



## SAVINGS, SUBSIDIES, AND SUSTAINABLE FOOD SECURITY IN MOZAMBIQUE

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### Can subsidies lead to sustainable growth?

SEVERAL SUB-SAHARAN AFRICAN COUNTRIES implemented large-scale fertilizer subsidy programs in attempts to boost the productivity and food security of smallholder farmers. With the recent global escalation in food prices, other countries in Africa and around the world are considering similar subsidies. This, then, is a critical moment to quantify the short-term impacts such programs have on farm output, and also to investigate ways to ensure longer-term impacts after subsidies are phased out. The key to determining whether provision of subsidies leads to long-term growth, even after the subsidies are no longer in effect, is to discover if farmer practices change fundamentally, or whether these practices change only (if at all) when subsidies are available.

The recent implementation of a program providing input support to smallholder farmers in rural Mozambique offers BASIS the opportunity to examine whether household wellbeing improves under subsidies, and if this improvement can be made sustainable. BASIS researchers are implementing a field experiment in the program's target regions that will result in recommendations to help make this and similar programs more effective in improving household consumption over the long term, as well as revealing alternative approaches to subsidizing farmers that might prove more effective in improving farmer knowledge, practices and output.

Importantly, the BASIS research also looks at whether providing farmers opportunities for savings

plans through a local financial provider will help subsidies achieve a greater sustainable impact. Do savings alone motivate farmers to invest in higher-yield seeds or technologies that improve harvests? Or are methods such as “savings matches”—whereby a bonus amount of funds is added to the farmer's savings account—needed to motivate farmers to begin saving? Follow up questions include whether farmers use these savings to improve their farm practices, and if they continue saving on their own once the attractive matches end.

The BASIS project also will look at group-based incentives for savings and how these differ in their effects from individual-based incentives. New thinking on the constraints to savings suggests several interventions that could facilitate the critical transition from subsidies to sustained agricultural growth. The BASIS project will evaluate these interventions.

### The Malawi experience

In May 2009, the Food and Agricultural Organization (FAO) launched a two-year program, through the European Union's Food Facility, that provides fertilizer (among other inputs) to approximately 200 farmers' associations to help boost local production. The farmers' associations link with private companies to market the fertilizer. To offset the high cost of inputs, many small farmers receive subsidies. Farmer co-investment is required, however, with farmers using their own funds to cover roughly 30% of the total cost. The program is targeted at rain-fed agriculture,

and most of these farmers in Mozambique have little or no experience with application of chemical fertilizers and other agro-chemical inputs.

Neighboring Malawi's longer history with subsidy programs provides an instructive background to the newer program in Mozambique. Periodically, Malawi has introduced fertilizer and seed subsidies over the sometimes fierce opposition of donors. Donor pressure led to subsidies being withdrawn in the late 1980s and again in the late 1990s, only to see their reintroduction in recent years. A key factor in donor opposition was the fact that subsidies, until recently, were paid entirely by the government, with subsidized seed and fertilizer available only through state outlets. This not only hurt the private sector's ability to compete, it also limited farmer choice with regard to the seeds and fertilizers that were available.

In 2006, after agreement that the program would increase the involvement of private dealers, farmers began to have a greater range of options when choosing the type and amount of seeds and fertilizer. Reports reveal that up to three-quarters of farmers chose more expensive hybrid seeds, for example, even though this made their co-investment more expensive. This factor is especially pertinent to the BASIS Mozambique study, which seeks to learn if farmer knowledge and willingness to invest in higher-yield inputs will endure in a sustainable way.

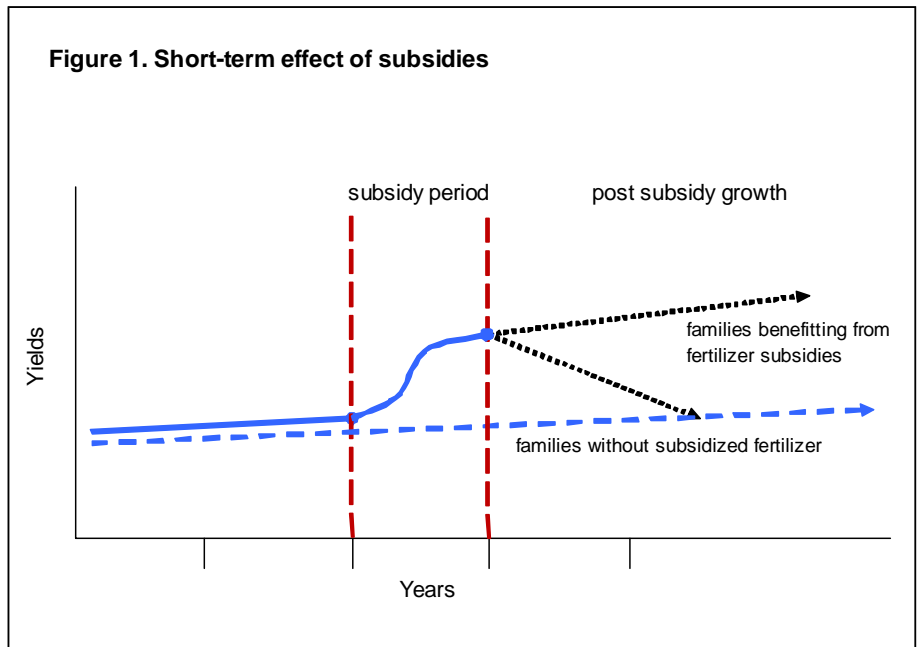
There is little doubt that a subsidy program, such as the one in Malawi, can have a profound effect on harvests. As shown in a stylized fashion in Figure 1, families that have an opportunity to purchase fertilizer and other inputs will often see a dramatic rise in farm output. The 2008 maize harvest in Malawi was the highest on record, nearly one-third larger than the previous record in 2006, which also followed a year of subsidization. (These also were years of very good weather.)

As the president of Malawi noted in a recent interview, the result of subsidies was that one of the poorest countries in the world became an exporter of maize. By supporting smallfarmers to rise above subsistence level, there can be enough production to feed the entire country. The president is leading an

effort to set up a pan-African advisory board on food security, and he hopes that lessons learned in Malawi can be scaled up across the continent.

### Savings: the added dimension

The BASIS project seeks to learn if there are methods, such as a savings program, that can turn a one-time or temporary provision of subsidized fertilizer into a long-run positive growth path for rural households. As illustrated in Figure 1, over time after subsidies are phased out the harvests for many families may gradually revert to pre-subsidy levels. Would a savings program, coupled with the subsidy, help sustain the gains? If so, what type of savings program is most effective?



To date there is little evidence as to if or how savings can aid the overall impact and reach of subsidy programs. Furthermore, we lack solid evidence regarding the effectiveness of different types of savings programs. The BASIS project seeks to reveal the impact of providing farmers with savings accounts that they are encouraged to use to accumulate funds for agricultural investment in future years once the initial subsidies have ended. In addition, the project will examine whether long-term impacts of savings accounts can be magnified if farmers are offered additional incentives to save in the form of substantial savings “matches.”

## The BASIS experiment

In contrast to the Malawi experience, use of fertilizer in Mozambique has been very low. This alone might justify a subsidy program that jump starts the uptake of fertilizer and improved technologies. Yet there are other valid reasons for introducing such a program in Mozambique or other developing countries. Many farmers simply may have no first-hand knowledge of the potential of these technologies, and there may be few if any farms nearby that would illustrate their potential for local farmers. Even if they had knowledge of and wanted to use fertilizer and fertilizer-responsive seed varieties, farmers in developing countries are often caught in a low-income trap and lack the liquidity needed to finance such use. A short-term subsidy may be the nudge needed to induce wider familiarity and take-up, which in turn can result in a change of farming patterns that can lead to the significant improvement in yields illustrated in Figure 1.

The new Mozambique fertilizer program uses vouchers instead of direct subsidies, and BASIS arranged to have vouchers distributed in a randomized fashion to a sample of farmers. In partnership with a local financial institution, Banco Oportunidade de Mocambique (BOM), BASIS researchers also will randomized offers of savings accounts. A lottery will determine the specific savings intervention offered to each farmer. To avoid potential complications that might arise if individuals in a village are offered different match rates, randomization will be carried out at the village level.

Each farmer will be randomly assigned to either a control group or one of several treatment groups. In this study, the main sample comprises farmers with access to some type of extension service, be it through an NGO or government entity, so that they have information on how to use fertilizer, if they choose to do so. The voucher randomization (VR) sample will be made up of farmers randomized into or out of the FAO voucher program. The VR sample allows the project to examine the interaction between voucher receipt and savings incentives.

As shown in the table, the VR sample consists of three treatment groups and a control. Farmers in

treatment group 1 will be offered the standard BOM savings account interest rate. Farmers in treatment group 2 will be offered “matched savings” accounts, where the farmer receives a match equal to, for example, 50% of his or her average savings balance during a defined match period. (The match rate is the percentage of the average balance in the account that will be contributed by the project at the end of the match period; it is not an annual percentage rate.) Farmers in treatment group 3 will be offered a savings match with a group incentive, where the match rate rises or falls in accordance to the average account balance of the entire group. Farmers are not required to use the match for fertilizer, yet the match amount does allow each farmer to afford the inputs provided in the FAO fertilizer package, which many farmers could not afford otherwise.

	No savings offered	Offered regular interest rates	Offered individual savings with 50% match	Offered group savings with match
<b>Receives voucher</b>	Y-0	Y-1	Y-2	Y-3
<b>Does not receive voucher</b>	N-0	N-1	N-2	N-3

The control group, designated as 0 in the table, comprises farmers that will be part of the survey and receive education about savings plans, but will not receive a savings account offer. These farmers will not be prevented from opening accounts on their own.

The groups also will be subdivided into two further categories: those who were randomized into the voucher program and those who did not receive vouchers. For example, the N-0 group is the overall control, receiving neither fertilizer vouchers nor savings offers. Through this randomization of vouchers, savings, and match savings, the project will be able to estimate a variety of distinct effects. To assess the impact of vouchers alone, for example, the analysis will compare group Y-0 to group N-0. To assess whether the offered savings programs are more effective when preceded by vouchers, the analysis will compare group Y-1 to N-1 for the regular BOM savings match, Y-2 to N-2 for the 50% savings match, and Y-3 to N-3 for the group savings.



## BASIS Briefs

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The success of the interventions will be measured by looking at changes in the following outcome variables: (a) per-capita income and expenditures—a standard measure of household economic wellbeing, (b) maize yields and use of seed varieties and fertilizers, and (c) the creation and use of savings accounts.

### Testing for impact

In the first half of 2010, the project team was in the field carrying out a test of the survey and treatment protocols and implementing the matched savings program on a pilot basis with a small number of farmers. In addition to gathering information on such items as current level of technology use, production and sales in maize, household expenditures and level of assets, the survey further queried farmers on savings habits and attitudes toward risk.

During meetings with farmer groups, project staff covered the importance of savings and keeping part of one's harvest proceeds for fertilizer and other agricultural inputs for the next harvest season. Farmers also were given specific instructions about using the FAO fertilizer package for maize, and information on BOM savings services and locations. After farmers completed the baseline survey, savings accounts were offered, and project staff assisted interested farmers in filling out the forms to open an account. Farmers then could make their initial deposit at a BOM branch or a *Bancomovil*, a mobile bank that services many of the sites. For those farmers offered savings accounts, project staff provided educational material, including illustrating the amounts one might save with or without a match, and the effect on one's match if deposits are made after the beginning of the match period or if savings are withdrawn before the end of the match period.

After review of the results of the pilot, the full study will take place in 2011-2012. Baseline surveys and the intervention will

be implemented in 2011, and follow-up surveys are planned for 2012 and 2013. With consumption in rural areas showing significant seasonal variation, we will undertake the surveys at the same time each year, from March to May. This follow-up work will track farmer habits and find out if impact from the short-term provision of the fertilizer subsidy seems sustainable. As we get further from the period of subsidization, we can see more clearly if there are enduring changes in farmer use of input and higher-yield seeds.

### Finding effective interventions

At a fundamental level, the BASIS project will be able to show the impact that subsidizing fertilizer has on yields, and subsequently household expenditures and general wellbeing. Since it has been shown that use of fertilizer in Malawi can have an immense impact, we would expect to see a stark difference in yields and the corresponding impact on household wellbeing between those who had the opportunity to co-invest in fertilizer and those who did not.

Yet the results from our randomized field experiment will go further and help distinguish methods needed to ensure long-term, sustainable benefits arising from programs such as the current FAO subsidy program in Mozambique. A subsequent *BASIS Brief* will evaluate best practices for potential interventions, such as a savings program, that are aimed at building farmer familiarity with new products and creating a willingness to continue to invest in the new practices learned when benefiting from subsidies.



### Related reading

UK Guardian. 4 May 2010. "Malawi president calls for greater cooperation in Africa to improve food security." <http://www.guardian.co.uk/katine/2010/may/04/bingu-wa-mutharika-food-security-africa>

World Development Report 2008. Accessible at: <http://econ.worldbank.org/>