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## **ZAMBIAN COTTON IN A REGIONAL CONTEXT: Performance under Liberalization and Future Challenges**

By

**David Tschirley and Ballard Zulu**

**INTRODUCTION AND OBJECTIVES:** Cotton is one unquestioned success of Zambia's turn toward a market economy. After liberalization in late 1994, production rose from 20,000 mt to more than 100,000 mt in the 1998 harvest year. After collapsing to less than 50,000 mt in 2000, it has risen steadily and is expected to approach 150,000 mt in 2003. Over 1998-2000, exports of cotton and textiles were first among all agricultural exports in value (Export Board of Zambia, 2001). The two closest competitors to cotton during this time – fresh flowers and sugar – are primarily produced on large operations, while cotton is almost entirely a smallholder crop. Its potential role in poverty alleviation and food security is thus very large. The success of this sector has been achieved despite historically low cotton prices in the world market over the past four years, serious problems of credit default during the late 1990s, and the departure in 1999 of the sector's biggest company, Lonrho.

This paper is directed toward policy makers and private stakeholders in Zambia's cotton sector. Its purpose is threefold:

- 1) to assess key elements of the performance of Zambia's cotton sector relative to other selected African countries;
- 2) to develop preliminary insights into the driving forces behind Zambia's performance and also the threats to improved future performance; and
- 3) to identify key issues within the sector that merit continued applied research and dialogue with stakeholders.

The paper grows out of earlier work on cotton by the Food Security Research Project (Govere et al. 2000), and draws heavily on more comprehensive reviews of cotton sector reform experience in Sub-Saharan Africa (Tschirley, Boughton, and Tefft 2002, Boughton et al.

2002). Readers interested in more detail regarding the reform experience in each country and methods used in the analysis should consult those papers.

The paper is organized around its three objectives. It first compares key performance dimensions of Zambia's cotton sector to regional neighbors Mozambique and Zimbabwe, Tanzania and Uganda in Eastern Africa, and Mali and Benin in West Africa. It then discusses the determinants of Zambia's performance before closing with a discussion of key issues and focused research that may be useful in informing those issues.

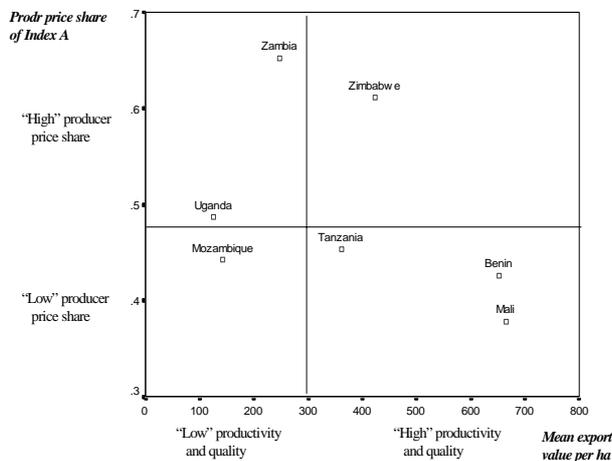
**ZAMBIAN COTTON IN A REGIONAL CONTEXT:** A commodity chain can be defined as the set of actors and related activities involved in producing the commodity and making it available in final form to consumers. For a crop like cotton in Zambia, these activities include importing chemical inputs, multiplying seed, and making each available to farmers; providing extension assistance to farmers; purchasing their product and recovering credit; actions by farmers and buyers to maintain product quality; processing of raw cotton; grading and exporting cotton lint; and spinning of lint. Actors include tens of thousands of smallholder and some large farmers, large and small processing firms, spinners, some cotton traders, input dealers, and government policy makers.

Key performance dimensions for any commodity chain are the levels of productivity and quality throughout the chain and the extent to which it pays farmers a competitive share of total value-added. These objectives may be in conflict in an economy like Zambia's. Ensuring high and rising productivity and quality require effective coordination between public and private players. This coordination may be more difficult to achieve when there are many buyers at the

farm level. Yet increased competition at this level is typically thought necessary for farmers to receive an adequate share of the final price. Such competitive pricing is one key determinant of long-term sustainability of cotton production, since farmers who consistently receive a low price will eventually shift to more remunerative crops.

The extent to which a commodity chain can perform well in both dimensions is thus one potentially useful measure of success. We focus on these two dimensions to develop a simple graphical assessment of the performance of our seven countries over harvest years 1995 – 2002.

**Figure 1.** Plot of mean cotton export value/ha against mean producer price share by country, harvest years 1995/96/97



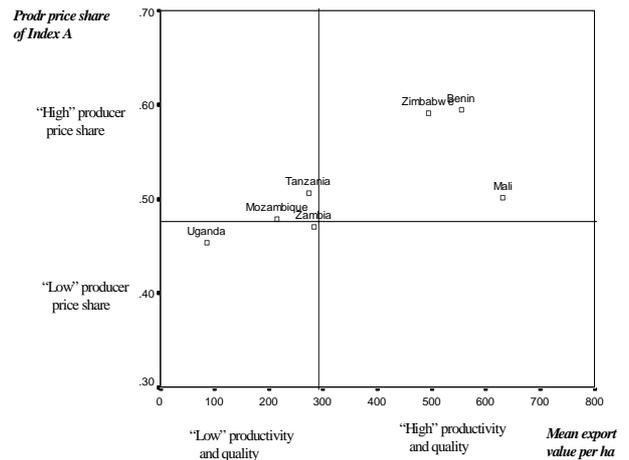
Our horizontal axis, *gross export value per hectare*, reflects farm productivity through the farm yield, productivity in processing through the ginning ratio<sup>1</sup>, and quality throughout the system through the premium or discount over Index A that each country receives on their exports.<sup>2</sup> It is a function of short-term coordination within production and marketing seasons, and also the success of the country over time in supporting research, extension, varietal zoning agreements, and other dimensions that provide the base

<sup>1</sup> The ginning ratio is the ratio of lint obtained to raw cotton processed. In SSA, it ranges from 0.33 in Mozambique to 0.42 in West Africa. Zambia's ratio is about 0.38.

<sup>2</sup> Index A is an index of the prices of eight classes of cotton of various origins traded in northern Europe. It is widely used as the best indicator of world price levels for this crop.

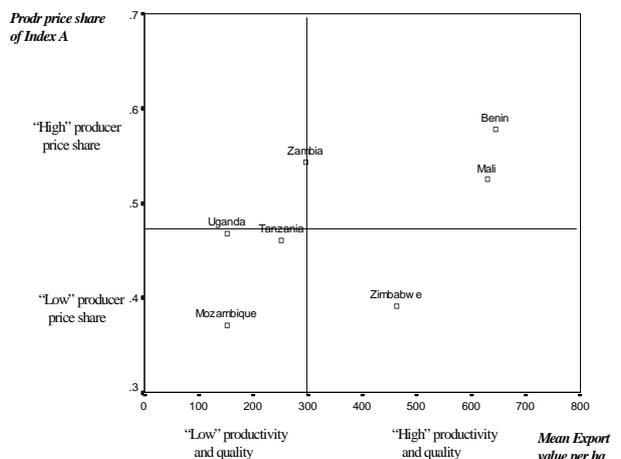
for productivity and quality. To control for the effect of short-term fluctuations in prices, we use the average Index A price over the eight years in our analysis, adjusted for each country's premiums or discounts. Our vertical axis is the *producer price share* of the sales price realized by ginning companies when they export cotton lint.

**Figure 2.** Plot of mean cotton export value/ha against mean producer price share by country, harvest years 1998 and 1999



We break our plots into quadrants using median annual values of export value per ha (US\$295/ha) and producer price share (0.473) for all seven countries over the 1995-2002 period. Results are shown in Figures 1 - 3. Countries in the southwest quadrant are the worst performers in each dimension, while those in the northeast quadrant are the best in each; southeast and northwest quadrants represent mixed performance. Seven major patterns emerge from this analysis.

**Figure 3.** Plot of mean cotton export value/ha against mean producer price share by country, harvest years 2000/01/02



- Zambia paid the highest average producer price share over the period. Its price performance has been erratic, however, dropping from the highest in the first period to among the lowest in the second, and back to among the highest in the third.
- Zambia was consistently in the middle of the pack in export value per ha, above Mozambique and Uganda and comparable to Tanzania. Unlike Tanzania, Zambia's performance in this dimension increased steadily over the periods.
- Three countries (Mali, Benin, and Zimbabwe) consistently achieved much higher export value per ha than other countries. Within this group, Mali and Benin consistently outperformed Zimbabwe.
- The price performance of Mali and Benin improved substantially over the periods, while Zimbabwe's fell dramatically in the final period.<sup>3</sup>
- Tanzania's performance in both dimensions worsened over time, while Mozambique and Uganda consistently performed among the worst in both variables.

**DETERMINANTS OF ZAMBIA'S PERFORMANCE:** This analysis suggests that the performance of Zambia's cotton sector compares favorably with its neighbors in Southern and Eastern Africa, with export values per ha well above those in Uganda and Mozambique but below Zimbabwe, and producer prices during the final period that far exceeded those in all these SEA countries. However, Zambia lagged well behind Mali and Benin in both respects. Table 1 provides further information from the 2000, 2001, and 2002 harvest years to allow us to look behind these performance numbers. Six points stand out:

- Zambia is unique among the countries analyzed in the almost complete absence of government in production, marketing, regulation, or direct financial contribution to the sector.<sup>4</sup>

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<sup>3</sup> Analysis of US\$ prices in Zimbabwe is made difficult by the country's dual exchange rate policy. Calculations in this paper use the "blend" rate, which is a weighted average of official and parallel rates. See Goreux for more detail.

<sup>4</sup> The Cotton Development Trust (CDT) has to date focused on technical issues. Mulungushi Textiles is a joint venture between the governments of Zambia and China (Mainland), but has a small market share and acts as a private company.

- The cotton sectors in Zimbabwe, Mali, and Benin -- the countries that have outperformed Zambia in export value/ha -- have all received subsidies from donors and the state. Subsidies in Zimbabwe started with a 30-year soft loan from the World Bank to the Cotton Marketing Board (CMB - now Cottco) in 1992, and included financial injections from government as late as 2001. Farmers in West and Central Africa as a whole received US\$50-60 million in subsidies during the last cropping season alone (Badiane, et al. 2002).

- Zimbabwe, Mali, and Benin all have concentrated market structures (though Zimbabwe's has become less concentrated in the past two years), and government in each influences competition, unlike in Zambia. In Zimbabwe, this influence is indirect through bureaucratic favoritism (Tschirley, Boughton, and Tefft 2002), while Mali and Benin impose heavy direct regulation.

- A key determinant of Zimbabwe's success to date had been its positive economic environment, especially more effective input markets than its neighbors and a legal system that allowed cost-effective seizure of assets of defaulters. The country's ongoing political and economic problems may now be undermining this success.

- Of the three countries that have performed worse than Zambia in export value per ha, two -- Tanzania and Uganda -- have seen heavy entry of ginners and traders since liberalization. Input distribution collapsed with reform in Tanzania, and reform was unable to revive Uganda's collapsed system. In each case, heavy public sector involvement has been used to revive input distribution while continuing to allow competition for purchase of raw cotton (Tschirley, Boughton, and Tefft 2002).

- Much like Tanzania, Mozambique and Uganda have systemic deficiencies in their input and varietal development systems that result in persistently very low farm yields. Protracted civil conflict contributed to these problems in each country. Mozambique may have perpetuated its position by attempting systematically to eliminate price competition among firms (through its so-called "Concession System" of regional monopolies) and failing to create mechanisms to encourage competition on quality of assistance.

Zambia's cotton sector emerges from this analysis as a remarkable success. With no direct support from government or donors, the sector has improved

productivity and quality<sup>5</sup> while paying farmers a higher average price share than any other country in the analysis. We suggest that this performance has been the result of several factors. First, the research system released two varieties shortly before liberalization (Chureza in 1988 and F-135 in 1992/93 – see Zulu and Tschirley 2002) that have provided the basis for current farm yields and ginning ratios. Second, Lintco's privatization was done in an orderly manner which allowed Lonrho and Clark to establish themselves without heavy debts nor immediate competition from companies and traders not strongly committed to the cotton sector. Finally, once competition did emerge and the initial crisis which it caused was overcome (see discussion below), Zambia appears to have found an effective balance between the often conflicting needs for coordination and competition in the sector. Zambia's sector is concentrated, as in Mali, Benin, and Zimbabwe. Unlike Mali and Benin, competition in Zambia is not regulated. Zimbabwe has one dominant firm that has received assistance from donors and government, while Zambia has two dominant firms who have received no such assistance. The resulting pattern and level of competition may have been crucial to ensure remunerative prices to farmers while not being debilitating for the input credit system, as in Uganda and Tanzania.

**KEY ISSUES FOR THE FUTURE:** The challenge for Zambia's cotton sector today can be conceived as follows: how can it maintain the workable level of competition it currently demonstrates while strengthening the coordination that is needed to increase export value per ha? Viewed in this way, a number of issues emerge.

*Are the Dunavant Distributor System and Clark outgrower scheme sustainable?* Zambia suffered a period of severe credit default by farmers during the late 1990s as competitors to the two dominant firms first emerged. The move by Lonrho/ Dunavant to its Distributor System was a key factor in overcoming this crisis while improving the quality of assistance to farmers. The system appears to have reduced the costs to the company of supporting smallholders while simultaneously increasing repayment rates. Clark has developed its own approach to this problem, apparently also with some success.<sup>6</sup> Yet these companies are

competing in the export market with enormous subsidies from developed countries<sup>7</sup> and, unlike West and Central Africa and to a lesser extent Zimbabwe, are doing so without any state or donor support. Can these companies maintain the quality of their assistance and extend its reach under these conditions? If not, what should be the policy position of the government?

*If external financial assistance to the sector is pursued, what should it focus on and how should it be designed?*

The fact that the sector substantially overcame the credit default crisis of the late 1990s on its own suggests that any new program in this area should focus on reducing the cost to private companies of providing input and extension services to farmers, and should not replace or fundamentally alter the private systems already in place.<sup>8</sup> In addition, any new program should be carefully designed to a) encourage continued innovation by private firms as they compete on the quality of their service, and b) avoid further consolidating the market positions of the two largest companies, since the competition from smaller players may be important in maintaining competitive price shares for farmers. The effective private innovations of Dunavant and perhaps Clark in dealing with input provision and credit recovery distinguish Zambia's cotton sector from every other country in this analysis except Zimbabwe. Maintaining an environment that rewards such private innovations is crucial to the sector's continued success.

Farm yields and ginning ratios in Zambia continue to lag well behind those in Zimbabwe and West and Central Africa, and lint quality is substantially lower than in Zimbabwe. Varietal development can have major impacts on each of these aspects. Thus, the fact that no new varieties have been released since liberalization does not bode well for the sector's future performance. Development, dissemination, and maintenance of new varieties and consistent delivery of high quality extension assistance require substantial resources over long periods of time, and this may be

<sup>5</sup> Quality has improved through effective control of polypropylene contamination.

<sup>6</sup> Clark declines to discuss the details of its outgrower scheme.

<sup>7</sup> ICAC estimates that subsidies are 50% of world prices in the U.S., 20% in China, and over 100% in the EU. Elimination of U.S. subsidies alone would raise world prices in the short-run by as much as US\$0.12/lb.

<sup>8</sup> We do not suggest that credit default is no longer a problem and could not again reach crisis proportions. Rather, we argue that the private sector innovations which have emerged under the current level and pattern of competition are valuable and arguably sustainable, and should not be negatively affected by any new program.

difficult to ensure at needed levels through forced savings (e.g., levies) within the sector. This area thus becomes an obvious choice for funding by government and donors. The key to obtaining and successfully deploying funding for this issue will be strong collaboration between government, private companies, and farmers to ensure a clear vision and effective management. A strengthened and perhaps reorganized CDT would need to play a major role in any such initiative.

In this context, Zambia needs to seriously assess the potential impact of Bt cotton on profitability for smallholders and cotton companies. Work on this issue in 1999 was abandoned due to the lack of a biosafety regulatory framework. Currently, such a framework is bogged down at the Ministerial level. A key step forward would be to recognize that biotechnology in a nonfood cash crop like cotton raises fewer controversial issues than it does in maize, and to move forward with a framework that would allow the testing of Bt cotton.

*What can Zambia do to lobby for “free trade” in cotton?* Elimination of cotton subsidies in the U.S. and EU could do more for cotton sectors in SSA in the short- to medium-run than any other single action. How can Zambia work with its neighbors (perhaps through the Common Market for Eastern and Southern Africa) to effect this change, while continuing to grapple effectively with the long-run challenge of improving productivity and quality in the system?

*What applied research and policy dialogues are needed to inform future policy and program choice?* Cotton liberalization in Zambia has been characterized by the almost complete absence of direct government involvement in the sector. Results to date have been encouraging, but future performance is likely to depend on more active strategic collaboration between government and the private sector, including farmers. Technology development and diffusion are one key area where such collaboration is needed. Another may be in sustainable mechanisms for input delivery and credit recovery. A better understanding of the organization, effectiveness, and sustainability of Dunavant’s Distributor System and Clark’s outgrower scheme could assist in the design of strategic programs of private-public collaboration to ensure their continued success.

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- Please direct all inquiries to the In-Country Coordinator, Food Security Research Project, 86 Provident Street, Fairview, Lusaka. Tel: 234 539; fax: 234 559; e-mail: [fsrp1@msu.edu](mailto:fsrp1@msu.edu).

**Table 1. Relationship Between the Market for Seed Cotton Purchase and Performance of the Cotton Input System in Seven Countries of SSA, 2000-2002 Harvest Years**

Country	Broader Ag Input System	Cotton Sector							
		Market for Seed Cotton Purchase		Seed Cotton Yield, kg/ha (rank)	Direct Subsidies?	Proportion of inputs obtained through cotton-specific scheme	Input Type		
		Structure	Regulation of Competition				Seed	Insecticides	Fertilizer
Mozambique	<b>Pervasive market failure;</b> almost no purchased input use outside out-grower schemes and peri-urban veg prodn.	Concentrated (top 2 have 40% market share)	Heavy	333 (6)	No	90%+ (All credit)	Old (>20 yrs), degenerated varieties. Fuzzy untreated	Frequently inappropriate types. Little attention to resistance 95%+ apply 3-4 applications	None
Zambia	<b>Some access:</b> 20% of small farmers obtain fertilizer (primarily for maize) through market channels	Highly concentrated (top 2 have 80-90% market share)	None	550 (4)	No	90%+ (All credit)	Moderately old varieties (10-14 yrs), well maintained. Mostly treated delinted	Generally appropriate types Resistance? 95%+ apply # of applications?	Micronutrient foliar feed on credit. Basal for cash sale, <10% use.
Zimbabwe	<b>Broad access:</b> 70-80% of <i>cotton</i> farmers obtain inputs through open market.	Highly concentrated (top firm has 60-80% market share)	None	742 (3) (>900 for outgrower farmers, 600 for indep. growers)	Yes	20-30% (All credit)	Newer varieties, well maintained. Mostly treated delinted	Knowledge-driven selection of types Some IPM practiced Nearly 100% of <i>outgrower</i> farmers apply	Cottco provides basal fertilizer on credit in all input packages
Tanzania	<b>Pervasive market failure</b>	Many players (30+)	None	496 (5)	No	90%+ (No credit: cash sale at 1/4 market prices)	Old (20-25 yrs), degenerated varieties. Mostly fuzzy untreated. Supply problems due to sale to oil processors.	Inappropriate types imported in 2002. No management of insect resistance. No data on how many farmers apply.	None
Uganda	<b>Pervasive market failure</b>	Many players (30-40). Top 5 have 40% market share.	Moderate	296 (7)	No	Seed: 90%+ Chemicals: ??	Single old variety. Lack of multiple varieties reduces degeneration. Mostly fuzzy untreated. Supply problems due to sale to oil processors.	Criticism of types imported by CDO Minority of farmers apply 2 applications among those applying	None
Mali	<b>Broad access</b> to inputs on credit <i>outside</i> cotton zone. Within zone, all inputs from CMDT.	Highly concentrated (public monopoly)	Heavy	1080 (1)	Yes	90% + (all credit )	Continual development. Effective varietal zoning.	Part of package Growing use of targeted staggered control spraying 5-6 times on calendar basis at reduced dosage.	Complex, Urea, manure recommended by IER and CMDT; widespread under dosage
Benin	<b>Broad access</b> throughout country	Concentrated	Heavy	1053 (2)	Yes	90% + (all credit )	Continual development. Effective varietal zoning.	Similar to Mali	Similar to Mali