



GENDER
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LAB

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LOCKING CROPS TO UNLOCK INVESTMENT: EXPERIMENTAL EVIDENCE ON WARRANTAGE IN BURKINA FASO

Authors: Clara Delavallade (Africa Gender Innovation Lab) and Susan Godlonton (Williams College)

KEY MESSAGES

- **Smallholder farmers in Sub-Saharan Africa face an array of challenges to realizing higher profits from their agricultural activities, including lack of adequate storage facilities and credit market imperfections.** For female farmers, who tend to earn less per hectare than their male counterparts, overcoming these issues could play an important role in unlocking the resources needed to improve their earnings and boost investment in their farms and households.
- **To address these constraints, warrantage, an innovative inventory credit system, offers farmers the opportunity to both store their crop production and access credit simultaneously.** At harvest time, farmers can deposit their grains at a warehouse as collateral for a loan commonly up to 80% of the grain value, to be stored for a pre-determined period at an annual interest rate.
- **In a study in Burkina Faso, a research team worked with 38 villages to look at the impacts of warrantage on a variety of household and agricultural outcomes when given access to storage warehouses in close proximity villages.** The study found that households which had access to the warrantage scheme had significantly higher harvest value: on average, they had a 15% increase. It appears that this effect is driven by households taking advantage of the ability to sell when prices were higher.
- **With additional cash on hand from increased revenues, households with access to the warrantage scheme invested more in education, increased their livestock holdings, and invested more in agricultural inputs for the following year.** No impacts were found on food expenditures or on food security indicators. These findings suggest that warrantage systems, when established through trusted community institutions, can positively influence household incomes and farmers' investment behavior.

GENDER INNOVATION LAB

The Gender Innovation Lab (GIL) conducts impact evaluations of development interventions in Sub-Saharan Africa, seeking to generate evidence on how to close gender gaps in earnings, productivity, assets, and agency. The GIL team is currently working on over 80 impact evaluations in more than 30 countries with the aim of building an evidence base with lessons for the region.

The impact objective of GIL is increasing take-up of effective policies by governments, development organizations, and the private sector to address the underlying causes of gender inequality in Africa, particularly in terms of women's economic and social empowerment. The Lab aims to do this by producing and delivering a new body of evidence and developing a compelling narrative, geared towards policymakers, on what works and what does not work in promoting gender equality.

CONTEXT

For smallholder farmers, it is often difficult to store crops beyond the immediate short-term. Constraints like inadequate storage facilities or credit market imperfections hold farmers back from potentially storing their crops to sell at points of the season when they might fetch a higher price, leaving farmers more vulnerable to volatile crop prices or seasonal liquidity constraints that can lead to weaker investment decisions. These challenges may be particularly acute for female farmers who face additional gender-specific constraints to accessing and using productivity-enhancing resources, and achieving the same returns from those resources as men.

To address these constraints, warrantage, an inventory credit system, offers farmers the opportunity to both store their crop production and access credit simultaneously. At harvest time, farmers can deposit their grains at a warehouse as collateral for a loan commonly up to 80% of the grain value, to be stored for a pre-determined period at an annual interest rate.

In this context, grain storage acts as a commitment device that keeps farmers from accessing their stored grains for a fixed duration and helps them to resist the need to sell crops at harvest when prices are low, helping to realize profits from seasonal price increases. It also acts as collateral, which allows financial institutions to provide credit to farmers, who are typically unbanked and lack other methods of gaining credit. When farmers use a warrantage system to shift the timing of their sales, they can also still maintain cash on hand, smooth their consumption, and diversify investment across the year due to the credit aspect of the system. In addition, by providing an appropriately constructed and ventilated facility for grain storage (in contrast to home storage, which can leave grains at-risk for pests), warrantage can reduce grain losses.

WHAT WE DID

In collaboration with the farmers' organization Cooperative de Prestation de Services Agricoles Coobsa (COPSA-C), the financial institution Coris Bank, the NGO Comunità Impegno Servizio Volontariato (CISV), the International Food Policy Research Institute (IFPRI), and researchers at Williams College, the Africa Gender Innovation Lab worked with 38 villages to look at the impacts of warrantage on a variety of household outcomes when given access to warehouses in 13 close proximity villages.

Immediately post-harvest in December 2014 and early January 2015, researchers instituted a household-level randomization through a public lottery among households expressing interest in warrantage. Households were randomly assigned into receiving either access to a warrantage system using a nearby facility or no access.

After the lottery, crops were stored in the warehouses until May 2015, when bags were redistributed to the farmers. At the time of both storage and redistribution, researchers collected administrative data that noted the types of crops that were stored, as well as the number of bags owned by each farmer. In August/September 2015, several months into the next agricultural growing season, researchers conducted an endline survey. Treated households were offered both features of warrantage: a credit feature, and a storage feature.

WHAT WE FOUND

Take-up of the storage feature of warrantage was near-universal, at 92%, which allowed households to shift from storing their crops at their home to storing them in village warehouses. In contrast, credit use was lower: only 38% of treated households took up the credit offer. There were no detectable differences between women- and men-headed households in interest in warrantage or in take-up of storage and credit features.

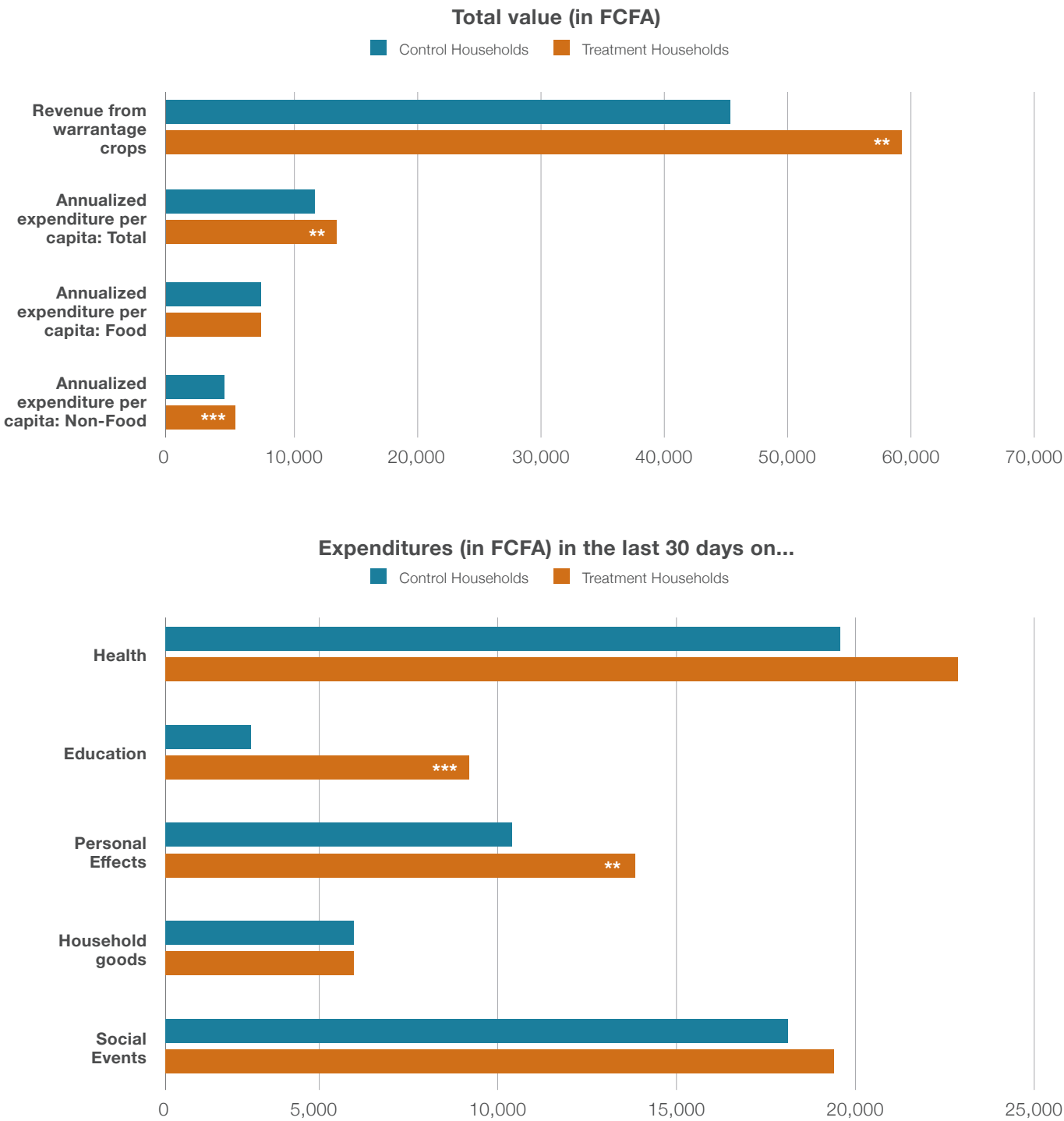
Households who had access to the warrantage scheme had significantly higher harvest value: on average, they had a 15% increase over the agricultural season. It appears that this effect is driven by households taking advantage of the ability to sell when prices were higher: households generally used the storage facilities to store sorghum and maize grains, which are common in the area and historically have significant price volatility. Through this increased storage of key grains, there is suggestive evidence that households sold less of them immediately after harvest, instead shifting their sales to the destocking period, when prices were higher.

With additional cash on hand from increased revenues, households in villages with access to the warrantage scheme consumed almost 10% more than those without access, invested more in education, increased their livestock holdings, and invested more in agricultural inputs for the following year. No impacts were found on food expenditures or on food security indicators.

Among households that used the credit option, the average loan size was approximately \$40, at an annual interest rate of 9.75%. Credit take-up was higher among households with a credit history. Credit repayment was universal.

Stakeholders were concerned that warrantage may negatively impact village sharing norms, but this study found limited evidence to support these concerns. In addition, the prevalence of warrantage did little to alter measures of institutional trust among either participating or non-participating households.

FIGURE 1: IMPACTS OF WARRANTAGE ON REVENUES AND EXPENDITURES



Note: The symbols */**/** denote statistical significance at the 10%, 5%, and 1% levels, respectively.



POLICY IMPLICATIONS & NEXT STEPS:

Households that received access to a warrantage system had clear benefits: increased income, which was spent on long-term investments, including human capital expenditures, livestock holding, and investment in agricultural inputs. This result shows that smallholder inventory credit can have positive impacts on farmers' investment behavior.

Simple cost-effectiveness calculations showed that the method of implementation for warrantage, using underutilized existing storage infrastructure is highly cost-effective, showing gains in production value roughly nine times higher than program costs.

When designing this type of policy to scale, it is important to note that the effectiveness of a warrantage system depends greatly on community trust in the institutions involved. In this study, COPSA-C had a long history of working in the community. Building trust prior to introducing warrantage is likely key to ensuring high take-up.

Reference:

["Locking Crops to Unlock Investment: Experimental Evidence on Warrantage in Burkina Faso", C. Delavallade and S. Godlonton, Journal of Development Economics. 2023. Vol. 160.](#)

FOR MORE INFORMATION,
PLEASE CONTACT

Africa Gender Innovation Lab
afrgenderlab@worldbank.org

Clara Delavallade
cdelavallade@worldbank.org

Léa Marie Rouanet
lrouanet@worldbank.org

1818 H St NW
Washington, DC 20433 USA
www.worldbank.org/africa/gil

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