AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

POLICY SYNTHESIS
FOOD SECURITY RESEARCH PROJECT - ZAMBIA
Ministry of Agriculture & Cooperatives, Agricultural Consultative Forum, Michigan State University – Lusaka Zambia
Number 25 (Downloadable at http://wwwaec.msu.edu/agecon/fs2/zambia/index.htm) November 2007

INCREASING DEMAND FOR QUALITY IN WORLD COTTON MARKETS: HOW HAS ZAMBIA PERFORMED?

***David Tschirley and Stephen Kabwe**

MAIN POINTS

1. Changes in spinning technology have increased the premium on high quality lint in the world market and increased the discount for lint contaminated with non-vegetative matter
2. The inherent characteristics of most African lint, plus the fact that it is hand-picked, should give it a substantial premium in the world market. However, because so much African lint is highly contaminated by world standards, much of it trades at a discount to Index A.
3. Zambia has been the outstanding success among a sample of nine SSA countries in improving quality; this achievement is directly attributable to the efforts of Dunavant and Cargill, made possible by company culture and by the concentrated structure of Zambia's industry
4. Quality (and input supply) can be quickly undermined as a sector becomes more competitive. Continued collaboration among ZACOPA and CAZ within the framework of the Cotton Act, facilitated by a non-partisan government role, will be crucial to maintain good performance.

INTRODUCTION: Spinning technology has driven increasing demand for quality in cotton lint, with a parallel increase in the penalty for cotton contaminated with non-organic matter. Intrinsic characteristics of African cotton typically place it above the A Index in quality; hand picking helps preserve these intrinsic qualities. However, inability to control contamination with non-organic matter means that most hand-picked African cotton trades at a discount to machine-picked cotton. Reducing contamination in could bring price premiums up to US$0.10/lb over the Cotlook A Index, or about 20% at typical world price levels. Capturing this premium requires coordination throughout the local supply chain; achieving such coordination depends crucially on sector structure and governance.

OBJECTIVE and METHODS: This Policy Synthesis draws on recent comparative work across nine countries of sub-Saharan Africa (Zambia, Mozambique, Zimbabwe, Tanzania, Uganda, Cameroon, Mali, Burkina Faso, and Benin) to provide background on the issue of cotton quality and assess Zambia's performance relative to the other eight countries. In the final section, we discuss key policy implications for Zambia.

COTTON QUALITY: Increasing demand for quality cotton can be articulated in the following motto: "fiber, only fiber, but more than just fiber."

***Fiber*:** As cotton is a natural product, its intrinsic quality (fiber properties), its cleanliness (staining and presence of non-lint organic matter) and contamination (presence of non-organic matter), and the homogeneity of its characteristics can vary greatly due to genetic, environmental, harvesting, and ginning factors. Such variability impacts processing performance, costs, and quality throughout the cotton textile chain. Fiber properties primarily depend on varieties grown, agroclimatic conditions, and crop management practices. Both cleanliness and contamination depend on harvesting methods, storage, transport, and ginning practices.

Better fiber quality translates into better yarn quality and higher processing efficiency. Among the fiber properties, staple length has the greatest influence on spinning performance. Cotton fiber represents about 50% of the cost of yarn. Traditionally, the price of cotton was largely determined by factors such as staple length, grade, color, and micronaire.[1] Those factors are still the

[1] Fiber length is the average of the longest half of fibers. Grade is a commercial value based on a visual assessment of

major determinants of price, but spinners today are also interested in other fiber properties that affect the quality of their yarns and the efficiency with which they can produce those yarns. As the textile industry has been striving to improve quality and efficiency through automatic high-speed machinery, new technologies place increasingly severe technical demands on textile fibers, raising the importance of other properties of cotton: strength (or tenacity), uniformity, maturity, fineness, elongation, neps (cotton fibers tangled in a knot), short fiber content, spinning performance, dyeing ability and cleanliness. All else equal, spinners pay a higher price for longer, finer, and stronger cotton lint that is white, bright, and fully mature.

Following the global trend toward improving yarn quality, the market share of medium and higher grades is rising, while the share of shorter ("coarse count") upland cotton is declining. Medium and higher grades of upland cotton now account for an estimated 75 percent of world trade.

The recognized benchmark for international cotton prices, the Cotlook A Index, is based on the representative offering price for a "basket" of the medium grade cotton most commonly traded internationally. Lint of this quality is typically used for the production of carded yarns. Yet the fastest growing and most remunerative market for upland cotton is for higher grades and finer cotton used for producing combed yarns[2] for the woven and knitted apparel sector. In that segment, the modern high-speed machinery requires better fiber characteristics, and greater homogeneity, to operate at maximum efficiency and spin high quality yarns. The fiber properties of most African upland cotton lie between these two levels, superior to Cotlook A Index specifications but not always reaching those needed for combed yarns (Table 1).

Only Fiber: Contamination of lint by non-vegetable foreign matter is the most serious problem confronting cotton spinners around the world. Contaminated cotton causes disruptions in the spinning process, increasing spinning cost and reducing the quality of yarn and end products. Because there are no cost-effective means of removing contamination once it is present in yarn contamination leads to the downgrading of end products or even to rejection of an entire lot.

Table 1: Fiber Properties of A Index, Typical African Upland Cotton, and Top Quality Lint for Combed Yarns

Fiber property	Cotlook A Index	Typical African upland cotton	Lint for ring spun combed yarns
Grade	Middling - white	Strict low middling to good middling	Strict middling — white
Staple length	1-3/32 inches (27.8 mm)	1-1/6 to 1-3/16 inches (27–30.2 mm)	≥ 1-1/8 inches (28.6 mm)
Micronaire	3.5-4.9	3.5–4.5	3.8–4.2
Fiber strength	25–30 grams per tex	27–32 grams per tex	≥ 30 grams per tex

Cotton lint that is contaminated, or that is suspected of being contaminated because of the origin, can only be sold at substantial discount to compensate the user for inspecting and cleaning the cotton before spinning. Price differentials for cotton with the same fiber characteristics range from 5 percent to 30 percent, depending on their degree of perceived contamination. These discounts are often applied to all cotton originating from an area or a country considered to be affected by contamination. The elimination of contamination thus stands out as the first priority for quality improvement in SSA.

More than Fiber: Pricing of lint is significantly influenced by the way cotton is marketed and shipped. The spinning industry today is especially concerned about consistency in shipments. Customers require homogeneous and reliable year-round shipments, with consistent cotton characteristics, standardized bales wrapped in cotton cloth, and bale per bale instrument classification data. Since some countries can offer bale per bale Standardized Instrument for Testing of Cotton (SITC) data, the lack of reliable cotton quality data on each bale negatively impacts the price of cotton that are classified manually. The homogeneity of deliveries depends on seed cotton grading, lint classification, and bale allotments.

a combination of lint color, cleanliness and preparation. Color is determined by the degree of reflectance (good) and yellowness (bad). Micronaire is a measure of fiber fineness and maturity.

[2] Carded yarn is typically used for knitting and weaving. Combed yarns are stronger, more uniform, smoother, purer, and have greater shine than carded yarns.

Trust and reputation matter in the cotton business. The market rewards origins and shippers that have a strong record of consistently delivering according to quality standards and honoring contract terms.

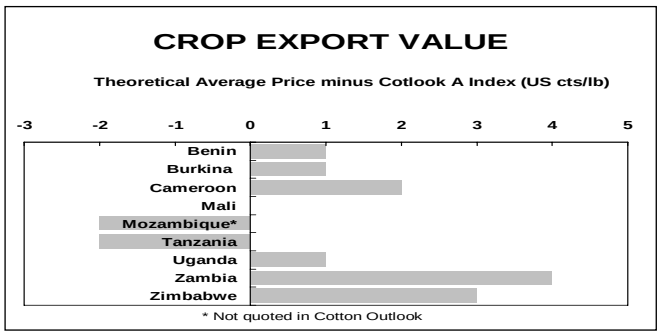
QUALITY PRACTICES AND RESULTS: Table 2 summarizes available information on quality practices and results for each country in the study. Growing fewer varieties makes it easier to maintain homogeneity of quality, though proper controls (as in Zambia) and good classification can ensure good performance even when several varieties are grown. More seed cotton grades are generally good, but only if these are strictly linked to lint classification outcomes. Instrument testing is increasingly important in the global lint market but rarely used in Africa. International cotton merchants put great importance on the reliability of lint classification, independent of the actual quality of the lint. Lint that is typically high quality but not reliably classified will not earn the premium that it otherwise would. Longer staple length is always good, and 1-1/8" is a typical benchmark. Contamination is crucial, and a reputation for high contamination is difficult to overcome.

SUMMARY QUALITY INDICATOR: This section estimates weighted average realized prices for cotton lint in each of the nine countries in the study. Calculating such a price requires data on the share of each cotton type in total production and the premium received by each of these types. Such data are exceptionally difficult to obtain. We therefore estimate the price based on the following data:

- Average premium for the quotation of the top type: 2-2 cents/lb for Mozambique and Tanzania, 2.5 cents for Benin, Burkina and Uganda, 0 for Mali, 3 cents for Zimbabwe, and 4 cents for Zambia.
- Usual world market price differences for grade compared to middling: good middling +1.5-2.5 cents/lb; strict middling +0.75-1.0 cents; and strict low middling minus 0.5-2.0 cents.
- Usual world market price differences for staple length, relative to 1-3/32": 1-5/32" +1.5-2.0 cents/lb; 1-1/8" +0.5-1.0 cents/lb; 1-3/32 +0 cents; 1-1/16" minus 1.75 to 4.0 cents/lb
- Actual 2005/06 classing data for West/Central Africa (WCA) countries and most recent available data or estimates for ESA countries.

A deduction of one cent per pound is applied to the weighted average quotation to reflect the usual difference between the seller's offering price and the actual negotiated contract price. Based on these calculations, theoretical weighted average export price differentials compared to the A Index range from – US$0.02/lb to + US$0.04/lb (Figure 1).[3]

Figure 1: Estimated Premium Weighted Average Basis - by country, US cents/lb



Zambia's outstanding performance stands out. Zimbabwe also looks good, but this is partly a legacy of past performance delivered by the national monopoly, followed by the concentrated system through 2001. The country's premium was substantially higher five years ago, prior to the entry of new firms, and is likely to fall over the next 2-3 years if quality control measures are not improved. The effect of Tanzania's competitive system is clearly seen in the discount that it receives; Uganda's better performance is partly due to its large share of roller ginning. Mozambique's poor performance reflects the legacy of a nearly unregulated local monopoly system with original concession companies uncommitted to productivity and quality; quality is likely better among the newer ginners, but it will take time for them to overcome the country's poor reputation. WCA's performance is quite variable but generally lies between the extremes of Zambia and Tanzania/Mozambique.

[3] See full report for more detail on these calculations.

Table 2: Summary Information on Quality Control Mechanisms and Results in Study Countries

	Sector Type	# of varieties	# seed cotton grades	Strictness of Seed Cotton Grading	Share of lint classed by instrument testing	Classifi-cation rating	Share of lint classed ≥1-1/8" and above	Reputation for contamination	Overall reputation and trend
Cameroon	National Monopoly	2	2	Strict	0%, but micronaire tests for each bale	Good	65%	Among most affected by stickiness but improving sharply	Good, improving (entered fine cotton market segment)
Mali	National Monopoly	2	3	Very lax	6%	Average	98%	Among the most contaminated	Average, improving
Burkina Faso	Local Monopoly	3	3	Lax	N/A (sample basis)	Good	80%	Moderately contaminated and improving	Good, improving
Mozambique	Local Monopoly	8	2	Lax	0%	Poor	15-20% (est.)	Moderately contaminated	Poor, possibly improving
Zambia	Concentrated	3	3	Strict	70%-80%	Very good	70-80% (est.)	Very good	High and improving
Zimbabwe	Concentrated (becoming competitive)	2	4	Very lax	N/A (sample basis)	Mixed	70-80% (est)	Moderately contaminated	Has fallen sharply since 2002
Tanzania	Competitive	1	2	Very lax	N/A (sample basis)	Average	30-40% (est.)	Among the most contaminated	Poor, fell since reform
Uganda	Hybrid (competitive structure)	1	2	Very lax	N/A (sample basis)	Average	93%	Among the most contaminated	High but much lower than in 1970s
Benin	Hybrid	1	2	Lax	5%	Average	76%	Moderately contaminated	Good but irregular

Sources: SONAPRA, SOFITEX, SODECOTON, CMDT. IAM, TCA, CDO, DUNAVANT, C. Poulton, International Traders

POLICY IMPLICATIONS: The cross-country study from which these results are drawn developed a typology of cotton sectors, used that typology to generate expectations about various dimensions of performance, and established to what extent those expectations were met. Sector types are listed in the second column of Table 2. Concentrated sectors were expected to perform best on quality; Zambia's performance, driven by the persistent efforts of Dunavant and Cargill, confirms this expectation.

Yet an additional key finding of the study is that concentrated sectors tend to be unstable, with persistent problems of new entry by companies that do not always share established companies' commitments to quality. Such entry has been associated with disrupted input credit delivery in both Zambia and Zimbabwe; in the latter, it has also begun to undermine quality. The study suggests that collaborative, multi-stakeholder regulation of the sector, including limited barriers to entry for ginners wishing to enter the sector, is required to preserve the positive performance on quality and input credit delivery of concentrated sectors (see FSRP PS # 28). The amended Cotton Act, once passed, will provide a legal framework that facilitates such collaborative regulation. The formation of the Zambian Cotton Pre-Financers' Association and its recent active collaboration with Cotton Association of Zambia, both bode well for the emergence of this type of regulation. It will be crucial as this collaboration unfolds that government play a non-partisan role and avoid direct action in the sector except when absolutely necessary.

This Policy Synthesis draws directly from Tschirley et al (2007). "Comparative Analysis of Organization and Performance of African Cotton Sectors: Learning from Experience of Cotton Sector Reform in Africa", forthcoming from World Bank.

This policy brief is published by the Food Security Research Project working in collaboration with the Agricultural Consultative Forum, the Ministry of Agriculture and Cooperatives, other Zambian stakeholders and Michigan State University, and is funded by USAID and SIDA (Sweden) in Lusaka. http://www.aec.msu.edu/fs2/zambia/index.htm Please direct all inquiries to the In-Country Coordinator, Food Security Research Project, 86 Provident Street, Fairview, Lusaka; tel: 260 1 234539; fax: 260 1 234559; e-mail; goverehj@msu.edu

*Authors are Professor International Development, MSU and Research Associate, FSRP