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## The New Generation of African Fertilizer Subsidies: Panacea or Pandora's Box?

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**INTRODUCTION:** For several reasons, fertilizer subsidies are again popular policy tools. First, there is broad agreement that fertilizer is a critical yet still-underused input for improving productivity and food security in Africa. Second, politicians have felt greater urgency to increase domestic food production since the 2007/08 food price crisis. Third, subsidy programs are highly visible, popular with voters, and viewed as politically beneficial. Fourth, donor budget support has made it easier for governments to pay for subsidies.

Malawi led in introducing this new generation of subsidies when it significantly expanded its subsidy in the midst of a major food crisis in 2005. Although the impact of the Malawi program has been debated, positive press encouraged others to follow, particularly during the 2007/2008 commodity price spikes. This note reports on what we have learned about the objectives and impacts of the new generation of

subsidy programs in Malawi, Zambia, Mali, and Senegal. For Mali and Senegal, information is drawn from fertilizer subsector reviews and secondary data (Faye et al. 2010; Bureau du Vérificateur Général 2009), while results for Malawi and Zambia draw primarily on farm-level panel data (Ricker-Gilbert, Jayne, and Chirwa 2011; Xu et al. 2009). The case of Kenya is also discussed as an example of growth in fertilizer consumption in the absence of subsidies (Ariga and Jayne 2009).

**SUBSIDY OBJECTIVES:** Fertilizer subsidy programs have multiple dimensions: financial, economic, social, political and/or environmental, as illustrated in Table 1. Multiple objectives can be contradictory or conflicting. For example, one objective may be to boost aggregate production, but that does not necessarily align with another often-stated goal, namely to alleviate poverty. Notably absent from stated objectives is the improvement of farmer knowledge of fertilizers to encourage adoption and efficient use.

**Table 1. Common Objectives of Subsidy Programs**

Objective	Malawi	Zambia	Mali	Senegal
Increase yields, production, food self-sufficiency	✓	✓	✓	✓
Provide a safety net or alleviate poverty	✓	✓		
Keep urban food prices low		✓	✓	✓
Compensate for factors making fertilizer expensive		✓	✓	✓
Improve private sector input distribution	✓	✓		

## FARM-LEVEL IMPACTS:

**Malawi:** Use of subsidized fertilizer was traced for different types of households between 2003/04 and 2008/09. Results show that:

- Households with more land and assets get more subsidized fertilizer, while female-headed households get less. The objective of increasing aggregate maize production contributed to this result in 2006/07 when zones with more maize production were targeted. Access by women and smaller farmer was improved between 2006/07 and 2008/09.
- Households in areas where members of parliament reside receive more subsidized fertilizer.
- Subsidized fertilizer has positive and significant effects during the subsidy year on recipients' maize production, tobacco production, and net value of rainy season crop production.
- Subsidized fertilizer has positive and significant effects on maize production in subsequent years, probably due to soil nutrient build-up, or improvement in management practices.
- Subsidized fertilizer does not increase livestock or durable asset values, nor is there evidence of spill-over effects over time to nonfarm sources of income.

**Zambia:** Distributional impacts for 2007 include the following (other years show similar patterns):

- Only 11% of all crop-growing small farmers received subsidized fertilizer.
- Only 5% of the subsidized fertilizer went to the poorest third of households.
- 76% of fertilizer went to the richest third of households, who have 9 times more assets and 2.5 times more area cultivated.

**Mali and Senegal:** A weakness in the Mali and Senegal programs was the failure to monitor and evaluate program impacts, and the absence of nationally representative panel data permitting analysis of who acquired subsidized fertilizer and how much was received. Subsector studies, however, confirmed the following points:

- Because the cost of subsidized fertilizer was still relatively high (about 50% of

government procurement cost), farmers who were eligible for credit (rice and cotton producers, many of whom are better-off) were the primary beneficiaries. Ten of 27 Senegalese producer organization leaders interviewed declared that subsidized prices were too high for members.

- Delayed delivery was a major problem reducing fertilizer use efficiency in both countries, as noted by 20 of 27 producer organizations in Senegal.
- Corruption in allocating subsidized fertilizer was a common complaint in Senegal, where 12 of 27 producer organizations mentioned *leakages* to traders and the politically influential.

## NATIONAL IMPACTS:

**Malawi:** Malawi improved food security following the 2005/06 subsidy expansion, meeting a key objective. Yet costs were high, rising from 61% to 74% of the Ministry of Agriculture budget, and from 8.4% to 16.2% of the national budget, between 2006/07 and 2008/09 (Dorward and Chirwa 2011). Crowding out also reduced the net increase in fertilizer use and increased costs per ton distributed. The 2006/07 subsidy displaced 22% of commercial purchases made during the 2003/04 pre-subsidy period. The rate was lowest (18%) for the poorest 1/5 of farmers and highest (30%) for the richest 1/5 (Ricker-Gilbert, Jayne, and Chirwa 2011), suggesting that targeting poor farmers could increase incremental fertilizer use. If poor farmers face other resource constraints, however, the costs of improved targeting to poor farmers could exceed the value of the additional output generated by reduced crowding out.

**Zambia:** Xu et al. (2009) showed that crowding out by input subsidies in Zambia has been surprisingly limited. Between 1999 and 2002, an additional 100 kilograms (kg) of subsidized fertilizer increased total fertilizer use by 92 kg on average across the country, for a crowding-out rate of only 8%. Crowding-out rates varied greatly across the country. When subsidized fertilizer was distributed in areas where the private sector was active, an additional 100 kg of

subsidized fertilizer resulted in a 12 kg decrease in total fertilizer use. Conversely, a 100 kg increase in subsidized fertilizer increased total fertilizer use by 106 kg when distributed in areas of relatively low private sector activity. Also, Zambian subsidy costs are 35% of the agricultural budget, significantly less than in Malawi.

***Mali and Senegal:*** The extent of crowding out in Senegal and Mali is difficult to assess. Before the subsidy, suppliers rarely imported fertilizer without guaranteed contracts from producer groups or government services. With the subsidy, the share of imports through government contracts increased as did the overall size of the market; the private importers/distributors benefitted from the increases. The size of the market outside these tenders is small, serving primarily the horticultural sector and rice farmers who do not use credit. While Senegal and Mali do not have crowding out effects in the same sense as Zambia and Malawi, irregularities in the tendering process that favored firms with close political ties to government were common, particularly in the initial years of each program. Furthermore, all participating firms complain of late payments by the government, which increase financing costs and delay subsequent orders. Finally, the programs have failed to meet some key objectives:

- Lower rice prices were a key objective in Mali, yet consumer prices remained above their long-term averages, raising questions about the accuracy of national production estimates.
- Senegalese rice farmers complain that the subsidized fertilizer price is often higher than for fertilizer obtained through other channels (e.g., producer organizations who import on their own), raising questions about the tendering process and the high margins that suppliers demand to cover anticipated cost increases due to late payments, etc.

**EVIDENCE FROM A PRE-SUBSIDY EXPERIENCE: KENYA:** Although Kenya introduced a fertilizer subsidy program in 2006, its previous record shows significant increases in fertilizer use without subsidies. From 1990 to 2006, fertilizer consumption roughly doubled

(225,000 to 420,000 tons). Not surprisingly, sales are concentrated in high productivity zones where 95% of farms apply it to maize, and limited in low productivity zones where only 13% of farms do so. From 1996/97 to 2006/07, the input dealer network expanded (distance to nearest supplier declined from 7.4 to 3.2 km), maize area fertilized rose from 60% to 70%, and maize application rates rose from 84 to 111 kg/hectare (Ariga and Jayne 2009).

Several factors explain these increases. First, liberalization in 1990 eliminated import licensing quotas, foreign exchange controls, and retail price controls. Second, from 1990 to 2006 the government had stable fertilizer policies. Third, donors financed programs to develop and market fertilizer-responsive varieties and less-expensive fertilizer products through private-public partnerships that supported demonstration programs to improve farmer and agro-dealer knowledge of improved products.

**LESSONS AND IMPLICATIONS FOR FEED THE FUTURE:** FTF will inevitably operate in countries that have input subsidies, so FTF will need to engage with governments on this issue. The literature on fertilizer subsidies shows that they are often inefficient, costly, fiscally unsustainable, and highly politicized. The new generation of subsidies is not immune to these critiques, yet there have been some positive production and food security outcomes in Malawi. The Kenya case shows, however, that solid progress can be made without subsidies. Despite their shortcomings, fertilizer subsidies are popular because beneficiaries receive something tangible from the government. By contrast, alternative investments capable of making substantial contributions to agricultural development (infrastructure, agricultural R&D, extension services) are slower to show impacts and the benefits may not be clear to the general public. Unfortunately, these alternative investments are difficult to implement if subsidy costs crowd out other investments.

Assuming that subsidies will continue to be politically popular, promoting best practices will be important. Attributes of *smart* subsidy programs include:

- Clear and non-contradictory objectives: for example, it is difficult for the same program to target the poorest farmers and also to achieve large increases in staple crop production;
- Ability to promote pro-poor growth without reverting to a pure safety net program;
- A clear exit strategy;
- Combining subsidies with other elements in a wider agricultural development strategy;
- Empowerment of key actors (suppliers, farmers) through capacity building that will ensure sustainable supply and demand when the subsidy ends; and
- Promotion of competitive markets and economic efficiency both nationally and regionally.

Since subsidy programs—old and new—are a Pandora’s Box, direct financial support for them is not recommended. Nevertheless, if they are implemented anyway, FTF can improve their outcomes by investing in:

- Basic agricultural statistics;
- Monitoring and evaluation and impact assessment of subsidy programs;
- Policy analysis, which includes short-term training for analysts on subsidy issues in addition to longer-term training where needed;
- Consultation with stakeholders;
- Experimentation with different types of targeting to reach intended beneficiaries as efficiently as possible; and
- Support for risk-sharing instruments to make alternative approaches to subsidies more attractive to governments.

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- \* Prepared by the authors based on an October 4, 2010 presentation to USAID/Washington by Kelly and Crawford. The presentation drew heavily on the work of other Food Security Group team members, including Thom Jayne, Joshua Ariga, Zhiying Xu, Nicky Mason, Bill Burke and colleagues. Examples of their work on Kenya, Malawi, and Zambia are listed in the References.
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