Effects of NAAIAP on Smallholder Production and Incomes

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Outline

- Introduction/motivation
- Highlights on NAAIAP
- Key questions
- Findings
- Policy & programmatic implications
Introduction

- Input intensification becomes critical in the context of:
  - Increasing population (increased demand for output)
  - Declining land sizes (pressure to produce more per unit area)
- Use of productivity enhancing inputs is an option to ensure increased output to support a growing population
- However, capacity to intensify is limited among some farmers

Introduction

- Government launched the NAAIAP fertilizer subsidy as a means to improve food security and incomes
  - Focused on maize growers
  - Maize is a major staple crop often equated with food security in Kenya
- Goals of NAAIAP
  - Improve access and affordability of fertilizer and seed
  - Raise productivity and output
  - Increase food security and incomes and reduce poverty
Highlights on NAAIAP

- National program started in 2007/08

- Two components
  - Kilimo Plus: free input packs (focus of study)
  - Kilimo Biashara: subsidized credit

- Between 2007/08 and 2011/12, over 500,000 farmers were reached by the program

Highlights on NAAIAP

- NAAIAP (Kilimo Plus) input packs
  - 50 kg each of basal and top dressing fertilizer
  - 10 kg of improved maize seed
  - Free one-time package per household/in one season only
  - Vouchers redeemable at accredited agro-dealer shops
Highlights on NAAIAP

- NAAIAP targeting criteria
  - Farmers unable to afford farm inputs at commercial prices
  - Farmers growing maize and had at least 2.5 acres of land
  - Vulnerable members of society (e.g. female- and child-headed households)
  - Farmers who had not received similar support in the past

Key questions & analysis

- Did the program achieve its goals?
- What are the lessons learned from Kilimo Plus and other ISPs in SSA?
  - For the design and implementation of future input policies and programs
- Focus of analysis
  - Effects of participation in Kilimo Plus on maize output, cultivated area, incomes and poverty
  - Compare the effects of Kilimo Plus to ISPs (Zambia & Malawi)
Data

- Tegemeo panel household survey
  - Using data from 3 waves (03/04, 06/07, and 09/10)
  - 2 years prior to Kilimo plus program
  - 1 year during the program period
  - Sample of 1,064 smallholder maize-growing households

- Review of literature of ISPs in Malawi & Zambia

Estimation methods

- Methods take into account that NAAIAP participants were not randomly selected

- A number of panel data methods and methods related to propensity scores
  - Difference-in-difference (DID); Fixed effects; Propensity score weighting-DID; Propensity score matching-DID

- Constructed poverty indices
  - Poverty incidence, gap & severity
  - Poverty line of USD 1.25/capita/day
Key findings

- NAAIAP considered ‘smarter’ than other ISPs in the region
  - Targeted (in practice) resource-poor farmers
    - NAAIAP recipients had less land, lower asset wealth & were of lower welfare status
    - However, recipients were already using fertilizer
  - Was implemented through vouchers redeemable at private agro-dealers

Key findings: impacts of NAAIAP

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Estimated effect of Kilimo Plus participation (FE)</th>
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<tbody>
<tr>
<td>Maize kg harvested</td>
<td>+361.2</td>
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<tr>
<td>Acres with maize</td>
<td>+0.41</td>
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<tr>
<td>Maize kg/acre</td>
<td>+556.2</td>
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<tr>
<td>Share of maize in total crop value</td>
<td>+0.04</td>
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<tr>
<td>Total acres cultivated</td>
<td>-0.08</td>
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<tr>
<td>Crop income (Ksh)</td>
<td>+9,022</td>
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<tr>
<td>Crop income/acre (Ksh)</td>
<td>+1,512</td>
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<tr>
<td>Total income (Ksh)</td>
<td>+32,809</td>
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<tr>
<td>Total income/capita/day (Ksh)</td>
<td>+7.03</td>
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<tr>
<td>Poverty incidence (poor=1)</td>
<td>-0.06</td>
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<tr>
<td>Poverty gap</td>
<td>-0.10</td>
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<tr>
<td>Poverty severity</td>
<td>-0.11</td>
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</tbody>
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Key findings: program effects

- Comparison with ISPs in Zambia and Malawi
  - Effects of Kilimo Plus on maize production were larger
    - 361 kg vs about 200 kg of maize for 100 kg increase in subsidized fertilizer
    - Potentially due to effective targeting of farmers using less fertilizer without subsidy
    - May be due to use of vouchers redeemable at agro-dealer shops, resulting in more timely access to inputs

Key findings: program effects

- Comparison with ISPs in Zambia and Malawi
  - Kilimo Plus reduced poverty severity by a larger magnitude than Zambia’s ISP
    - Likely due to its more effective targeting of resource-poor farmers
Implications for other programs

1. ISP design and implementation have important implications for program impacts

2. Proper targeting during implementation is important for achieving goals
   - Ensure official & effective (in practice) targeting match
   - Guidelines to focus on farmers not currently using fertilizer
     - May increase impacts & reduce crowding out effects

3. Program design should be well guided by program objectives

4. Use of existing private-sector input distribution mechanisms
   - Encourages private sector participation
   - Reduces distortionary effect on private market
     - Improves timeliness in accessing inputs & farming operations
     - Ensures better input access for all farmers
Implications for other programs

5. Have a more holistic approach to improving production & sustainable intensification
   - Consider using vouchers for other crops and inputs
     - May imply increased outputs for other crops
     - Promote diversification
     - Use of other productivity enhancing inputs (e.g. lime)
   - Increase in complementary public/private investments
     - Research, extension, irrigation, infrastructure, information, affordable & appropriate innovations & technology

Thank you