The effects of Kenya’s ‘smarter’ input subsidy program on smallholder behavior and economic well-being: Do different quasi-experimental approaches lead to the same conclusions?

Nicole M. Mason  
Michigan State University  
Department of Agricultural, Food, and Resource Economics  
masonn@msu.edu

Ayala Wineman  
Michigan State University  
Department of Agricultural, Food, and Resource Economics  
wineman1@msu.edu

Lilian Kirimi  
Egerton University  
Tegemeo Institute of Agricultural Policy and Development  
lkirimi@tegemeo.org

David Mather  
Michigan State University  
Department of Agricultural, Food, and Resource Economics  
matherda@msu.edu

Selected Poster prepared for presentation at the  
The effects of Kenya’s ‘smarter’ input subsidy program on smallholder behavior and economic well-being: Do quasi-experimental approaches lead to consistent conclusions?

Nicole M. Mason, Ayala Wineman, Lilian Kirimi, and David Mather
Department of Agricultural, Food, and Resource Economics, Michigan State University; Tegemeo Institute of Agricultural Policy and Development, Egerton University

1. INTRODUCTION & CONTRIBUTIONS

Often cited as a prime example of successful private-sector-led fertilizer market development in Sub-Saharan Africa (SSA), Kenya has now joined the ranks of SSA countries implementing an input subsidy program (ISP) for improved seed and inorganic fertilizer. While other ISPs in the region (e.g., Malawi, Zambia, and Nigeria) have been studied in detail, relatively little is known about the effects of Kenya’s targeted ISP, the National Accelerated Agricultural Inputs Access Program (NAAIAP). NAAIAP is smaller (Mason et al., 2017) than other ISPs in the region because it:

- Targets (in practice) resource-poor farmers, and
- Is implemented through vouchers redeemable at private agro-dealers.

However, it is also ‘smarter’ because private-sector fertilizer markets were already well developed and smallholder farmers were using nearly optimal levels of fertilizer in Kenya prior to the implementation of NAAIAP (Angira and Jayne, 2009; Sheahan et al., 2013; Sheahan et al. 2014).

This paper contributes to the literature by:

1. Estimating the effects of NAAIAP participation on smallholder cropping patterns, incomes, and poverty.
2. Using two econometric and quasi-experimental approaches to evaluate the robustness of the results; and
3. Comparing the effects of NAAIAP to those of other ISPs in SSA, and discussing the likely bids between differences in program designs and differences in program impacts.

2. KEY FEATURES OF THE NAAIAP SUBSIDY PROGRAM

- National program from 2007/08-2013/14, replaced by county-designed and implemented subsidy programs beginning in 2014/15
- Between 2007/08 and 2011/12, nearly 500,000 farmers were reached by the program (see Table 1).
- In 2008/09 (which is captured in the panel survey data used in this study), approximately 5% of Kenya smallholders participated in NAAIAP

Program goals (focusing on smallholder farmers):
1. Improve access and affordability of fertilizer and seed
2. Reduce produce and input costs
3. Increase food security and incomes, and reduce poverty

4. METHODS

We provide a series of online tutorials that will guide you through the...

The authors gratefully acknowledge financial support from the United States Agency for International Development (USAID)/Kenya’s National Accelerated Agricultural Inputs Access Programs (NAAIAP); the United States Agency for International Development (USAID)/Kenya’s Tegemeo Institute of Agricultural Policy and Development; and Egerton University.

ACKNOWLEDGEMENTS

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neglected.

4. RESULTS

Table 2. ATT estimates for participation in NAAIAP

We estimate the average treatment effect on the treated (ATT) of NAAIAP participation using:

1. Simple difference-in-differences (DID) (without covariates),
2. Fixed effects (FE),
3. Proportionality score weighting (PSW)-DID, and
4. PSM- DID, and calculate Rosenbaum bounds to assess the robustness of the PSM-DID ATT estimates to a wide range of unobserved heterogeneity (‘hidden bias’ (Rosenbaum, 2002)).

We were not able to identify a sufficiently strong and plausible exogenous IV, so could not utilize the IV estimation approach.

Use of the TAPRA Panels allows us to control for a rich set of household, village, and regional characteristics, such as the:

- Gender, age, and education of the household head,
- Fertilizer composition and assets
- Distance from the household to roads, maize seed and fertilizer retailers, extension advice, and other services
- Market prices for key inputs (fertilizer, seed, land, labor) and expected market prices for key crops
- Agro-ecological conditions (elevation, and current season and long-run average rainfall, moisture stress, and temperature)

We select control variables for the probit used to generate the propensity score following the iterative procedure described in Imbens (2014).