Voucher Schemes for Enhanced Fertilizer Use: Lessons Learned and Policy Implications

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Agriculture Sector Council Seminar
January 25, 2012

Presented by
Ian Gregory
IFDC
Historical Perspective

• Traditional fertilizer subsidies were an integral policy tool of the “Green Revolution” applied universally
  ➢ Overcoming market failures
  ➢ Creating demand pull
  ➢ Greatest impact applied to staple grain production

• Pitfalls increased over time due to:
  ➢ Excessive fiscal costs and risks
  ➢ Late delivery
  ➢ Rent-seeking and political economy and patronage
  ➢ Rationing
  ➢ Lack of equity and efficiency
  ➢ Displacement of the private sector

• And subsidized fertilizer went out of fashion in the 1980s
Rethinking Fertilizer and Other Input Subsidies

- Fertilizer vouchers first used by IFDC in Afghanistan for 200,000 targeted farmers in 2002 and 2003
- Used again in Malawi in 2003 and 2004 to demonstrate an alternative to the Targeted Inputs Program (TIP)
- Pilot programs were introduced in Nigeria in 2004
- By 2006, voucher programs were termed as “smart subsidies” and promoted by the World Bank
- In 2008, several SSA countries introduced voucher programs in response to the spike in both fertilizer and grain prices
- By 2010, questions were being asked: “How Smart?”
Essential Requirements of Efficient Voucher Programs

1. Clear objectives
2. Farmer-targeted
3. Private sector development
4. Holistic development package
5. A minimum life of 3 years
6. A maximum life of 5 years
7. A phased exit plan reducing support
Generalized Schematic of a Voucher System

- **Fertilizer Dealer**
  - Fertilizer supplies
  - Voucher
  - Reimbursement
  - Repayments if required

- **Financial Institution**
  - Voucher

- **Implementing Organization**
  - Voucher

- **NGO**
  - Recommendations for selection of farmers
  - Voucher

- **Community Organization**
  - Extension Department

- **Farmer**
  - Voucher
Examples of Vouchers

Afghanistan

Malawi

Kyrgyzstan
Three Voucher Program Comparisons

• SPLIFA in Malawi 2003-2004 \textbf{POVERTY REDUCTION}
  \begin{itemize}
  \item Implemented by IFDC and NGO Consortium
  \item Funded by DFID and World Bank
  \end{itemize}

• AISP in Malawi 2005-present \textbf{FOOD SECURITY}
  \begin{itemize}
  \item Implemented by Government of Malawi
  \item Funded by Government of Malawi via donors
  \end{itemize}

• FSP in Ghana 2008-present \textbf{FERTILIZER SUBSIDY}
  \begin{itemize}
  \item Implemented and funded by Government of Ghana
  \end{itemize}
| **Malawi, Sustaining Productive Livelihoods through Inputs for Assets (SPLIFA)** Funded by DFID and World Bank/Implemented by IFDC and NGO Consortium |
| **No. of Beneficiaries/Period** | 40,000 and 60,000/2003 and 2004 (originally for 3 years) |
| **Objective** | Multiple: Inputs for assets; family food security; private sector development |
| **Targeting** | Smallholders with 2-3 months “hungry period” |
| **Package** | 1 x 50 kg urea + 1 x 10 kg hybrid maize seed |
| **Farmer Contribution** | 2 months work on supervised road construction |
| **Procurement** | Private sector and implementer |
| **Distribution** | 200 private sector dealers with 10% fee |
| **Pricing** | Market |
| **Voucher** | Single voucher for input package + technical brochure + demonstrations |
| **Program Cost** | $2.1 million/year |
| **% of Budget** | 0.1% |
| **% of Agriculture Budget** | 8.4% |
| **Holistic Development** | Partial |
| **Exit Strategy** | Yes |
SPLIFA Results and Evaluation

Results
• Reduced hungry period by 1-3 months
• Maize production per farm increased from 200-300kg to 450kg+
• Drought impacted second year results
• Family assets were increased slightly
• 2-year participants benefited more than 1-year participants
• Inputs were preferred to cash or food
• Inter-cropping was reduced

Evaluation
• Food security status provides a good targeting modality
• Inputs package was under-funded – had no basal fertilizer
• Technical package to farmers needs to be fully integrated
• Programs need to be fully funded for a minimum of 3 years
• Benefit-Cost Ratios (BCR) should be calculated
**Malawi, Agricultural Inputs Support Program (AISP)**  
**Funded by Donors/Implemented by Government of Malawi**

<table>
<thead>
<tr>
<th>No. of Beneficiaries/Period</th>
<th>2.6 &gt; 1.6 Million/2005 onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Family and national food security</td>
</tr>
<tr>
<td>Targeting</td>
<td>Set by MOAF, priority to vulnerable households</td>
</tr>
<tr>
<td>Package</td>
<td>1 x 50 kg basal, 1 x 50 kg TD, 1 x 5 kg maize or 1 x 2 kg legume</td>
</tr>
<tr>
<td>Farmer Contribution</td>
<td>Average 14%</td>
</tr>
<tr>
<td>Procurement</td>
<td>Private sector by tender</td>
</tr>
<tr>
<td>Distribution</td>
<td>Public sector ADMARC/SFRF; small (14%) by private sector</td>
</tr>
<tr>
<td>Pricing</td>
<td>Market</td>
</tr>
<tr>
<td>Voucher</td>
<td>Voucher for each input type</td>
</tr>
<tr>
<td>Program Cost</td>
<td>$285 million/year (2008/09)</td>
</tr>
<tr>
<td>% of Budget</td>
<td>16.2%</td>
</tr>
<tr>
<td>% of Agriculture Budget</td>
<td>114%</td>
</tr>
<tr>
<td>Holistic Development</td>
<td>No</td>
</tr>
<tr>
<td>Exit Strategy</td>
<td>No</td>
</tr>
</tbody>
</table>
AISP Results and Evaluation

• Maize production increased by 1.1 million mt from yield increases
• Poor targeting of vulnerable poor
• Private sector all but crowded out
• Unsustainable cost
• No exit strategy
• No holistic approach to market development
• No development of output markets
<table>
<thead>
<tr>
<th>Measure</th>
<th>Ghana Fertilizer Support Program (FSP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Beneficiaries/Period</td>
<td>1 Million/2008-2010 followed by Waybill system 2010 on</td>
</tr>
<tr>
<td>Objective</td>
<td>Overcome threat of reduced fertilizer use for food production</td>
</tr>
<tr>
<td>Targeting</td>
<td>Originally targeted to products; now open to all farmers Commercial farmers have to obtain authorization</td>
</tr>
<tr>
<td>Package</td>
<td>1 x 50 kg basal, 1 x 25 kg TD</td>
</tr>
<tr>
<td>Farmer Contribution</td>
<td>50%; after 2010 60%</td>
</tr>
<tr>
<td>Procurement</td>
<td>Private sector</td>
</tr>
<tr>
<td>Distribution</td>
<td>Private sector (limited in first year)</td>
</tr>
<tr>
<td>Pricing</td>
<td>Negotiated delivered prices to districts</td>
</tr>
<tr>
<td>Voucher</td>
<td>Voucher for each input type</td>
</tr>
<tr>
<td>Program Cost</td>
<td>$14-26 million/year</td>
</tr>
<tr>
<td>% of Budget</td>
<td>0.6%</td>
</tr>
<tr>
<td>% of Agriculture Budget</td>
<td>16%</td>
</tr>
<tr>
<td>Holistic Development</td>
<td>No</td>
</tr>
<tr>
<td>Exit Strategy</td>
<td>Originally for 1 year then extended</td>
</tr>
</tbody>
</table>
Ghana, Fertilizer Support Program (FSP)

- Straight fertilizer subsidy program
- Limited targeting after initial year
- Dominated by private sector interests
- Complicated, inconvenient voucher redemption
- Late payments to importers
- Changed to a Waybill program in 2009/10
- Maize production increased by 38%, yields by 17%
Voucher Programs Implemented

- Afghanistan (EFP)* 2002-2003
- Malawi (TIP) 2000-2004
- Malawi (SPLIFA)* 2003-2004
- Malawi (AISP) 2005-present
- Ghana (FSP) 2008-present
- Nigeria (2004)* onward
- Rwanda (CIP)* 2008-present
- Tanzania 2009-2011
- Kyrgyzstan (KAED)* 2011
- Tajikistan (ProApt)* 2010-

* IFDC-implemented programs
Lessons Learned With Vouchers

DO THEY WORK?

1. For poverty reduction?
   Yes, if targeted to vulnerable, potentially viable farmers and maintained for 3-5 years

2. For improving food security?
   Yes, but at a huge cost and with leakage, crowding out, etc. and mainly crop-specific
   Based on mixed evidence from 1980s, not sustainable

3. As a short-term fix for price spikes?
   Maybe, but distort markets, and at-source subsidy is a lower cost alternative
Conclusions

1. They are not a panacea for every situation.
2. They are not a replacement for holistic market development.
3. Target the vulnerable but viable small farmers, these are the potentially productive poor.
4. Targeting may be easy to design but difficult to implement.
5. Be market-friendly and do not distort markets.
6. Link beneficiaries to savings programs.
7. Exit strategies are still difficult to implement.
8. Contain administrative costs.
How to Implement

1. Analyze the farm situation, value chains, institutional capacity and fertilizer responses
2. Select objectives and targeting modality
3. Estimate time frame to achieve objectives
4. Design market-friendly interventions
5. Incorporate intensive training into program
6. Monitor and evaluate impact on all stakeholders
7. Incorporate into holistic market development
Thank you.
Questions, I am sure?
Opportunities and Risks of Fertilizer Voucher Programs

Experiences from eastern and southern Africa

USAID Agricultural Sector Council Daybreak Seminar

David Rohrbach
Senior Agricultural Economist
World Bank
January 2012

Views and interpretations expressed are those of the author and do not necessarily represent the views and policies of the World Bank
• Models vary widely
• But there are some common lessons
• Next steps
Zimbabwe (ZAIP) e.g. 2010/11

**Aim:** Revitalization of smallholder maize production and input trade after drought and period of hyperinflation

**Target group:** 133,000 farmers

**Level of subsidy:** 100% on 50 kg per household

**Method:** Contracted fertilizer supplier to sell to targeted households through rural retail shops in exchange for voucher

**Cost:** $7 million

**Incremental Production:** +/- 30,000 t

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Malawi (AISP): 2005/6-present

Aim: Increase maize production and food security

Target group: 1.6-2.0 million farmers

Level of subsidy: +/- 90% on 100 kg per household

Method: Government purchase of fertilizer and exchange for vouchers through parastatal depots

Cost: +/- $120 million (roughly 75% of MoA budget)

Incremental production: +/- 700,000 to 1,000,000 t
Tanzania (NAIVS): 2008/09 to present

**Aim**: Increase in maize and rice production, increase fertilizer adoption, agrodealer development

**Target group**: 2 million farmers

**Level of subsidy**: 50% on 100 kg per household

**Method**: Farmers exchange vouchers for fertilizer on regulated market

**Cost**: $75 million (roughly 23% of MoA budget)

**Incremental Production**: +/- 500,000 t
Need Clarity of Performance Objective

**Food Security**

1. Aggregate national maize production
2. Proportion of smallholders producing enough to meet their food requirements

**Market Development**

1. Number of commercial shops selling fertilizer
2. Quantity of commercial purchases (*by new adopters*)
3. Decline in costs of fertilizer at farm gate

**Sustainable Use**

1. Fertilizer use efficiency (e.g. kg grain per kg N)

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Whose Food Security?
Value of added grain production to household producing a surplus: US$0.15/kg

versus

Value of added grain production to household facing production deficit: US$0.30/kg
Primary benefit derived from avoiding food imports in Malawi

Export Parity: +/- $180

<table>
<thead>
<tr>
<th>Maize price US$/MT</th>
<th>Scenario</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>270</td>
<td>BCR</td>
<td>0.722</td>
<td>0.865</td>
<td>0.997</td>
</tr>
<tr>
<td></td>
<td>NPV</td>
<td>-80.55</td>
<td>-40.81</td>
<td>-1.07</td>
</tr>
<tr>
<td>280</td>
<td>BCR</td>
<td>0.749</td>
<td>0.897</td>
<td>1.033</td>
</tr>
<tr>
<td></td>
<td>NPV</td>
<td>-72.65</td>
<td>-31.16</td>
<td>10.33</td>
</tr>
<tr>
<td>290</td>
<td>BCR</td>
<td>0.776</td>
<td>0.929</td>
<td>1.069</td>
</tr>
<tr>
<td></td>
<td>NPV</td>
<td>-64.76</td>
<td>-21.51</td>
<td>21.73</td>
</tr>
<tr>
<td>300</td>
<td>BCR</td>
<td>0.804</td>
<td>0.961</td>
<td>1.105</td>
</tr>
<tr>
<td></td>
<td>NPV</td>
<td>-56.86</td>
<td>-11.86</td>
<td>33.13</td>
</tr>
</tbody>
</table>

Adapted from Dorward, Chirwa, Slater presentation

Import Parity: +/- $280
### Targeting Plans versus Practice

<table>
<thead>
<tr>
<th>Planned</th>
<th>Practiced</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Village Voucher Committee</strong> identifies:</td>
<td><strong>Village leadership identifies:</strong></td>
</tr>
<tr>
<td>• Full time farmer</td>
<td>• Diligent farmers</td>
</tr>
<tr>
<td>• Less than 1 ha land in maize</td>
<td>• Capable of paying top-up</td>
</tr>
<tr>
<td>• Willing and able to co-finance inputs</td>
<td>• Rotate across recipients</td>
</tr>
<tr>
<td>• Willing to follow extension advice</td>
<td></td>
</tr>
<tr>
<td>• Diligent farmer</td>
<td></td>
</tr>
<tr>
<td>• Priority to female headed households</td>
<td></td>
</tr>
<tr>
<td>• Priority to farmers who are new adopters</td>
<td></td>
</tr>
<tr>
<td>• Each recipient receives 3 consecutive years</td>
<td></td>
</tr>
</tbody>
</table>

**Key issues:** minimize displacement of commercial purchases; local ownership is important for effective implementation
Choice of Voucher Method Depends on Status of Fertilizer Supply Chain (and Politics)

**Key concern:** how to minimize risk of lacking fertilizer for voucher exchange

- Malawi: government purchases and distributes all fertilizer
- Zimbabwe: contract particular supplier who is paid when vouchers are redeemed
- Tanzania: district registration of agro-dealers designated to service particular villages
Add-ins to build fertilizer supply chains?

• Specialized training for agro-dealers
• Contract requires agrodealer to carry in extra fertilizer for sale
• Contract may require fertilizer company to establish credit line with decentralized agrodealers

But a high probability remains that when voucher program ends, supply to farmgate ends
Change in profit when the subsidy is removed

<table>
<thead>
<tr>
<th></th>
<th>Value of Grain</th>
<th>Cost of inputs</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% subsidy</td>
<td>140,000</td>
<td>60,000</td>
<td>80,000</td>
</tr>
<tr>
<td>remove subsidy</td>
<td>140,000</td>
<td>60,000</td>
<td>80,000</td>
</tr>
<tr>
<td>full cost</td>
<td>140,000</td>
<td>60,000</td>
<td>80,000</td>
</tr>
</tbody>
</table>

Tsh/ha
## What Level of Investment Will Farmers Make?

<table>
<thead>
<tr>
<th></th>
<th>Quantity</th>
<th>Cost</th>
<th>Net Return</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0 fertilizer</td>
<td>0</td>
<td>Tsh 378,521</td>
<td>5</td>
</tr>
<tr>
<td>Farmer Practice</td>
<td>1 bag DAP 1 Bag Urea</td>
<td>Tsh 108,000</td>
<td>Tsh 702,583</td>
<td>4</td>
</tr>
<tr>
<td>Standard</td>
<td>1 bag TSP 2 bags CAN 1 bag urea</td>
<td>Tsh 178,000</td>
<td>Tsh 878,890</td>
<td>2</td>
</tr>
<tr>
<td>recommendation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1</td>
<td>1.5 bags basal 1.5 bags top dress</td>
<td>Tsh 144,000</td>
<td>Tsh 705,191</td>
<td>3</td>
</tr>
<tr>
<td>Option 2</td>
<td>2 bags basal 2 bags top dress</td>
<td>Tsh 192,000</td>
<td>Tsh 929,995</td>
<td>1</td>
</tr>
</tbody>
</table>

**BUT currently, most farmers are struggling to find Tsh 80,000 (US$52) for the subsidy top-up**

Adapted from 2008/9 & 2009/10 trial results
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Sustained success depends on complementary Investments

**Improve fertilizer use efficiency**

– Better targeting of fertilizer to soil/crop demands
  
  • E.g. what nutrients are most limiting to crop performance

– Combine inorganic with organic

– Improve weed control and water management
  
  • E.g. basin planting; conservation agriculture

– Link with quality seed of preferred varieties
Complementary Investments?

Reduce farmgate price of fertilizer

– Business training for agrodealers
– Partial credit guarantees
– Facilitate group purchases by farmers
– Contract farming/supply chain development
Exit/Graduation Strategies

• De facto:
  – Rolling one year “emergency” commitment
  – “When farmers can afford fertilizer on their own” or the budget runs out
  – Three years?

• Alternatives that need broader testing...
  – Reduce subsidy gradually over time
  – Encourage savings/commitment savings
  – Facilitate input supply during period of crop sales
  – Promote contract farming linked with input supply

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Significant Risks

- Vouchers (or fertilizer) distributed late
- Vouchers redeemed by agents distributing
- Counterfeiting vouchers (or fertilizer)
- Vouchers redeemed for cash
- Price inflation: greater demand than fertilizer supply (top-up or subsidy grows)
- Number of target recipients grows faster than population
- Over-reporting of production
Despite the green revolution, retail maize prices were too high?
Future Directions

• Improving fertilizer use efficiency
• Alternative strategies for strengthening competitive input markets
• Testing alternative exit strategies
• Smart vouchers/ICT based systems
• Third party monitoring for improved management
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Thank you!

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