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INSTITUTIONAL MODELS FOR ACCELERATING AGRICULTURAL COMMERCIALIZATION: EVIDENCE FROM MAIZE, COTTON AND HORTICULTURE

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SUMMARY

Although a majority of Zambians work in agriculture, only a small minority of smallholders succeed in transitioning to high-productivity, high-value commercial agriculture. Only 20% of cotton farmers and less than 5% of maize and horticulture farmers succeed as top-tier commercial growers (Table 1).

By tracing the long-term agricultural trajectories of successful commercial cotton, maize and horticulture farmers, this study identifies two broad agricultural pathways out of poverty. The low road, exemplified by cotton production, involves a two-generation transition via low-value but with well-structured markets. The more restrictive high road, epitomized by horticulture production, offers a steeper ascent, enabling prosperity within a single generation, but requires commensurately higher levels of financing, management and risk.

Personal characteristics that define successful commercial smallholders include: • strict discipline; • treatment of farming as a business; • good management of crop production, labor and finances; • a strong propensity to save; and • willingness to invest in their children's education. Key institutions affecting smallholder performance include: • management and marketing support provided by the cotton companies to their

Table 1. Concentration of Marketed Sales Among Farmers Growing Each Crop, 2007

	Percent of Small and Medium Farms		
Farm category	Maize	Cotton	Horticulture
Top half of sales	3	20	1
Bottom half of sales	36	80	46
Growers with no sales	62	0	53
Total growers	100	100	100

Source: Supplemental Farm Household Survey 2008.

METHODS

This paper traces the trajectories of successful commercial smallholders in order to identify key personal characteristics and institutional support systems that enable some to succeed as commercial smallholder farmers. Analysis focuses on maize, cotton and horticulture, three widely marketed crops with strikingly different market institutions. Maize receives intensive government input and marketing support. In contrast, cotton relies primarily on private contract farming schemes, while horticulture enjoys no large-scale institutional support from either the public or private sectors.

Quantitative analysis of the characteristics of top-tier commercial smallholders relies on three large-scale national household surveys of over 3,000 farm households in 2001, 2004 and 2008. Qualitative interviews with 90 successful commercial maize, cotton and horticulture farmers in Mumbwa, peri-urban Lusaka West, Chongwe, Lundazi, Chipata and Katete provide detailed life histories and farmer self-assessments of the personal qualities and

institutional circumstances that enabled them to succeed where many others have failed.

AGRICULTURAL PATHWAYS OUT OF POVERTY

To chart an agricultural pathway out of poverty, higher labor productivity is necessary to raise per capita incomes, enable households to free their children from farm labor obligations, deploy oxen or hired labor in their stead and finance school fees, livestock investments and financial savings that enable households to survive market downturns. Farm households can increase family labor productivity through intensification (either higher input use, better management or a move to high-value commodities) as well as through mechanization and expansion of cultivated area. The most successful commercial smallholders seek to raise labor productivity in all of these ways.

Among those who succeed as commercial smallholders, two pathways predominate. The low road, exemplified by cotton production, involves low value output and low cash input costs. Given widespread input lending and extension support from ginning companies, cotton provides an entry point for large numbers of poor but disciplined farmers with little nonfarm income. The best managers grow their cotton business over time. Although low value crops such as cotton (and maize) cap farm earnings at modest levels, successful farmers use cotton revenues to finance entry into higher-input agriculture and to educate their children, thus opening new pathways to high-wage nonfarm employment for the next generation.

The high road, exemplified by horticulture production, involves high value products with commensurately high cash input requirements. Small initial savings finance inputs for very small horticulture plots. Successful farmers accumulate savings and increase their scale over time. After 15-20 years, the best attain high incomes, accumulate savings that enable them to withstand periodic setbacks, and ensure their children's future through heavy investment in education.

Commercial maize production, in contrast, does not generally provide a feasible on-ramp for the poor. Although maize, like cotton, is a low-value annual crop, unlike cotton commercial maize production imposes high input costs for fertilizer and seeds. Moreover, because of its sensitivity to moisture stress, rainfed maize production involves higher production risk than cotton during drought years. Although maize does not offer easy entry for the very poor, it does offer a an optional low value option for households wealthy enough to finance its high input costs. Mid-career farmers with significant nonfarm savings or successful cotton and horticulture farmers sometimes shift into commercial maize production over time, particularly in years when they believe they can capture large government subsidies.

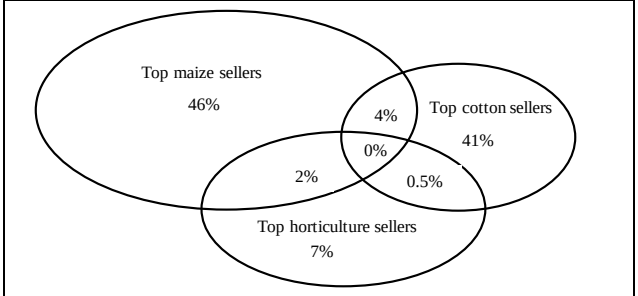
INDIVIDUAL CHARACTERISTICS

Asset holdings. The characteristics of top-tier commercial cotton and maize farmers differ significantly from those who succeed in horticulture. The most successful cotton and maize farmers are more likely to be male-headed, with larger endowments of productive assets such as land, cattle, farm equipment and vehicles.

In contrast, among the top commercial horticulture farmers, land holdings do not emerge as statistically significant. Because horticulture production generates per-hectare earnings an order of magnitude larger than cotton or maize, horticulture producers can become affluent on relatively small land holdings.

Shifting specialization. At any given time, most commercial smallholders concentrate primarily on a single commercial crop. Among the top-tier sellers, less than 10% sell multiple crops in high volumes (Figure 1).

Figure 1. Percent of the Top Smallholder Farmers Selling Maize, Cotton and Horticulture, 2007

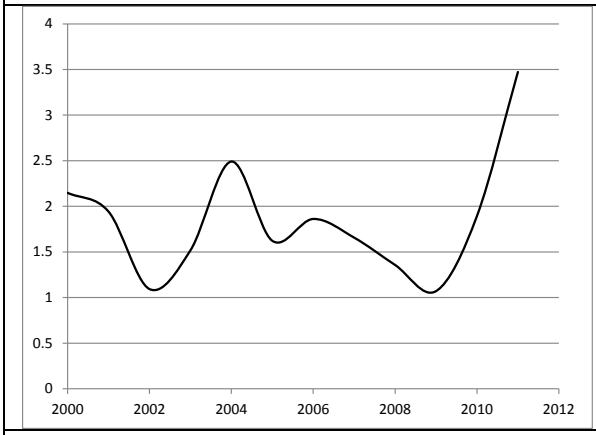


Source: Supplemental Farm Household Survey 2008.

Farmers who succeed in horticulture typically retain this focus, given the high profitability of horticulture production. Among top-tier farmers, horticulture generates per hectare returns ten times higher than cotton or maize. Not surprisingly, among the successful commercial horticulture farmers we interviewed, roughly 90% began in horticulture and remain selling primarily horticulture products today.

In contrast, farmers growing low-value crops such as cotton and maize often shift from one commercial crop to another in response to changing price incentives. Over the past decade alone, the price of cotton relative to the price of maize has ranged between 1 and 3.5 (Figure 2).

Figure 2. Price of Cotton Relative to the Price of Maize



Source: Cotton Board of Zambia and Agricultural Market Information Centre.

As a result of these rapidly shifting incentives, the top commercial maize and cotton farmers change over time. Of the farmers accounting for the top half of maize sales in 2000, only one-third remained in the top tier in 2003, while roughly another third fell into the group accounting for the bottom half of sales, and the remaining third stopped selling maize altogether. The farm household panel survey data suggests that farmers who exited the top-tier of maize sellers did so intentionally, by reducing area planted to maize.

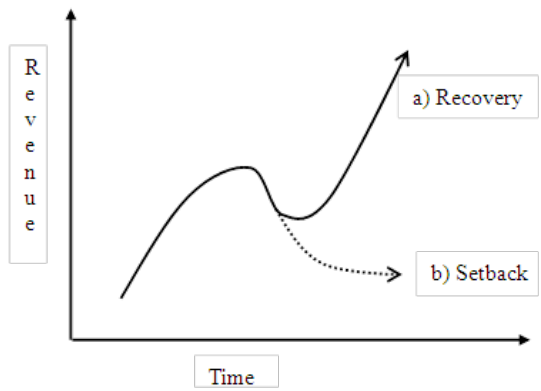
Movement among cotton farmers reveals similar patterns. Between 2003 and 2007, after the cotton price collapse of 2006 and the surge in support to the maize sector, about one-third of cotton farmers stopped growing cotton altogether.

High farm productivity. Increased productivity goes hand in hand with agricultural commercialization. The most commercially oriented maize farmers attain maize yields of 3 tons per hectare, compared to roughly 2 tons for the bottom half of sellers and only 1 ton for the non-sellers. Similarly, the top selling cotton farmers achieve yields roughly double those of the bottom half. Among horticulture producers, the productivity differential is even more startling: over 10 times higher for the top half than for the bottom half of sellers. As a result, average horticulture farmers produce per hectare crop values two to three times higher than those achieved by cotton and maize farmers. Among the top tier commercial sellers, farmers specializing in horticulture earn per hectare revenues over ten times higher than top tier cotton and maize growers.

Good managements. To attain these high levels of productivity, successful commercial smallholders require strong management skills, for supervising crop production, labor and finances. Horticulture and cotton, in particular, demand precise agronomics and careful farm management. But good agronomic practices are not sufficient. Successful commercial farming also requires the ability to manage and supervise hired labor. Poor spraying or crop harvesting can reduce crop quality and revenue. As one told us, "You have to be in the fields."

Highly disciplined cash management and savings accumulation prove essential to successful horticulture farming. The horticulture farmers we interviewed repeatedly emphasized the need to maintain bank savings or an explicit cash cushion to enable them to restart their business following a catastrophic loss. One highly successful horticulture put it this way, "If I make 5 million Kwacha ($1,000), I must put 1 million ($200) in the bank." Because this financial cushion enables them to recover from setbacks, financial institutions, particularly for savings, provide critical support for ensuring generally upward trajectories for commercial smallholders (Figure 3).

Figure 3. Alternate Trajectories Following an Agricultural Shock



Source: Chapoto et al. (2012).

Invest in their children. All but one of the farmers we interviewed hired labor specifically to enable their children to go to school. Quantitative data from Zambia's national farm household surveys suggest that top-tier commercial smallholders send 10% to 15% more of their children to school than non-sellers. Part of their long-term business plan involves launching their children on successful non-farm trajectories.

INSTITUTIONAL SUPPORT

Management training. Successful commercial farming requires highly disciplined management of crop agronomics, hired labor and finances. Among the three commodity groups we studied, only the cotton farmers enjoyed systematic extension support aimed

at building up these requisite skills. The major ginners provide regular agronomic support to their farmers through cotton schools, lead farmers and training of specialized service providers. They emphasize farmer recruitment, youth leadership training and development of management skills through a system of lead farmers, sub-leaders and deliberate mentoring. By combining performance bonuses with gradual promotion and demotion, they systematically cultivate and groom the best managers for positions of increasing responsibility. Individual farmers then transfer these skills to other arenas, making the cotton schools important incubators for successful commercial farmers and agribusiness entrepreneurs.

Savings institutions. The financial capacity to absorb shocks, recover, and reconstitute production following a catastrophic loss represents one of the defining characteristics of successful commercial smallholders. Careful cash management and savings prove essential not only for financing inputs and hiring labor but also for cushioning commercial smallholders against shocks from erratic rainfall, episodic disease outbreaks and unpredictable price swings. Farmers who build up a financial cushion or fungible livestock assets are able to rebound and rebuild in the aftermath of a major drought, disease infestation, or precipitous price fall (Figure 3). Institutions that support both forms of savings help to advance prospects for successful smallholder commercialization. Control of contagious livestock diseases is a public good that helps to shelter assets of vulnerable as well as currently prosperous farm households. For financial savings, formal banks and more recent mobile money transfer and savings schemes offer potentially important vehicles for farmers to secure the financial savings necessary to their commercial survival.

Land allocation. Successfully navigating Zambia's land allocation and administration systems is an important shared attribute of successful smallholder farmers, both for acquiring initial land to begin farming and acquiring additional land for expansion. Of the 90 farmers we interviewed, all began farming on customary land. As their commercial farming business expanded, some of the most successful moved to neighboring constituencies to obtain expanded communal land allocations. One of the highly successful horticulture farmers we interviewed purchased a 400-hectare leasehold farm on state land in Chibombo, 150 kilometers from his home.

Over time, population growth in the customary areas is leading to land pressure and land fragmentation. This increases the difficulty in obtaining contiguous land allocations of sufficient scale to support commercial farming. The successful farmers we interviewed confront this problem by moving to areas where communal land is available or where they can purchase a leasehold farm. Ultimately, customary land authorities will need to devise systems for consolidating land holdings and transferring use rights in blocks of sufficient scale to permit commercial farming, either in communal areas or in designated farm blocks on state land.

POLICY IMPLICATIONS

From a policy perspective, cotton provides a very broad on-ramp and horticulture a more narrow but very steep on-ramp to the roadways out of poverty -- both at little cost to the government budget. Cotton helps farmers with little start-up capital who are geographically disadvantaged. Horticulture provides opportunities to farmers who are geographically lucky enough to live near surface water and urban centers. Meanwhile, maize provides a broad low road up the mountain, but no on-ramp for the poor. At enormous cost to the public treasury, maize production offers a profitable alternative for well-established farmers with sufficient land, cattle and equipment to farm large blocks of land in a low-value crop. In 2011, the Zambian government spent $100 million on maize procurement alone. Investment of some of these funds in public goods such as improved infrastructure for urban horticulture markets, rural electrification in high-potential horticulture zones, a stronger Cotton Board and cotton research could generate significant payoffs. Zambia's past policies of lavish spending on maize have not succeeded in reducing rural poverty (Jayne et al. 2011). Less expensive alternative investments in cotton and horticulture may generate higher payoffs by enlarging available agricultural pathways out of poverty for commercial smallholder farmers.

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