank* (blog), May 11 2022, <https://blogs.worldbank.org/opendata/fertilizer-prices-expected-remain-higher-longer>

^[2] Frank K. Nti, "Impacts and Repercussions of Price Increases on the Global Fertilizer Market," *US Department of Agriculture Foreign Agricultural Service*, June 30, 2022, <https://www.fas.usda.gov/data/impacts-and-repercussions-price-increases-global-fertilizer-market>

^[3] Duflo, Esther, Michael Kremer, and Jonathan Robinson. "Nudging farmers to use fertilizer: Theory and experimental evidence from Kenya." *American economic review* 101, no. 6 (2011): 2350-90.

^[4] Magruder, Jeremy R. "An assessment of experimental evidence on agricultural technology adoption in developing countries." *Annual Review of Resource Economics* 10 (2018): 299-316.

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^[4,5,6] Dillon, Andrew and Niccolo Tomaselli. "Making Markets: Experiments in Agricultural Input Market Formation." Unpublished, last modified June 2022.

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