



Can Increasing Smallholder Farm Size Broadly Reduce Rural Poverty in Zambia?

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Key Points/Summary

- 1) The majority of smallholder farmers in Zambia face land constraints in the midst of apparent land abundance because agricultural settlements tend to be concentrated in areas where there is infrastructure and most arable land in these areas has already been claimed;
- 2) Over two thirds of Zambian farmers own and cultivate less than two hectares of land, and they account for only 40% of total cultivated land and 31% of the value of production by farms between 0 and 20 hectares in Zambia respectively;
- 3) Mean annual household agricultural sales are significantly higher among the minority who own and cultivate relatively larger areas of land. It is this small group of farmers that has been participating in the agricultural growth that Zambia has experienced in the past decade;
- 4) Because the majority have not participated in this agricultural growth, rural poverty rates have remained stubbornly high at about 80%;
- 5) Farm size is significantly and positively associated with smallholder agricultural sales. Increasing smallholder farm size by one hectare is associated with poverty reduction of 86% to 53% for those owning less than one hectare, by 44% to the 50% range for the other farm size ranges, and from 84% to 48% for all the households; and
- 6) Increasing smallholder farm size should, therefore, be an important policy option aimed at increasing agricultural production and productivity, as complements to the range of other recognized public investments and enabling policies.

INTRODUCTION: Despite Zambia's sustained and fairly robust agricultural growth since 2000, rural poverty levels have remained at about 80% over the past 15 years. Because over 70% of Zambia's agricultural households are small-scale farmers cultivating less than two hectares of land, they must effectively contribute to agricultural growth if the process of growth is to be broadly based in Zambia.

Nationwide representative data shows that smallholders in Zambia largely own and cultivate small pieces of land of land. According to the Rural Agricultural Livelihoods Survey (RALS) of 2012, 64% of the smallholder farmers own less than two

hectares while about 70% cultivate less than two hectares of land. Smallholders who cultivate less than two hectares of land account for only about 31% of all agricultural output in the country, although they are the majority, which means that these farmers participated marginally in the agricultural growth through maize bumper harvests of recent years. These farmers received relatively little subsidised fertiliser and sold very little maize, hence they were unable to benefit from the Government supported producer price. The farmers benefiting the most from the government's expenditures on supporting maize prices were clearly those selling the most maize.

This policy brief is based on the study by Hichaambwa and Jayne (2014) that determined the relationship between household farm size and agricultural commercialization and simulated the effect of increasing smallholder farm size on rural poverty.

DATA AND METHODS: The study used a dataset with 22,239 observations developed by pooling three nationally representative surveys of the 2004 and 2008 Supplemental Surveys and the 2012 RALS. These surveys collected information of smallholder rural livelihood in addition to agricultural production and marketing with respect to the 2002/3, 2006/7 and 2010/11 seasons. It employed the lognormal double hurdle model which is popular in analyzing smallholder market participation as it allows for two separate stochastic processes of market participation

and the extent of level of market participation in its respective equations.

KEY FINDINGS: Agricultural Growth Has Largely Been Accounted for by Few Smallholders. Table 1 shows the mean annual household agricultural sales for 2002/3 season and the level of growth up to the 2010/11 per farm size category. While agricultural sales for the smallholders with farm sizes less than two hectares were the least and increased by only 8% from an average of about ZMW 1,051 per household per year those of smallholders with larger farm sizes (five hectares and above) increased by 36-41% from an annual household average of ZMW 6,536 – 11,633. It was among these smallholders that poverty rates declined during this period by 36-38% to 26-36% while the overall poverty rate remained high at close to 70% as is shown in Table 2.

Table 1. Mean Annual Household Agricultural Sales and Growth (2002/3 to 2010/11) by Farm Size Category

Farm size category	Percent households	Mean 2002/03 Agricultural sales at constant 2011 ZMW	%Growth (2002/03 to 2010/11)
< 2 ha	64	1,051	7.8
2 to <5 ha	30	3,121	9.1
5 to <10 ha	5	6,536	35.9
10 to 20 ha	1	11,633	40.6
Total	100	2,063	14.8

Source: CSO/MACO/FSRP Supplemental Surveys 2004 and 2008; CSO/MAL/IAPRI 2012; Authors' Computations.

Table 2. Relative Change in Poverty Rates (2002/03 to 2010/11) by Smallholder Farm Size Category

Farm size category	Percent households	Poverty rate by agricultural season		
		2002/03	2006/07	2010/11
< 2 ha	64	89	84	76
2 to <5 ha	30	81	84	61
5 to <10 ha	5	72	75	36
10 to 20 ha	1	63	68	26
Total	100	85	83	68

Source: CSO/MACO/FSRP Supplemental Surveys 2004 and 2008; CSO/MAL/IAPRI 2012; Authors' Computations.

Increasing Farm Size Is Significantly and Positively Associated with Increased Smallholder Agricultural Sales. Using econometric techniques controlling for prices of fertilizer, maize seed and maize grain, effect of the Food Reserve Agency (FRA) through lagged district maize purchases, participation in the Farmer Input Support Program (FISP), rainfall and household socio-economic characteristics such as labour availability (number of adult equivalents), value of productive assets, and sex, education level and age of the household head show that there is a significant positive relationship between farm size and smallholder agricultural sales. Increasing smallholder farm size by 1%, other factors held constant, is associated with a 0.13 percentage point increase in the probability that a farmer will participate in agricultural output markets. To put these findings in perspective, a percentage increase in farm size would on average increase smallholder agricultural sales by only 0.38% among all smallholders and by 0.84% among selling smallholders all other factors held constant.

Increasing Farm Size Would Significantly Reduce Rural Poverty Rates. To demonstrate the poverty reduction potential of increasing smallholder farm size, we use the results of the above analysis for each household to estimate the expected new agricultural sales, total household income and ultimately poverty rates by increasing farm size by one and then two hectares.

Table 3 shows that increasing farm size by one hectare is associated with an increase in agricultural sales sufficient to reduce the poverty rate from 86% to 53% among households starting out with less than one hectare. A one-hectare increase in farm size reduces poverty rates for the other farm size categories by 44% to the 50% range. Among the entire sample, a one-hectare increase in farm size is associated with a reduction in rural headcount poverty rates from 84% to 48%. Not only are the poverty rates drastically reduced but household incomes become more equitably distributed as well.

CONCLUSIONS AND POLICY IMPLICATIONS: The above analysis has shown that small farm size is a very important factor constraining smallholder agricultural commercialization and poverty reduction among the 70% of farms less than two hectares in Zambia. Promoting access to land among this large group constitutes an important means (but certain not the only means) for promoting broad-based smallholder commercialization and structural transformation processes.

Therefore, current efforts for increasing smallholder technology adoption and productivity can be effectively complemented with those aimed at increasing the average farm size from prevailing levels to the 3-5 Ha range from which significant agricultural sales can be achieved.

Table 3. Simulated Poverty Reduction by Increasing Farm Size by Farm Size Category

Farm size category	Poverty rate (%) by scenario		
	Current (Mean farm size=2 ha) (2010/11 season)	Scenario 1 (Mean farm size=3 ha)	Scenario 2 (Mean farm size=4 ha)
<1 ha	85.5	53	46
1 to <2 ha	88.0	46	36
2 to <5 ha	81.8	44	32
5 to <10 ha	70.4	46	36
10 to 20 ha	61.6	50	43
Total	84.0	48	38

Source: CSO/MACO/FSRP Supplemental Surveys 2004 and 2008; CSO/MAL/IAPRI 2012; Authors' Computations.

The target, resources permitting, should be to reach 10-12 Ha as the average smallholder farm size that can both produce significant crop surpluses as well as provide the means for subdivision to support rural livelihoods among the next generation, which would then buy another 20-30 years for demographic and economic transitions to take place that would eventually shift the majority of the labor force into non-farm employment. A policy that supports migration to areas of land abundance would entail basic public goods investments in fertile regions suitable for agricultural commercialization. Such investments would include trunk highways, health care facilities, schools, electrification, irrigation etc. to open up more land for cultivation in agro-ecologically suitable areas that are currently under-utilized.

This approach is likely to provide a more equitable pattern of agricultural growth and poverty reduction than the current emphasis on farm block development program, for two main reasons. First the smallest sizes in these farm blocks (30 - 50 Ha) are too big for the majority of the smallholders and as result the farm blocks can each only accommodate very few. Second, the majority of the smallholders lack the necessary resources and knowledge to effectively participate in the farm block allocation process. Therefore, in its current form, the farm block development program cannot increase access to land except for small proportion of farmers, very few of which are likely to be land-constrained smallholder farmers.

We hope that this analysis will stimulate broader discussions in Zambia about how to achieve sustainable and equitable patterns of rural development over the coming several decades, how to make agricultural growth more inclusive, and the role of land allocation policies in achieving these important goals.

REFERENCES

Hichaambwa, Munguzwe and T.S. Jayne.
2014. [Poverty Reduction Potential of](#)

[Increasing Smallholder Access to Land.](#)

IAPRI Working Paper No. 83. Lusaka:
IAPRI.

Central Statistical Office, Ministry of Agriculture and Cooperatives and Food Security Research Project (CSO/MACO/FSRP). 2004. Second Supplemental Survey to the 1999/2000 Post-Harvest Survey Data. Lusaka, Zambia: FSRP.

Central Statistical Office, Ministry of Agriculture and Cooperatives and Food Security Research Project (CSO/MACO/FSRP). 2008. Third Supplemental Survey to the 1999/2000 Post-Harvest Survey Data. Lusaka, Zambia: FSRP.

Central Statistical Office, Ministry of Agriculture and Livestock and Indaba Agricultural Policy Research Institute (CSO/MAL/IAPRI). 2012. Rural Agricultural Livelihoods (RALIS) Survey Data. Lusaka, Zambia: IAPRI.

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