

## Innovative Finance for Technology Adoption in Western Kenya

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Farmer tends to his field in Kenya

**Fieldwork:** Innovations for Poverty Action (IPA)

**Location:** Western Kenya

**Sample:** 1589 farmers in 232 groups of 5-7 farmers

**Timeline:**  
2012 to 2014

**Partners:**  
One Acre Fund (OAF)

*Seasonal fluctuations in crop prices can have direct impacts on farmers' earnings and savings. Crop prices are often lowest right after harvest, increasing substantially in the months afterwards, but farmers are not always able to take advantage of these price changes. Researchers evaluated whether well-timed access to credit allows maize farmers to make better use of storage and sell their output at higher prices. The loan offers allowed farmers to store more maize and earn slightly higher revenues, with larger impacts for farmers granted loans immediately following harvest.*

**Policy Issue:** Seasonal fluctuations in crop prices can have direct impacts on farmers' earnings and savings. Crop prices are often lowest right after harvest, increasing substantially in the months afterwards. For example, in East Africa, over the six to eight months following harvest, maize prices may increase as much as 50 percent. But farmers do not always take advantage of these prices. Even with opportunities to store crops, farmers often sell their maize at low prices immediately after harvest to obtain cash for urgent

expenditures and bills, buying it back later in the season at higher prices after exhausting their own harvests. One potential explanation for this is that farmers have poor access to credit or savings, with few opportunities to secure cash besides crop sales. Improved access to credit could benefit farmers, yet credit is relatively expensive and inflexible compared to savings. Savings products could help farmers accumulate cash, but farmers may find it difficult to save due to competing uses for their money and demands from family or friends. Can loans secured by harvests help farmers access loans and boost income?

**Context of the Evaluation:** Prior to this evaluation, farmers in the study area in Webuye, Kenya, cited credit constraints as the primary reason for selling maize quickly rather than storing it until prices rose. Only 8 percent had taken a loan from a bank in the previous year and 25 percent had obtained loans from an informal source such as a moneylender, family member or friend, in the previous three months.

Since 2006, One Acre Fund (OAF), a microfinance NGO, has served over 136,000 farm households in Kenya to help combat these challenges. OAF offers in-kind, joint-liability loans of fertilizer and seed to groups of 8-12 farmers, along with training on improved farming techniques. Within defined village clusters, OAF typically serves 20 – 30 percent of all farmers.

**Details of the Intervention:** In partnership with OAF, researchers evaluated whether well-timed access to credit can allow farmers to make better use of crop storage and sell their output at higher prices. To explore the impact of the timing of the loans, researchers randomly assigned 232 groups of farmers across 17 village clusters (a total of 1,589 farmers) into one of three groups:

- *Post-Harvest Loan:* 77 groups (474 farmers) were offered a loan directly following harvest in October.
- *Three Months Post-Harvest Loan:* 75 groups (478 farmers) were offered a loan three months after harvest in January.
- *Comparison Group:* 80 groups (635 farmers) were not offered a loan.

To qualify for the loan, farmers were required to commit maize as loan collateral, and used laminated tags with OAF's logo to mark collateralized bags of maize. A bag of maize was valued at KSH 1500 (US\$17.44) for October loans and KSH 2000 (US\$23.26) for January loans. Farmers paid a 10 percent interest rate on the loan, with full repayment after nine months.

Following random assignment of the loan treatments, a subset of individuals within each group was randomly selected to receive a simple cash lockbox to promote savings and help farmers overcome self-control.

In sum, farmers were randomly assigned to one of six groups.

Group	Loan Offer	Lock Box
1	Post-Harvest Loan	Yes
2	Post-Harvest Loan	No
3	Three Months Post-Harvest Loan	Yes
4	Three Months Post-Harvest Loan	No

Group	Loan Offer	Lock Box
5	None	Yes
6	None	No

Researchers additionally randomly selected 159 farmers within the comparison group to receive laminated tags to test whether the tag alone allows farmers to credibly claim to friends and family that they cannot give away their stored maize, especially in a context in which local norms promote sharing of surplus maize.

Finally, if enough farmers change the timing of their crop sales and purchases, they could affect the overall supply and demand for crops in the market, influencing the price. To test the impact of the loans on overall market prices for crops, researchers randomly offered loans to more farmers in some village clusters than others. In nine clusters, 80 percent of farmers' groups were offered loans. In eight, 40 percent were offered the loan.

**Results and Policy Lessons:** The loan offers allowed farmers to store more maize and earn slightly higher revenues, with larger impacts for farmers granted loans immediately following harvest and for those in villages where fewer farmers were offered loans.

*Loan take-up:* Take-up of the loan treatments was high. Of the individuals offered post-harvest loans, 329 (69 percent) applied and qualified for the loan. Among farmers offered the three months post-harvest loan, 281 (59 percent) qualified for and took up the loan. Post-harvest loan amounts exceeded that of three month post-harvest loans: farmers taking out a loan in October borrowed KSH 5294 (US\$61.56) compared to KSH 4345 (US\$50.52) borrowed by those in January.

*Maize inventories and revenues:* Farmers offered loans held more maize in storage, with larger inventory increases among farmers offered post-harvest loans. Relative to the comparison group, farmers in the post-harvest loan group had 0.77 (26 percent) more 90 kg-bags and farmers in the three months post-harvest loan had 0.46 (15 percent) more 90 kg-bags on hand.

Farmers offered loans earned slightly lower revenues in the

three months after harvest, suggesting they refrained from selling at low prices, and slightly higher revenues nine months after harvest when prices tend to be higher. During the four months following harvest, farmers in the post-harvest group and three months post-harvest group earned less income than farmers not offered loans. But, two rounds of surveys later, farmers in the post-harvest group and three months post-harvest group earned KSH 1841 (US\$21.41) and KSH 852 (US\$9.91), respectively, more than those in the comparison group. These earnings are equivalent to roughly one-sixth to one-third of farmers' total cash savings. Moreover, over the course of the year, farmers offered the post-harvest loan generated KSH 542 (US\$6.30) more revenues than the comparison group or the three months post-harvest loan farmers.

Overall, the post-harvest loan had larger impacts on farmers than the three months post-harvest loan, perhaps because receiving the loan in January was less useful for farmers trying to smooth their maize sales. Farmers in the three months post-harvest loan group likely had to sell some of their maize before they received the loan, depleting their inventories and therefore their revenues over the course of the year.

*Market price:* The loan offers had some impact on market prices within areas in which a higher share of farmers was offered loans. During the months immediately following harvest, maize prices in areas with 80 percent of farmers groups offered loans were 3 percent higher, likely because more farmers held larger inventories, which depressed supply and drove up prices. However, prices converged as time went on. As a result, farmers in areas where fewer of their peers were also offered loans benefitted more: they bought more inventory at low prices immediately after harvest so that they had more inventory to sell going into the higher price season.

Overall, the results suggest that loan offers can help farmers make maize purchases during periods of low prices, put more maize in storage, and sell maize at higher prices later in the season, increasing farm profits. But, while this evaluation suggests that access to credit allowed farmers to take advantage of price and storage opportunities, more research is needed to understand how widespread offers of credit could impact markets as a whole.

**Related Papers Citations:** *Burke, Marshall, Lauren Falcao Bergquist, and Edward Miguel. 2019. "Sell Low and Buy High: Arbitrage and Local Price Effects in Kenyan Markets." The Quarterly Journal of Economics, Volume 134 (2): 785–842.*

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