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Is FISP Reducing Poverty among Smallholder Farm Households in Zambia?

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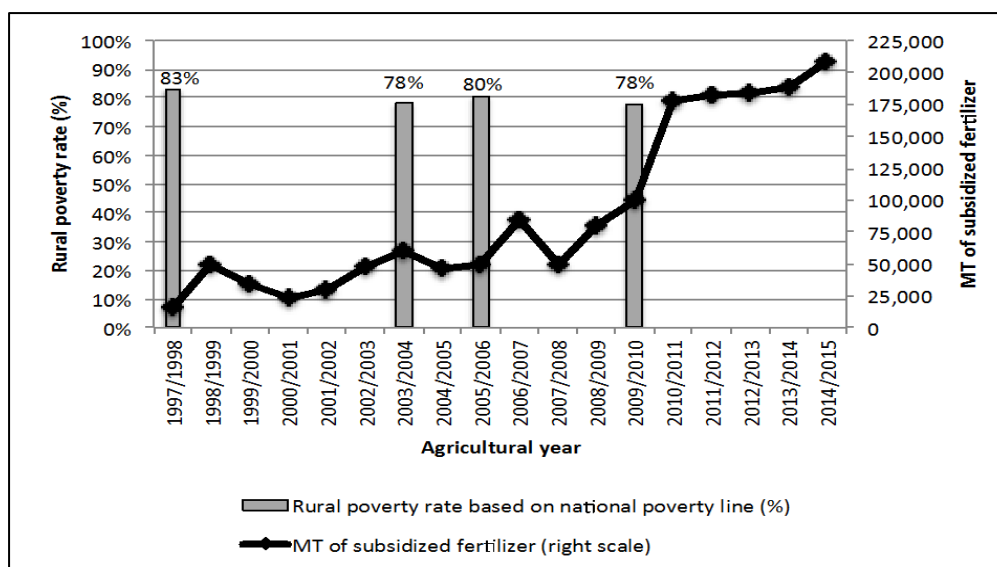
Key Points

1. Despite the scaling up of the Farmer Input Support Program (FISP), the rural poverty rate in Zambia remains high at 78%. Since the inception of FISP in 2002/03, the rural poverty rate has remained unchanged despite K4.7 billion expenditure on FISP over 13 years.
2. Results show that FISP fertilizer raises incomes by approximately 7.7% and reduces the severity of poverty by 3.6 percentage points, but the effects are not large or widely distributed enough to reduce the likelihood of households' incomes falling below the poverty line.
3. The limited effect of FISP on poverty is mainly due to very little FISP fertilizer reaching poor households. For example, in 2002/03, only 7% of FISP fertilizer went to the poorest 40% of the smallholder population, whereas the richest 20% garnered 63% of FISP fertilizer. By the 2010/11 season, the situation had only marginally improved: the poorest 40% of smallholders got 15% of the fertilizer while the richest 20% got 42% of it.
4. Two key ways that the Zambian government could increase FISP participation among poor smallholders without increasing the subsidy rate are:
 - i. Removing the FISP requirement that beneficiaries be members of a cooperative or other farmer group, as poor smallholders may not be able to afford to join or pay annual dues; and
 - ii. Capping the maximum area cultivated for beneficiary households at 2 ha instead 5 ha, as eligible households in the 2-5 ha cultivated range currently capture a disproportionately large share of FISP fertilizer and many of them may be able to afford fertilizer at unsubsidized prices.

INTRODUCTION: African governments spend more than US\$1 billion per year on agricultural input subsidy programs (ISPs) (Jayne and Rashid 2013). Many of these programs, including Zambia's Farmer Input Support Program (FISP), include among their objectives raising farm incomes and reducing rural poverty, but relatively little is known about the extent to which ISPs are achieving these objectives. Stubbornly high rural poverty rates in Zambia and Malawi despite many years of large-scale ISPs have raised doubts that ISPs effectively reduce poverty. For example, since the inception of FISP in 2002/03, the rural poverty rate has remained unchanged at 78% despite K4.7 billion expenditure on FISP over 13 years (CSO 2011) (Figure 1). In addition, results from previous studies on Zambia's and Malawi's ISPs cast doubt on the poverty-reducing effects of

the programs because: (1) subsidized fertilizer is disproportionately allocated to wealthier households; (2) crowding out of commercial fertilizer purchases by ISP fertilizer and diversion and resale of fertilizer intended for ISPs before it reaches intended beneficiaries has dramatically reduced the impacts of ISPs on total fertilizer use; (3) crop yield response to ISP fertilizer has been low; (4) ISPs have only minimally reduced retail maize prices; and (5) spending on ISPs has come at the expense of other public investments that have been shown to have higher returns to agricultural growth and poverty reduction. This policy brief and the paper on which it is based (Mason and Tembo (2015)) seek to answer the question, do fertilizer subsidies raise incomes and reduce poverty among smallholder farmers in Zambia?

Figure 1. Trends in the Official Rural Poverty Rate and the Quantity of Subsidized Fertilizer Distributed through Zambia's ISPs, 1997/98-2014/15 Agricultural Years



Source: CSO (2009, 2011); MACO (various years); MAL (various years).

Notes: The official rural poverty rates are based on the national poverty line and consumption expenditures, and come from Zambian government reports based on the Living Conditions Monitoring Surveys. The poverty rates are for 1998, 2004, 2006, and 2010. The metric tons (MT) of subsidized fertilizer are for a fertilizer-on-credit program run by the FRA from 1997/98-2001/02, the Fertilizer Support Program from 2002/03-2008/09, and the Farmer Input Support Program for 2009/10-2014/15.

DATA AND METHODS: Using nationally representative survey data from smallholder farm households in Zambia, we estimate the effects of FISP fertilizer on household incomes, poverty incidence (the probability that household income falls below the US\$2 and US\$1.25/capita/day poverty lines), and poverty severity (the squared percentage difference between household income and these poverty lines).¹ The survey data include detailed information on household acquisition of FISP fertilizer as well as the household's farm activities, income sources, land- and non-land assets, and demographic characteristics. We used both the SS and RALS data sets to examine the relationships between FISP fertilizer and smallholder incomes and poverty. Various econometric models were then estimated using the SS panel data in order to identify the causal effects of FISP fertilizer on incomes and poverty. (See Mason and Tembo 2015, for detailed descriptions of the data and methods).

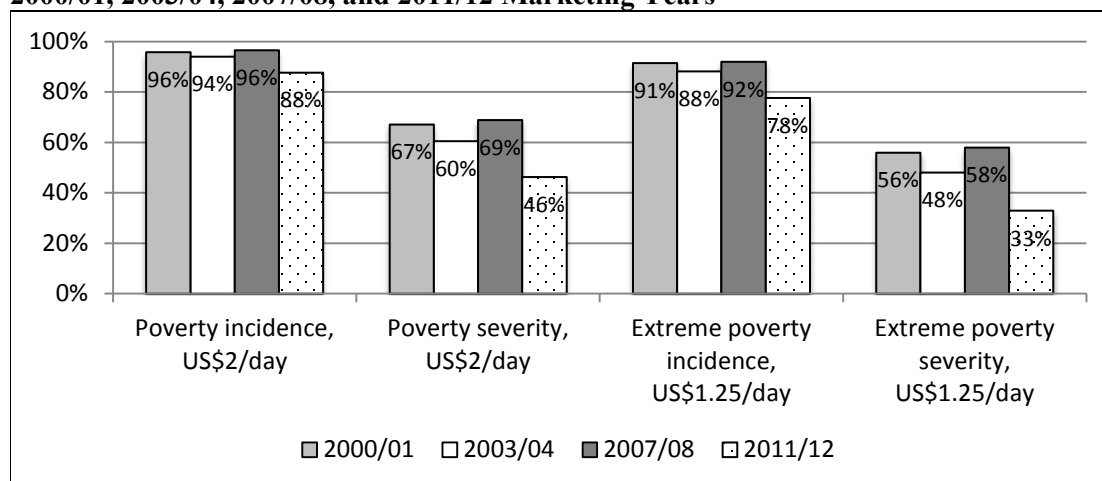
¹ The data are from the Supplemental Survey (SS), a three-wave panel survey conducted in June/July of 2001, 2004, and 2008, and from the Rural Agricultural Livelihoods Survey (RALS), a cross-sectional survey conducted in June/July 2012 by the Indaba Agricultural Policy Research Institute (formerly the Food Security Research Project) in collaboration with the Central Statistical Office and the Ministry of Agriculture and Livestock.

RESULTS: Three key findings emerge from the analysis.

First, based on the descriptive analysis of poverty incidence and severity, it appears that FISP failed to put a substantial dent in rural smallholder poverty in the 2000s despite being scaled up. Figure 2 shows that poverty incidence among smallholder households is very high (88% or above) and remained stagnant between 2000/01 and 2007/08. However, smallholder poverty rates were significantly lower in 2011/12 than in previous years, though still very high in absolute terms. This decline could be due to FISP or other factors; we estimated econometric models in order to control for these other factors and thus, isolate the effects of FISP on poverty.

Second, our results show that poorer smallholder households are much less likely to receive FISP fertilizer than wealthier households; moreover, poor households that manage to get FISP fertilizer get substantially less of it than wealthier households (Table 1, sections A and B). In general, wealthier households capture a disproportionately large share of the total FISP fertilizer distributed in Zambia (Table 1, section C). For example, in 2002/03 the poorest households in the bottom two income quintiles (40% of the smallholder population) received only 7% of the total FISP fertilizer distributed,

Figure 2. Trends in SS- and RALS- Based Measures of Poverty among Smallholder Farm Households, 2000/01, 2003/04, 2007/08, and 2011/12 Marketing Years



Source: Authors' calculations based on the 2001, 2004, and 2008 CSO/MACO/FSRP Supplemental Surveys and the 2012 CSO/MAL/IAPRI Rural Agricultural Livelihoods Survey.

Notes: The poverty severity figures are mean poverty severity across all households (poor and non-poor). Also note that these poverty figures are based on income, whereas those in Figure 1 are based on consumption expenditure.

whereas the households in the top income quintile (top 20%) received 63% of it. The situation improved somewhat in 2010/11 but FISP fertilizer still went disproportionately to wealthier households: the poorest 40% of smallholders got 15% of the fertilizer while the richest 20% of the smallholders got 42% of it. These results suggest that one reason why FISP has largely failed to reduce poverty (one of its main stated objectives) is that the program has been targeting wealthier smallholders (Mason, Jayne, and Mofya-Mukuka 2013).

Third, and most importantly, after controlling for other factors, FISP fertilizer has a positive effect on smallholder incomes but negligible, if any, effects on poverty. On average, a 200-kg increase in FISP fertilizer raises real total household income by K1, 140 (US\$233) or 7.7%, and income per adult equivalent by K224 (US\$46) or 6.9%.² While these income increases are fairly large in *percentage* terms, they are not very large in *absolute* terms. FISP fertilizer has no significant effect on the likelihood that household income falls below the poverty line. FISP fertilizer does reduce the *severity* of poverty but the effects are relatively small in magnitude. On average, receiving and additional 200 kg of FISP fertilizer reduces poverty severity by 2.7 percentage points and extreme poverty severity by 3.6 percentage points. These are quite small declines relative to the high rates of poverty severity (median of 74.9%) and extreme poverty severity (median of 61.6%) in the sample.

CONCLUSIONS AND POLICY

IMPLICATIONS: Evidence from the study suggests that poverty among Zambian smallholder farmers has remained high despite many years of large-scale input subsidies through FISP. Relatively wealthy households are much more likely to receive FISP fertilizer than are poorer households. And although FISP raises smallholder incomes, these effects are not large enough or widely distributed enough to reduce poverty incidence among smallholder farmers in Zambia.

To increase FISP participation among poor smallholders without increasing the subsidy rate, the Zambian government could consider: (i) removing the cooperative/farmer group membership requirement (poor smallholders may not be able to afford to join or pay annual dues (Burke, Jayne, and Sitko 2012)); and (ii) capping the maximum area cultivated for beneficiary households at 2 ha instead of 5 ha (currently 78% of poor households cultivate less than 2 ha but households cultivating more than 2 ha capture most (55%) of the FISP fertilizer (Mason, Jayne, and Mofya-Mukuka 2013)). Recapitalizing the Food Security Pack Program, a program that targets free seed and fertilizer to the poorest of the poor but that has been starved for funds since the mid-2000s, could also help reduce smallholder poverty (*ibid*).

To boost the effects of FISP on smallholder incomes by improving its impacts on maize production, government should: (i) prioritize timely delivery of FISP fertilizer through an

² All Kwacha values are in real 2011/12 terms.

Table 1. Distribution of FISP Fertilizer among Smallholder Households by Total Gross Income per Adult Equivalent Quintiles, 2002/03, 2006/07, and 2010/11 Agricultural Years

Extreme poverty or FISP fertilizer receipt		Agricultural Year	Total income per adult equivalent quintile					All HHs
			1 (lowest)	2	3	4	5 (highest)	
% receiving FISP fertilizer	(A)	2002/03	2.0	4.6	7.9	9.8	19.9	8.8
		2006/07	1.7	4.9	11.1	14.5	24.4	11.3
		2010/11	11.3	19.9	29.8	39.9	49.2	30.0
Mean kg of FISP fertilizer per recipient HH	(B)	2002/03	101	144	188	256	421	300
		2006/07	107	183	214	296	508	356
		2010/11	169	198	218	251	334	259
% of total FISP fertilizer distributed	(C)	2002/03	1.6	5.0	11.2	19.0	63.3	100.0
		2006/07	0.9	4.4	11.8	21.4	61.5	100.0
		2010/11	4.9	10.2	16.8	25.8	42.4	100.0

Source: 2004 and 2008 CSO/MACO/FSRP Supplemental Surveys; 2012 CSO/MAL/IAPRI Rural Agricultural Livelihoods Survey.

electronic voucher; (ii) provide extension support to farmers on best agronomic and soil fertility management practices; and (iii) improve the targeting of FISP fertilizer so that it is allocated to households that cannot afford fertilizer at commercial prices. The latter would reduce crowding out of commercial fertilizer purchases by FISP fertilizer and increase the effects of FISP on total fertilizer use and maize production.

Finally, government should consider other approaches to poverty reduction that are likely to be more cost-effective than FISP, such as social cash-transfer programs and investments in rural infrastructure, agricultural research and development, health, and education.

REFERENCES

- Burke, W.J., T.S. Jayne, and N.J. Sitko. 2012. *Can the FISP More Effectively Achieve Food Production and Poverty Reduction Goals?* FSRP Policy Synthesis No. 51. Lusaka, Zambia: Food Security Research Project.
- Central Statistical Office (CSO). 2009. *Living Conditions Monitoring Survey 2006 Draft Report – Chapter 12, Poverty*. Lusaka, Zambia: CSO.
- CSO. 2011. *Living Conditions Monitoring Survey Report, 2006 and 2010*. Lusaka, Zambia: CSO.
- CSO, Ministry of Agriculture and Livestock (MAL), and Indaba Agricultural Policy Research Institute (IAPRI). 2012. *2012 Rural Agricultural Livelihoods Survey Data*. Lusaka, Zambia: CSO.
- Central Statistical Office, Ministry of Agricultural and Cooperatives and Food Security Research Project (CSO/MACO/FSRP). Various Years. *Supplemental Survey Data*. Lusaka, Zambia: CSO.
- Indaba Agricultural Policy Research Institute (IAPRI). 2012. *The 2012 Rural Agricultural Livelihoods Survey: Interviewer's Instruction Manual*. Lusaka, Zambia: IAPRI.

Jayne, T.S. and S. Rashid. 2013. Input Subsidy Programs in Sub-Saharan Africa: A Synthesis of Recent Evidence. *Agricultural Economics* 44: 547-562.

Mason, N.M., T.S. Jayne, and R. Mofya-Mukuka. 2013. Zambia's Input Subsidy Programs. *Agricultural Economics* 44: 613-628.

Mason, N.M. and S.T. Tembo. 2015. *Do Input Subsidies Reduce Poverty among Smallholder Farm Households? Evidence from Zambia*. IAPRI Working Paper No. 92. Lusaka: IAPRI.

Ministry of Agriculture and Cooperatives (MACO). Various years. *Fertilizer Support Programme Implementation Manual*. Lusaka, Zambia: MACO.

MAL. Various years. *Farmer Input Support Programme Implementation Manual*. Lusaka, Zambia: MAL.

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