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The impacts of agricultural input subsidies in Malawi

Christopher Chibwana and Monica Fisher

Achieving food self-sufficiency on a national basis is a high priority for the government of Malawi. The goal of the Farm Input Subsidy Program (FISP) is to enhance food self-sufficiency by increasing smallholder farmers' access to and use of improved agricultural inputs, thereby boosting the incomes of resource-poor farmers. This policy note summarizes the results of recent research by Chibwana, Fisher, Masters, and Shively (CFMS 2010) and by Chibwana, Fisher, and Shively (CFS 2010), on the effectiveness of FISP voucher distribution to smallholder farmers, and on impacts of the FISP on fertilizer use, maize yields, and land allocation. The studies used data from a 2009 survey of 380 farm households in two districts in central and southern Malawi.

Effectiveness of FISP voucher distribution

The Farm Input Subsidy Program (FISP) is administered through vouchers or coupons that enable eligible households to purchase fertilizer, hybrid seed, and pesticides at reduced prices. The program targets smallholder farmers who own land and are legitimate residents of their villages. Beneficiary selection, which is carried out by village heads and members of village development committees (VDCs), is supposed to give priority to "vulnerable" groups. During the 2008–2009 season, the year used as the basis of the CFMS and CFS studies, each targeted household was to receive two vouchers, which entitled a household to 100 kilograms of maize fertilizer at about eight percent of market price, and two kilograms of free hybrid maize seed or four kilograms of open pollinated maize seed. Some households also received a coupon for 100 kilograms of tobacco fertilizer. During the 2008–2009 season, a total of 150,000 tons of maize fertilizer and 20,000 tons of tobacco fertilizer were acquired by the Malawi Government for distribution to smallholder farmers through the FISP. The cost was estimated at US$221 million, 95 per cent of which was financed through the government budget, and five per cent by Malawi's development partners.

Results of the CFMS (2010) study indicated that, contrary to stated FISP criteria, households headed by young females were less likely to receive a complete input subsidy packet than households headed by older males. Furthermore, poor households were less likely than rich households to receive any voucher. As female-headed households and poor households often have relatively small landholdings, these households may have been considered ineligible for the program. On average, householders with more education received more coupons than the recommended amount, possibly because educated individuals were more successful at bargaining with village chiefs and VDC members. Household heads that had lived in their villages for longer periods had a higher probability of receiving coupons, suggesting that duration of residency had a positive influence on relationships with village leaders.

Overall, CFMS (2010) found that poor and vulnerable households were not the primary beneficiaries of the subsidized inputs in the two districts studied. Other researchers came to similar conclusions using nationally representative datasets (Holden and Lunduka 2010a; Doward et al. 2008; Ricker-Gilbert and Jayne 2008). Thus, it is apparent that modifications to the FISP coupon distribution system are needed to stimulate the use of improved maize technologies among resource-poor smallholder farmers.

First, the criteria for beneficiary identification should be made more clear and explicit. The general advice —to select "vulnerable" groups— is problematic. Village heads and VDCs should instead be directed to select beneficiaries on the basis of specific, easily identifiable characteristics that are correlated with poverty in rural Malawi, such as households headed by females, or households with thatch-roofed houses, rather than corrugated iron roofs. Second, the guideline that coupon recipients own and cultivate land should be amended to specify minimum and maximum farm sizes. The specified sizes would differ among districts, based on regional differences in land availability. Third, the guidelines

should be made more accessible to local chiefs by making them available in local languages.

A series of modifications similar to the suggested changes were implemented in 2009–2010 and 2010–2011. In 2009–2010, furthermore, enumerators and agricultural extension officers worked alongside village chiefs and VDCs to identify beneficiaries and distribute coupons, increasing the probability that beneficiaries were selected on the basis of program criteria, rather than for political reasons. Research is needed to assess whether the recent modifications improved the FISP's effectiveness at providing vouchers to the rural poor.

Impacts of the FISP on fertilizer use and maize yields

Maize yields in Malawi have remained low, partly due to limited adoption of improved varieties and partly to soil nutrient loss through continuous monocropping. The FISP was designed to increase maize productivity by providing resource-poor farmers with improved maize seed and chemical fertilizer. It was hoped that the program would introduce many farmers to improved inputs, stimulate future demand for those inputs, and ultimately lead to long-term benefits.

Results of CFMS (2010) suggested that the subsidy program for maize did increase the use of maize fertilizer among recipient households. The study also found a positive relationship between the amount of fertilizer used and maize yield (Figure 1). Furthermore, plots that were planted with improved maize had 21 percent higher yields than those planted with traditional maize. Finally, maize plots that were intercropped with other crops, such as pigeon peas, beans, and cassava, had 18 percent lower yields than those that were monocropped.

The specific effects of the seed and fertilizer subsidies for farms surveyed in Kasungu and Machinga can be understood by comparing yield for different input combinations (Figure 1). Points t0 (traditional maize) and h0 (hybrid maize) represent yields at average fertilization rates used by farmers who did not receive fertilizer subsidies. Points t1 (traditional maize) and h1 (hybrid maize) represent yields at mean fertilization rates for farmers who received fertilizer subsidies. Thus, access to fertilizer through the subsidy program enhanced production of traditional maize from t0 to t1, and of improved maize from h0 to h1. Access to both hybrid seed and fertilizer increased yield from t0 to h1.

Based on the results of CFMS (2010), the FISP has been successful in moving farm households toward food self-sufficiency. However, the average increase in maize yield attributable to the receipt of a complete packet of coupons (i.e., both seed and fertilizer subsidies) was 447 kg/ha, which is only about twice the gain from receiving only fertilizer. This suggests that FISP may be placing too much emphasis on fertilizer relative to hybrid seed. The fertilizer to seed ratio in FISP vouchers is 25:1, but the optimal ratio is 5:1 for most areas in Malawi. Based on the differences between yields of traditional and hybrid maize, and the high cost of fertilizer compared to seed, greater promotion of hybrid seed use would probably make the FISP even more effective.

Ensuring long-term food security in Malawi may depend on policies that increase delivery of hybrid maize seed to farming communities. Farmers sampled in the CFMS (2010) study planted 38 per cent of their land with traditional maize varieties and only 25 percent with improved maize. The supply of high quality, improved seed is currently constrained by limited seed development and production. Significant government investment in these activities is needed as the first step in enhancing availability and use of improved seed. At the same time, it is necessary to strengthen the seed services unit of the Department of Agricultural Research, which is responsible for seed inspection and certification. Finally, an extensive program of farmer education about the advantages of using certified seed, as opposed to recycled seed, is needed.

Effects of the FISP on land use

CFS (2010) found that the FISP affected land use by increasing the amount of land allocated to maize. Households that received a complete packet of coupons for maize allocated 16 percent more land to maize than households that did not. Similarly, households that received coupons for tobacco fertilizer allocated more land to tobacco than households that did not. Finally, farmers who received coupons for both improved maize seed and maize fertilizer allocated 45 percent more land to improved maize than farmers who did not receive any coupons.

The expansion of maize acreage occurred at the expense of other crops (legumes, cassava, and sweet potato), which were allocated 21 percent less land, on average (CFS 2010). Thus, the objectives of Malawi's agricultural policies—to increase both maize production and crop diversity— may be difficult to achieve under the FISP. A move toward greater specialization in maize by Malawian smallholders is not intrinsically bad; as stated above, maize plots intercropped with other crops had yields that were 18 percent lower than plots that were monocropped

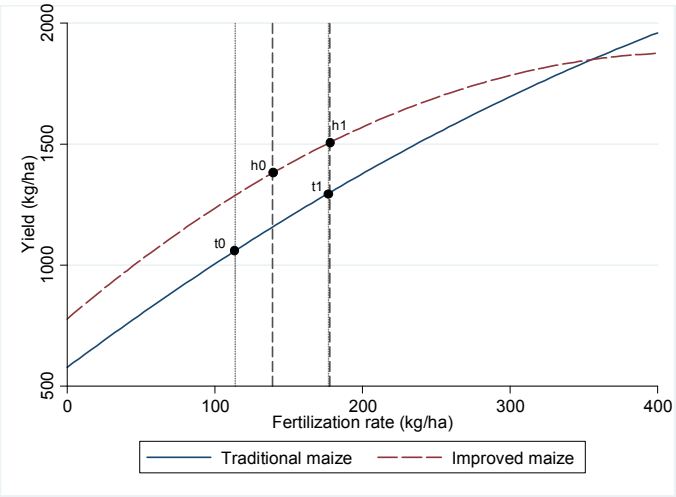
(CFMS 2010). Maize also provides labor savings, improved pest control, and flexibility in planting and harvesting times in comparison to some of the other main crops grown in Malawi. On the other hand, by growing a mixture of crops, farmers can reduce potentially negative impacts of labor shortages, seasonal production needs, and uncertain climate conditions. Movement towards monocropping dominated by improved varieties of maize might make farm households more vulnerable to climate variability and change. In addition, the increase in maize acreage at the expense of relatively drought-tolerant crops, notably cassava and sweet potato, could exacerbate the impact of drought on food security.

A number of policies could be instituted to concurrently increase maize production and crop diversity. Researchers from national and international agricultural organizations in Malawi have developed improved varieties of crops that are drought tolerant and/or have soil-building properties. Government investments in production and distribution are needed to enhance availability of these seeds to farm households. Improved varieties of crops other than maize should be included in the FISP, to allow farmers to experiment with and gain knowledge of new and diverse crops. In 2008–2009, the FISP offered a flexible coupon that allowed farmers to choose between improved maize or legume seeds. Most farmers selected the maize, partly due to a lack of legumes in the market. However, in 2009–2010, farmers were provided with both maize and legume coupons, and the availability of legumes in the market increased considerably. The amount of land allocated to legumes probably was less impacted by increased allocation to maize during that year than during the year examined by CFS (2010). Offering coupons for one or more drought-tolerant crops would also be a valuable policy, given that droughts and dry spells are common and irrigation infrastructure is under-developed in Malawi. Finally, educating farmers about advantages of crop diversification would reduce the negative effects of monocropping. The soil-building properties of legumes are well known by farmers in rural Malawi, but do not provide sufficient reason to increase production of leguminous crops. However, recent research showed that education about the nutritional benefits of legumes greatly enhanced interest in growing them (Bezner-Kerr et al. 2007). Adoption of such policies by the Malawi government could help the FISP achieve the goals of food self-sufficiency and increased farm household income, and at the same time, reduce any unintended and counterproductive trends toward crop simplification and monoculture.

Conclusions

Political imperatives indicate that farm input subsidies will remain a key strategy for increasing agricultural productivity in Malawi. CFMS (2010) and CFS (2010) studied the impacts and effectiveness of the FISP. Overall, poor households that received FISP vouchers were better off than non-recipients. Receipt of FISP vouchers was associated with increased fertilizer use, higher maize yields, and expansion of maize production at the expense of other crops. These results have implications for designing future subsidy programs that will have the greatest possible positive impact on agricultural production in Malawi. First, FISP and other subsidy programs must target poor households, thus requiring modifications to the recipient selection procedures used in 2008–2009. Second, although fertilizer remains a key input for maize production, it is necessary to enhance availability of improved seed for maize and other crops, especially legumes and drought-tolerant crops. The latter policy is particularly important to achieving the dual objectives of food security and crop diversification articulated in Malawi's Agricultural Sector Wide Approach (ASWAp) document.

Figure 1: Yield of traditional and hybrid maize with and without fertilizer subsidies



Source:CFMS (2010).

This Brief is based on two research papers: (1) Christopher Chibwana, Monica Fisher, and Gerald Shively "Cropland Allocation Effects of Agricultural Input Subsidies in Malawi", which is forthcoming in World Development, fall 2010 and (2)Christopher Chibwana, Monica Fisher, Charles Jumbe, William Masters, and Gerald Shively "Measuring the Impacts of Malawi's Farm Input Subsidy Program."

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IFPRI HEADQUARTERS

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
2033 K Street, NW • Washington, DC 20006-1002 USA
Tel: +1-202-862-5600 • Skype: IFPRIhomeoffice
Fax: +1-202-467-4439 • E-mail: ifpri@cgiar.org

IFPRI-LILONGWE
P.O. Box 31666 • Lilongwe 3, Malawi
Tel: +256-1-789747 • E-mail: ifpri-lilongwe@cgiar.org

Contact: Monica Fisher, Research Fellow (m.g.fisher@cgiar.org) or Klaus Droppelmann, Senior Program Coordinator (k.droppelmann@cgiar.org)

MINISTRY OF AGRUCULTURE AND FOOD SECURITY
Capital Hill • Lilongwe, Malawi
P. O. Box 30134 • Lilongwe 3, Malawi
Tel: +265-1-789033 • Fax: +265-1-788003

Contact:
Readwell Muspole • Interim Director of Agricultural Planning Services
(musopoler@gmail.com)