

*Full Length Research*

# Competiveness and incentive production of cotton sector in Mali

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The Cotton production of has enormous problems originate from external factors (higher fertilizer prices, the producer price fluctuation) and internal factors (internal credit, claims of producers of short period payment of cotton seed to creditors), whose effects influence supply of Malian cotton. This work intervenes during an economic crisis when measures have been taken to increase cotton production in Mali. The objective of this work is to analyze the effects of input subsidies and increase seed cotton prices in relation with the global market of cotton fiber on the performance of the cotton sector in Mali. Surveys were conducted with a sample of 240 farms in four CMDT zones with two villages by area in 2008 /09, 2010/ 11 and 2011 /12, and the data from the CMDT (CMD, 2012) were used to develop a matrix of Policy Analysis. The results of analysis showed an improvement in the level of competitiveness of the cotton sector in Mali, and the level of incentives for the production of seed cotton with a subsidy of 50 % of the normal market price and the price increase of cotton seed with motivating factors.

**Key words:** fertilizer subsidy, price, cotton sector in Mali, competitiveness.

## INTRODUCTION

Mali is a forest- agro pastoral country. Indeed, the Malian economy is based on agriculture, which accounts for over a third of GDP (CPS / SDR, 2011). The part of cotton in the contribution of agricultural GDP is more than 6% and more than 3 million households depend cotton sector for their livelihood in Mali (INSTAT, 2010).The cotton sub sector has boomed and it became a major actor in rural development (construction of rural roads, schools, wells, extension, research funding, training). Malian Company for Textile Development (CMDT) as a public service has played its role as an actor in the economy until 2001. Before this date (2001), financial sponsors, specifically the World Bank had introduced a request for the liberalization and privatization of the cotton sector in Mali. At that time the CMDT, the principal of cotton industry that makes profits, the Malian authorities were opposed

to the liberalization of this sector.

Since 2001, there has been a combination of several factors (management issues, price fluctuations on the world market, increased fertilizer prices, internal debts of cooperatives and climate issues). This situation has resulted in lowering incomes of producers from cotton production and the abandonment of cotton production by 70,867 producers between 1999/ 2000 and 2008 /2009 (154,860 producers 1999/2000 against 83,993 producers in 2008/2009), which provoked the decline in domestic production level of seed cotton from 459 123 to 201 406 tonnes in the same period (CMDT, 2008).

However, face to the high deficits of the company despite the efforts made by the Malian government to support the cotton sector, the government of Mali was forced to start the process of privatization. These reforms led to the creation of four (4) branches of the CMDT (but they have not been privatized) by the zoning system which are the northeast subsector, the southern subsector, center subsector and the west subsector.

To reverse this trend, the 2009 /2010 growing season

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was marked by the return of the state in cotton sector; especially, by making available cotton fertilizer at a subsidized prices to 50% of normal market prices through the "Rice Initiative " program. The policy to increase cotton production, the government has maintained the level of fertilizer subsidy at 50 % of the average price on the market in 2010/ 2011 and 2011/2012.

According to the National Department of Agriculture (DNA, 2011), the total amount of the subsidy during the agricultural season of 2010/2011 had been estimated at 22 billion FCFA against an economic forecast slightly less than 20 billion CFA.

The implementation of this policy required the growing mobilization of financial resources from the state and the support of the technical and financial partners. Table 1 shows the amount of fertilizer subsidy from 2008/2009 to 2011/ 2012.

Figures 1 to 2 show the evolution of prices of fertilizers in the CMDT zone. The price of cotton complex as the price of urea has a tendency to increase and that is remarkable in 2006/2007 (2006/2007, and it corresponds to the period of food crisis, the inflation of major staple crops prices, factors of production such as agricultural inputs) . The price reaches its peak in 2008/2009 with more than 350 Fcfa/kg. This upward tendency has started since 2002 but in irregular way. From 2009, the price fell back to 250Fcfa/kg because of the subsidy guaranteed by the Malian government on fertilizers.

Maintaining this level of subsidy has been accompanied by the establishment of a producer price incentive mechanism applied on seed cotton since 2008/2009 at the price of 255Fcfa/kg in 2011/2012. This price was 185Fcfa/kg in 2010/2011 against 170 CFA / kg in 2009 /2011. In addition, there was a discharge of internal debts of cooperatives from inputs (debts between cooperative members) up to 3.175 billion CFA francs. Internal debts favored by collective surety were the basis for demotivation of "good producers" who saw their incomes reduced after cotton commercialization for reimbursement of input credit of agricultural cooperative campaign (CMDT, 2012).

The mechanism of fixing producer prices is related to the changes in the price of cotton fiber on the world market, but the government assuming the role of "service CMDT " often do not offer a price which matches to this mechanism. The mechanism should consist either to encourage producers by fixing a premium price whose supplement is taken in the supporting funds or national budget or to swell the CMDT's coffers by proposing the price which is lower than prior mechanism's price in agreement with the National Union of Cotton Producers (NUCP).

It is this direct fertilizer subsidy combined with the increase in the price of seed cotton due to favorable world price of cotton fiber that are called " incentive factors " which will be analyzed in the context of this study.

It has therefore become necessary to measure the

effects of fertilizer subsidy and increase the price of seed cotton under the pricing mechanism.

The objective of this work is to analyze the effects of incentive factors on the performance of the cotton sector in Mali.

## METHODOLOGY

To carry out this study, data were collected on the basis of a questionnaire with a sample of 240 farms in four areas CMDT during 2008/2009, 2010/2011 and 2011/2012. The data collected focused on the production, area, yield, family labor and wage work, materials and equipment and by type of agricultural farms.

We notice that the data from 2010/11 are involved in the calculations to deepen our analysis because during this campaign, the level of fertilizer subsidy was already 50%. The new measures are increasing the price of seed cotton favored by the world market and the discharge of internal debts of cooperatives.

### Sampling technique

#### Zones

Cotton zone in Mali is a vast zone where each locality has its own characteristics. For the sampling technique, the survey has covered the four zones that are CMDT zones Koutiala, Bougouni, Kita and Fana.

We chose the zones in order to have two villages in each of the CMDT zones, which gave us a total of 8 villages.

#### Villages

The villages were selected by reasoned choice, taking into account their accessibility, specificity (number of producers, relative importance of cotton production) and agro-ecological zones characteristics. At this level, the 8 selected villages are N'Tarla, Pala (CMDT region Koutiala), Kola, Guana (CMDT Fana region) Ouroum, Mafeleni (CMDT region Bougouni), Doukourakoron and Batimakana (CMDT Kita region).

For our study, we adopted the classification based primarily on the level of equipment (number of plough, sower and oxen) regardless of the number of herds. Unlike of CMDT classification that distinguishes four types<sup>1</sup> of farms (type A, type B, type C and D), we used 3

<sup>1</sup> A. Well equipped for animal traction (at least one plow, seeder and multi sower) and with at least one cart, and with a herd of more than 10 cattle , with at least two pairs of oxen

B. Operating with at least one pair of oxen and a unit of animal traction, but with a herd of cattle under 10 heads, including the horse hitch

types (= Well equipped type A and type B = Equipped with Less = Type C + D). This is explained by the fact that the D type CMDT tends to disappear.

The survey covered 240 farms distributed among the four zones of CMDT (60 per zone) and 8 Co producers Cotton (CPC) (1 by cooperative village). In the villages investigated, the number of CPC varies from 1 to 3, and the joining numbers has been decisive for the choice of this cooperative. The number of farms is distributed according to the different types of farms (Well equipped, equipped, Less equipped) by categorizing them based on their relative importance of each category at the national level.

Thus, it was for this reason, the analysis got from the investigation 38% well-equipped farms (92 farms), 44% of farms equipped with (104 farms), and 18% less equipped farms (44 farms). The Table 2 shows the distribution of the survey sample.

Based on the size of the sample used in each village, farms had been inventoried and drawn randomly (by counting one step) from a list elaborated by cotton producers and the representative of cooperative of cotton producers.

### The analysis indicators

For the analysis of effects on performance, we have defined two performance criteria which are the competitiveness of the cotton sector and incitement for production. They are measured according to the following criteria: 1) changes in the ratio of the Domestic Resources Cost (DRC), 2) the nominal protection coefficient (NPC) and 3) the effective protection coefficient (EPC). So we did use the Policy Analysis Matrix (PAM) for the calculation of these indicators.

### Policy analysis matrix

The MAP was developed by Monke and Pearson (1989), to assess the impact of the entry of Portugal into the European Economic Community on agriculture. By assessing the impact of agricultural policies on the crops subsector, MAP allows the evaluation of the effects of withdrawal or state interventions on the crops. It also helps to quantify the effects of sector based intervention of public power in taking into account the equity dimension, that means the distribution of income, profits between actors and how to get there by alternative agricultural policies that would reduce the distortions. To

this end, the MAP appears as the most appropriate instrument for our work.

It is composed of two types of budgets: one valued at market prices or financial prices (financial budget) budget and the other to the social opportunity cost or economic price (economic budget).

Financial prices are those that producers pay or receive while economic prices reflect the cost of the economy or society, it is the price that would prevail in the absence of distortion (or action).

Differences (transfer) between the financial budget and economic budget are also calculated. The budget is built for each production system which contributes to resources and for each actor of the sector. Before designing the budget, all inputs and outputs are respectively classified tradable or non-tradable. Tradable goods, also known as marketable, are those that can theoretically be imported / exported and are valued using prices on international markets. Non - tradable goods, or also known as the domestic factors are those that are not normally tradable on international markets. Table 3 shows the MAP model.

### Concepts and calculation of indicators MAP

A, B, C and D represent elements of the financial budget, E, F, G and H of those economic budget.

The differences between the financial budget and economic budget are represented by I, J, K and L.

(1) Private Profit (or financial),  $D = A - B - C$ . D measures the competitiveness of the production system considered. D is called the Private Profitability Net (PPN). If  $PPN > 0$ , it implies that the production system is considered financially viable.

(2) Social or economic profit,  $H = E - F - G$ . H measures the comparative advantage. H is called the Net Social Profitability (NSP). If  $NSP > 1$ , the activity has a static comparative advantage.

### Indicators of policy analysis

- Transfer income,  $I = A - E$ .
- Transfer of tradable inputs,  $J = B - F$ .
- Transfer of domestic factors,  $K = C - G$ .
- Net Transfer,  $L = D - H = I - J - K$ : This is the net impact of economic policies and market imperfections.

In practice, first the nominal protection is evaluated. This protection is measured by the Nominal Protection Coefficient, which measures the effects of protection on the price of the product by the relative increase in the price of the product in the domestic market compared to its price on the international market. The Nominal Protection Coefficient (NPC) is the relationship between the domestic price of a product and the reference price of

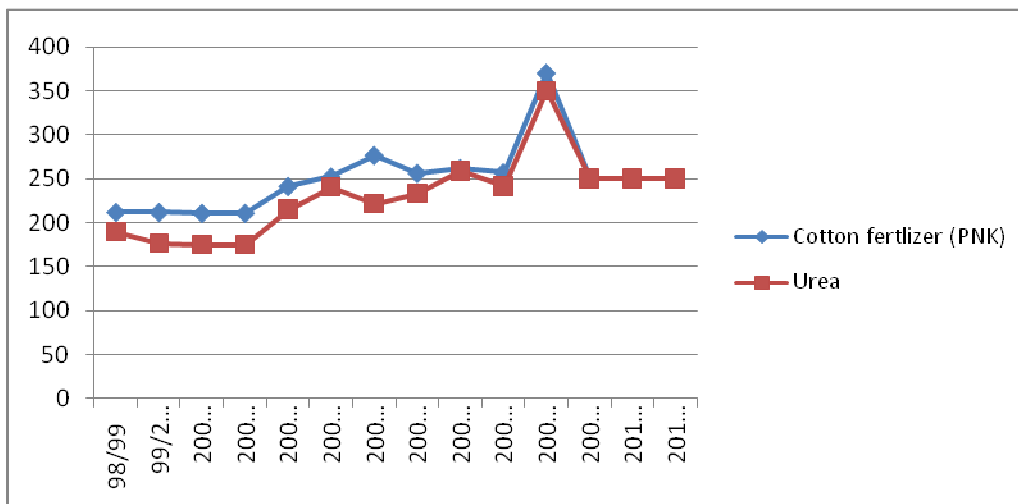
C. Not equipped for animal traction operation, but knowing to drive an hitch and having an incomplete equipment

D. Operating manual cultivation, not knowing little or animal traction. They are in a precarious situation without human resources, without equipment

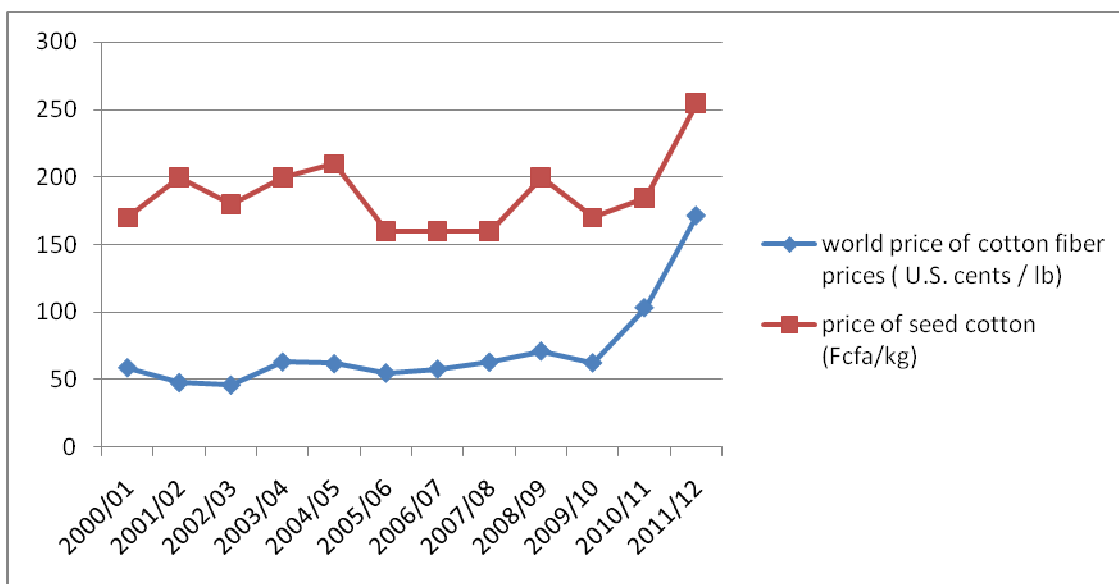
**Table 1.** Amount of fertilizer subsidy from 2008/2009 to 2011/ 2012 in billions of CFA.

Type of Expenditure	2008/09	2009/10	2010/11	2011/12
General expenses for Inputs subsidies in FCFA	11,638	21,310	22, 047	31,000
Achievements for cotton producers of CMDT in (FCFA)	NC	11,850	10,194	18,000

Source: National Department of Agriculture, Balance of agricultural crops in 2010/2011, SPAAA/FAO, 2012



**Figure 1.** Evolution of the price of fertilizers (complex cotton and urea) in the CMDT zone from 1998/1998 to 2011/ 2012 in FCFA / kg. Source: CPS / SDR. 2012.



**Figure 2.** Shows the evolution of the price of seed cotton (CFA / kg) world price of cotton fiber prices (U.S. cents / lb.) from 2000/2001 to 2011/2012. Sources: Based on data of CMDT and ICAC. 2012.

this product in local currency. Formally, the nominal protection coefficient of the product is given by the following expression:

$$NPC = P_f / P_e = A / E$$

Where  $P_f$  is the financial product price (or market price), and  $P_e$  the reference price

$Mp =$  Market price = selling price

$Pe =$  Reference price = selling price - (margins + state intervention imperfect competition).

If the NPC is > 1, it means that the domestic price is higher than the international price. The sector thus

**Table 2.** Distribution of the sample by zones and type of operation.

Zones CMDT	Villages	Type			Total
		well-equipped	equipped	less equipped	
Koutiala	PalaN'Tarla	23	26	11	60
Fana	Kola, Guana	23	26	11	60
Kita	Doukourakoroni, Batimakana	23	26	11	60
Bougouni	Ouroum, Mafiléni	23	26	11	60
Total		92	104	44	240

**Table 3.** Overview of the array of policy analysis.

Variable	Income	Factor costs		Profits
		Exchangeable inputs	Non exchangeable Inputs	
Financial budget	$A = P_f \cdot Q_f$	$B = P_t \cdot Q_t$	$C = P_n \cdot Q_n$	D (1)
Economic budget	$E = P_e \cdot Q_e$	$F = P_i \cdot Q_i$	$G = P_d \cdot Q_d$	H (2)
Divergence	I (4)	J (5)	K (6)	L (3)

Source : Monke, E. A. et Pearson, S.R (1989).

generates (in the same proportions) higher than they could be in an economy applying international price parity income. This means that the property enjoys protection in relation to imported or exported good. There is an incentive for producers which is higher than it should be in terms of value opportunity and the international market. So, producers benefit a subsidy due to the intervention of a protective structure. The protective structure is said to be positive.

Otherwise, that is if the NPC is  $< 1$ , it means that the domestic price is lower than the international price. The sector thus generates incomes (in the same proportions) is lower than they could be in an economy applying international price parity income. The country does not protect its market in this case.

NPC = 1 reflects the balance or the optimal level of exchange competitiveness between the national and international market. The protective structure is called neutral. Producers are neither favored nor disadvantaged (Mohanty et al., 2003).

To take into account the measure of subsidy on the price of inputs, we calculated the effective protection coefficient (EPC). This indicator is used to give a measure of the incentives created by national economic policy including pricing policy for the sector. This coefficient indicates the combined effect of price policies products and exchangeable goods of excitement of agricultural production goods. So, it is therefore a more accurate indicator of the exact level of incentives relative to the world market. It is determined by the following formal expression:

$$EPC = \frac{(Product - changeable goods^*)}{(Product - changeable goods^{**})} = \frac{(A - B)}{(E - F)}$$

\* In market prices, in reference price\*\*

If  $EPC < 1$  means that the combination of transfer product, on the one hand, and an intermediate consumption (Exchangeable goods), on the other hand, results in an effective distribution lower of income than it would be in case of application, all other things being equal, international prices. Product is implicitly taxed. Domestic producers are disadvantaged.

On the other hands, if the  $EPC > 1$ , the actor's branch of the activity (production) at the national level earn more revenue they would gain without distorting prices. This is compared to global actors. Domestic producers benefit from an implicit subsidy on inputs and / or protection of the product price.

$EPC = 1$  reflects the balance or the optimal level of exchangeable competitiveness between the national and international market. The structure of effective protection is called neural.

Regarding the competitiveness analysis, we used the method of Domestic Resource Cost (DRC). It is interpreted as the opportunity cost of domestic resources since it measures the production and processing of a unit produced using local resources (Zongo, 2006, quoted by KPERIM et al, 2010). It was also in India to measure the competitiveness of the cotton sector (MOHANTY S et al, 2003). It compares the value of domestic resources used in the production of a good currency they can save.

This method was developed in the 1960s by Michael Bruno to try to solve the problem of the Israeli government currency.

If the value of DRC is between zero and one ( $0 < DRC < 1$ ), it means that the sector has a comparative advantage. In other words, it is economically efficient. It is less expensive in domestic resources to produce locally than to import. The local crop sector is called competitive. A value of DRC greater than one ( $DRC > 1$ ), it means

that the cost of domestic inputs used is greater than the value created measured in international prices, thus causing a loss of wealth for the community. Minimize the CDR is therefore to maximize the profit for the community.

A value unit DRC (DRC = 1), resulting in a case of indifference. That is to say that there is no profit or loss for the community producing locally or importing the considered goods (KPERIM et al., 2010). Formally, the DRC is given by the following expression:

$$DRC = (\text{Domestic factors}) / (\text{Product- Exchangeable inputs}) = G / (E-F)$$

For this work we used the Spreadsheet of MAP (Excel software designed) developed by Tom Randolph, the Association for the Development of Africa Rice Centre (WARDA) (Called the Africa Rice) and previously adapted to the cotton sector in the Project Mobilization of Internal Resources (PAMORI) in 1998.

### Hypotheses of calculation

- The estimated of reference price of cotton grain (CFA) has been calculated by taking account of the ginning rate and the reference price of cotton fiber (in CFA)
- The ginning rate of cotton (grapping) (e%)= 0.42 (CMDT, 2012)
- The selling price of cotton fiber in position FOB= the average weighted of the value of all contracts, all type of cotton (traditional, nontraditional all quality, all loading period for the same year.

The real Interest rate has been calculated according to the following formula:

$$I = [(1 + R_n) / (1 + R_i)] - 1$$

with  $R_n$  = Nominal rate Interest and  $R_i$  = Inflation rate, These rates are from the "Banque Centrales des Etats de l'Afrique de l'Ouest (BCEAO).

- The estimated of reference price ( $P^*$ ) of one ton of cotton grain will be computed according to the following way:

$$P^* = P_i / X$$

with  $X = 1 / e\%$  with  $P_i$  the selling price of one ton in cotton fiber and  $X$ , the quantity of grain cotton to produce one ton of cotton fiber.

- For local taxation we applied the rate of "UEMOA" currently used, therefore, there are no taxes on the inputs.

## RESULTS OF DATA ANALYSIS

### Characterization of farms

The agricultural campaign 2008/ 2009 is the base year for this study, so the characterization data for this campaign is presented in Table 4.

Given this table, the difference found between the types of farms at the level of people in employment and the level of equipment also influence on the acreage of cultivated cotton and the grain of cotton yield. This is how the type well equipped with a good level of equipment is ranking in first position with a large area (4.37 ha) and a good yield of (1048 kg / ha), it is followed by the type equipped with an area 2.24 ha and a yield of 950 kg / ha. For the less equipment type, which does not have means, is ranking last with an area of 1.41 ha and a yield of 783 kg / ha.

It should be noted that the available resources are often not used efficiently on farms. This part is discussed in the next section through the analysis of costs in Domestic Resources Cost (DRC).

### Competitiveness of the cotton sector in Mali

During the 2008/2009 campaign, the industry has experienced difficult situations both at the producer level (high price of inputs) and at the level of the CMDT (low price of cotton fiber on the world market). These factors have led to a negative balance for the campaign.

Unlike the 2008/2009 campaign, those of 2011/2012 had a favorable situation related to the changes in the price of the fiber on the world market; therefore, there has been a good result at the CMDT and the producer level.

The analysis of the DRC was realized on three campaign seasons (2008/2009, 2010/2011 and 2011/2012.). We emphasize that the 2010/11 campaign comes in the calculations to deepen our analysis because during this campaign, the level of subsidy fertilizer was already 50%. The new factor is the increase in the price of grain cotton favored by the global fiber market in 2011/ 2012. The types of farms do not have the capacity in terms of efficiency of labor, materials and equipment; the results are presented by type that can provide more detailed information on the cost of resources expended in relation to yield obtained. Table 5 shows, the cost of domestic resources by type of farms in 2008/2009, 2010 /and 2011/ 2012.

From analysis of this table it is shown globally a DRC inferior to 1 for all types of farms and for the three agricultural campaigns.

We find that the ratio decreases from 2011/2009 compared to 2008/2009 in all types of farms at overall view. This is due to the decrease of expenses and the increase of cotton prices on the world market.

The ratio is always lower for the less equipped farms. This is due to the low cost of production with this type because it has less equipment. a low cost of depreciation and less labor for the cotton production. This reflects an efficient use of resources for this type.

In 2010/11, despite the improvement of the global cotton fiber during the CRD did not experience great improvement. With the socio-political crisis in the Ivory Coast. the cost of tradable factors (fuel. spare parts etc.)

**Table 4.** Characteristics of agricultural farms surveyed in 2008/2009.

Variable	well-equipped		equipped		less equipped		Global	
	Me	Dev	Me	Dev	Me	Dev	Me	Dev
Number of actives (working population)/farms	13	12	9	5	5	2	10	7
Number of oxen for plough	5	2	2	1	1	0,45	3	1
number of mounted disk plough	2	1	1	1	1	2	1	1
Number of multi cultivators	2	1,43	1	0,95	0,5	1,05	1	1
number of seeder	1	1,3	0,6	0,4	0	0,2	1	1
Acreage of Cotton	4,37	3,22	2,24	1,74	1,41	0,82	3	2
Cotton Yields	1048	335	950	299	783	328	957	318
work time/cotton	75	28,14	91	38,18	64	23,31	80	32

Me= mean; Dev. = Standard Deviation.

**Table 5.** Domestic resource cost by type of farms in 2008/2009 2010/2011 and 2011/ 2012.

Type	Cotton growing season		
	2008/2009	2010/2011	2011/2012
Well equipped	0.96	0.84	0.56
Equipped	0.90	0.86	0.67
Less equipped	0.70	0.73	0.60
Global	0.90	0.85	0.63

has risen sharply. This has greatly influenced the costs at the processing (ginning) and marketing during this period.

Overall, Mali has a comparative advantage in producing cotton with domestic factors. This advantage has gradually improved with the incentive factors in 2011/2012.

### Producers' motivation for more production

To measure the incentive for the production of grain cotton, indicators of Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) were calculated. Table 6 shows the values of the NPC C by type of farms during the years 2008/2009, 2010/2011 and 2011/2012.

In analysis of this table, it shows that a NPC greater than 1 for the 2008/2009 and 2011/2012 in all types of farms but with a higher value for the last agricultural campaign.

Producers of grain cotton at the national level have earned higher income than it could be with the international price parity. So there's been an incentive to motivate producers to produce at national level during the agricultural campaigns of 2008/2009 and 2011/2012.

This situation of 2008/2009 is explained by the policy of fixing the producer price where the price difference was supported by the support funds.

In 2010/2011 despite the fertilizer subsidy, NPC remains below 1 for the last two types and that of the 2008/ 2009. This is due to the fact that despite the

improvement remarked in the global fiber market in 2010/2011. Farmers received lower prices (185 Fcfa/kg) compared to the 2008/ 2009 season (200 Fcfa/kg). The types of equipped and less equipped farms do not have the same level of incentive factors received compared to the well equipped with the price of 185 CFA francs in 2010/ 2011; consequently they have relatively low yield.

The persistence of problems (Aforementioned) that the Malian Company for Textile Development (CMDT) has experienced huge financial deficit. During 2010 /2011, the government has fled the used pricing mechanism in 2008 / 2009 and establishes a price consensus with the National Union of Cotton Producer (NUCP) in order to swell the CMDT's coffers. But in 2012/2013, the government has maintained the same price 255Fcfa/kg (prices 2011/2012) without considering the mechanism of pricing of grain cotton in spite of the downward trend of prices on the world market fiber.

Regarding the coefficients of effective protection, the same observation decrease in 2010/2011 compared to 2008/2009 (Table 7).

We find a coefficient which is inferior to 1 in all farm types in 2008/2009 and 2010/2011. Cette situation means that subsidies on inputs have not reached the level that would give more revenue to domestic producers.

In opposite side in 2011/2012 the CPE became greater than unity; the national producers have earned more income than they would gain without distorting fertilizer prices. This is due to the incentive measures of 2011/2012 which not only maintained the same level of subsidy on inputs but also increased the price from 185

**Table 6.** Evolution of NPC by type of farms in 2008/09. 2010/11 and 2011/2012.

Type	Cotton growing season		
	2008/2009	2010/2011	2011/2012
Well equipped	1.06	1.06	1.63
Equipped	1.06	0.97	1.53
Less equipped	1.06	0.92	1.55
Global	1.06	1.01	1.39

**Table 7.** Evolution of CPE by type of farms in 2008/09. 2010/11 and 2011/2012.

Type	Cotton growing season		
	2008/2009	2010/11	2011/2012
Well equipped	0.97	0.95	1.87
Equipped	0.94	0.82	1.72
Less equipped	0.96	0.74	1.68
Global	0.95	0.88	1.51

to 255 Fcfa/kg in connection with the pricing mechanism.

## DISCUSSION

The important factors such as rainfall the payment period contribute to the production of cotton grain in Mali (Therault et al., 2013) are not taken into account directly in the calculation of the MAP but it does not affect the result analysis of the model because of its structure. However, the interpretations have some concerns such as the rainfall effects (amount and distribution in the year). which greatly influences the yields performance a key parameter in the MAP.

Our study measured the effects of subsidies on fertilizers and the increase in the producer price of grain cotton in relation to the mechanism of pricing of cotton grain that considers the level of equipment of agricultural farms (type of agricultural farm).

India MAP was used to compare the comparative advantage of cotton to other products (rice. wheat. sugar cane) in five states. The results showed that the cereals have more comparative advantage than cotton especially in Maharashtra and Haryana because of the government policy for food security that gives the best price and high input subsidy to producers of cereals (S MOHANTY al., 2003). This confirms our results 2011/212 with the best price to the producer and partial fertilizer subsidy.

Our results showed that the producer price of cotton grain has not reached the level of prices of cotton fiber on the world market if the pricing mechanism was applied. This confirms that the MAFAP / FAO (MAFAP. 2012) which found a reduction in nominal protection rates for this 2011 2010 / during a study conducted in collaboration with IER Mali.

## Conclusion

The cotton sector in Mali remains competitive. despite of the unfavorable change of global fiber prices. This level of competitiveness has improved with incentive factors such as (fertilizer subsidy and price increases of seed cotton). The Malian government concerned about the progress of cotton sector. it doesn't strictly apply the mechanism of pricing according to the situation of principal actors in the cotton sector. This allows encouraging some producers to produce more and maintain the others in an acceptable financial situation. This common agreement between (Mali and UNPC State) to manage the cotton sector appealed to the character of "service public" CMDT. The fertilizer subsidy is a very important measure to reduce the cost of production of seed cotton and make the industry more competitive. But the current level of competitiveness of industry is not sustainable because it is especially favored by the changes in the price of seed cotton on the world market and fertilizer subsidies. whose amount constantly increase for the Malian government. One way to maintain this level of competitiveness is to raise the level of performance of seed cotton.

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