

What are the effects of improved on-farm storage on food security and local food prices? A field experiment in Tanzania

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1 Introduction

In recent years an increasing number of programmes have been implemented to reduce post-harvest losses, for example through improved on-farm storage. Reducing losses has been promoted as a way to improve food security and sustainability. Yet, there is a very thin literature on the actual food security impacts of reducing post-harvest losses, and practically nothing is known about broader impacts on local markets.¹

2 Research Questions and Hypotheses

What are the causal effects of improved on-farm storage on local market prices and their seasonal variance?

Hypothesis: Market prices in villages treated with on-farm storage interventions show less seasonal variance than prices in untreated villages.



Fig. 1. Prices for maize typically increase strongly a few months after harvest in Tanzania.

What are the causal effects of improved on-farm storage on food security of farmer's households?

Hypothesis: Smallholder households using improved on-farm storage have on average higher self-reported food security.



Fig. 2. Farmers in Kingale village, Tanzania, re-packaging their harvest.

3 Method: Cluster Randomized Control Trial

We implement the first Randomized Control Trial (RCT) on the effects of reduced food losses on food security & local markets. 66 farmers groups randomly allocated to either treatment or control, with a total of 1023 farmers, participate. Treatment groups receive: a) Training and Demonstrations on how to reduce post harvest losses, and b) 5 Hermetic storage bags of 100kg for improved on-farm storage.



Fig. 3. Agricultural extension officer explaining the use of hermetic metal silos to store farmers harvest safely.



Fig. 4. The hermetic technology leads to "suffocation" of damaging insects inside the maize bags.

4 Data Collection: Mobile Phone SMS Surveys

How do we measure the impacts? We work with simple SMS surveys. Farmers can respond free of charge. Every Wednesday at 1pm local time, each farmer receives our short weekly survey – short, means 2 questions. It measures current local prices, recent sales made, and storage levels. Every 3 months, the farmers get a longer survey of 6-12 questions, which includes questions to measure self-assessed food security. After having completed a survey, farmers automatically receive an airtime top-up as incentive.



Fig. 5. Farmer responding to our SMS survey in Kondoa District, Dodoma Region, Tanzania.



Fig. 6. Farmers receive airtime transfers after completing a survey to encourage their participation.

5 Insights and Outlook

The response rate to the SMS survey was between 40 and 45% so far. Below figures show the preliminary data from the first 6 out of 104 weeks of weekly data collection (food prices), and the results of the first SMS baseline survey on food security with 9 more rounds to follow. The figures show treatment (upper Panel) and control groups (lower Panel) data. The findings from the first year of the study will be available in mid 2018.

Maize Prices in Tanzanian Shilling, 6 Sep. - 11 Oct 2017

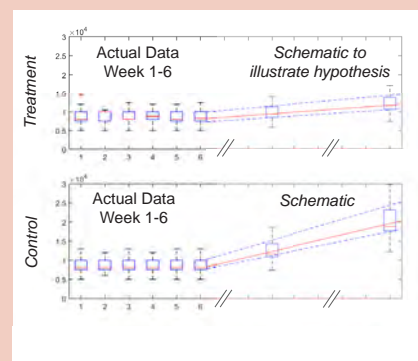


Fig. 7. Prices for 1 debe (~20kg) of maize in Tanzanian Shilling on left hand side. Preliminary data, before data cleaning. Right hand side illustrates the stated hypothesis.

Self-assessed Food Security (Baseline) - June 2017

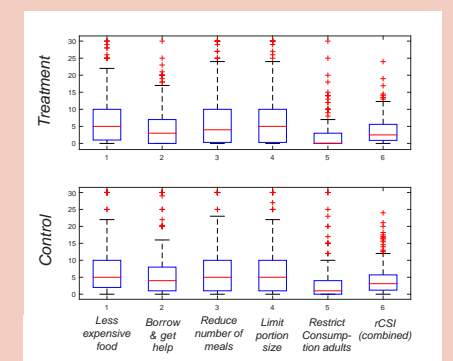


Fig. 8. Survey data on self-assessed food insecurity, based on WFP reduced Coping Strategies Index (rCSI).

6 References

1. Sheahan, M., & Barrett, C. B. (2017). Review: Food loss and waste in Sub-Saharan Africa. Food Policy, 70(Supplement C), 1–12. <https://doi.org/10.1016/j.foodpol.2017.03.012>