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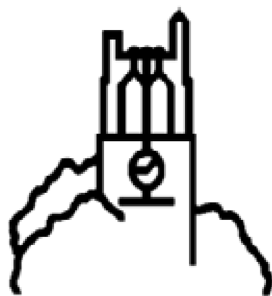
MSU International Development Working Paper

The Many Paths of Cotton Sector Reform in Eastern and Southern Africa: Lessons from a Decade of Experience

by

David Tschirley, Colin Poulton, and Duncan Boughton



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EXECUTIVE SUMMARY

Cotton is a rare economic success story in Sub-Saharan Africa (SSA), generating cash incomes for millions of smallholder households and allowing the continent to capture a rising share of world trade in the crop. Specific characteristics of the crop, especially its need for purchased inputs and the typical inability of smallholder farmers to access these on a cash basis, have fueled concern that the economic reforms sweeping the continent since the early 1990s may derail this remarkable success story. At the same time, technology has driven sharp declines in real prices over the years, putting severe pressure on inefficient systems; the massive subsidies provided to cotton farmers in developed economies have added to the difficulties for African producers.

With cotton sector reform in much of SSA a decade old, it is now possible to begin learning from experience. This paper assesses the record of five countries in southern and eastern Africa: Tanzania, Uganda, Zimbabwe, Zambia, and Mozambique. The paper focuses on the course of reform in each – initial conditions, key elements of the reform, and institutional response to it – and draws lessons for policy makers, donors, and researchers.

Our conceptual approach suggests that there may be a trade-off between competition and coordination in cotton systems. More precisely, it suggests that the structure of the cotton market in a producing country may strongly influence which challenges are most difficult to meet and which types of institutions need to emerge if the system is to be sustainable. Pre-reform institutional set-ups ranged from Tanzania and Uganda's cooperative based systems, to Zimbabwe and Zambia's single channel systems, to Mozambique's "concession" system.

The review of reform experience highlights three points. First, initial conditions (prior institutional set-up and performance), and thus the motivation for reform, varied widely across the countries. Second, the reform path in each country shows strong *path dependency*: historical and pre-reform institutional set-ups either re-emerge or strongly condition the choice of post-reform institutions. Finally, there has been a great deal of institutional "churning" in most countries, centered primarily on the need to ensure input provision and credit recovery. The cooperative-based cotton systems in **Tanzania and Uganda** lead quickly after reform to highly competitive markets for seed cotton. Price competition was intense and farm prices improved, but each country saw the collapse of its input supply system and a decline in lint quality. As a result, the two countries that most closely approached the competitive ideal in market structure saw the most direct and persistent state involvement in efforts to ensure input provision to farmers. **Zimbabwe and Zambia**, each with single channel marketing systems prior to reform, maintained relatively concentrated sectors. Through the early part of this decade, each performed much better on input provision and cotton quality than did Tanzania and Uganda. Perhaps surprisingly, each also paid attractive prices to farmers. Recent developments in Zimbabwe, however, may be undermining some of this success. In reforming its cotton sector, **Mozambique** returned to the concession model prevalent during the colonial era. Key post-reform themes have been the absence of any systematic approach to evaluate and re-award concession areas, widely divergent performance between early investors and new entrants, and the government's openness to new investment, albeit always within the concession model. Until

recently the country clearly lagged its neighbors in productivity and quality, but new entrants since the early 2000s have begun to change this.

The paper shows that each country brought a very different history into its reform process, and each has used very different approaches to solve common problems of input distribution, credit recovery, and quality control. Overall, the picture is relatively positive. Fears that reform would undercut the basis for effective interlocking of transactions and also complicate collective decisions on long-term investment have often proved well founded. Yet predictable benefits of reform, such as higher prices, more timely payment, and reduced pressure on state budgets, have also been realized. It also seems clear that analysts at the outset of reform underestimated the persistence and ability of sector participants – both public and private – to innovate in pursuit of workable solutions to the specific problems unleashed by reform in their countries.

We draw several lessons from this experience. First, though cotton sectors face common technical challenges, workable solutions must be responsive to local conditions. The recent experience of Tanzania (and, arguably, Mozambique) should encourage policy makers to work with sectors as they are, rather than to try to radically influence sector structure or to impose a "textbook" solution to a particular problem from outside. Second, institutional innovation is the key to improving performance in cash crop sectors; large injections of public capital are not needed. Third, direct state management of funds from industry levies is problematical. Vesting regulatory and coordination functions within multi-stakeholder bodies may be the most promising approach for many sectors. Fourth, the principal objective for institutional innovation, and the appropriate role for public agencies in promoting innovation, varies with the structure of the market for seed cotton. In sectors where many firms compete for seed cotton, the main objective should be to ensure effective and efficient coordination, so as to enable the provision of public/collective goods and to provide assurance for asset specific investment. In sectors with less direct competition among firms, the main objective should be to provide incentives for strong performance in pricing and service provision. Finally, regular "deliberative fora" are invaluable for building trust between stakeholders and seeking innovative solutions to tackling sector-wide problems.

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ACRONYMS

CDF	Cotton Development Fund
CDO	Cotton Development Organization.
CMB	Cotton Marketing Board
CNA	*Companhia Nacional de Algodão*
DFID	UK Department for International Development.
FAO	Food and Agriculture Organization
IAM	*Instituto do Algodão de Moçambique*
ICAC	International Cotton Advisory Council
JVC	Joint Venture Company
LINTCO	Lint Company of Zambia
PCSs	Primary Cooperative Societies
RCUs	Regional Cooperative Unions
SEA	southern and eastern Africa
SSA	Sub-Saharan Africa
UCGEA	Uganda Cotton Ginners and Exporters Association
ZPA	Zambia Privatization Agency

THE MANY PATHS OF COTTON SECTOR REFORM IN EASTERN AND SOUTHERN AFRICA: LESSONS FROM A DECADE OF EXPERIENCE

I. INTRODUCTION

Cotton is a rare economic success story in Sub-Saharan Africa (SSA). While the continent's share of world agricultural trade fell by half from 1980 to 2000, its share of cotton trade rose by 30% (FAO 2002), and predictions are that its share will continue to grow (FAO 2004). Production grew three times more rapidly in SSA over the period than it did in the rest of the world (Goreaux 2002). Moreover, cotton is predominantly a smallholder crop, with over 2,000,000 poor rural households in SSA depending on it as their main source of cash income. Among export crops with substantial smallholder farmer involvement in SSA, cotton ranks second in value only to cocoa, and its production is spread much more widely across the continent. Clearly, the profitability of cotton production and processing in Africa has large and widespread impacts on poverty in the continent.

Because of the need for purchased inputs to achieve economic on-farm yields, and high quality requirements throughout the supply chain to be competitive in world markets, processed commodities such as cotton require effective coordination to be produced, processed, and marketed competitively. Since most farmers in SSA require credit to access the needed inputs, one of the key coordination challenges is to ensure timely use of appropriate inputs and to recover the credit. Due to widespread failure of credit and input markets in SSA, most approaches to the input credit problem have featured *interlocked transactions*, in which a firm wishing to purchase the farm output – typically a ginner in the case of cotton – provides inputs to farmers on credit and attempts to recover the credit upon purchase of the product.

Variously referred to as *contract farming* or *outgrower schemes*, such arrangements have governed production of a wide range of cash crops throughout the developing world for many decades.[1] When effective, they allow smallholder farmers to profit from a crop they might ordinarily not have access to, and allow processors to benefit from these farmers' low costs of production.[2] Yet the conditions under which contract farming can be expected to emerge and persist are relatively restrictive, relating primarily to production and marketing characteristics of the crop and to characteristics of the market into which farmers sell (Delgado 1999; Benfica and Tschirley 2002[3]). Numerous examples exist of failed efforts, primarily related to the inability of processors to recover input credit (Stringfellow 1996; Glover 1990). While cotton and the markets into which it is sold by farmers often lend themselves to contract farming operations, it too has frequently been threatened by acute credit default crises. Over the longer term, cotton

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1 See Glover (1990) for a review of experience in eastern and southern Africa through the late 1980s.

2 These low costs of production are related primarily to the very low price at which many smallholder farmers are willing to "sell" their labor in production of the crop, and to the low supervisory costs inherent in using primarily family labor. See Binswanger and McIntire (1987).

3 See Jaffee (1994), however, for an empirical review of the widely varying circumstances under which contract farming has emerged, and examples of failure where external conditions seemed favorable.

systems can be undermined by the inability of participants in the supply chain to agree on and develop financing mechanisms for investments in research, extension, and quality control.

Thus, a fundamental fact is that the performance of cotton input systems in SSA, which is key to the crop's overall performance, is strongly influenced by the structure and behavior of the market for seed cotton. By affecting the prospects for successful collective action, the characteristics of the seed cotton market may also influence the ability of cotton sectors to meet longer-term productivity and quality challenges. This fact has fueled concern that the economic reforms sweeping the continent since the early 1990s, by undercutting the basis for effective interlocking of transactions and also complicating collective decisions on long-term investment, may derail this remarkable success story. For example, a major comparative review of cotton sector performance in Anglophone and Francophone countries of SSA through 1988 concluded that, in West Africa's single channel systems (which to that time had been far more successful than systems in Anglophone countries), "privatization of input distribution … should be considered only with the greatest caution, due to the need to link distribution with credit and output marketing." (Lele, Van de Walle, and Gbetiobouo 1989). It further cautioned about the potential "collapse of the cotton industry in francophone Africa" if research and extension were moved out of existing single channel systems without viable alternative institutional approaches to ensure the continuity of these activities.

At the same time, real cotton prices have declined by over 50% since 1970-75 (FSRP 2000), putting severe pressure on inefficient production and marketing systems. Much has been made of the role of subsidies to cotton farmers in developed economies in reducing world prices. Indeed, these subsidies are massive and appear to have significantly affected world price levels.[4] Yet the *trend* in world prices would be strongly negative even without these subsidies.[5] As ICAC (2005) notes, "advances in technology, including biotechnology and other pest management techniques, are reducing cotton production costs worldwide, and many producers can cover costs at current (low) prices" (parentheses added). Clearly, countries have no choice but to innovate continuously to reduce the cost of production, ginning, and marketing over time.

With cotton sector reform in much of SSA a decade old, it is now possible to review the empirical record and begin drawing lessons from experience. In this paper, we assess the record of five countries in southern and eastern Africa: Tanzania, Uganda, Zimbabwe, Zambia, and Mozambique. In four of these countries, cotton is the first- or second most important smallholder cash crop; only in Uganda does it substantially lag other cash crops.[6] We focus on the course of reform in each – initial conditions, key elements of the reform, and institutional response to it – and attempt to draw lessons for policy makers, donors, and researchers. We begin by outlining the challenges faced by cotton production and marketing systems. Next we

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[4] ICAC estimates that subsidies are equivalent to 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.

[5] The decline in cotton prices is not unusual when compared to other commodities: over the same period, real prices have fallen approximately 45% for cocoa and coffee, over 50% for maize, and nearly 70% for sugar.

[6] Based on FAOStat data on export value of cashew, coffee, cocoa, cotton, tea, and tobacco (http://faostat.fao.org/). In Uganda in 2003, cotton lint's export share among these crops was 6%; shares in other countries 20% in Tanzania, 33% in Mozambique, 58% in Zambia, and 77% in Zimbabwe. Tobacco was excluded from calculations in Zimbabwe because it is primarily produced by large scale farmers.

review the range of pre-reform institutional responses to these challenges, before discussing the reform process in each country and reviewing the evolving institutional response to it. Finally, we assess the performance that each country has achieved and attempt to relate this to its initial conditions and subsequent institutional responses. We close by outlining lessons for strategies to improve cotton systems in SSA.

II. KEY CHALLENGES IN COTTON PRODUCTION AND MARKETING SYSTEMS

Cotton supply chains need to deal effectively with nine key technical challenges if they are to generate increased value-added over time in a sustainable manner:

- Support strong varietal research and dissemination. Seed quality has major impacts on yields, ginning ratios, and fiber characteristics. It thus establishes the outer limits of productivity and quality throughout the system.
- Maintain the purity of varieties once they are released. This typically requires varietal zoning agreements, which demand some level of horizontal coordination among players.
- Assure sufficient and timely provision of treated seed to farmers. Treated seed reduces disease in a very cost-effective manner.
- Assure sufficient and timely provision of appropriate pesticides to farmers. Most cotton varieties currently in use in SSA are highly susceptible to attack by pests, so that in many areas 3-5 pesticide applications are considered necessary for economical yields.
- Manage pesticide use to reduce cost and avoid insect resistance. The "pesticide treadmill" – inappropriate use of chemicals which increases insect resistance, leading to more use – increases financial costs and both environmental and human health externalities.
- Manage pesticide use to reduce damage to human health and the environment. This issue has received very little attention to date, and is becoming an increasingly important issue within several Francophone systems; Maumbe and Swinton (2003) note the significant health costs incurred by pesticide-using cotton farmers in Zimbabwe.
- Assure appropriate use of fertilizers. High cost of fertilizers and varieties that do not respond well to fertilizer mean that this input is often not profitable on cotton in SSA. Wider use, which may be a prerequisite for cotton to make major and sustainable contributions to poverty reduction, requires reducing its cost and combining it with improved varieties more responsive to fertilizer.
- Control quality from the farm gate through the export of fiber. Quality relates to fiber characteristics and to the uniformity of these characteristics in any given export lot. Countries with a reputation for high and uniform quality will have a ready market and better prices for their output even during the periodic gluts which afflict the world cotton market.
- Pay farmers sufficiently remunerative prices to ensure their continued and increasing participation in the sector.

Meeting these challenges requires both public and private goods, and hence a great deal of coordination among public and private players. The state is often ill-equipped to provide the necessary public goods; if they are to be provided at all, these and the necessary private goods must typically be provided by the cotton companies. This is easier when the number of companies involved is few. On the other hand, seed cotton producers also want attractive prices, which may more likely be generated where a large number of companies compete vigorously for available seed cotton supply. This reasoning suggests that there may be a trade-off between competition and coordination in cotton systems (Poulton et al. 2004). More precisely, it suggests that the structure of the cotton market in a producing country may strongly influence which

challenges are most difficult to meet, and may thus condition the types of institutions which need to emerge if the system is to be sustainable. In the next section we examine pre-reform approaches to these challenges in each country, before discussing each country's reform path.

III. PRE-REFORM INSTITUTIONAL SET-UPS

Pre-reform institutional set-ups in the region for cotton production and marketing can be classified into three groups: cooperative unions working with national cotton marketing parastatals (Tanzania and Uganda), single channel state marketing monopolies (Zimbabwe and Zambia), and nationalized but quasi-independent units coordinated by a state organization (Mozambique).

3.1. Tanzania and Uganda's Cooperative Based Systems

In Tanzania and Uganda, ginneries into the 1960s were primarily owned by independent Asian businessmen (Baffes 2002; Dorsey 2002). With independence and the rise of the cooperative movement in each country, these ginneries passed into the hands of rural cooperatives. In Tanzania through 1994, Primary Cooperative Societies (PCSs) typically handled marketing of seed cotton from farmers, while Regional Cooperative Unions (RCUs) handled ginning. Each enjoyed a statutory monopoly in their geographic area of operation. RCUs then returned a share of the ginned cotton seed to the PCSs for distribution to farmers, and sold the lint to the Cotton Board[7]. The Cotton Board had a monopoly on the export of lint, imported pesticides and distributed them on credit to RCUs, and set pan-territorial and pan-seasonal producer prices.

The system in Tanzania suffered from serious financial difficulties at least from the early 1970s[8]. Overstaffing, poor management, and poor credit recovery lead to liquidity crises for the Cotton Board, which was frequently unable to purchase the crop in a timely manner from the RCUs. These in turn could not advance inputs and operating capital to the PCSs. Producers had to wait one and even two years for payment, whose real value was drastically reduced by inflation. Much cotton was left uncollected or unginned. Gibbon reports that production of seed cotton fell from an average of over 200,000 mt from 1971-75 to an average of about 130,000 mt during the 1980s, while the debt of the Cotton Board and RCUs exploded.

Uganda's story is similar in many regards, made worse by the intense civil conflict of the Obote and Amin years. Production bottomed-out in late 1980s and early 1990s at less than 20,000 bales from an average of about 400,000 bales between 1960 and 1973[9].

3.2. Zambia and Zimbabwe's Single Channel Systems

Similar set-ups in Zambia and Zimbabwe prior to reform lead to very different performance. From 1977 to 1994 state-owned LINTCO (Lint Company of Zambia) provided certified seed, pesticides, sprayers, bags and extension advice to farmers, and purchased seed cotton from them

[7] Gibbon (1999) notes that the board in Tanzania changed names frequently; we will follow him and refer to it simply as the Cotton Board.
[8] Baffes (2002) and Gibbon (1999) document these problems.
[9] Production in Uganda is quoted in 185 kg bales of lint. 20,000 bales thus represent 3,700 mt of lint, equivalent to about 10,000 mt of seed cotton. The peak of 400,000 bales represented nearly 200,000 mt of seed cotton.

at a fixed price. LINTCO had a near monopsony in buying seed cotton and a monopoly in distributing cotton inputs on credit. Available data suggest that, from 1987 to the year immediately following liberalization (1995), production was fluctuating but in secular decline, falling below 20,000 mt of seed cotton in the 1995 harvest year. According to Zambia Privatization Agency (ZPA), LINTCO was also in serious financial crisis before its sale, having accumulated substantial unpaid debts.

Zimbabwe's Cotton Marketing Board (CMB) was formed in 1967 in the early stages of Rhodesia's Unilateral Declaration of Independence from Great Britain. The Board exercised monopoly power from the purchase of seed cotton through export of lint, and paid fixed prices negotiated between government and the Rhodesia National Farmers Union (later re-named the Commercial Farmers Union; Larsen 2001). At the advent of black majority rule in 1980, the new government progressively reoriented agricultural extension, credit services, and buying depots towards smallholder farmers. One result of this change is that, while over 90% of cotton in 1980 was produced by large scale commercial farmers, by the end of the decade the smallholder sector produced about half[10]. As the number of farmers quadrupled, reflecting the entrance of smallholders, total production boomed, from an average of about 150,000 mt of seed cotton in 1980-1983 to over 250,000 mt in 1988-1991. Unlike many parastatals in the region, it does not appear that corruption was a serious problem in the CMB (World Bank 1992). Farm prices continued to be based on strict grading, and smallholders received the highest average prices in southern and eastern Africa (Boughton et al. 2003; Larsen 2001). A record of strong investment in varietal research continued, and credit was made widely available through the Agricultural Finance Corporation. Partly as a result, smallholder productivity was the highest in the region (average yields of about 700 kg/ha), and the careful quality control that had earned Zimbabwe a ready market and a price premium of about 10% in world markets was maintained.

This remarkable success came, however, at the cost of substantial budget deficits, related to a policy of subsidized sales of lint to local spinners (Larsen 2002a), and to the much higher costs of serving large numbers of dispersed smallholder farmers. Though the Cotton Marketing Board's deficit was the smallest of the four statutory boards, by the early 1990s it was becoming increasingly difficult for the country to resist pressures for reform.

3.3. Mozambique's Cotton Concessions

From the early 20th century through the early 1960s, cotton production in colonial Mozambique was based on smallholder production in an outgrower model in which large Portuguese "concession" companies held exclusive rights to the purchase and ginning of cotton in specified geographical areas. State sanctioned coercion to ensure production by smallholder farmers was a regular feature of the system. Beginning in the mid-1960s, with the rise of the unrest that would eventually topple the regime, colonial authorities began aggressively to promote cotton production by commercial settler farmers. This approach succeeded in maintaining total production levels despite sharply falling smallholder production. Total production of seed cotton averaged about 120,000 mt from 1960 to 1974, with a peak of 144,000 mt in 1973. At

[10] By 2000, the smallholder share exceeded 80%.

independence in 1975, these concession companies were nationalized as quasi-independent units coordinated by the *Secretaria do Estado do Algodão*. Commercial production collapsed in 1975, and production by both sectors declined steadily into the mid-1980s, driven by the combined effects of civil war and disastrous policies of central planning. By 1985, total production was less than 10,000 mt, and the government was ready to begin considering alternative models for the sector.

IV. THE REFORM PROCESS: INITIAL CONDITIONS AND INSTITUTIONAL RESPONSES

Table 1 summarizes the institutional set-up prior to reform, key indicators of performance at the start of reform (primarily production trends and indebtedness in the system), and the timing and key elements of reform in each of our countries. Tables 2-6 provide detailed chronologies of reform for each country, while Table 7 highlights the range of institutional approaches used in the countries to ensure input provision and credit repayment. Three points stand out. First, initial conditions (prior institutional set-up and performance), and thus the motivation for reform, varied widely across the countries[11]. Second, the reform path in each country shows strong *path dependency*: historical and pre-reform institutional set-ups either re-emerge or strongly condition the choice of post-reform institutions. Finally, there has been a great deal of institutional "churning" in most countries, centered primarily on the need to ensure input provision and credit recovery. We treat each of these points in more detail by reviewing the reform process in each country.

4.1. Tanzania and Uganda: Competitive Sectors Struggle to Ensure Input Supply and Quality

The cooperative-based cotton systems in these two countries lead quickly after reform to highly competitive markets for seed cotton with 20-30 independent buyers competing for farmers' production. Price competition was intense and farm prices improved, but each country witnessed the collapse of its input supply system and a decline in lint quality.[12] As a result, the two countries that most closely approached the competitive ideal in market structure saw the most direct and persistent state involvement in efforts to ensure input provision to farmers.

Reform in **Tanzania** has been marked by a succession of institutional approaches to improve input availability and quality. Until recently the country was viewed as a classic illustration of the difficulty of applying a competitive market model to cotton; by 2005, however new developments provided grounds for guarded optimism that the sector might be finding solutions to its problems.

Reform began during the 1990/91 cropping season, when RCUs were given greater pricing autonomy on seed cotton purchases. In 1991, the Cooperative Act privatized RCUs and PCSs and allowed easier formation of new ones. RCU debt was written off in several phases between 1991 and 1995 (Gibbon 1999). Also around this time, donors began to finance a program of ginnery rehabilitation and construction with low interest loans. Definitive reform arrived in 1994 with the passage of the Cotton Act, which removed the statutory monopolies held by the Cotton

[11] A more detailed assessment of the constituents in the reform process, and of the balance of influence between government, donors, farmers, and ginners, is important but beyond the scope of this paper. For an example from Mali, see Bingen (1998).

[12] Poulton et al. (2004) report that Ugandan and Tanzanian lint (along with Mozambican) in 2001 were among the most contaminated in the world, according to the International Textile Manufacturers' Association.

Table 1. Cotton Sector Reform: Prior Institutional Set-up and Performance, and Timing and Key Steps in Reform

Country	Pre-Reform Institutional Set-up	Performance Prior to Reform	Timing and Key Elements of Reform
Tanzania	Quasi-independent Regional Cooperative Unions held local monopolies, sold lint to Cotton Board which held a national monopoly on exports. Entirely smallholder production in cooperative societies.	Production had declined by about one-third from early 1970s, to about 130,000 mt. Massive debt lead to 1-2 year delays in paying farmers; much cotton went uncollected or unginned; yet exported cotton received a premium on world markets	Initial steps in 1990 with greater autonomy for RCUs; definitive reform in 1994 with elimination of Cotton Board monopoly
Uganda	Very similar to Tanzania. Cooperative Unions purchased seed cotton from farmers and sold to Lint Marketing Board, which held monopoly on lint marketing and also provided all seed to CUs. Entirely smallholder production in cooperative societies.	Production had collapsed to less than 5,000 mt, from over 70,000 mt from 1960-1973. Debt throughout the system. Farmers uninterested in cotton.	1993, with elimination of Lint Marketing Board's monopoly on lint marketing
Zimbabwe	Single channel system: CMB provided all inputs and extension assistance to smallholder farmers, purchased all seed cotton from them, ginned and exported all lint. Both commercial and smallholder production.	Successful transition from reliance on white commercial farmers to black smallholder farmers. Production increased nearly 70% (to 250,00 mt) from Independence to late 1980s/early 1990s. High productivity, quality, and farmer prices maintained. Substantial deficits related to higher costs of serving smallholder sector.	Initial steps in early 1990s with "commercialization" of Cotton Marketing Board. CMB privatized as Cottco in 1994 and other private firms allowed to compete. Government maintained investment in Cottco until 1997. CMB debts written off as part of privatization process.
Zambia	Single channel system in hands of LINTCO. Entirely smallholder production.	Production had trended down from about 40,000 mt per year in late 1980s to under 20,000 mt in 1994. Substantial debt and farmer dissatisfaction with LINTCO.	1994, with sale of LINTCO to two private companies. Each operated in separate areas of the country.
Mozambique	Nationalized and quasi-independent concession companies with local monopolies, coordinated by *Secretaria do Estado do Algodão*. Roughly equal mix of smallholder and estate production.	Rapid collapse in production from Independence in 1975 to 1985, from about 120,000 mt to less than 10,000 mt. On-going civil war created insecurity for farmers and high costs for companies.	1986, with establishment of first Joint Venture Company. By 1991, four JVCs were responsible for nearly all cotton production in the country.

Table 2. Summary Chronology of Cotton Sector Reform in Tanzania

Year	Action Taken	Comments
1989	RCUs take over seed cotton purchase, input distribution from Cotton Board (TCB)	Pervasive liquidity constraints and input credit default by farmers. 1-2 year payment delays on seed cotton.
1990	Donor-financed ginnery rehabilitation begins	
1991	Fixed seed cotton prices replaced with indicative prices	Cotton production reaches 85,000 mt fiber, peaks at 96,000 mt next year. Heavy cooperative sector debt. Production falls to 40-45,000 mt next two years.
1994	Cotton Act eliminates monopoly of Board and RCUs, allows competition in marketing, ginning. Cotton Board remains buyer of last resort	Heavy competition for seed cotton. Many private ginneries built alongside existing cooperative capacity. Input prices increase sharply. Input credit disappears, use by farmers collapses.
1995	Agricultural Input Trust Fund formed	Provides subsidized credit to input dealers. Low uptake and poor credit recovery. Input use remains very low.
1997	Agricultural Input Trust Fund abolished	
1999	Cotton Development Fund (CDF) formed	Financed by levy on ginned seed cotton. Cash sale by local governments at below market prices. Insecticide availability increases by factor of 10 over next two years
2001/02	CDF switches from oil-based to water-based imported pesticides	Only 15% of chemicals taken-up by farmers, due to lack of familiarity, lack of access to pumps. Some of these chemicals still being sold in 2003/04.
2002/03	CDF replaced by "passbook" system	Cotton sellers entitled to chemicals for approximately one-spray per year. Broadens access, may leave more room for private sector and create more accountability in system.
2005	Seed cotton auction pilot due to take place in 7-8 districts, but postponed to 2006	Aimed at improving information and incentives at first buyer level to improve quality.

Table 3. Summary Chronology of Cotton Sector Reform in Uganda

Year	Action Taken	Comments
1971-88	Civil war under various leaders	Economy devastated, cotton production falls from 25% of agricultural exports to nearly zero.
1988	Peace Accord ends most insurgencies	Cotton production begins to rise from low of 2,000 mt lint.
1994	Monopoly of Lint Marketing Board ended. 39 cooperative ginneries privatized. Cotton Development Organization formed.	Cotton production rises to 20,000 mt lint over next three years. Seventeen new private ginning companies emerge.
1997	Ginneries begin charging for cotton seed for first time	Lower plantings, combined with El Nino, reduce production to 6,000 mt.
1998	CDO/UCGEA Cotton input scheme begins	Provides seed and pesticides on credit to 200-300,000 smallholder farmers. Production nearly triples to 15,000 mt.
2000	Input scheme abandoned after two years	Very low levels of input use, low recovery levels.
2001-02	CDO attempts to promote use, but no comprehensive strategy in place.	Production steady around 20,000 mt, same level reached prior to input scheme.
2003	Ugandan cotton production areas divided into nine zones, with company-led zonal development plans designed to increase investment in extension and other services	
2005	Cottco of Zimbabwe leaves Uganda after two-season attempt at direct production plus purchases from smallholder farmers.	Total production remains around 20,000 mt

Table 4. Summary Chronology of Cotton Sector Reform in Zimbabwe

Year	Action Taken	Comments
1980-93	Colonial single channel system for cotton extended to smallholder farmers	Smallholder cotton production booms, reaches 75% of total production. Outstanding varietal development and zoning, technical assistance and quality control. Smallholder yields average 700 kg/ha, high by SEA standards.
1992-93	CMB input credit scheme launched with World Bank soft loan	In response to 1992 drought.
1994	Cotton Marketing Board (CMB) renamed Cottco, remains in public ownership. Government assumes debt. Private traders allowed to enter at all levels.	Cargill, Cotpro, and several very small companies enter market over next two years. Cottco continues to dominate market. Entry barriers remain (ginning and export permits difficult to obtain).
1994	Ministry of Ag. forms National Cotton Council	Coordinating body focusing on quality and pest management
1997	Government reduces ownership in Cottco to 25%. Cottco acquires 60% share in Cotpro.	Cottco/Cotpro controls 70-80% of market, Cargill 20%, other players 1%.
2000	Cottco subsidiary Quton receives exclusive rights to commercialize varieties developed by Cotton Research Institute.	Two additional players enter sector.
2001-2	Government reduces ownership in Cottco to 10%	Massive real devaluation of Z$ not passed onto producers, triggering rapid entry by ginning and buying companies. Cottco retains 70% market share. Growing concerns about credit default.
2003		Continued entry by new firms. Cottco market share down to 58%. Farmers paid fixed price for seed cotton irrespective of quality.
2004	Cottco dramatically scales down outgrower credit scheme, citing credit repayment problems.	11 buyers now in the market. Prices improved, quality reduced, input supply more tenuous

Table 5. Summary Chronology of Cotton Sector Reform in Zambia

Year	Action Taken	Comments
1977-94	State-owned LINTCO runs single channel cotton system	Production trends downward from mid-1980s in spite of rising international prices. Public debt accumulates.
1994	Lintco sold to two private companies: Lonrho and Clark Cotton	Two companies operate for two years in separate areas of country. Production booms, aided by high international prices.
1997-99	Four new ginning companies enter market, group of independent traders also emerges. Government does not intervene	Combined Dunavant and Clark market shares fall to 80%. Competition for seed cotton increases. Charges that new entrants provide few if any inputs to farmers. Credit recovery falls below 60% during 1997/98 season.
1999	Lonrho, citing input credit losses of US$2m, leaves Zambia. Assets purchased by private company Dunavant.	Lonrho had begun to launch "Distributor Scheme", Dunavant (under same management) continues to develop it. Credit recovery over 60%.
1999-2001	Dunavant fully develops its private Distributor Scheme	Credit recovery improves to 85%. At least one of the recent entrants falters but does not leave market.
2001/2	Drought in southern areas of country	Indications that credit recovery rate decreased
2002	New government enters late 2001, launches Cotton Outgrower Credit Fund	Publicly funded credit line for input provision, being developed in close collaboration with ginners. First direct government involvement in the sector since liberalization in 1994.
2003/04	Cotton Bill proposes new Cotton Board	Regulatory functions only. Heavy policing role.
2003/04, 2004/05	Cotton Outgrower Credit Fund expands, becomes revolving fund	Funds increased to $390,000 from $250,000 first year. Disbursements favor smaller players in relative sense. Recoveries suggest effective management.

Table 6. Summary Chronology of Cotton Sector Reform in Mozambique

Year	Event/Action Taken	Comments
1975-89	Independence, nationalization, civil war	Cotton production collapses from average of 138,00 mt seed cotton 1972-1974 to under 20,000 mt 1986-1988
1989	Three JVCs awarded concessions in traditional cotton belt located in north of country	Seed cotton production is re-launched after falling to a low of 15,000 mt/year over past four years
1989-95	JVC model with closed concessions remains dominant approach in the sector; cotton belt remains dominant production zone	Seed cotton production rises to over 50,000 mt in 1995, due primarily to area expansion. Sporadic problems of credit default
1996-99	Three private companies awarded concessions	Seed cotton production surpasses 100,000 mt in 1999. Yields remain stagnant around 300-400 kg/ha. New entrants without concessions create major credit default problem
1998	Producer associations with at least 20 ha of cotton allowed to contract with cotton company of their choice	Many associations contracted with cotton companies for more favorable terms. New entrants formed large fictitious associations – essentially large lists of farmers – to purchase within concession areas
2000	Government announces "open concession system" with view towards gradual liberalization	Production recovers somewhat. Credit default problems continue. Lack of transparency in applying new rules. Major outcry from concession holders threatening to leave the sector
2001	Return to closed concession system, producer associations lose right to organize for input provision.	Companies discontinue pricing premia for associations. Indications of continued credit default, unrest among farmers
2001-02	Dunavant, Cottco, and Plexus enter, locating outside the cotton belt. CNA continues to expand, also outside the cotton belt	All four companies have strong orientation towards farm level productivity and quality
2003/04	Production share outside the cotton belt exceeds share within it for first time	Dunavant expanding aggressively; its share and that of Cottco, CNA, and Plexus set to rise further

Table 7. Selected Institutional Mechanisms for Input Delivery to Smallholder Cotton Farmers in Five Countries of SSA

	Mechanism	Year Initiated	Synopsis
MOZAMB.	Concession System	1989	Legal geographical monopsonies for seed cotton purchase. Ginning companies responsible for distributing inputs. Wide coverage but low quality seed and insecticides, no fertilizer. Yields 350 kg/ha. Periodic loan default crises spurred by new entrants. To date, crises resolved by providing new concessions to largest entrants.
	"Open" Concession system	2001 (abandoned 2002)	Allowed new entrants to compete for groups of farmers within existing concession areas. Strong opposition from established concession holders. Lack of transparency in mediating claims of new operators.
ZAMBIA	Distributor System	1999	Private (Dunavant). Operates within a liberalized but concentrated cotton sector. "Distributors" contract with company to receive inputs on credit; package includes treated delinted seed, insecticides, foliar spray (micro-nutrient); Distributors choose which and how many farmers to work with; earnings a function of credit recovery. Credit repayment rates rose from about 60% to 85% by 2001. Yields rose from 450 kg/ha to 600 kg/ha.
	Cotton Outgrower Fund	2002	Public/Private. Government credit at low interest to ginning companies to finance input provision. Allocations across companies favored small players in relative sense. High repayment allowed creation of revolving fund.
	Cotton Board	2005	Public/Private. Statutory body only. Not yet approved. Substantial policing powers to control "poaching" and practices which reduce cotton quality.
TANZANIA	Agricultural Inputs Trust Fund	1995 (abolished 1997)	Public/private. Operated in system with many seed cotton buyers. Subsidized credit to input dealers. Low uptake, poor credit repayment
	Cotton Dev. Fund	1998 (abolished 2002)	Public/private. Operated by public sector in system with many seed cotton buyers. Privately financed by levy on ginning activities. Fund imported chemicals and distributed them to local governments for cash sale at below market price. Increased insecticide availability 10x over two years. 95% of cotton inputs purchased through system. Imported unfamiliar chemicals 2001/02, low uptake. Some chemicals diverted to market.
	Passbook System	2002	Public/Private. Cotton sellers receive stamp in official passbook entitling them to pesticides sufficient for approximately one spray the following year. Broadens access, may leave more room for private sector and create more accountability in system.

Table 7. (continued) Selected Institutional Mechanisms for Input Delivery to Smallholder Cotton Farmers in Five Countries of SSA

ZIMBABWE	Cottco outgrower scheme	1992 (Abandoned in 2002)	Private (Cottco). Began prior to reform with soft loan from World Bank; subsequently operated within a liberalized but concentrated cotton sector. Borrowers organized into groups. Each farmer must produce >= 800 kg seed cotton. Available inputs include treated seed of proper variety
	Cottco "Gold Club"	1992 (Abandoned in 2002)	Private (Cottco). . Upper tier within company's outgrower scheme for loyal (and generally larger) producers. Members can receive larger loans
	Input voucher program	1995	Private (Cargill). Inputs for next year's crop delivered at time of this year's seed cotton purchase
UGANDA	UCGEA/CDO Input Credit Scheme	1997 (abolished 1999)	Public/private. Operates in system with many seed cotton buyers. Uganda Ginners and Exporters Association in conjunction with Cotton Development Organization (CDO). Supported with loan from World Bank. Inputs distributed on credit to 200-300,000 farmers. Companies competed to purchase seed cotton. Fund replenished by levy on lint exports. Dramatically improved input availability, but suffered from "leakage" to market, required large subsidy. Abandoned after two years. Insecticide use collapsed. No fertilizer use.
	CDO Seed Scheme	1999	Public/private. Operates in system with many seed cotton buyers. All seed legally belongs to CDO until it has sufficient to meet anticipated demand. Ginners deliver quota to CDO, which treats and dresses seed, returns to ginners for distribution. Competition from oilseed processors diminishes availability for planting.

Board and RCUs and allowed competition at all levels of the cotton system. The Cotton Board remained as a regulatory body and, in principle, as a buyer of last resort.

The country's pre-reform set-up of relatively autonomous RCUs owning and operating cotton gins strongly influenced the highly competitive market structure that prevails today. Easy finance for rehabilitation and construction of gins reinforced this tendency. Baffes (2002) reports that during the first year following the Act, 22 new private companies began trading seed cotton and eight new ginneries were built. Competition for seed cotton in the main production area of the country was intense (Gibbon 1999). By the 1998/99 production season, RCU market shares had fallen to 44% (from over 90%), and continued falling to less than 10% by 2002, with private ginners and traders handling the rest (Baffes 2002).

The major benefits of increased competition were that farmers received substantially higher prices, and were paid on time in cash. Production doubled from 1994 to 1995. The distribution of insecticides, however, collapsed, driven by the heavy competition for seed cotton, which made credit recovery risky at best (Gibbon 1999; Larsen 2002b; Baffes 2002). Even seed distribution faced major problems, as investment in oil mills increased processing capacity in the main production zone by 50%, and many ginneries decided to sell more seed to the mills. These input supply problems lead to a steady decline in cotton production after the first year of liberalization; during the 1999/00 and 2000/01 seasons, production was lower than at any time since at least 1970. Poulton et al. (2005) document the decline of quality control measures at rural buying stations and provide compelling evidence that lint quality declined dramatically.

The Tanzanian government attempted almost immediately upon liberalization to address the input supply problem. The Agricultural Input Trust Fund provided subsidized credit to private input dealers during 1995 and 1996, but was abolished in 1997 due to low utilization and poor credit recovery (Baffes 2002). The Cotton Development Fund (CDF) was created in 1999, initially financed by a 3% levy on cotton exports, 1.15% of which was to fund chemical imports. Under this arrangement, the Cotton Board imported chemicals and distributed them to local governments for below market prices.

The Fund tripled the pre-reform availability of chemical inputs (Larsen 2002b), but suffered from serious problems. First, the mechanism made it impractical for private input dealers to compete in cotton inputs and may thereby have weakened the broader input distribution system. Second, Baffes (2002) and Larsen (2002b) both report that the Fund suffered substantial corruption, with diversion of product to the market. Third, in 2001/02 the Fund abruptly switched to importing water-based insecticides rather than the traditional oil-based products. The former are significantly cheaper and can be as effective as the oil-based products. However, insufficient efforts were made to prepare farmers for the new products or to ensure sufficient availability of water-based sprayers. Farmers took up only about 15% of the chemicals; as reported by Maro and Poulton (2004), some of the chemicals were still being used during the 2003/04 season. Initial attempts to improve quality control were similarly ineffective.

Thus, until at least 2003, thirteen years after the onset of reform and nearly a decade after the entrance of private companies, cotton sector performance in Tanzania on the key dimensions of

input supply and quality control provided cause for real concern about the sector's long-term prospects. Three developments since that time, however, suggest reasons for guarded optimism. First, the CDF in 2002/03 switched to a "passbook" system for input supply. Under this system, cotton sellers receive a stamp in an official passbook entitling them to chemical inputs from CDF at the start of the next season. On average, the entitlement amounts to enough insecticides for about one spray. Maro and Poulton (2004) argue that the system has at least three advantages over the old mode of CDF input supply. First, it broadens access to chemical inputs, since all farmers now have a claim on at least a minimal supply of chemicals; previously, half of farmers did not use chemicals despite the subsidized prices charged by CDF. Second, they argue that the system "has in-built accountability for its financial management" since, if "money leaks out of the system, it should become immediately apparent when farmers are unable to claim the chemicals to which they are entitled." Finally, by providing enough for only one chemical treatment, the system leaves room for private input dealers to grow; in the past, 50% of farmers applied an average of two- to three insecticide treatments per season, and many of these can be expected to want to continue making more than one application.

The second reason for guarded optimism in Tanzania relates to proposals for a cotton auction system at rural buying posts. Quality deterioration since liberalization has been related primarily to purposeful but hidden spoilage of seed cotton, for example by adding water, soil, and rocks in the bags being sold. By concentrating seed cotton sales in fewer posts (one per village or group of villages) and providing independent quality control at those posts in the context of the auction, there is some reason to believe that the quality control problem may begin to be dealt with more effectively. Finally, production reached an all-time high in 2004, driven by high prices paid in 2003, good weather, and increased input availability related to the passbook system.

A deeper reason for the improved performance of the Tanzanian sector is the concerted action of the Cotton Board, in collaboration with leading ginners within the Tanzania Cotton Association, to tackle the problems facing the sector. This action has been based on a strengthening consensus that, with so many seed cotton buyers/ginners in the sector, some form of sector-wide action is necessary to promote access to inputs and enhance quality control. While the efficiency and effectiveness of some Cotton Board actions can be questioned, the consensus has grown that the response to inefficiency should be to increase the accountability of the Board to sector stakeholders, rather than to pare back its functions.

In **Uganda** in 1994, the Lint Marketing Board's monopoly was ended, 39 cooperative ginneries were privatized, and the public sector Cotton Development Organization was formed. Over the next three years, 17 private ginners entered the market, spurred in part by low interest loans as in Tanzania, and production tripled to over 20,000 mt. Poor weather reduced production to about 6,000 mt in 1997. CDO focused primarily on ensuring quality seed supply to farmers, while the provision of chemical inputs collapsed, as in Tanzania.

In 1998, the Ugandan Ginners and Cotton Exporter's Association (UGCEA) collaborated with the CDO in an innovative attempt to resolve the input supply problem (Gordon and Goodland, 2000). A levy on raw cotton financed a fund which CDO used to supply chemical inputs to between 200,000 and 300,000 farmers. Given the competitive market structure in the country, it

was felt that credit recovery from farmers would be impossible. The responsibility for repayment was therefore placed on ginners, who competed freely for seed cotton and were to pay back to the fund in proportion to their share of the market. Poor weather the first year, however, resulted in production levels about one-half those anticipated, drastically reducing repayments by ginners. Management of the scheme was also suspect, with inputs leaking into the market. After one more year, in which production was much better, the scheme was abandoned. Through about 2003, no comprehensive strategy for input provision emerged (Lundbaek 2002), the output market remained highly competitive with many small buyers, and production stagnated around 20,000 mt. Over the past three years, ginners have been able to collaborate to resuscitate the so-called "seed wave system", and the zonal system has been legalized, limiting "pirate buying" and reducing risk for companies promoting the crop. Production recovered by 2005 to about 45,000 mt.

4.2. Zimbabwe and Zambia: Concentrated Sectors Deliver Good Performance

The two countries with single channel marketing systems prior to reform have maintained relatively concentrated sectors. Through the early part of this decade, each performed much better on input provision and cotton quality than did Tanzania and Uganda. Perhaps surprisingly, each also paid attractive prices to farmers. Recent developments in Zimbabwe, however, may be undermining some of this success.

Reform in **Zimbabwe** – Southern Africa's star performer for several decades – was characterized until the early 2000s by an orderly process of "commercialization" of the single channel parastatal, gradual privatization accompanied by probable bureaucratic favoritism to maintain its position, and the perpetuation of a highly concentrated, though fully private, sector performing well on productivity, quality, and prices paid to farmers. From the early 2000s forward, the sector has seen rapid new entry, spurred in part by macroeconomic distortions; since this time, price performance has been mixed, credit default has increased, and productivity and quality have probably fallen.

In September 1994, the government renamed CMB as Cottco but maintained its public ownership while officially allowing private operators to enter at all levels of the system. Yet over the next two years, only two significant new companies – Cargill and Cotpro – entered the market, and Cottco continued to dominate. In 1997, government reduced its ownership share in Cottco to 25%, and the company acquired a majority share in Cotpro. During the 1999/00 and 2000/01 seasons, the combined company controlled 70%-80% of the market, while Cargill controlled about 20% each year (Hayani-Mlambo, Poulton, and Larsen 2002).

Cottco's dominance through the 2000/01 season can be attributed in part to its history of outstanding technical support to farmers and attention to quality throughout the chain, and to the stability of company management through reform[13]. Bureaucratic favoritism may also have played a role: government officials at this time explicitly stated that, while "competition is

[13] The Managing Director and Marketing Director have been with the company for 17 and 29 years, respectively (http://www.thecottoncompany.com/about/html/index.html).

good", the country should use its existing ginning capacity before new capacity is built (Larsen 2002c), and several potential competitors indicated that ginning and export licenses were very difficult to obtain. The privatized Cottco also received financial assistance from government as late as 2001 (Larsen 2002a).

A distinguishing characteristic of Zimbabwe through 2001 is that its broader agricultural input system functioned relatively effectively. Of the country's roughly 250,000 smallholder cotton farmers, only 60-80,000 received inputs on credit from outgrower companies, most from Cottco (Hayani-Mlambo, Poulton, and Larsen 2002; Larsen 2002). The rest purchased seed and chemicals on the open market. Mean yields of about 600 kg/ha among self-provisioning farmers suggests that they were relatively successful in obtaining a sufficient supply of insecticides, if not fertilizer, for their crop.[14] This fact has important implications for the types of outgrower schemes that are likely to emerge: since cotton can be easily purchased on the open market without having to support farmers with inputs and extension advice, the only schemes which are likely to emerge are ones which will substantially increase yield and promote loyalty to the company.

Cottco's outgrower scheme fits this description. It began during the 1992/93 season with a soft loan from the World Bank to the CMB to help relaunch smallholder cotton production after the devastating regional drought of 1992 (Goreaux 2002; Larsen 2002). The company carefully screens potential farmers into its scheme and expects all borrowers to be part of a joint liability group. It favors those able to achieve total production of at least 2,000 kg of seed cotton (Larsen 2002); this compares to average total production per household of 800-900 kg in Zambia, and 200-300 kg in Mozambique. Borrowers are provided with treated delinted seed of high quality, fertilizer, and an effective mix of insecticides. So-called Gold Club membership is a reward for consistently high supplies to the company - production of at least 6,000 kg per year - and entitles the borrower to take cash loans for labour hire and other purposes as well as receiving inputs on credit. Through 2001, credit repayment rates were 95% or higher in most years.

Cargill avoided providing input credit, instead launching an innovative input voucher scheme (Table 7) in which farmers selling the current season's crop received inputs for the following season and had the value of the inputs deducted from their sales receipts. High inflation rates in the country made this approach attractive to many farmers.

Between 2001 and 2004, the total number of seed cotton buyers in Zimbabwe rose from five to 11, spurred by a fall in the real prices paid to farmers by the major players. This decline occurred despite a large depreciation of the Zimbabwe dollar, which Cottco and Cargill did not fully pass-on to farmers. New players competed heavily on price, driving Cottco's market share from over 70% to below 60%. Prices to farmers rose 35% in real terms over the period, despite

[14] The figure of 600 kg/ha is calculated from the estimated outgrower yield of 900 kg/ha and a reported national average of 700 kg/ha, with approximately one-third of farmers in outgrower schemes. The fact that Zimbabwean cotton continued to earn a 10% premium on world markets is further evidence that non-outgrower households have been able to obtain sufficient and appropriate insecticides, since staining is a key quality problem generated by poor control of insect pests.

little change in world market prices, making it clear that the large players had depressed prices in 2001-03.

Improved price performance, however, was accompanied by a weakening of input distribution and quality control. Cottco progressively scaled-back its high quality input credit schemes. New entrants established their own schemes, but low credit repayment suggests that several of them may not be sustainable, and it is doubtful that their quality matches that of Cottco. Poulton et al. (2005) also report that "new entrants led the abandonment of grading at primary marketing, quickly forcing established players to follow". They suggest that Zimbabwe may be on the verge of losing the price premium it has commanded for at least two decades on world markets.

Thus, by 2005, Zimbabwe's cotton sector was being afflicted by problems similar to those seen in Tanzania, despite much higher concentration in the Zimbabwean system. Under current circumstances, it is unlikely that the sector will be able to maintain its record of high quality support to farmers, high and rising smallholder productivity, high credit repayment, and top quality lint exports. Whether the higher farm prices seen since 2003 will be enough to offset these disadvantages for farmers remains to be seen.

The cotton sector in **Zambia** since reform has passed through three clear phases: reform and rapid expansion, followed by a credit default crisis, which was resolved entirely through private sector innovation. The sector may now be entering a fourth phase, as the government makes its first forays into proactive policy to promote the sector. Reform began with the sale of LINTCO to two companies, Lonrho Cotton and Clark Cotton. Through 1996, competition between the two was minimal, as they operated in different areas of the country. Each company initiated outgrower programs and had very little problem with credit repayment. From 1994 through 1998, cotton production increased by a factor of three to four, depending on data source, facilitated by very high international prices and aggressive promotion of the crop by Lonrho and Clark.

However, from 1997 the expansion of the cotton production base attracted many new entrants, both in ginning and assembly. At least four new ginning companies emerged and began to compete aggressively in the purchase of cotton· Some ginners contracted agents to recruit farmers on their behalf in addition to the farmers directly recruited by them. There also emerged a group of independent cotton traders who obtained their own inputs, distributed them to farmers, purchased seed cotton and sold to any ginner wishing to purchase it.

Government at the time was committed to a liberalized economic policy and made no attempt to limit this competition. As the number of ginners and assemblers expanded, several key problems came to the fore. First, ginning capacity expanded to over 150,000 mt per annum, while production peaked at about 105,000 mt in 1998 and then declined for three years. This overcapacity created a competitive "scramble for cotton" among ginners to increase their throughput and minimize unit ginning costs. The emergence of agents and independent traders contributed substantially to this scramble for cotton. Firms operating outgrower schemes experienced increased loan default rates as competing firms, some of which did not operate outgrower schemes and hence could offer higher prices, purchase cotton from farmers

participating in other firms' outgrower programs. These problems were exacerbated by a continual decline in world market prices from their peak in 1995, which was passed on to farmers.

Farmers had grown accustomed over several years to increasing prices, and with limited information on world market conditions, they found it difficult to understand the reasons for the price declines. This, together with a lack of transparency in how each buyer determined its prices and deducted input costs, lead many farmers and their representatives to conclude that they were being exploited. Ginners estimate that loan repayment rates dropped from almost 86% in 1996 to about 65% in 1999.

At the same time, increased default rates created incentives for outgrower firms to capitalize their bad loans into the cost of inputs for those farmers who did repay[15], resulting in lower net prices for cotton after deducting the cost of inputs. Farmers who remained loyal and repaid their loans were thus penalized, potentially fueling a vicious cycle of further loan defaults or exit from participation in outgrower programs.

The sector reached a crisis point in 1999. Lonrho, the largest buyer, was sold to Dunavant, a privately held U.S. cotton company. Among its reasons for departing, the company cited $2 million per year in unpaid loans. Other outgrower firms cut back on the number of farmers they supported from the 1999/2000 season, driving production to a post-reform low of less than 50,000 mt.

Since this nadir, the sector has undergone important structural change, and has recovered dramatically. The agents and independent buyers that contributed so much to the credit repayment problems in the late 1990s largely disappeared. At least one of the new ginners went out of business in late 2002. These developments were associated with two parallel strategies adopted by Dunavant. First, it launched in 1999, and over the next several years it refined, its "Distributor System", which dramatically improved credit repayment rates among farmers. Second, Dunavant used this system to aggressively expand its production network. Partly as a result, national production more than tripled between 2000 and 2004, driven by yield growth in addition to area expansion, and credit repayment improved from about 65% to over 90%. A problem of polypropylene contamination, which was threatening the country's export market, has been largely resolved and the country now receives a premium on world markets. Finally, despite operating in a much more concentrated sector, companies in Zambia have continued to pay prices nearly as high as in Tanzania.

This recovery was driven entirely by private sector innovation. Key among these innovations is Dunavant's Distributor System for extension assistance and credit recovery; Clark's less well known (and more traditional) system also seems to have been effective. Tschirley and Zulu (2004) provide a detailed discussion of the Distributor System. The approach relies on independent contractors, called Distributors, who receive inputs from Dunavant on credit, decide

15 One outgrower company states that in 1999 it attempted to offset its loan defaults by adding a 50% mark up to the price of inputs.

on their own how many and which farmers to support with these inputs, and work to ensure sale of those farmers' cotton to Dunavant for the purpose of credit recovery. Distributors' remuneration is tied to the amount of credit recovered, on an increasing scale. The company screens all Distributors, and requires that each produce cotton themselves and live in the same area as the farmers to whom they provide services.

The Distributor system greatly diminishes the amount of information that Dunavant needs to manage to ensure adequate credit recovery. The company develops strong relationships with a limited number of Distributors and creates incentives for them to recover as much credit for the company as possible. Thus, the company attempts to substitute the Distributors' local knowledge, social capital, and financial incentives for its own data bases and enforcement mechanisms. To date, the system has been highly successful.

Zambia appears now to be entering a fourth phase in its post-reform period, marked by more direct government involvement to promote the sector. The two key elements of this new approach are the Cotton Outgrower Fund and the proposed Cotton Board[16]. The Outgrower Fund is part of a broader government effort, launched in 2002, to support export crop production. Stated objectives are to increase production by increasing the availability of inputs on credit, and to reduce "pirate buying" in which firms purposely buy cotton from farmers who have been supported by other companies. The Fund started with an allocation of about US$250,000 from government during the 2002/03 growing season. Effective credit recovery and additional allocations from government increased the Fund to US$390,000 for the 2004/05 growing season, and turned it effectively into a revolving fund. Distribution of resources from the Fund favors smaller players in a relative sense: while the share of total credit disbursements received by the two largest companies (Dunavant and Clark) in 2004/05 was less than their share of national production the previous year, two smaller companies received credit shares three- to four times greater than their previous year's production share. Disbursements to two ginners who had almost no production during the previous year seem clearly intended to allow them to become at least recognizable players in financing of farmers. The total area financed by the program remains small, at about 3% of the previous year's harvested area. For the smaller players, however, the financing has a substantial impact on their ability to work with farmers.

To date the scheme has avoided the error of centralizing input procurement and distribution to farmers within itself – a key factor in the demise of Uganda and Tanzania's post-reform input distribution efforts. By channeling credit to private cotton companies already working with farmers and allowing the companies full freedom in using it, the Fund essentially becomes a means to increase resources in the system and reduce borrowing costs for the companies. By attempting to involve all major firms in the sector, the Fund may create some leverage to discourage pirate buying. A related benefit may be in helping smaller firms remain in the market while at the same time giving them a vested interest in playing by the rules.

The proposed Cotton Board would be a statutory body with public and private membership and no mandate to participate as a buyer or seller in the cotton market. The genesis of the Board dates to at least 2000, when the Cotton Development Trust and private stakeholders started

[16] Tschirley and Zulu (2004) provide a detailed discussion of each.

developing a regulatory framework for the sector, driven in large measure by a desire to avoid a repeat of the credit default crisis that nearly destroyed the sector from 1997 through 1999. Perhaps as a result of this starting point, the proposed Cotton Act (which would create the Cotton Board) grants very broad policing powers to the Board, essentially creating a parallel police force. It uses vague language in specifying the conditions under which these powers can be exercised, and attempts to insulate decisions of the Board from judicial review. It also transfers powers and responsibilities reasonably within the mandate of the Ministry of Agriculture to an agency another step away from political accountability. Such an approach seems at odds with the fact that the sector survived the crisis of the 1990s due in large measure to the institutional innovations and improved management that emerged from competition between the two major players. Tschirley and Zulu (2004) suggest that the Act needs instead to focus on developing legal bases and operational approaches to improve information on borrowers' credit history, on promoting collective action to improve cotton quality and productivity, and on improving the monitoring of sector performance beyond credit repayment.

4.3. Mozambique: Struggling to Update the Concession Model [17]

In reforming its cotton sector, Mozambique returned to the concession model prevalent during the colonial era, first with public/private Joint Venture Companies (JVCs), and later complemented by fully private companies. Key themes during the post reform era have been the absence of any systematic approach to evaluating and re-awarding concession areas, widely divergent performance between early investors within the traditional cotton belt and new entrants outside it, and the government's openness to new investment, albeit always within the concession model. Until recently the country clearly lagged its neighbors in productivity and quality, but new entrants since the early 2000s have begun to change this.

The first JVC began operation in 1986, and was joined by two more in 1990. In addition to exclusive buying rights within a geographical "concession area", each company received blocks of land for direct production, and existing gins. In return, the investors rehabilitated the gins and agreed to supply inputs and technical assistance on credit to any smallholder farmer within the concession area wishing to produce cotton. The Civil War was ongoing at this time, intensely so in cotton growing areas. As a result, companies had to pay for private militias to protect gins and to accompany truck convoys bringing seed cotton out of rural areas and taking lint to the port for export. They also had to rehabilitate roads and bridges with their own funds. Companies and government negotiated pan-seasonal and pan-territorial prices, with little direct input from farmers.

JVCs dominated the sector into the early- to mid-1990s, when fully private companies began to appear. By 1995 there were four JVCs and six private companies, with the former concentrated in the cotton belt region of Nampula and southern Cabo Delgado Provinces and the latter lying primarily outside this area to the south, in the provinces of Zambezia, Sofala, and Manica. This mixed public-private approach resulted in strong production increases, reaching a post-

[17] This section draws heavily from Tschirley et al. (2005).

Independence peak of 116,000 mt of seed cotton in 1999. Production then plunged to less than 40,000 mt in 2000, driven primarily by a collapse in Nampula.

Falling prices after 1995 and entry of new buyers had put severe stress on the concession model in Nampula. New private companies operating outside Nampula province negotiated concession agreements with government and largely respected the rules of the game. Others, operating within Nampula, attracted production out of concession areas by offering higher prices while providing few or no inputs to farmers, leading to widespread credit default by these farmers. The first serious instance of pirate buying, as it was called in Mozambique, occurred in 1995. In a pattern that was to be repeated in future years, the pirate buying resulted in strong protests from concession companies, start-and-stop efforts by government to restrict the illegal purchases, farmer protests in favor of the new buyers and, eventually, resolution of the problem by providing the buyer with his own concession area. The concession system continued to be challenged, however, by new entrants and growing farmer discontent, the latter linked to the lowest yields and prices in the region.

In 1998, the government's Cotton Development Strategy encouraged the formation of farmer groups to deal independently with the cotton company of their choice, even if the group's land lay within a concession area. Such groups had begun to form prior to the rule change, many of them contracting with cotton companies for higher prices and better support than could be achieved by individual farmers. However, the policy change was exploited by some new buyers, who formed extremely large groupings of farmers with no training and no coherent governing structure, called them associations, and used them to justify cotton purchases within concession areas despite providing little effective support to the groups. Concession companies responded by promoting associations of their own, and the conflict in the region escalated, reaching a crisis in 1998/99.

Faced with persistent illegal buying which it could not control, with mounting farmer protests to be allowed to sell to whomever they wished, and with donor pressure to open the sector to increased competition, government in 2000 launched a short-lived attempt to gradually liberalize the sector. In October 2000, during the first national meeting of government and stakeholders, participants adopted an "open concession" model with a view towards eventual full liberalization. The model allowed communities within concession areas to opt out of their implicit contract with the concession company and deal with a competing company from input provision through sale of the seed cotton. Competing companies in the early years of the transition were to have the burden of demonstrating that communities within concession areas wished to opt out of the concession and work with them. Eventually, the playing field was to be leveled among new entrants and existing concession companies (MADER 2000a; MADER 2000b).

Production under the more open system recovered to about 71,000 metric tons in 2000/01 (from 35,000 MT the previous year). The system was welcomed by new companies and many farmers, but heavily criticized by concession companies as unwieldy. It foundered on information problems in enforcement and on a lack of transparency in the decision process allowing communities to opt out of the concession. The second annual stakeholders' meeting, in October

2001, was more dominated by the established ginners. In it, government backed away from the open concession system, eliminated the rights of farmer groups to contract with the company of their choice (a right which they enjoyed even prior to the reforms of 2000), and once again resolved the pirate buying problem by offering the largest buyer his own concession area. Since that time, production in the cotton belt has stagnated, and yields have remained between 300 and 400 kg/ha, with levels as low as 230 kg/ha reported for some concession areas (HORUS 2004).

While Nampula went through these disruptions, policy makers remained open to new investment, albeit always under the concession model. This openness over the past several years has created the conditions to potentially transform the sector. The Center region of the country, south of Nampula, now has three of the best performing cotton companies of Sub-Saharan Africa: Dunavant, which expanded its operations from Zambia in 2000, Cottco, which entered from Zimbabwe in 2001, and Dagris, historically linked to West Africa, which began operations in Mozambique in 1995 as CNA (*Companhia Nacional de Algodão*). In nine years of operation, CNA has become the largest cotton company in the country, with average smallholder yields above 800 kg/ha each of the past three years. Dunavant has expanded its area of operation by acquiring an existing concession company. If it meets production targets for 2004/05, it will be the third- or fourth largest company, with excellent prospects for sustained rapid growth through both area expansion and yield increases. In only two years of operation, Cottco raised its production to nearly 5,000 MT, and its yield of 520 kg/ha in 2004 already exceeds those found in Nampula. Each of these companies brought improved seed from other areas of Africa and combined it with more effective extension assistance. Finally, all three have paid higher than the minimum price in recent years (though CNA returned to the minimum in 2004), a practice which has been exceedingly rare among established concession holders in Nampula.

Plexus, which took over the LOMACO concession in Cabo Delgado, also shows promise[18]. It has taken advantage of earlier technical work done by LOMACO to raise yields to 480 kg/ha, and intends to raise them to 700 kg/ha in two years. The company reports ginning outturn ratios of 40.5%, among the very best in Africa and far above Mozambique's recent average of 33%-35%[19]. Plexus has also remained committed to LOMACO's vision of developing farmer organizations, which are a key element in eventually providing a way out of the concession model.

Additional optimism regarding Mozambique's prospects stems from the more constructive role now being played by IAM (*Instituto do Algodão de Moçambique*), the sector's public regulatory body. From its formation in 1991 through the early 2000s, IAM was preoccupied resolving conflicts over price setting and credit default. Since about 2002, it has used US$400,000 – US$500,000 generated annually by a 2.5% export levy, combined with donor funds to begin a process of institutional strengthening and reform and to play a more active coordinating role in the sector. It has focused its coordination efforts on proposals to carry out yearly evaluations of

[18] LOMACO was the cotton company, owned by Lonrho of Moçambique, that operated the cotton concession in Cabo Delgado provice from 1986 until its bankruptcy in 2001.

[19] The ginning outturn ratio represents the amount of lint obtained from one kilogram of seed cotton. CNA reports a ratio of 41%, meaning it obtains 0.41 kg of lint for every kilogram of seed cotton.

concession holders and to make re-awarding decisions every five years, and to increase the transparency of price setting by linking it explicitly to world markets. Outside funding, complemented by sustainable mechanisms for self-financing within the sector, will be needed for some time to build technical and managerial capacity within IAM to carry out these functions. Stakeholders have proposed that these tasks be passed eventually to a multi-stakeholder (inter-professional) body, but no such body exists at this time.

V. LESSONS FOR PRAGMATIC REFORMERS

Table 8 summarizes the status of our five cotton sectors as of 2005. In three of the five countries – Tanzania, Zambia, and Mozambique – there is some cause for optimism regarding future prospects. Each brought a very different history into its reform process, and each has used very different approaches to solve common problems of input distribution, credit recovery, and quality control. Tanzania, with the most competitive system among the five countries, has paid some of the most remunerative prices to farmers since reform, and may now be finding an approach to public/private coordination that will allow it to reverse the sharp post-reform declines in input availability and lint quality. Zambia has the most concentrated sector, yet has also paid attractive prices to farmers, and seen steady rises in production, yields, and quality. It is now using the Cotton Outgrower Fund to ensure some level of effective competition among firms while providing smaller actors with a reason to follow the "rules of the game". Mozambique has, along with Uganda, been the region's poor performer over the past 15 years. Yet by remaining open to new investment, and by choosing well which new investors to accept, the country has unleashed a positive dynamic which may remake the sector over the next five years.

Political unrest and macroeconomic instability in Zimbabwe complicate assessment of its prospects. Long the star performer of the region, it is now threatened by problems similar to those which afflicted Tanzania for more than a decade after its reform – heavy competition in the seed cotton market which undermines input provision and quality control. Because its broader input and credit markets work better than those in Tanzania, and because Cottco and Cargill are strong companies, the country's prospects have to be considered good if the political and macroeconomic situation can be stabilized in reasonable time.

Uganda, with a history and market structure very similar to Tanzania's, showed little cause for optimism as late as 2003, as repeated failures to solve the input supply and credit repayment problem had led to low and stagnant production. The recent departure of Cottco provides additional reason for concern. Yet the past two- to three years have seen some progress on the sector's key institutional challenges, with an associated doubling of production. It remains to be seen whether this progress will continue.

Overall, the picture which emerges is relatively positive. The fears alluded to at the beginning of this paper (Lele, Van de Walle, and Gbetiobouo 1989), that reform would undercut the basis for effective interlocking of transactions and also complicate collective decisions on long-term investment, have often proved well founded. Yet predictable benefits of reform, such as higher prices and more timely payment, have also been realized; state budgets have also generally benefited from reduced support to parastatals or cooperatives. It also seems clear that analysts at the outset of reform underestimated the persistence and ability of sector participants – both public and private – to innovate in pursuit of workable solutions to the specific problems unleashed by reform in their countries. Dunavant's Distributor System, Cottco's outgrower scheme, and, perhaps, Tanzania's passbook system stand out in this regard.

Table 8. Status of Cotton Sectors in Southern and Eastern Africa as of 2005

Country	Market Structure and Firm Behavior	Input Provision and Credit Recovery	Lint Quality	Production & Productivity Trends	Future Challenges
Tanzania	- Many firms compete heavily in output market - High seed cotton prices despite high burden of taxes and levies.	- Little progress on seed qual. - Partial provision of chemicals through Passbook system. - Leaves room for development of independent private input system	- Declining prior to reform; decline has continued since - Auction system offers hope for improvement, but still awaiting pilot phase	- Record production in 2004 after slump of several years - Limited input provision on credit makes production more price responsive than in neighboring countries	- Maintain (and expand?) passbook system - Develop auction system for quality control - Increase farm productivity
Uganda	- Many very small firms compete heavily in output market - Cottco left sector in 2005	- Little or no provision by cotton buyers as of 2003. Some progress since that time.	- Declined since reform	- Rose to 45,000 mt in 2005 from 20,000 mt - Individual farmers produce very small quantities (100-200 kg)	- Public/private cooperation to improve input provision - Increase scale of production at farm level
Zimbabwe	- Concentration declining, with heavy competition from new firms - Cottco's market share < 60% - Prices rival Tanzania after brief decline	- Share of farmers receiving input credit steady at 35-38% - Quality of assistance has declined and sustainability open to question	- Indications that it is declining, as farm level quality control has diminished	- Yields probably falling, based on Cottco ending its input schemes - Production remains > 200,000 mt, near record levels	- Develop sector coordination strategies in a more competitive environment to reinvigorate input and extension assistance and stem decline in quality
Zambia	- Highly concentrated, CR2>85% - High prices, rivaling Tanzania	- Effective among top two players, though indications in 2005 of more credit default - More provision by smaller players due to Cotton Outgrower Fund	- Polypropylene contamination controlled since 2003; lint now receives small premium on world markets	- Production booming - Yields appear to be rising steadily	- Strengthen effective competition while avoiding credit default crises - Rework Cotton Act to stress coordination over policing - Introduce new germplasm
Mozambique	- At least 10 companies, each with geographic concession - Prices to farmers remain the lowest in region - Proposals on table for evaluation and re-awarding of concessions	- Both effective outside Nampula - New seed available in most of country, including Nampula - Credit default a recurring problem in Nampula	- Remains generally poor, with 3% discount on world markets; exceptions for some companies	- Prod'n rising since 2000, but well below 1999 peak - Nampula losing share - Yields outside Nampula rival best in region; among lowest in region w/in Nampula	- Extend performance seen outside Nampula into the province - Operationalize plan to regularly evaluate and re-award concessions

We draw several lessons from this experience. First, though cotton sectors face common technical challenges, workable solutions must be responsive to local conditions. Sector structure is heavily influenced by history, and is a key variable in determining what is and is not likely to be appropriate for a given sector. The recent experience of Tanzania (and, arguably, Mozambique) should encourage policy makers to work with sectors as they are, rather than to try to radically influence sector structure or to impose a "textbook" solution to a particular problem from outside.

Second, institutional innovation is the key to improving performance in cash crop sectors; large injections of public capital are not needed. Where governance and accountability are tolerably effective, levies on cotton marketing, ginning and/or export activities can generate all the funding required for cotton-related research, quality control, and perhaps input supply[20].

Third, the failure of the CDO scheme in Uganda, and the Agricultural Inputs Trust and Cotton Development Fund in Tanzania, all suggest that direct state management of the funds from such levies is problematical. Vesting regulatory and coordination functions within multi-stakeholder bodies, where the state is one stakeholder amongst several, may be the most promising approach for many sectors. Zambia's public/private sector approach with the Cotton Outgrower Fund is one good example of this. This perspective suggests that it may be important to transform Mozambique's IAM fairly quickly into a multi-stakeholder organization, as has been proposed by stakeholders there.

Fourth, the principal objective for institutional innovation, and the appropriate role for public agencies in promoting innovation, varies with the structure of the market for seed cotton. In sectors where many firms compete, the main objective should be to ensure effective and efficient coordination, so as to enable the provision of public/collective goods and to provide assurance for asset specific investment. This may require that the state – or a multi-stakeholder authority vested with authority by the state – oblige participants to sign up to certain codes of conduct (concerning respect for others' contracts, quality control practices and seed varietal zoning, for example) as a condition for holding a license to operate within the sector. This is the approach proposed by Zimbabwean stakeholders in response to the sector's recent difficulties[21]. In addition, it may require that the state and private actors collaborate to introduce new, sector-wide coordination mechanisms, as has occurred in Tanzania.

In sectors with less direct competition among firms, the main objective should be to provide incentives for strong performance in pricing and service provision. Where limited competition is due to a concentrated market structure, as in Zambia, the focus should be on assuring effective competition for the major players while providing these competitors with reasons to avoid promoting credit default. The Cotton Outgrower Fund has been used for this purpose in Zambia, and seems a more promising approach than giving the Cotton Board (or any other regulatory

[20] However, it is hard to see African cotton sectors providing anything more than very modest net financial transfers to the remainder of the economy, particularly while international lint prices remain depressed. Instead, their contribution to growth should occur primarily through income/consumption and other multipliers.

[21] It is also part of the approach embodied in Zambia's proposed Cotton Act, perhaps in anticipation of more ginning firms arising in the country.

authority) exaggerated powers to police the sector. Where the lack of competition is policy-induced, as in Mozambique, the challenge is to provide incentives for strong performance even among firms whose internal culture may not reward such performance. In Mozambique this is being tackled by revisions to the regulations governing cotton concessions. Confidence in the new system will depend on transparency and fairness in the decision-making process for extending or terminating concessions.

Finally, regular "deliberative fora" (Hall and Soskice 2001) are invaluable for building trust between stakeholders and seeking innovative solutions to tackling sector-wide problems. It is easier for small numbers of key stakeholders to chart a common course than large numbers. In some cases stakeholder associations (such as Tanzania Cotton Association) can partially overcome this numbers problem, but where there are major divisions within stakeholder groups (e.g. amongst ginners in Mozambique or between established and newer firms in Zimbabwe) progress may be dependent upon the ability of the state to play an even-handed but strategic role.

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