



COTTON SUBSECTOR

BACKGROUND

At the beginning of the 1990's, the drop in world market prices for cotton lint and the rising costs of domestic production that led to the overvaluation of the CFA Franc progressively eroded the competitiveness of the cotton subsector to the point where it was producing at a loss. The combined effects of the devaluation of the CFA Franc in January, 1994, and the rise in world cotton prices in 1994 and 1995, have, in contrast, injected new life into the subsector. Its profitability and competitiveness have thus improved, at least for the time being. While these two events have certainly contributed to a better short-run environment for the subsector, the fall in world prices, combined with the strong depreciation of the dollar in the second half of 1998, demonstrate the vulnerability of the subsector. Consequently, the gains may be short-lived. Because cotton revenues are so important for farmers, the cotton companies, governments and other actors in the subsector, and thus for overall economic growth, it is important to review the mechanisms by which actors' profits are translated into sound investments that are capable of generating and sustaining long-term growth and competitiveness based on real gains in productivity.

OBJECTIVES

This bulletin summarizes the results of a series of studies undertaken by researchers from research institutes and universities in Benin, Burkina Faso, Chad, Mali and Senegal on the effects of the devaluation of the CFA Franc (CFAF) on the profitability of the cotton subsector, its constraints, and its perspectives. On the basis of this research and the contributions of representatives of producers, governments and cotton companies, expressed at a symposium held in Bamako, Mali in July, 1998, the bulletin raises issues to be considered regarding what needs to be done to ensure the economic and environmental sustainability of the cotton subsector.

RESULTS: Overall Trends

The results from Benin, Burkina Faso, Mali and Chad show the same general trends, in contrast to those observed in Senegal.

• **Increased Seed Cotton Production:**

Under generally favorable climatic conditions, the production of seed cotton rose in 1997/98 by between 80% and 107%, depending on the country, relative to the average level for 1990 to 1993.

**Percentage Change in 1997/98
relative to the averages for 1990/91 to 1993/94**

	Area	Agro- nomic yield	Seed cotton prod.	Lint prod.	Producer price	
					nom'l	real
Benin	137	-20	104	90	103	15
Burkina Faso	64	19	95	108	88	37
Chad	88	9	107	106	99	1,5
Mali	141	-17	79	86	84	26
Senegal	25	-21	-1	3	117	56

Sources: Cotton Companies; CFTD

• **Expansion in Cultivated Area:**

This increase is due above all to an expansion in cultivated area, ranging from 64% to 141%. In contrast to the decline observed in Benin, Mali and Senegal, the yields in Burkina Faso and Chad increased by 19% and 9%, respectively, but remained more than 10% below those of the former countries.

• **Increased Production of Cotton Lint:**

The increase in production, expansion of ginning capacity and the sustained high ginning ratios allowed the cotton companies to increase their production and sale of cotton lint by between 86% and 108%.

• **Franc Zone Exports Gain Market Share:**

The growth in the volume of exports allowed the exporters in the CFA Franc zone to gain a greater share of the world market, i.e., 13.9% in 1997/98 - a 58% increase relative to the 8.8% share the countries held from 1991/92 to 1993/94.

• **Phenomenal Increase in Gross Sales:**

The doubling in the sale price of cotton lint in CFAF in 1994, the high level of the world price from 1994/95 to 1996/97 relative to the historical average, and the appreciation of the dollar in 1997/98, had the combined effect of maintaining an average sale price of more than 950 CFA Francs/kg (C.I.F. Europe) during the last four years. This increase and the strong growth in production drove a phenomenal increase in gross sales

This synthesis was written by James Tefft (INSAH/MSU) with John Staatz (MSU), Josué Dioné (ADB) and Valerie Kelly (MSU) on the basis of studies undertaken by Gauthier Biaou, Adam Ahanchédé (FSA/UNB) and Henri Gouthon (CNEX) in Bénin; Yamsékéré Tiendrébéogo, Jean-Pierre Sawadogo and Kimseyinga Savadogo (CEDRES) in Burkina Faso; Demba Kébé, Lamissa Diakité and Hamady Djouara (IER) in Mali; Amadou Diouf, Léna Fall (UPA/MDR) and Babacar Faye (ISRA) in Sénégal; Yacoub Abdelwahid and Mahamat Foye (DPPASA/MDR) in Chad; with support from Jean-Charles LeVallée and Chris Penders (MSU).

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revenues of the cotton companies - a rise of 61% to 225% in real terms - to reach almost 200 billion CFAF in Mali in 1997/98.

- **Improvement in Government Finances:**

This windfall was such that export earnings from cotton exports accounted for over 50% of total export earnings, thus generating additional foreign exchange that allows these governments to honor their debt-service obligations, which increased (in CFAF terms) with the change in parity.

Impact and Producer Response

- **Price Increase:**

Following the rise in the sale price of lint, producer prices began to increase in 1994/95. By 1997/98, nominal producer prices were 84% to 114% higher than the average level for 1990 to 1993. While producer prices did not rise as much as world prices - which grew 127% - resulting in a decrease in the producers' share of the export price to a level of 43% to 51% - the producer price did rise more strongly on average than did the price of inputs that determine the costs of production. Expressed in real terms, the producer price in Benin, Burkina Faso, Chad, Mali and Senegal increased by 15%, 37%, 1.5%, 26% and 56%, respectively, across the entire period (1994-97). However, in 1994, the high rate of inflation combined with the slow transmission of cotton price increases to producers resulted in a downturn in the real producer price in the majority of the countries.

- **Attractiveness of Cotton:**

The need to maintain a certain standard of living in the face of inflation, to purchase consumer goods on credit, and to obtain input credit inaccessible outside of the cotton subsector, are the factors, among others, that explain the attractiveness of cotton for farmers. In combination with the rise in the producer price, these factors contributed to an expansion in the area under cotton cultivation.

- **Reduction in Fallow Periods, Increase in Newly Cleared Land:**

The results of the studies show that this expansion is attributable to a reduction in fallow periods, a substitution of cotton for food crops and livestock grazing in the traditional production areas, and the bringing of newly cleared areas into production in zones where cotton has not been previously grown.

- **Reduction in the Use of Fertilizer:**

The rise in the price of inputs of between 83% and 129% influenced the decision of the majority of producers to lower the dosage of chemical fertilizers. While the level of fertilizer applied remains below recommended doses, particularly in Chad where the price was at least 10% to 20% higher than in the other countries, farmers increased use of manure following the devaluation, although the doses remained insufficient.

- **Insufficient Labor:**

The expansion of area caused an increase in the demand for labor. In order to meet this need, producers have increased

their own labor time and tried to increase use of hired labor, which was not always available. In spite of these additional efforts, the fields often remained insufficiently maintained.

- **Higher Production Costs:**

In general, the increases in input prices, depreciation on equipment, and labor use raised the costs of production by between 50% and 79%, depending on the country. The increase in costs was tempered, however, by small increases in insecticide costs, due to a change in the type of insecticide and the dosage used.

- **Rising Real Revenue for Farmers with Animal Traction Equipment:**

In terms of net real returns - excluding the cost of family labor - the change in profitability remains small. While the equipped producers have in general increased their revenues (Benin, Burkina Faso, and the Kadiolo zone of Mali), the response was strongly linked to a rise in yields. With the exception of Benin, net real returns of semi-equipped and non-equipped producers fell.

At first glance, the comparative analysis of the period after devaluation shows that the daily returns to labor - and thus the profitability - to the cultivation of coarse grains (millet, sorghum, maize) is superior to that of cotton. However, these results fail to take into account the share of the amortization of the «cotton» equipment and the use of «cotton» inputs on cereals, both of which ought to be imputed to the cost of cereals production when calculating profitability.

- **Purchases of Consumer Goods Rather than Directly Productive Investments:**

Farmers whose profits rose have, in general, used their revenue to buy consumer goods and improve their housing. Very little productive direct investment has been realized. With regard to the purchases of agricultural material and draft animals, the studies reveal that the majority of these purchases are made in cash. Used equipment is purchased more often than new equipment.

- **Collective Revenue Invested in Social Infrastructure:**

The use of collective revenues by farmer organizations involved in the cotton subsector, earned mainly by handling the assembly of seed cotton for the cotton companies, is principally used for the construction of schools, health centers, wells and other infrastructure of a social character, formerly provided (at least in theory) by the state.

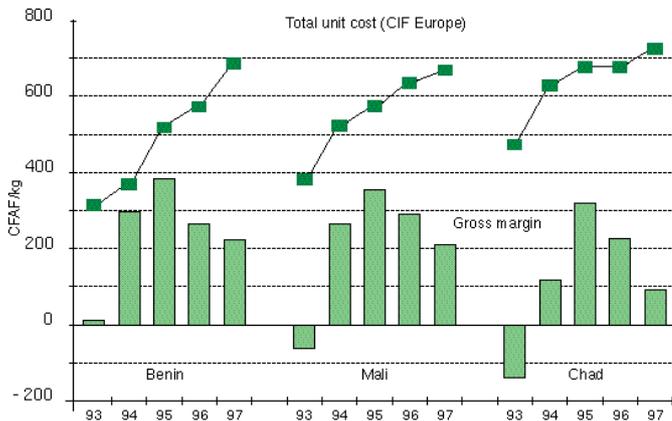
Impact and Response of the Cotton Companies

- **Increase in the Total Delivered Unit Cost of Cotton Lint:**

The average total delivered unit cost of lint to the cotton companies increased by between 52% and 120%, depending on the country, between 1992/93 and 1996/97, ranging from 670 to 734 CFAF/kg (C.I.F. Europe). The smallest percentage increases occurred in Senegal and Chad, on account of their already higher total unit costs in 1992/93. In Benin, the rise in the producer price increased the cost of buying seed cotton by 115%, which represented nearly 72% of the company's total unit cost, compared to 44% and 58% in Mali and Chad,

respectively. In the land-locked countries, the costs of transport increased more than other categories, often rising more than 100%. While the rise in financial charges is explained by new investments in factories, overhead charges increased significantly even if the cost of development activities grew during this period.

Change in total unit cost and gross margin of cotton lint



Sources : SONAPRA, CMDT, COTONTCHAD

• **Increase in Gross margins:**

In spite of the increase in total unit costs, gross margins remained high due to the devaluation and the rise in world prices in 1994 to 1996, on one hand, and the appreciation of the dollar, from 1996 to 1998, on the other. While the gross margin reached and even surpassed 300 CFAF per kilogram in 1994/95, the continued increase in the total unit cost of lint reduced the gross margin, which fell by between 40% and 71% in 1996/97. In 1996/97, the gross margins on cotton lint were 90, 207 and 233 CFAF per kilogram in Chad, Mali and Benin, respectively.

The distribution of the gross margin among actors changed very little following the devaluation in Benin and Mali. More than 85% of the gross margin was absorbed by the Beninese government and the stabilization fund, and nearly 8% was returned to SONAPRA and the producers (divided between individual producers and farmer organizations). In Mali, on the other hand, the CMDT received nearly 40% of the gross margin, followed by the producers (33%), the Malian government (21%) and the stabilization fund (6%).

• **Use of profits:**

The cotton companies used their returns to build, modernize and increase their ginning capacities, to repay the debts incurred during the crisis and to diversify investments in private, non-cotton related companies.

The profits received by the governments helped to reduce government budget deficits, reimburse public arrears and debts, and contribute to the stabilization funds. With the exception of Senegal, the taxes and direct and indirect tariffs that come from the cotton subsector represent a significant portion of government revenues.

POLICY IMPLICATIONS

The responses of the actors and the other trends apparent in the cotton subsector following the devaluation of the CFA Franc are generally positive, particularly compared with the situation in 1993. It is nonetheless clear from the studies and the opinions of the actors that the measures necessary to make the subsector more productive and competitive, in a sustainable manner, have not yet been put into place.

The recent fall in the sale price to around 704 CFAF/kg (C.I.F. Europe), a level close to the current total delivered unit cost (C.I.F. Europe) of certain countries, illustrates the risks of external factors that confront the subsector.

The situation calls for a shift in cotton policies towards a greater emphasis on improving the productivity and competitiveness of the subsector and requires certain accompanying measures that need to be planned now. These measures should be designed to achieve the following objectives: a reduction in total unit cost of cotton lint; sustainable production of cotton seed; and efficient management of price and exchange-rate risks.

The historical success of the cotton subsector relative to other subsectors in the economies in CFA Franc zone is, in part, due to the strong participation of the governments in the development and monitoring of cotton policies. The recent involvement of farmer organizations in several countries in the subsector's management is a positive step. The implementation of the aforementioned measures will require strengthening the partnership between farmers, cotton companies and the governments.

Reduction in total unit cost of cotton lint

Today, more than ever, the risks of volatility in the world market and the dependence of many CFA-zone countries on cotton revenues require a redoubling of efforts to reduce the unit costs of production of cotton lint in order to maintain the subsector's competitiveness and the profits to which it has grown accustomed. This effort to create a leaner, more profitable and competitive subsector requires a reexamination of alternative, more efficient and less costly methods to carry out the different functions of the subsector. This reexamination should be based on a detailed and transparent audit of the accounts of the cotton companies. The success of recent initiatives in certain countries to reduce costs - e.g., in initial assembly of seed cotton and in transportation - demonstrates the types of improvements that are possible.

• **Institutional evolution:**

The cotton subsector stands at a critical juncture in its institutional evolution. It remains to be seen whether the partial modifications of certain costly functions (transportation charges, public service activities) are adequate to reduce the total unit cost of cotton. If these changes do not succeed in achieving the desired cost reductions, then it will be necessary to consider more fundamental structural changes to achieve such goals. Although increased competition may lower costs in certain stages of the subsector (e.g., ginning), these potential cost savings at any given stage must be balanced against the benefits derived from an integrated subsector with tight vertical coordination.

The decisions regarding the future institutional evolution of the subsector become all the more complicated when one considers the current consolidation and establishment of contractual networks by multinational agro-chemical pharmaceutical firms that possess the intellectual property rights to a variety of performance-enhancing genetics (for example those containing the BT gene). Access to those genetic resources will play a key role in determining the future competitiveness of the subsector. The need to maintain continued access to the results of ongoing varietal and biological research will demand close relations with these companies, although the best mechanism to assure such relations - international partnerships or contractual mechanisms - remains to be determined. While an integrated subsector may possess advantages in accessing this new technology, the interest of the giant multinationals in investing in the CFA Franc zone will depend in part on the protection of their intellectual property rights. Establishing mechanisms to assure enforceable contracts thus becomes very important.

- ***Need to Clarify Roles:***

In all the discussion about the restructuring of the subsector, the fundamental question comes down to this: What is the best way of organizing individual and collective action to improve the productivity of the different levels of the subsector, and the coordination among those levels, while taking into account economies of scale and trying to avoid rent-seeking behavior? In short, it is not simply a question of changing the system. It involves determining the appropriate roles of the individual and collective action and then empowering the relevant actors with the legal, financial, organizational and technical resources needed to carry out those roles.

Given the need of the subsector to remain competitive, it may no longer be possible for the subsector to directly finance «public good» activities. In that case, it will be necessary to clearly distinguish the costs and the associated investments in the production of cotton and those involved in the provision of public goods and services. The former must be borne by the subsector but the latter should be financed by public resources (including the state's share of cotton revenues).

Given the good historical performance of the cotton companies in carrying out general development activities and the lack of other public development agencies to carry out such functions in some countries, the companies could feasibly continue these public missions through non-cotton financing. However, their involvement as providers of such services may be short-lived in certain countries to the extent that greater democratization and decentralization may offer other possibilities for carrying out development activities.

The past experiences of restructuring subsectors in other countries or for other commodities reminds us of the importance of implementing changes gradually. Whether or not restructuring disrupts the coordination between various levels of a subsector depends on the capacity of new actors to carry out new functions, the efficiency of economic governance systems and the mechanisms for the enforcement of contracts. At the same time that actions are taken to reduce the total unit cost of production, the gross margin could also be improved by obtaining a higher value for the cotton seed (nearer to its opportunity cost), by additional efforts required to produce a better quality of fiber destined for niche markets, and a re-orientation of the profits that result from the gap between the costs the companies are allowed to charge under the contract-plans (*coûts objectifs*) and their actual unit costs of production. Enhancing local value-added to the cotton lint at the national

and regional levels could also reduce the effects of shocks from the world market. With a better coordination of cotton and textile policies, efforts to reduce energy costs, improve the financial productivity of labor and develop targeted marketing strategies, the cotton subsector could conquer certain markets in the sub-region (pharmaceutical, small production shops, inexpensive cloth).

Sustainability of Production

The current trend of extensification, in which farmers are not following recommended cropping practices and conservation measures and are not using enough mineral and organic fertilizers, is not sustainable in the long run. It has resulted in low yields and has had a negative effect on the environment in general and soil fertility in particular. At the risk of oversimplifying a complex problem which manifests itself differently in every country, the challenge is to produce cotton and other crops in a manner that responds to the immediate needs of farmers and the country while providing the nutrients needed to sustain soil fertility.

- ***Farmer strategies:***

It is clear that the reduction in the number of years in fallow and the insufficient quantities of fertilizer and organic supplements do not currently permit the soil to maintain an appropriate level of nutrients. Similarly, new land currently being opened to production, while productive today, will eventually have similar problems unless it receives sufficient fertilizer. Farmers' behavior with respect to the adoption of cropping practices appears to be largely determined by their primary interest in meeting their food needs and maintaining a certain standard of living, at least in the short run, in the least risky way possible. Farmers, like almost all the actors, particularly in developing countries where many are confronted with the basic problem of survival, focus on the potential short-term benefit of using the recommended technologies, not necessarily with respect only to cotton but relative to the overall contribution to their overall objectives. They thus tend to discount the long-term financial returns to soil recaptalization stemming from current investments in fertilizer.

Given farmers' priorities, their aversion to risk, the current input/output price ratio, the higher short-term return to alternative activities relative to investment in soil fertility (e.g., dry season, rural-to-urban migration instead of spreading manure), it is worth asking whether the technical packages recommended to farmers for intensive production are appropriate and profitable for all types of cotton farming households given their scales of operation, their degree of mechanization and their food situation.

- ***Components of an intensification program:***

The measures necessary to encourage farmers to use appropriate doses of fertilizer and organic matter and adopt other conservation practices will almost certainly vary by country. Nonetheless, these measures will probably contain some of the following elements: a better incentive environment, an efficient extension system, more thorough integration of livestock and farming operations, a larger percentage of fully-equipped producers, and greater involvement of farmer organizations supported by an adequate research program.

- The continued use of unsustainable extensive practices in Benin in spite of relatively large increases in producer prices relative to other countries illustrates that high prices alone are insufficient to motivate farmers to intensify production. Improving the input/output price ratio nevertheless remains important and will require additional efforts to reduce the cost of fertilizer. First, pooling purchases at the regional level for a single formula of fertilizer and greater use of bulk blends are two potential cost-cutting actions that merit greater study. Second, if the establishment of a competitive system can contribute to a lower unit cost of fertilizer, its efficient functioning will first require the development of skills of new actors, a viable credit system and access to market information for all actors. Investments of a public nature are also indispensable to develop a legal system and mechanisms for contract enforcement and to create a government or industry oversight committee to coordinate and monitor plant protection activities and input quality. Recent experiences in Benin could be instructive in this area.
- It is also important to evaluate the availability of qualified personnel in the cotton company or other government agencies to participate in an extension program related to soil recapitalization.
- Improved soil fertility will also require increased use of manure. Increased availability of manure depends, however, on intensive livestock production and the means to transport the manure to the fields. The need to equip farm households currently lacking animal traction equipment and to replace old and worn-out farming equipment on many other farms calls, in turn, for a review of policies and other factors that may constrain imports and local manufacture of agricultural equipment.
- Given the nature of communal land use rights and their detrimental effects on farmers' interest in undertaking long term soil conservation measures (on fields whose future use is not guaranteed), a community-based approach and participation of farmer organizations would appear to offer possible solutions to the problem. The transfer of functions to farmer organizations would, however, need to be preceded by appropriate training, especially in the area of financial management of communal resources. Improved performance of these structures will depend in large part on the creation of an appropriate institutional and legal environment that assures the establishment and respect of transparent working rules acceptable to all the actors. The creation of decentralized structures currently under way in certain countries will undoubtedly influence these developments.
- Greater incorporation of economic analysis in the future development of technology packages is also needed in order to understand better the level of profitability and appropriateness of the recommendations for different types of farmers according to their size, equipment levels and food situation.

- **Financing of productive investments**

Investments in the productivity-enhancing measures mentioned above will require greater mobilization of financial resources. The choice and source of financing will

be strongly influenced by any changes to the institutional structure of the subsector. Given the relative lack of governments' financial resources other than those generated by the cotton subsector and the important share of net revenues allocated to the cotton companies and governments, it is highly likely that the cotton subsector will itself need to bear the cost of financing the implementation of a large part of these measures.

Measures to remove major obstacles to improved subsector productivity should receive priority and participating actors should receive the funds needed to implement them. Such an approach requires both a new division of the net revenues and a reorientation of their future use. It is important to reexamine the current uses of cotton revenues in the context of the priority investments needed to attain the productivity and sustainability objectives in the short and long term.

As government (which is a primary beneficiary of subsector profits) searches for a balance between its current financing needs for its operating budget (e.g., civil servant salaries), servicing the foreign debt and investing in other important non-cotton sectors, it needs to bear in mind that without productive reinvestment in the cotton subsector, the subsector's competitiveness risks being eroded to the point that it kills the goose that lays the golden eggs.

While certain productive investments linked to the short-term performance of the subsector can be financed directly by the subsector, others whose impact is more long term should be financed from the gross margin and thus will depend on the level of the subsector's profits. A larger part of the government's share of the profits could be allocated to productive investments of a public nature (e.g., transport infrastructure, training actors, recapitalizing soil). For example, investments in improved roads could lower transport costs that would contribute to lower input prices.

Stabilization funds represent another potential source of financing for productivity-enhancing investments. The opportunity cost of the stabilization funds appears very high compared to their past use and potential effectiveness in the future. Could these funds best be used for other productive investments? An alternative use of the fund presupposes, however, the existence of alternative ways to manage risks of fluctuations in world market prices.

Risk management

The probability of future fluctuations in the world market price and exchange rates requires an evaluation of the mechanisms to manage these risks. The increase in Chinese exports and the drop in Asian demand for cotton lint in 1998 that led to a fall in the world market price, and the depreciation of the dollar relative to the French franc, resulted in a 22% decrease (200 CFAF/kg) in the CFAF price in a period of three months (9-11/98). This change highlights again the effect of price and currency variability on the competitiveness of cotton in the franc zone, and calls for greater reflection on the most appropriate price system for the subsector.

- **Stable producer price:**

If it is important to increase producer prices in periods of a high world market price, the losses recorded by the subsector in 1991/92 and 1992/93 lead one to question whether the system is able to reduce the price in down periods.

The call for a more flexible price system must be balanced, however, by the need for a stable producer price or at least a floor price that guarantees the relative profitability of growing cotton. Stable prices have proven to be very important to assure a constant level of production needed for actors throughout the subsector to have profitable investments. For short term fluctuations, greater use of futures markets for cotton lint and foreign exchange offers a certain level of protection.

- **Exchange rate policy:**

Future changes in the euro-dollar exchange rate and the potential risk of the devaluation of the Chinese yuan - with implications for increased competitiveness, rising lint exports and a drop in world market price - are scenarios that are useful to consider when examining the current and future break-even point for cotton lint in the CFA franc zone. What are the limits of the capacity of the subsector to maintain its future competitiveness? Does the magnitude of the potential effects of these two events present a risk that would compromise any future gains in competitiveness resulting from the efforts to improve subsector productivity? What is the best exchange rate policy for the CFA franc - fixed, flexible - to manage currency fluctuations and their effects on subsector competitiveness?

Although this subject exceeds the context of this discussion, it may prove useful for countries in the franc zone to evaluate the experiences of other cotton-producing countries which are organized differently, have flexible exchange rate policies and maintain a different type of price system.

- **Diversified economy:**

Finally and independently of price and exchange rate policy, a more diversified economy less dependent on cotton with greater promotion of other subsectors would contribute in the long run to a reduction in risks to economies in the franc zone.

Maintaining the expansion of the cotton subsector and sustainable economic growth demand that the subsector not rest on its laurels. The technical, political, institutional and financial aspects are all inextricably linked, and the stakes are so important at the sectoral and the macroeconomic levels that it would be dangerous to treat them as simply technical problems. The solution to current challenges facing the subsector require a pro-active approach and the involvement of all the actors in the design, implementation and monitoring of the productivity-enhancing measures.

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