Panacea or Pandora’s Box?
Fertilizer Subsidy Impacts and Recommendations for Improving Subsidy Performance

Presentation at USAID
Washington, D.C.
October 4, 2010

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Presentation Overview

• Background: fertilizer promotion and subsidies
• Recent evidence on subsidy implementation and impacts
• Evidence from pre-subsidy experience (Kenya)
• Lessons and implications for Feed the Future
Background: Fertilizer Promotion and Subsidies
Fertilizer Promotion: Increasing Demand

- Research and extension
- Improving the affordability of fertilizer
- Managing farmers’ price and production risk
- Promoting more effective producer organizations
- Improving the coverage and quality of rural education
Fertilizer Promotion: Improving Supply

- Reducing fertilizer sourcing costs
- Reducing fertilizer distribution costs
- Improving the environment for business financing and risk management
- Improving the environment for supply chain coordination
- Proactive role of government
Prior “State of the Art” on Fertilizer Subsidies

• 2006. Alternative approaches for promoting fertilizer use in Africa, with particular reference to the role of fertilizer subsidies.
  – Crawford, Jayne, Kelly (World Bank)

• 2007. Policies and actions to stimulate private sector fertilizer marketing in sub-Saharan Africa
  – Kelly, Crawford (FAO)

• 2007. Fertilizer Use in African Agriculture: Lessons Learned and Good Practice Guidelines
  – Morris, Kelly, Kopicki, Byerlee (World Bank)

• 2008. World Development Report, Chapter 6
Reasons for Interest in Fertilizer Subsidies

• Recent/proximate factors:
  – Political sensitivity of food shortages → urban riots following the world food price crisis of 2007/08
  – Sharp fertilizer price hikes from 2007 to 2008
Reasons for Interest in Fertilizer Subsidies

• Earlier and continuing factors:
  – Broad agreement that fertilizer is underused in Africa yet critical for improving productivity and food security
  – Viewed as visible, popular, and politically beneficial
  – Perceived as providing rapid production and food security impacts
  – Budgetary support from donors enables financing of subsidies
Why Do We Care?

• Trade-offs between subsidies and public goods investments
• Subsidy impacts on output markets and trade policy
• Inadequate monitoring and evaluation of subsidies
• Politicization of agricultural statistics
• Inability of subsidies to reduce poverty sustainably
Recent Evidence on Subsidy Implementation and Impacts
Subsidy Objectives

- Multiple dimensions: financial, economic, social, political, environmental
- Often poorly defined, open to multiple interpretations, and conflicting
- Implementation problems often traceable to lack of clear, agreed objectives
Subsidy Objectives: Specific Examples

- Increase yields, aggregate production, food self-sufficiency
- Provide a safety net or alleviate poverty
- Keep urban food prices low
- Compensate for factors that make fertilizer too expensive
- Nurture development of private sector input systems
Subsidy Program: Design/Implementation

• Are vouchers used? If so, how distributed?
  – By government staff, village committees, producer organizations
• Copay by farmers required?
  – Range 10%-70%
• How is the fertilizer procured?
  – Openness, timeliness, number of importers
• How is the fertilizer distributed?
  – Government services vs private traders
Types of Farm-Level Impacts

• Who gets access?
• Timeliness of delivery?
• What effects on yield?
• What effect on output markets/sales?
• Effect on prices, incomes, agricultural wages?
Farm-Level Impacts (Access): Malawi

- Four program years: 2005/06 to 2008/09
- Households with more land and assets get more subsidized fertilizer
- Female-headed households are much less likely to receive subsidized fertilizer
- These targeting “errors” were reduced between 2006/07 and 2008/09
- Subsidized fertilizer appears significantly related to districts in which members of parliament live
Farm-Level Impacts (Outcomes): Malawi

• Subsidized fertilizer has positive and significant effects during the subsidy year on recipients’:
  – Maize production
  – Area planted to maize,
  – Life satisfaction
• ↑ maize area offset by ↓ area in other crops
• Positive and significant longer-term effect on maize production in subsequent years.
Farm-Level Impacts (Access): Zambia

• In 2007, only 11% of all crop-growing smallholders received subsidized fertilizers:
  – 1% of the poorest households; 7% of the richest
• Only 5% of the subsidized fertilizer went to the poorest third of households
• 76% went to the richest third of households, with 9 times more assets and 2.5 times more area cultivated
• Similar patterns of access in other years
Farm-Level Impacts: Senegal and Mali

- Access to subsidy:
  - Both countries: only farmers with cash or credit
  - Mali: government facilitated credit in 1\textsuperscript{st} year
- Timeliness: Later than desirable
- Yield impacts not monitored:
  - Senegal: Perceptions of favorable yield impact
  - Mali: Complaints about poor fertilizer quality
- Impact on prices/incomes/wages:
  - Senegal: unknown
  - Mali: No change in consumer rice prices; hypothesis of higher farm incomes unconfirmed
Types of Government/National Impacts

- Impact on government budgets
- Impact on national crop yields and production
- Overall benefit-cost relationship
Government/National Impacts: Malawi 2006/07

Costs = $74 million (net budget); $92 million (economic)
Assuming 1 kg Nitrogen gives 15 kg grain: a/

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<thead>
<tr>
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<th>Displacement 40%</th>
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<th>Displacement 25%</th>
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<tr>
<td></td>
<td>Market Price ($/ton)</td>
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<td>Maize Price ($/ton)</td>
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<tr>
<td></td>
<td>148</td>
<td>160</td>
<td>160</td>
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<td>BCR b/</td>
<td>1.02</td>
<td>1.10</td>
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<td>NPV ($m)</td>
<td>$1.53</td>
<td>$9.09</td>
<td>$11.50</td>
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a/ At grain:N ratio = 12, all scenarios are unprofitable
b/ BCR = Benefit-Cost Ratio; NPV = Net Present Value
Govt/National Impacts (Budget): Zambia

• Budget projections 2010:
  – MACO poverty reduction budget is 45% of total agriculture budget
  – FSP subsidy program is 78% of poverty reduction budget
  – So fertilizer subsidy is 45% x 78% = 35% of total agriculture budget
  – (historical range is 35% to 40%)
• Incremental production due to subsidy has not been established
Government/National Impacts: Senegal/Mali

• Finance and budget impacts:
  – Governments pay more than market rates
    • Mali: 4.7 billion FCFA loss reported by Bureau du Vérificateur, of which 2.3 b for fertilizer overcharges
    • Senegal: farmers in Senegal River valley able to get better prices
  – Inadequate funding → late payments to suppliers → higher interest costs → higher fertilizer costs in the following year to compensate
• Incremental production unknown or disputed
Types of Impacts on Input Supply System

- Displacement effects (do subsidies “crowd out” commercial fertilizer sales?)
- Expansion/contraction of outlets, sales, investments by type of actor
- Serving remote areas
- Professionalism
- Competition/collusion
Definition of “displacement”

• **Displacement**: Some farmers who would have bought commercial fertilizer obtain/use subsidized fertilizer instead.

• Hypothetical example (‘000 tons):
  – Before: Subsidized = 0, commercial = 100, total use = 100
  – After: Subsidized = 50, commercial = 75, total use = 125 (not 100 + 50 = 150).
  – **Displacement** = (100 – 75)/100 = 25%
Evidence on Displacement: Malawi (2006/07)

• In 2006/07:
  – The subsidy reduced HH commercial purchases by 29% relative to 2002/03 without the subsidy
  – Displacement was lowest (24%) for the poorest 1/5 of farmers and highest (37%) for the richest 1/5.

• Implications:
  – Smaller net increase in total fertilizer use
  – Greater program costs per ton distributed than with zero displacement
  – Less business for private fertilizer dealers

• Suggests that targeting the subsidy to poor farmers could increase incremental fertilizer use

• Of 73 communities with no subsidy in 2000:
  – 47 got subsidies in 2003; private sales declined by 47%
  – in 14 communities, private sector completely dissolved

• Overall, 1 kg of subsidized fertilizer increased total use by 0.93 kg (some displacement occurred)

• Effects depend on extent of private sector activity:
  – Low activity: 1 kg of subsidized fertilizer ↑ total use by 1.06 kg on average, and 1.7 kg in poorest areas
  – High activity: 1 kg subsidized fertilizer ↑ total use by only 0.01 kg, and lowered use in some areas.
Input System Impacts: Senegal/Mali

- Displacement by design
  - 1\textsuperscript{st} objective was to avoid decline in fertilizer use due to 50\% increase in price
  - 2\textsuperscript{nd} objective was expansion of production
- \textit{Wait and See} behavior of importers
- Distribution impacts
  - Mali: done by local government
  - Senegal: using some of existing network
Evidence from Pre-Subsidy Experience: Kenya
Kenya Experience: Favorable Factors

What factors explain the increase in fertilizer use in Kenya?

• Liberalization in 1990 eliminated:
  – Import licensing quotas
  – Foreign exchange controls
  – Retail price controls

• Stability in fertilizer market policy
Kenya Experience (2): Response

- Expansion in distribution
  - 10-11 importers
  - 500 wholesalers
  - 8000 retailers
- Reduction in distance from farm to supplier:
  - 7.4 5.6 3.7 3.2 km
- Investment in farmer training (FIPS, KMPD)
- Increased competition and reduced margins
Kenya Experience (3): Margins

constand 2007 Ksh per 50kg bag

Nakuru, wholesale

Mombasa, cif

- 70% of farmers fertilized maize in 2007
  - Up from 56% in 1996
- No increase in average dose (56-59 kg/ha)
- Correlation between average yield increase of 20% and rise in share of maize fields fertilized
- Location is dominant factor:
  - > 90% use fertilizer in high potential zones
  - Less than 30% elsewhere
- Intercropping also important.
Lessons for Feed the Future
Lessons: Best Practices (1)

- Evidence shows that subsidies are likely to be:
  - Inefficient
  - Costly
  - Fiscally unsustainable
- Fertilizer support strategies need to be broader than subsidies
- Benefits/costs of alternative uses of public expenditures must be considered.
Lessons: Best Practices (2)

• Subsidy “do’s”:
  – Clear, non-contradictory objectives
  – Part of a wider strategy
  – Favor markets if they promote competition
  – Pay attention to sustainability of demand
  – Empower farmers
  – Strive for economic efficiency
  – Devise an exit strategy
  – Pursue regional integration
  – Promote pro-poor growth, BUT don’t treat fertilizer as a safety net
Lessons: Subsidies are “Messy”

• Highly politicized
• Highly popular
• Difficult to design
• Difficult to implement
• Lack of supporting investments
• Difficult to evaluate
• Gluts $\rightarrow$ negative spillovers to output markets.
Lessons: Alternatives to Subsidies Unattractive

- **Alternatives** are slow to show impacts
- Impacts diffuse...not as easily seen by general public
- Don’t provide government with public image they are looking for
- Ineffective in emergency situations
- Difficult to introduce once subsidies in place
- Yet, Kenya case shows alternatives do have long-term benefits
Implications for
Feed the Future
Implications: General

- FTF will be in countries that have or want input subsidy programs.
- FTF will need to engage constructively with Governments on this issue.
- FTF will need to work within the subsidy environment.
- Given Pandora’s Box, direct support not recommended BUT
- FTF can improve outcomes.
Implications: Priorities for Support

• Data collection
  – Basic agricultural statistics
  – Subsidy M&E and Impact Assessment

• Policy analysis units
  – Short term training for analysts in subsidy issues
  – Longer-term training when needed

• Stakeholder consultations

• Experimentation on…
  – Types of targeting
  – Risk-sharing instruments to make non-subsidy approaches more attractive to governments
Implications: Design and Implementation

- Keep direct involvement at a minimum
- Promote learning from past experience
  - Exchange visits
  - Research/synthesis of cross-country results
- Help shed light on difficult issues
  - Conflicting goals
    - Poverty alleviation
    - Increased marketed surplus
  - Targeting vs universal subsidy
  - Roles for government vs. private sector
Implications: Farm-Level Priorities

• Address deficiencies in fertilizer research and extension to improve profitability of input use

• Research updating needed
  – Fertilizer response, including micro-dosing
  – Costs of production to improve subsidy targeting

• Extension
  – Farm management and marketing skills
  – Producer organization capacity building for group marketing and procurement of inputs
Implications: Input Supply Priorities

- Improve understanding of:
  - Complementarities and trade-offs between private and government distribution systems
    - When and where does government have a role?
  - Contribution of different supply structures to product supply and knowledge/skill transmission
    - Independent agro dealers à la CNFA and IFDC
    - Vertically integrated distributor networks
Thank You