Savings, Subsidies and Sustainable Food Security in Mozambique

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AEA RCT registration number: AEARCTR-0000239

Research Papers: Subsidies and the African Green Revolution: Direct Effects and Social Network S...

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Policy issue

In 2003, several countries in sub-Saharan Africa committed to investing 10 percent of their national budget on agricultural development. Many have since implemented large-scale input subsidy programs on products like fertilizer and seeds as a way to boost food security and small farm productivity. Despite increasing interest from policymakers and development agencies in supporting subsides for modern agricultural inputs, there is little understanding of the impact of those policies on improving use of agricultural technologies, agricultural output, and household well-being. While many subsidies programs are usually permanent, implementing them temporarily may help governments achieve the same goals and save money. Moreover, promoting savings among farmers may enable them to use the saved funds for agricultural investments once subsidies end. Can temporary subsidies on agriculture inputs have lasting impacts on technology adoption even once the subsidy ends, and how does promoting savings influence these impacts?

Context of the evaluation

Agriculture accounts for more than 25 percent of Mozambique's Gross Domestic Product, but agricultural technology adoption has been slow in Mozambique compared to other countries in the region. [1] Most of the farmers participating in this study had little or no experience using chemical fertilizers, pesticides, and other agricultural inputs. Moreover, few households had formal savings. The government of Mozambique piloted a limited, two-year fertilizer subsidy program for maize and rice producers from 2009 to 2011.

Farmers planting maize

Cephas Joshua Beujung Samwini

Details of the intervention

In partnership with the Ministry of Agriculture in Mozambique, researchers conducted a randomized evaluation to measure the impact of both a temporary subsidy for fertilizer and savings program on farmer's agricultural investments and household well-being.

The government voucher program took place over the 2009–10 and 2010–11 crop seasons. Researchers randomly selected a total of 94 communities to participate in the study. Government agricultural extension officers created a list of eligible farmers in each community, with input from local leaders and agricultural input retailers. This resulted in a study sample of 1,589 individuals.

Researchers then randomly assigned half of the farmers to receive vouchers coupons for 100 kilograms of discounted fertilizer and 12.5 kilograms of improved seeds. The total value of the input package was about MZN 3761 (US$117 in 2011 prices), with farmers required to pay 27 percent of this cost, or MZN 1016 (US$32). The remaining half of farmers served as a comparison group and was not assigned to receive a voucher.

Before the start of the 2011-2012 agricultural season, researchers subsequently divided communities and individuals into three savings groups:

1. Basic savings program: Participants received financial education through three 3- to 4-hour sessions conducted jointly by research staff and representatives of the partner bank, Banco Oportunidade de Moçambique (BOM). Sessions took place

in each community over the course of three months in 2011 and covered the following topics: benefits of using fertilizer and improved seeds, basic principles of household budgeting and financial planning, how to use savings accounts to accumulate resources for agricultural inputs and other investments, and the use of savings as buffer stocks for self-insurance. The ultimate goal was to encourage participants to open and use savings accounts.

2. Matched savings program: In addition to the financial education program detailed above, participants in this group were offered a 50 percent match on the minimum balance held in accounts with the partner bank during specified time periods, for up to MZN 1500 (USD 56).
3. Comparison group did not have a savings intervention.

In total, there were 6 treatment groups.

	Basic savings	Matched savings	Comparison group
Received subsidy	Subsidy + Basic savings	Subsidy + Matched savings	Subsidy only
Comparison group	Basic savings only	Matched savings only	Comparison group

Researchers conducted three survey rounds, first in 2010-11 agricultural season (when the subsidy was offered), and in the 2011-12 and 2012-13 agricultural seasons (when no subsidy was offered). They collected information on use of agricultural technologies, agricultural production, household finances, and social network connections.

Results and policy lessons

Despite low take-up, the temporary subsidy for technology adoption increased agricultural input use, maize yields, and household consumption during and after the subsidized period. Farmers with access to both the subsidy and the savings program increased their savings.

Not all farmers redeemed their assigned vouchers: Less than half of farmers assigned to receive a voucher used it to purchase inputs on maize crops. Among those assigned to only receive the subsidy, most farmers claimed they did not pick up the voucher due to inability to make the co-payment.

The savings programs encouraged more farmers to open savings accounts: While 5 percent of farmers in the comparison group had an account with the partner bank, BOM, 20 and 27 percent of farmers offered the basic and matched savings program, respectively, opened an account with BOM. Account ownership at any bank was also higher for farmers offered either savings program. Famers in the savings treatment groups also saved more: formal savings balances increased by MZN 1,300 (USD 40) to 3,700 (USD 114) across the various treatment groups. For comparison, farmers offered neither the subsidy nor savings treatment had on average MZN 1,340 (US$41) in savings.

For farmers offered only the subsidy, the program led to an increase in technology adoption, maize yields, and living standards, both during and after the subsidy period: During the 2010-2011 agricultural season, when the subsidies were offered, households in the subsidy-only treatment group used 17 kilograms more fertilizer (74 percent increase) and 4.16 kilograms more improved seeds (22 percent increase) than the comparison group. The subsidy-only group also experienced maize yields increases of 177 kilograms per hectare, a 22 percent increase from a comparison group average of 821 kilograms per hectare. After the subsidy ended, farmers in the subsidy-only group continued to use fertilizer at higher rates than comparison households and likewise experienced higher maize yields. Although researchers found no impact on households' consumption during the subsidy period, after the subsidy was lifted, household consumption was also 13 percent higher than in the comparison group. Researchers suggest that the persistence of these impacts even after the subsidy ended reflects that farmers learned about the returns to fertilizer and continued to use it.

Farmers offered the subsidy influenced their peers to use fertilizer: Though they did not receive any subsidy, farmers in contact with farmers who did used 78 percent more fertilizer and had 83 percent larger maize yields after the subsidy ended. These farmers were likely learning about the benefits of fertilizer use from their peers who received the subsidy.

These initial findings illustrate that temporary input subsidies can be an effective policy to promote lasting increases in agricultural technology adoption, agricultural outputs and living standards among subsidy beneficiaries and their peers. Analysis of the savings interventions, and of the effect of the savings interventions on the impact of the subsidy, are still ongoing and will be the subject of future reports.

Carter, Michael R., Rachid Laajaj, and Dean Yang. 2013. “The Impact of Voucher Coupons on the Uptake of Fertilizer and Improved Seeds: Evidence from a Randomized Trial in Mozambique.” American Journal of Agricultural Economics 95(5): 1345-51.

Carter, Michael R., Rachid Laajaj, and Dean Yang. “Subsidies, Savings and Sustainable Technology Adoption: Field Experimental Evidence from Mozambique.” Working paper, July 2016.

Carter, Michael, Rachid Laajaj, and Dean Yang. 2021. "Subsidies and the African Green Revolution: Direct Effects and Social Network Spillovers of Randomized Input Subsidies in Mozambique." American Economic Journal: Applied Economics, 13 (2): 206-

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1. World Bank Data Catalog, “Mozambique: Agriculture, value added (% of GDP).” http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=MZ