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**Preserving vertical co-ordination in the  
West African cotton sector**

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## **Summary**

In this paper, we defend the idea that in the African context, non-market co-operation between farmers and ginning companies outperforms market transactions. In the absence of a reliable legal mechanism, market liberalization threatens the sustainability of contractual agreements between farmers and cotton companies. We present alternatives to the full market competition option and to the public monopoly organization that allow the production contract to be preserved. Special attention is paid to the case of Burkina Faso where efficiency gains have been obtained thanks to the strengthening of farmers' organizations and their financial participation in the cotton company.

**Key Words:** Cotton – West Africa – Contract farming – markets failure – zoning – yardstick competition

## 1. INTRODUCTION

African cotton production has strongly increased since the 70s making the region the second world exporter of cotton lint in 2000/01 (appendix A). This production was initially promoted by public companies, which were the sole buyers of seed cotton and the sole exporters of cotton lint<sup>1</sup>. In the historical model, the cotton industry was characterized by vertical co-ordination between farmers' groups and cotton companies. This co-ordination took the form of a contractual arrangement that went far beyond a forward contract specifying only prices and quantities. Indeed, it could be interpreted as an implicit production contract with mutual commitment (Glover, 1984, 1987; Porter and Phillips-Howard, 1997). It was tacitly renewable and resulted from insurance, credit and input market imperfections. On the one hand, the public company generally supplied the farmer with credit and adequate inputs such as seeds, pesticides, fertilizer, and technical assistance. Moreover, the production contract included a short-term price insurance mechanism as cotton and input prices are set at the beginning of the season. The company committed itself to buying all the harvest, whatever the international price. On the other hand, the farmer pledged to deliver his harvest to the company in order to reimburse the input credit. Although this organizational model has been successful in promoting cotton production, some critics have been concerned about the low level of farmer prices (Pursell and Diop, 1998). The poor incentive system was said to contribute to allocative inefficiencies and to the persistence of poverty in rural areas.

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<sup>1</sup> Generally, public companies did not have a legal monopoly on inputs supply. However, in most cases, they were the sole sellers of cotton inputs.

In the 90s, these criticisms led to structural reforms, in turn giving rise to a wide range of market and institutional options. Most countries chose a combination of partial privatization and market openness. Where public enterprises remained, the range of their activities was modified considerably in order to reduce production costs and to improve competitiveness. For instance, in Ghana, the reforms allowed free entry into the cotton sector. In Benin, the public monopoly<sup>2</sup> was removed, but competition between ginners is still strongly regulated by an inter-professional organization. In Côte d'Ivoire, the former cotton production area of the CIDT has been divided into three zones. Two of them have been allocated to private firms while the third remains under the control of the CIDT. In Burkina Faso, the cotton sector was under the control of a single company (SOFITEX)<sup>3</sup> until 2001. However, the state now has a minority share in the company, management being in the hands of a private operator under the close control of farmers' unions.

Whatever the institutional evolution of the cotton sector, one thing seems crucial: preserving the strong co-operation between farmers and ginning companies. Indeed, in the absence of a reliable legal mechanism, market liberalization may induce the collapse of contractual agreements between farmers and firms. Consequently, in a context where market failures still remain a major hindrance and the farmers' welfare a major goal, it is important to investigate the costs and benefits of different institutional arrangements.

In the first section we discuss the expected advantages of the production contract. The main idea of this section is to highlight the fact that in the African context, non-market co-operation between farmers and traders outperforms market transactions. In the second section, we show through the Ghanaian experience, that the main advantage of the historical model is to prevent opportunistic behaviors when property rights are incomplete. In the third section,

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<sup>2</sup> In the historical model, the public firm is both a monopsony for cotton collection, and a monopoly for cotton lint exportation. In this paper, for convenience, we refer to this firm as the "monopoly".

illustrated by the Malian case, we outline the cost of the monopolistic market structure. In the following sections, we present alternatives to the full market competition option and to public monopolistic organization. The fourth section addresses the case of Burkina Faso where some efficiency gains resulted from the farmers' participation in the cotton company. In the fifth section, we analyze the potential benefits of horizontal unbundling through the Ivorian experience. Finally, we draw the main conclusions.

## **2. PRODUCTION CONTRACT AS A RESPONSE TO TRANSACTION COSTS**

In Africa, the high level of transaction costs prevents farmers from having access to certain markets. These transaction costs are generated by the costliness of information. Asymmetric information induces moral hazard and adverse selection on insurance, credit and input markets. In this case, production contracts between farmers and a firm reduce the market transaction costs associated with the identification of the agent, the monitoring of its behavior and enforcement in the case of non-compliance with the contractual arrangement (Coase, 1937; Williamson, 1975, 1985).

First, the production contract allows partial compensation for the failure of the insurance market. Indeed, the input and seed cotton prices are usually set at the beginning of the season. Hence, the price risk is transferred to the firm, which can be considered as less risk adverse and more able to manage it. This price guarantee promotes production and improves farmers' welfare as it allows them to smooth their consumption (Newbery and Stiglitz, 1981). It goes without saying that alternative individual strategies against risk are also available when insurance or credit markets are lacking. The farmer can diversify his activities inside or outside the agricultural sector to reduce income volatility (risk management). In

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<sup>3</sup> In 2001, a new private operator entered the market, generating a potentially competitive market structure.

addition, he can cope with the residual risk by setting up a precautionary savings fund (inter-temporal consumption smoothing) or by sharing risk inside a mutual insurance group, e.g. an ethnic or village community (inter-individual consumption smoothing) (Besley, 1995). Whatever their interest, the aforementioned individual strategies are of course costly. Indeed, diversification prevents the exploitation of comparative advantage. The cost of precautionary saving is prohibitive for the farmers who are near the subsistence threshold and the savings do not protect against repeated negative shocks. Moreover, the farmers only have access to productive assets (cattle, food stocks ...) which are an imperfect substitute for saving products since their liquidation breaks into the future household income (Deaton, 1992). Finally, mutual insurance schemes only protect against idiosyncratic risks, and social pressure may be insufficient to prevent opportunistic behavior of the members (Jalan and Ravallion, 1999; Ligon, 1998; Townsend, 1994).

Second, the production contract is a response to the input credit market failure. In sub-Saharan countries, freehold property does not exist so credit cannot be secured by a mortgage on land. Moreover, the farmer cannot pledge his future harvest as security to a formal or informal credit institution because of the riskiness of the harvest value. Hence, the main advantage of the production contract is its seasonal credit facility. On the one hand, a production contract reduces the uncertainty of the future value of a harvest. It eliminates price risk and reduces yield volatility by guaranteeing input access and technical advice. On the other hand, in the countries where the banking system has collapsed, the cotton companies have to substitute for the banks and provide input credit.

Third, the production contract is a response to the input market failure. In the cotton sector, the quality of inputs (seeds, fertilizers, chemicals and technical advice...) is a crucial factor for high yields and the quality of cotton lint. The main characteristic of the input market is the informational asymmetry between the buyer and the seller regarding the quality of the

product leading to an adverse selection phenomenon (Akerlof, 1970). The willingness to pay for products offered is weak, so only sellers of poor quality inputs offer them for sale. Consequently, poor quality inputs will drive away the good ones and little trade will occur. A potential solution is the implementation of legal standards, but this solution is not easy due to the present weaknesses of African governments. In this case, the trading company alleviates the absence of legal standards by a commitment to the quality of input supplied.

To sum up, thanks to seasonal credit, production contracts allow cotton farmers to benefit from a steady provision of quality inputs. Moreover, the contractual commitment to a trading company gives farmers access to services such as agricultural advice and to a price insurance covering the whole harvest (Araujo Bonjean and Combes, 2001). The firm also benefits from the contractual commitment through an increase in cotton yields, steady deliveries, as well as a high quality product. This contract farming system can be seen as a “win-win” arrangement for both sides.

### **3. THE ENFORCEMENT OF THE PRODUCTION CONTRACT IN THE AFRICAN COTTON SECTOR : THE CASE OF GHANA**

The production contract in the cotton sector is a co-operative solution that benefits both farmers and ginning companies. However, in Africa, the main obstacle to the implementation of such contracts is the failure of the legal framework, which allows opportunistic behaviors. Farmers might not comply with their contractual obligations, nor might they deliver the effective harvest or reimburse the input credit. Moral hazard is reduced in a monopolistic market where the farmer’s outlet for seed cotton is unique, as is the case in a large number of West African countries. Indeed, defaulting would prove costly as the farmer would be excluded from the contractual relationship with the cotton company and consequently would be confronted with the difficulty of pre-financing the cotton season.

In the case of a competitive market, the farmer can sell his product to a rival firm. The question then arises as to whether the cost of defaulting is as high as in a monopolistic market. From an analytical point of view, game theory suggests that in the context of repeated games over an infinite period, the solution of a mutual commitment between farmers and firms should emerge. Respect of the contract is an investment in a good reputation: the default can be profitable in the short run but costly in the long run if the agent's discount rate is not too high. However, in Africa, experience shows that the farmers' discount rate is rather high, especially for the poorest. Moreover, even in the favorable case where the agent's discount rate is not too high, the problem in repeated games is the multiplicity of equilibrium (Folk theorem). Indeed, the self-enforcement conditions of the production contract also imply a common belief in the effectiveness of the punishment mechanism (*i.e.* the non-renewal of the contract in case of default). When this condition is not fulfilled, the co-operative solution of the production contract cannot emerge in a competitive market.

In Ghana, the liberalization of the cotton sector dates back to 1986. The public ginning company, the Cotton Development Board (CDB), was replaced by the Ghana Cotton Company Limited. The GCCL is a major company, whose private shareholding was initially 70% but grew to 85 % in 1995. The market also opened to fully private firms and today, ten companies are operating with three major ones: GCCL, PDL and Nulux. In this context, farmers used to get input credit from one firm and deliver their harvest to another, thus avoiding repaying their loan. Indeed, without any public regulation, the "free entry for all" policy favored the emergence of small-scale traders ("purchase companies") which do not invest in downward activities and are not interested in providing input credit.

In comparison with these "purchase companies", the ginning companies have a deeper transformation process with higher fixed costs. Therefore, they have to supply credit in order to secure a minimum provision of seed cotton without any guarantee about the effective



delivery. Confronted by a large scale cheating phenomenon, the ginning companies have to lower the purchasing price of cotton, aggravating the problem of debt collection. In this institutional environment, characterized by problems of enforcement, producer prices remained quite low in relation to international prices and purchase prices in neighboring countries (Table 2). After a sharp increase at the end of the eighties, following the liberalization process, cotton production remains far below its potential. For instance, in Côte d'Ivoire, a country with similar natural conditions, seed cotton production is more than ten times that of Ghana (table 1). Production failed to develop because of a low input use and low yields. The recent years experience shows that, despite the implementation of a zoning agreement (see below) firms have failed to set up efficient rules to counter the cheats, leading to the collapse of cotton production.

[INSERT TABLE 1 : Seed cotton production]

[INSERT TABLE 2 : Ratio of the producer price to the to international price of cotton lint]

#### **4. ECONOMIC INEFFICIENCIES AND AFRICAN COTTON PUBLIC MONOPOLIES : THE CASE OF MALI**

If the production contract is easier to promote in a public monopsony/monopoly context, the potential cost of this market structure cannot be ignored. The loss of economic efficiency and the distributional impact of this situation are well known.

First, for an exogenous international price, and as the result of the market power of the purchasing firm, seed cotton is paid at a lower price than the price peasants would receive in an environment of perfect competition. Second, mark up prices can result from the monopoly

position of the cotton company in the input market. Hence, a non-socially optimum consumption of inputs may occur, resulting in a loss of production. To some extent, the provision of inputs is subject to a *lock-in* effect resulting from the opportunistic behavior of the processing firm (Williamson, 1975). The presence of such allocative inefficiencies has been deeply analyzed since the publication of the World Bank 1981 Report on accelerated development in Sub-Saharan Africa. However, until the early nineties, cotton production has generally been promoted in the framework of public monopolies.

Beyond these allocative distortions, the public cotton companies have been criticized for enhancing "X-inefficiency". From the initial property rights theory (Demsetz, 1967) to the recent microeconomic developments (Tirole, 1990), there is a large body of literature indicating that most public enterprises suffer from a low level of productivity. They tend to remain inside their production-possibility frontier, failing to derive as much output as they could from the resources they employ (Leibenstein, 1966, 1989). With private ownership, good technical efficiency normally underlies the profit goal and the long run condition for company survival. In a public company, less attention is generally paid to this factor. The way in which property rights are distributed and the soft budget constraint these organizations face give rise to the Hicksian "quiet life".

Together with the property rights, a competitive market, as noted by Leibenstein (1987), stimulates pressure from the "bottom" from buyers or users, and pressure from the "top", from owners or their representatives. In public monopolies, these sources of stimulation are quite weak, when they indeed exist. Agents have limited incentives to work at best end for the whole community and the risk of a low level of effort is likely.

These criticisms on the way African public monopolies have been, and sometimes still are, managed have found a concrete illustration in the recent financial problems of the CMDT<sup>4</sup> in Mali.

The CMDT is a mixed company, with a majority state shareholding (60 % for the state and 40 % for DAGRIS). CMDT benefits from a legal monopoly on seed cotton purchases and provides farmers with inputs, credit and technical advice. Cotton production in Mali expanded considerably since the sixties (table 1). With a production around 600 000 tons in 2001/02, Mali is becoming the first African producer of cotton (appendix C). Nevertheless, this significant performance did not prevent critics. At the beginning of the new millennium, the Malian monopoly faced a severe financial crisis that was not only due to the dramatic fall in international prices, 46% from August 1997 to December 1999. Dissatisfaction had grown up among farmers who denounced the poor public management of the firm as a major source of low farm gate prices.

One of the main criticisms that have been put forward, especially for the 1997-1999, is the high and still increasing costs of processing units. Cotton transportation by the CMDT has also proved to be particularly costly. Another grievance has been focused on the financial terms of the investment program and on its consequences on the CMDT capacity to finance cotton production. The situation was at its height in the 2000/2001 season when the CMDT had to cut the producer price to reduce its huge deficit in a context where low international prices made the budget constraint harder. This situation led the farmers to reduce their cotton production significantly (tables 1 and 2). With a production of about half a normal year, the crisis reached a climax. Several regional workshops and the national conference (e.g. *états généraux*) of April 2001 followed these events, aiming at setting up a reform agenda. This

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<sup>4</sup> Compagnie Malienne de Développement des Textiles.

agenda includes in the short run the implantation/entry of a new operator and in the medium run, the privatization of the CMDT.

## **5. MONOPOLY AND FARMERS' PARTICIPATION : THE CASE OF BURKINA FASO**

A solution to reduce public monopoly inefficiencies while preserving vertical-coordination in the cotton industries would be to strengthen the empowerment of farmers. To some extent that is what Hirschman (1970) referred to as the *voice* option. It is worth examining the effective possibility of this strategy by considering the restructuring of the Burkina cotton sector. Until the end of the nineties, the cotton sector was considered within the framework of a public monopoly, integrating a wide range of activities from seed cotton collection to cotton lint exportation. The institutional change that took place in 1999 contributed to the evolution of the organization towards a more private and a less integrated one, while maintaining an implicit obligation for farmers to contract with SOFITEX.

SOFITEX is the historical leading sector-based organization. The Burkina State has long been the main shareholder and supervisor, the supervision taking the form of various regulations, including the determination of pan-territorial prices of seed cotton and cotton inputs. In this institutional scheme, the capital of the society was held by the State (65%) and the CFDT (*Compagnie Française pour le Développement des fibres Textiles*<sup>5</sup>), the French agribusiness company, (34%). The situation evolved with a significant public divestiture. In 1999, the property rights over SOFITEX were redistributed in a way which allowed the active participation of farmers (*accord inter-professionnel*). With the redefinition of the ownership structure, the interests of the State were reduced to 35% in favor of collective organizations of

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<sup>5</sup> The CFDT became DAGRIS in June 2001.

producers (30%), UNPCB (*Union Nationale des Producteurs de Coton Burkinabè*) being the national grouping of these entities. DAGRIS, the third partner, maintained its 34% participation and retained the operational management.

With this new capital structure, farmers are now in a better position to supervise the management of SOFITEX. They have the opportunity to stimulate the reduction of managerial slack, to prevent inefficiencies and to initiate external audits aiming at controlling the management. For example, in 1997, the auditing procedure proved to be useful in revealing excessive transportation costs. A key element of the reform has been the constitution of cotton farmers unions (GPC) which substituted for the former village groups (*groupements villageois*). The national hierarchy of the professional organization (UNPCB) and its sub-regional representations co-ordinate GPC action. This farmer's organization reduces the cost of collective action and strengthens the farmers' *voice*.

Thanks to this professional organization, the cotton producers are also improving their knowledge of international prices. This information can be seen as a prerequisite for appraisal of the price they should ask. Moreover, farmers can refer to sub-regional markets as benchmark markets before requesting price revisions. During the last season (2001/2002), the producer price was at its highest level whereas the international prices were at their lowest since the mid eighties (Table 2). Today, not only is the price of seed cotton the most remunerative of the West African region, but it also preserves the sustainability of the financial situation of SOFITEX. On the contrary, in another institutional context, the ginning companies of Côte d'Ivoire and Benin show a deficit that is financed by the State (Goreux and Macrae, 2002).

SOFITEX sells inputs on credit to the GPC that is repaid by deducting the input cost from the seed cotton price. The members of the GPC are collectively responsible for the refunding. Peer monitoring within the group helps to reduce farmers' moral hazard.

Moreover, the monopsony position of SOFITEX allows a credible threat of non-renewal of the credit supply to be exerted on the defaulting GPC. The reform is partly successful as the new GPC inherited a huge debt from the former GV. Nevertheless, a reduction in the arrears can be observed over the last two seasons.

## **6. ZONING AND LOCAL YARDSTICK COMPETITION : THE CASE OF COTE D'IVOIRE**

As shown by the Burkina Faso experience, farmers' participation in decision-making can be successful in a monopoly context. However, such participation can also be thought of in an indirect competitive market structure. In the theoretical framework of market contestability, the efficiency of a market is not directly determined by effective competition. Following Baumol and Lee (1991), perfect contestability provides a standard for the competitive market where entry and exit are free. As the mere threat of entry is presumed to be sufficient to enforce good conduct by the incumbent, the best strategy should be to create the conditions for the monopoly to be constantly disputable by means of potential entry.

It has been suggested above that durable vertical co-ordination between farmers and a cotton company is easier to promote in the context of a unique buyer. Therefore, this institutional structure conflicts with the principle of perfect contestability as the entry mechanism is restricted. Nevertheless, the benefits of contestability can be approximated through indirect competition that requires the intervention of a regulatory body. The regulator has a crucial role to play in defining the missions of the firm and enforcing the schedule of conditions. In addition, the regulator has the opportunity to guarantee some of the properties of market contestability, for example, through the concession-awarding system. In this model, competition is not *on*, but *for* the market and takes the form of periodically repeated auctions for the monopoly (Demsetz, 1967). The threat of breaking or non-renewal of the concession

should prevent opportunistic behaviors. If this sanction is not credible, the private firm would be in a similar situation to that of the public monopoly with contract planning.

The feasibility of the concession-awarding system will depend on several factors. First, one may call attention to the difficulty in specifying the economic and social obligations of the operator and of financing these missions. Second, the informational asymmetries between potential operators, or between these operators and the regulator, are sources of adverse selection and moral hazard. This is especially important when the concession-awarding has to be renewed. Specific assets of the incumbent that result from past activity have the dimension of a sunk cost for potential rivals who intend to enter the market. Third, the term of the concession is also a significant parameter: a short-term concession promotes perfect contestability but discourages long-term investment. In spite of these practical constraints, the concession-awarding system brings a non-negligible contribution to the level of market contestability and may be preserved to favor long-run mutual interest.

Awarding concessions can be conceived within the framework of a horizontal unbundling by geographical monopoly units. The sharing of the national territory, which is currently labeled the zoning strategy, has been introduced in Ghana and Côte d'Ivoire. Its main expected advantage is to allow indirect competition through benchmarking. This "yardstick" competition procedure is commonly used for regulatory purposes to extract monetary or slack rent from public utilities where the monopoly situation has a technological legitimacy (Littlechild, 1986; Schleifer, 1985). Indeed, in the cotton sector, regional units can be brought into competition by the regulatory mechanism. Moreover, in a zoning system where firms are more likely to be private, the state can retain a minority stake in some of them to strengthen the supervision. The status of the shareholder normally gives the state a better knowledge of the cost structure, and might put it in a position to counter any collusion between cotton firms.

The relevance of the comparison between firms is conditioned by several restrictions. First, the product must be homogenous or sufficiently so, but cotton seed seems to respect this constraint. Second, units must operate in the same cost conditions for the comparison of regional monopolies to make sense. In the cotton sector such a situation is unlikely. For example in Burkina Faso, the chance for the “fringe competition” to be successful seems to be low. The private firm entering the market will have to operate in a region (East and Central zones) where the public infrastructure is poor and the seed cotton production is more risky than elsewhere. Third, if cost conditions differ over the whole territory, all organizations will have to be put in a virtually identical operating environment. Consequently, for the valuation of the management to be as *pure* as possible, all relevant exogenous factors have to be considered. Fourth, we have to assume that regional units do not collude, requiring at least different private shareholders. Fifth, the geographical divisions must be respected, which means that the regulatory authority must be endowed with sufficient coercive powers, namely for enforcing compliance with the specifications about the collection area. The regulatory authority has an important role in monitoring and exacting punishment. It should include state representatives, farmers and other professionals from the sector, and be protected against political pressure.

Two zoning experiences have been implemented in West Africa. In Ghana, a zoning agreement was concluded between the different cotton companies in 1999, as an answer to the generalized cheating that stemmed from overall disruption of the free market system. However, public authorities have handled the zoning very badly. Indeed, there was no consensus among actors in the definition of the cotton areas. The candidates for entry to the market were not selected on a transparent basis. There was no tender-bid to control entry and no investigation of their financial quality. In addition, the companies were unable to obtain any guarantee about the effectiveness of their collection area. The entering firms were given



new zones cutting into those already established. The Ghanaian experience is a good illustration of the difficulty of setting up an efficient institutional option such as zoning in a context of a poor regulatory body proceeding from a weak State.

In the Ivorian case, the CIDT (*Compagnie Ivoirienne de Développement des Textiles*) has been broken down into three units, each one being in a monopoly situation over its regional area. Two new operators entered the market. IPS-Paul Reinhardt and Aiglon groups, were respectively assigned the northwest (Ivoire Coton, is a subsidiary of IPS-Paul Reinhardt) and the northeast region (LCCI, a subsidiary of Aiglon). The new CIDT is undergoing privatization and the farmers might be the main shareholders with a participation of about 80 %. The central region was assigned to this third firm. Although the market has been allocated in accordance with the bidding mechanism, the two private firms proved to be heterogeneous in their financial quality. Indeed, the former has accumulated arrears against the farmers over the last two seasons while the latter not only paid in due time but also extended the economic and social missions implemented by the former public CIDT.

In this institutional system, a pan-territorial seed cotton price is negotiated by private actors and ratified by the public authority. The yardstick competition principle should then work through the unit cost of the cotton seed. The firm, which is unable to pay the pan-territorial regulated price, reveals its low profitability and might leave the market. However, in the Ivorian case, the financial situation of one firm makes it unable to pay the producers in due time and the state failed to regulate the market. To answer this problem, some observers have suggested increasing the degree of market liberalization by promoting a competitive environment among ginning companies. In this perspective, zoning should disappear as well as the regulated price. By following this strategy, it is worth noting that the Ivorian solution would represent a move from the zoning system to the market option while the Ghanaian

experience goes the opposite way, zoning being supposed to be a practical answer to market failures.

The yardstick competition between local monopolies is a normative option that theoretically combines both the incentives of the market and the stability of the production contract. However, the experiences of the two aforementioned countries suggest the necessity for a strong regulatory body. Indeed, the lack of credibility of the public institutions proved to be a major source of failure. In Côte d'Ivoire, the late payments of cotton farmers have not been punished and in Ghana the zoning agreement proved to be very difficult to respect. The outcome of the alternative solution of free market competition is itself uncertain where the state is unable to enforce the mutual commitments.

## **7. CONCLUSION**

West African countries have already accumulated considerable experience of the various possibilities of restructuring their cotton sectors. Although some are pursuing structural reforms within the framework of a public monopoly, as Mali is in this case, others have given preference to the private option with varying degrees of market competition. In all cases, the weakness of the state is a major hindrance that does not allow the opportunistic behavior of agents, whose discount rate is high, to be thwarted.

Most experiences demonstrate the necessity to strengthen the role of farmers through groups and professional organizations. It can be done through a partial acquisition of the ginning company's shares by producers' associations. In 1999, Burkina Faso followed this option with some success. A reduction in free-riding phenomena has been progressively observed, especially by means of a higher rate of input credit reimbursement as a result of farmers' financial participation in the cotton company. This behavior can be analyzed as the result of the lengthening of the temporal horizon that accompanies the collective organization

of cotton producers. Indeed, farmers' groups are more sensitive to the reputation effect and more willing to invest in the building of a social capital. Collective action through groups tends to overcome both the short-sightedness of agents whose rationality is bounded and the failures of public institutions.

In the long run, the competitive market equilibrium is Pareto optimal. However, transition costs cannot be ignored. Indeed, in the transitional period, the main problem is to promote production in a context where mutual confidence does not emerge spontaneously. In this phase, the production contract has to be preserved against opportunistic behaviors that can result from firms as well as peasants.

We have seen that one typical case of moral hazard is generalized "cheating". The input credit is unpaid while there are no easy retaliatory measures on the part of the firm. In this case, the monopoly structure can be seen as a preferred option if peasants' power is strong enough. This power can proceed from farmers' organizational structures or shareholding in the ginning company. One alternative way could be the zoning system that promotes indirect competition between well-defined geographical areas. However, this institutional option does not significantly reduce the need for public regulations and its feasibility is problematic in the West African context of weak states. Therefore, while the final normative solution is known, the wide range of present institutional experiences will reveal the best practical way to reach this outcome.

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**Table 1 : Seed cotton production (1000 tons)**

	60-61	70-71	80-81	90-91	95-96	96-97	97-98	98-99	99-00	00-01	01-02
Mali	6	53	108	276	406	453	523	518	460	240	575
Burkina	3	23	63	190	151	214	338	284	254	276	375
Côte d'Ivoire	4	29	137	261	217	265	337	361	395	287	383
Ghana		0	7	13	18	25	34	38	36	35	14

Source : DAGRIS

**Table 2 : Ratio of the producer price to the to international price of cotton lint (Cotlook A indice)**

<b>Country</b>	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
Burkina Faso	0,30	0,40	0,52	0,46	0,57	0,67	0,48	0,68
Cote d'Ivoire	0,43	0,41	0,52	0,53	0,62	0,67	0,61	0,64
Mali	0,34	0,38	0,45	0,44	0,57	0,55	0,45	0,68
Ghana	0,13	0,15	0,42	0,41	0,61	0,45	0,26	0,55
Cotlook A indice (cts/lb)	80	98	81	79	66	53	59	48

Calculated for a common ginning ratio of 42 %

Source : DAGRIS, Goreux and MacCrae (2002), IFS

**Appendix A : Exports of cotton lint (2001-2002) (1000 tons)**

		Exports	% exports			Exports	% exports
1	United States	1 960	32	11	Turkmenistan	120	2
2	Francophone Africa	890	15	12	Pakistan	98	2
3	Uzbekistan	729	12	13	Egypt	98	2
4	Australia	697	11	14	Tajikistan	93	2
5	Greece	250	4	15	China	87	1
6	Syria	229	4	16	Zimbabwe	87	1
7	Mali	201	3	17	Kazakhstan	87	1
8	Burkina Faso	142	2	18	Brazil	76	1
9	Cote d'Ivoire	136	2	19	Cameroon	76	1
10	Benin	125	2	20	Paraguay	76	1

Source : ICAC and DAGRIS

**Appendix B : Main producing countries of cotton lint (2001-2002) (1000 tons)**

		Production	% production			Production	% production
1	China	5 008	24	11	Syria	348	2
2	United States	4 370	21	12	Egypt	250	1
3	India	2 722	13	13	Mali	239	1
4	Pakistan	1 807	9	14	Turkmenistan	196	1
5	Uzbekistan	1 023	5	15	Cote d'Ivoire	163	1
6	Francophone Africa	946	5	16	Burkina Faso	152	1
7	Turquie	849	4	17	Benin	136	1
8	Brazil	718	3	18	Zimbabwe	131	1
9	Australia	675	3	19	Tajikistan	120	1
10	Greece	414	2	20	Argentina	120	1
	Other countries	651	3		Total	20 918	100

Source : ICAC and DAGRIS



**Appendix C : Cotton lint production in Africa (1990-2000)**

Rang	Pays	Production of cotton lint (1000 tons)	% of African production
1	Egypt	229	15
2	Mali	170	11
3	Benin	150	10
4	Côte d'Ivoire	140	9
5	Zimbabwe	128	9
6	Burkina Faso	115	8
7	Chad	76	5
8	Cameroon	75	5
9	Sudan	62	4
10	Togo	58	4
11	Nigeria	50	3
12	Tanzania	36	2
13	South Africa	33	2
14	Zambia	27	2
15	Mozambique	22	1
16	Uganda	22	1
17	Madagascar	17	1
18	Ghana	17	1
19	Ethiopia	15	1
20	Guinea	11	1
	Others African countries	47	3

Source : ICAC and DAGRIS