AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

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

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

Help ensure our sustainability.

Give to AgEcon Search

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

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

AgriGender *Journal of Gender, Agriculture and Food Security*

AgriGender 2019; **Volume 04, Issue 01**, 13–29, doi:10.19268/JGAFS.412019.2

Women's empowerment in cotton growing: a case in Northern Benin

Faridath Aboudou[†] & Michel Fok[◇⋆*]

[†] *LARES, Duplex n6 cité Houéyiho, 08 BP 0592 tri-postal, Cotonou, Bénin*
[◇] *CIRAD, UPR AIDA, F-34398 Montpellier, France.*
[⋆] *AIDA, Univ Montpellier, CIRAD, Montpellier, France.*

*Corresponding author. E-mail: michel.fok@cirad.fr

This article addresses the economic and social impacts for women growing cotton through the interrelated dimensions of resource, agency and achievements in women's empowerment. Women's growing cotton is explained by analyzing their characteristics and those of their husbands and of the other women, in the perspective of intra household negotiations and in the specific context and recent history of cotton production. Our study found a noticeable share of 20 percent of farms where women and their husbands simultaneously earned cotton income and where women spent less time in the fields while enjoying better decision-making power. This new status of income generation and role sharing within households is a win-win situation, benefitting from a change in social norms which required an extra-household chock, a period of cotton sector uncertainty in an exacerbated monetization context. As monetization keeps on prevailing in all African countries, it should favor further women's empowerment.

Keywords: Income; Household; Bargaining Power; Social Norms

Introduction

The perception of cotton, a frequent cash crop in Africa, dramatically evolved over the 20th century. This crop had long been regarded as a crop of subservience and coercion by colonial powers wishing to diversify the sources of raw material for the textile industry in Europe (Isaacman 1985). From the late 1970s onwards, at least in West Africa, this crop was presented as an example of successful agricultural development, because it contributed to modernizing farming techniques through ox-drawn cultivation (Mcphail and Polti 1988), with the effect of improving food security on the farms involved (Raymond and Fok 1994). In the early years of the new millennium, cotton cultivation in French-speaking Africa was included in the rather short list of success stories of African agriculture (Gabre-Madhin and Haggblade 2003), in particular because it induced an associative process among producers who took over the marketing of their production and participated in determining the prices of production inputs and seed-cotton. However, the degree of success has been debated since the restructuring of cotton sectors guided by privatization or liberalization principles (Bourdet 2004; Kaminski et al. 2011). Such a restructuring has implied an uncertainty in the procurement of production factors and payment to producers, notably in Benin but also in Cote d'Ivoire.

The assessment of the impacts of cotton cultivation in Africa, summarized above, however is typical of the perception of farm holdings as homogeneous units; the economic impact of this crop on farm heads is assumed to reflect on each member of the farming household, such as the wives. Cotton farms and cotton sectors have been the subject of many studies to understand the differences in performance between countries (Lele et al. 1989), or between types of sector coordination (Poulton et al. 2004), but we know of none that has tried to identify impacts on the different categories of members in farming families. A study of a century of cotton crop development in Mali, based on an analysis of the opposition and reconciliation of the interests of the involved players (Fok 1993), integrated the opposition of interests between farm heads (men by customs in Mali) and youngsters, but without addressing the case of women.

In West Africa, some limited research work on women's involvement in cotton production shows that this involvement has been erratic. Up to the late 1970s, cotton cultivation was perceived negatively by women, considering it contrary to their economic interests. In Cote d'Ivoire, the extension of cotton cultivation had led women to work more in men's cotton fields, to the detriment of their own plots of land and thus the income they could earn from them (Peltre-Wurtz and Steck, 1991). Later on, when women wanted to grow cotton for themselves, their initiative was thwarted. This is what Bassett (2002) observed, again in Cote d'Ivoire, over the period 1981–1997 when he identified that the number of women involved in growing cotton on their own

behalf has initially increased then declined. In fact, women took the initiative of cultivating cotton on their own behalf, but men reacted soon afterwards to thwart their wives' attempts because they feared their demobilization in collective fields and their loss of control over them.

The launch of alternative cotton production modes to obtain identity-cotton, such as organic cotton or organic and fair-trade cotton at the turn of the Century, again drew some attention to women's involvement. The alternative type of cotton obtained was called "women's" cotton in Mali (Droy 2008, 2011), Burkina Faso (Somé 2010) or Benin (Tovignan and Nuppenau 2004). Women's involvement is explained by the production method, which rules out the use of chemical inputs, freeing them from the very frequent difficulty of obtaining the inputs. The denomination "women's cotton" is nevertheless somewhat exaggerated, with a maximum of 40 percent of women among registered producers, a share that can be overestimated by the phenomenon of men who have resumed production on their own behalf but hiding themselves behind the names of their wives (Somé 2010 p. 224).

Women's involvement in the production, studied in the specific case of identity-cotton, was in addition addressed in a partial way. In south-west Mali, the access of women to production factors (especially land and labor) was assessed (Droy 2008), or the yield threshold to ensure profitability was calculated (Droy 2011), but without consideration of the characteristics of the farms to which women belonged and of the intra-household dimension in the allocation of production factors. In Benin, Tovignan and Nuppenau (2004) sought to determine factors influencing the adoption of organic cotton on farms and particularly the factor of women's involvement while the low yield level was observed (Kloos and Renaud 2014). All the work mentioned contained few quantitative elements, no account of production was detailed and no comparison with men's cotton cultivation was made.

Only one recent study, to our knowledge, deals with women's involvement in cotton cultivation from the perspective of analyzing intra-household negotiation, regardless of the production mode. In Burkina Faso, over the 2005–2009 period, Somé (2010) showed that women could acquire the right to grow cotton with support, or less opposition, from their husbands by using their power to refuse to work in their husbands' fields and threaten to return to their fathers' villages. Men who ignored the resistance of their wives could no longer continue to grow cotton and suffered from the economic decline of their farms. The phenomenon reported is indicative of women's empowerment through the indivisible interrelation of the three dimensions of resources, agency and achievements as Kabeer (1999) proposed, although the dimension of achievements was less, if any, measured.

The objective of this paper is to provide a fuller and more quantitative illustration of women's empowerment through the interrelation of the dimensions of resources, agency and achievements in a cotton producing country. The paper is based on an analysis of women growing cotton on their own behalf in Benin. The analysis lies on a quantitative approach based on a sample of 213 farms. The argument is that a new situation is taking place in cotton production where women can grow cotton for themselves while continuing to contribute labor to their husbands' cotton plots. We set out to demonstrate that both men and women benefit from this new situation on farms where the structure makes heads (men by customs in the studied country) more vulnerable in coping with all their financial duties and more open to sharing roles with their spouses. The latter enjoy more flexibility in their time use and more decision power. The findings of the paper support the advocacy of enabling more women to produce cash crops with a view to improving their own well-being, as well as that of their households in a positive sum game, and highlight the crucial influence of extra-household factors. As socio-economic factors in Africa, such as exacerbated monetization in rural areas, tend to make men's financial position more vulnerable, more opportunities are offered to women to gain empowerment.

This paper starts with a literature review about the dimension of intra-household negotiations enabling women to commit with conducting economic activities like growing cash crops.

Literature Review

Women pushed out of cash cropping...

Women were less frequently involved in cash crops. In Ghana, C. R. Doss (2002) noted that when crops were destined for the market men were more likely to be involved, without excluding that a small proportion of women might grow them as well. In Malawi and Uganda, Njuki et al. (2011) also observed that men controlled commodities that were high revenue generators, either products were sold on formal markets or not, like for pigeon pea in Malawi (Me-Nsope and Larkins 2011). The men's monopoly on cash crops has fueled the perception assimilating men's crops to cash crops, and women's crops to food crops (FAO 2012; Zakaria 2017; Doss 2001). Women's lesser involvement in cash crops might result from a dynamic process within households. Cheryl Doss (2002) found that, as crops became more profitable, men tended to move into their production. Hill and Vigneri (2014) pointed out a number of examples of crops or commodities that started in the women's domain, but were later on controlled by men after they were commercialized. The shift in the control over a cash crop might also result from a change in the production conditions as was observed in water control schemes for rice production in Africa (Blanchard de la Brosse 1989).

...as a consequence of men's power in allocating production factors

The position of women in cash crop production is illustrative of the general issue of intra household allocation of production factors, which is influenced by who has the power to take decisions (Doss 2013) and control income in households. The frequent imbalanced power in decision-making leads men to dictate which crops to grow, as well as the right and the frequency of women to go and work on their own plots. By considering the gendered dimension of intra-household allocation of production factors,

Udry et al. (1995) demonstrated the inefficient outcome in a study in Burkina Faso where households were frequently headed by polygamous men, and where distinct negotiating powers could prevail as a consequence of preferences among spouses (Katz 1991).

The notion of men's cash crops is misleading and does not do justice to the share of women in their husbands' plots. Kochhar (2013) pointed out that women's unpaid labor was one of the main driving forces behind men's formal and informal economic activities, such as cash crop production. This is especially true in the case of cotton cultivation, which is very labor intensive for weeding and harvesting.

However, women's participation in their husbands' cash crop production is not necessarily granted and not necessarily at the level desired by men. Zakaria (2017) argued that members' participation in their household cash crop production is a function of their role in intra-household power relations regarding decision-making and access to household productive resources. The extreme case is observed on farms headed by women in which there are no men to challenge decisions.

Women's involvement in cash cropping is advocated...

Women's greater involvement in cash crops for their own benefit is advocated, because cash crop production holds a significant potential as a means by which rural households and women can improve their welfare (Hill and Vigneri 2014), but women's access to production factors has to be firstly improved, as for land in Ghana (Vigneri and Holmes 2009). Only a recent study, has questioned the desirability of further involvement of women in cash crops, cocoa and oil palm production in the case studied (Anderman et al. 2014), because negative relationships were found with several food security indicators in the specific case of forestry areas in Ghana. In the more general case of cotton production in West African savannah areas, a positive relationship with food crop production has been found and related to the widespread adoption of ox-drawn agriculture, which also increases the productivity of food crops (Raymond and Fok 1994).

The advocacy of further involvement of women in cash crops is backed up by the efficiency of women. Women were found to be equally productive as men and received equal prices to men, when they farmed with the same resources and sold their crops in the same way (Hill and Vigneri 2014), as it was observed in cotton production in northern China (Wang and Fok 2017). Vigneri and Holmes (2009) found that labor was the only variable input with a positive and significant contribution to the yields obtained by women, notably hired labor, indicating that female farmers use hired labor and land more efficiently than men do.

...but access to resources is required

Women's involvement in cash crops is impeded by constraints whose alleviation could actually help to improve their involvement. In general terms, Hill and Vigneri (2014) claimed that by both improving women's access to land and credit, and encouraging better integration of food markets through improved roads, and increased mobile networks (to reduce trader search costs), women would be more enabled to engage in cash crop production. With regard to market access, a social change might be needed, for instance in making female use of bicycles socially acceptable.

The improvement of women's involvement in cash crops could also result from actions taken at the women's own initiative. This is the case of the setting up and the strengthening of female farmers groups or marketing groups that female farmers can join, hence allowing women access to more profitable marketing channels (Hill and Vigneri 2014).

Access to resources is a matter of multiform and evolving agency

In general, land ownership appears to improve women's empowerment and bargaining power (Seebens 2011) for engaging in cash crop production, in line with the interrelation of resources, agency and achievements in empowerment highlighted by Kabeer (1999). In Ghana, with the gradual individualization and commercialization of land rights, cultivating cocoa trees has become a more gender-balanced farming practice because women are also able to acquire land rights (Duncan 2010) and, in so doing, manage their own farms and retain control of the income generated by their sales (Hill and Vigneri 2014).

Women gain in bargaining power by challenging the authority of decision-taking in their households when they feel that the intra-household allocation of production factors is detrimental to them. Persistent complaining, pleading ill-health, threatening to return to the natal home, withdrawing into silence, and withholding conjugal rights from their husbands, are all means used by women, not only in South Asia, but elsewhere, a 190 s in Latin America and the United States (Agarwal 1997). Somé (2010) precisely reported the same means were deployed by women in the cotton areas of Burkina Faso. Women's capacity to challenge the authority of decision-taking is dependent on their fallback position or threat point, namely their well-being position if they decide not to cooperate with their husbands. Agarwal (1997) indicated nevertheless that the fallback position was under the influence of extra-household environmental parameters, such as parental wealth, an individual's non-wage income, and the legal structure governing marriage and divorce.

In the case of cotton production areas, Bassett (2002) in Cote d'Ivoire and subsequently Somé (2010) in Burkina Faso emphasized the dimension of intra-household bargaining process and defined the notion of "negotiation spaces" opened up by the confrontation of two processes. On the one hand, women may be able to use other actors to grow cotton, acquire inputs and market the product if their husbands do not agree to help them, or not enough. On the other hand, men must take into account their wives' desire to grow cotton for themselves because they cannot produce without them and take the risk of braving their resistance action. This notion is consistent with the observation that women's freedom on farms is greater on those that do not perform the best (Vimard 1997). Indeed, in the situation where a farmer is unable to meet all the family's needs, as observed

in Burkina Faso (Somé 2010), it is difficult for a man (especially if he is polygamous), if not impossible for him to oppose the initiative of his wife to earn more money in order to send her children to school, when he himself cannot afford to send all of his children to school. In Benin, peasants most often admitted that women's financial gains relieved their household expenses (Kloos and Renaud 2014), although they remained fearful of losing their power over women.

The assessment of bargaining power between household members is complex because of its context-specificity and its variation between women. The variation of women's bargaining power is obvious between countries as Kevane (2000) demonstrated 215 when addressing Sudan and Burkina Faso. The bargaining power varies also according to ethnicity. In Burkina Faso, in the cotton area of Bereba, Mossi women were prohibited from brewing beer unlike Bwa women who seemed to be discouraged from farming on their own and almost none had personal fields. Bargaining power could even fluctuate between women in the same context: Mossi women in households with more farm equipment had to work more in the fields of their husbands. Generally, the bargaining power of women is dependent upon their characteristics such as their education, incomes and assets (Doss 2013). For example, in the same household where the head is polygamous, a woman holding the first rank among the farmer's wives has stronger bargaining.

The assessment of women's bargaining power is complex also because it may evolve over time. Agarwal (1997) identified the factors influencing women's bargaining power, such as the ownership of, and control over assets (especially arable land), access to employment and other income-earning means, support from NGOs or from the State. These factors impinge on women's subsistence opportunities and access to resources from outside the family, thereby affecting their bargaining power within the family because they impact their fallback position.

Agency: crucial aspect of changes in social norms

Changes in social norms are of crucial importance in altering women's bargaining power, as Agarwal (1997) firstly emphasized. Social norms used to be assumed to be exogenous to households, but they are not immutable, are subject to bargaining, and change, so that they are exogenous to households and communities only in the short run, but not in the long run. The endogeneity process of bargaining over social norms (by which norms are challenged before being redefined) is based on three interdependent phenomena. One, the role of economic factors pushes people to challenge norms; for instance men's increasing income difficulty may lead them to accept, if not ask their wives to assist them in sharing the burden of expenses (Attané 2009). Two, the role of groups (as opposed to individuals) enhances people's ability to challenge norms. Three, the interactive nature of bargaining, within and outside the household, makes the challenge of social norms more effective. For this reason, Kevane (2000) claimed that the study of extra-household factors influencing social norms is of utmost importance because of the alteration in the regulation of economic activities in which women can be involved.

For changes in social norms to actually occur, with an impact on men-women relationships, the changes have to be accepted. Seebens (2011) believes that some social and economic contexts are more propitious to the needed acceptance. In times of economic crisis, norms may be easier to change as compared to times of relative wellbeing. Generally, a win-win situation must result and must look immediately obvious to all participants. If the husband benefits from the changing of a current norm, he may not oppose its change.

Role-sharing among spouses, a social norm under change by men's weakened financial position

In West Africa, a strong social norm pertains to role-sharing among spouses. The norm in all societies in West Africa a standard regularly reiterated by the entire social body is that a husband's duty is to meet the needs of his wives and children, notably in terms of staple food and all fees related to the running of the household. This obligation is seen as the direct corollary of his authority over his family.

The norm of role-sharing between spouses in West Africa is undergoing change and it is interestingly analyzed by Attané (2009) through the influence of money circulation within urban households in intra-household negotiation, and in defining what should be the respective roles of spouses within a household. She observed that the circulation of money modelled couples' relationships, transformed the expectations of both sexes, and modified the idea that everyone can have of themselves and their relationship with their surroundings. According to this standpoint, more and more men faced with the increase in household expenses expected women to offer their monetary contribution. They presented this contribution as a normal and necessary adaptation that must be sustainable in the face of new social and economic imperatives. Sometimes they even conditioned the acceptance of their wives' projects on such participation.

Extra-household factors of men's weakened financial position in West Africa

In West Africa, the ongoing changes in household decision-making and spouses' role-sharing are related to the men's relatively weakened position in financial terms. This situation is induced by extra-household factors, the main one being the monetization process as it impacts money circulation within a household as emphasized above.

The monetization of social life, such as the increase in the cost of living (care, schooling of children, foodstuffs) has amplified the share of cash transfers within the family group (Attané 2011), sometimes going beyond the capacities of household heads (men). In some cases, as indicated above, men ask their wives to contribute more economically. In other cases, the loss of authority resulting from the failure to face all expenses leads men to become more open and agree to their wives becoming involved in more economic activities. In these cases, women gain bargaining power through the reduction or loss of such power by their husbands. Another extra-household factor worth mentioning is the more or less generalized practice of corruption, taking vari-

ous forms, which helps to exacerbate monetization. No service is free, and even free public service has to be paid for because of the corrupted behavior of public agents as Blundo et al. (2001) have described and categorized. Rural areas are concerned like cities, so farm heads are faced more frequently to the need of cash.

Cotton sector uncertainty, potential extra-household factor in Benin

Cotton production is of economic importance in Benin, one of the main four producing countries in West and Central Africa. This production comes mainly from the north (Borgou Province) and far north of the country, especially in Alibori Province and, to a lesser extent, in Atacora Province.

As in all cotton producing countries in West and Central Africa, production is based on the organization of farmers in villages to form groups of cotton producers, mainly if not exclusively men. Untill recently, women were not registered as distinct cotton producers in most countries. Benin has been implementing the restructuring of its cotton sector since 1998 which implied notably the privatization of the ginning industry. Farmers produce seedcotton which has to be ginned to separate fiber from seeds. Ginning used to be implemented by a unique state-owned company operating nationwide. The restructuring process has led to set up new ginning companies by private operators which operate alongside the state-owned company with quotas administratively distributed. In the restructuring course, cotton producer groups were dismantled and replaced by cooperatives, but without fundamental modifications of the way production inputs were supplied on credit (seeds, fertilizers, herbicides and pesticides) and reimbursed at the marketing of producers' seed cotton.

In Benin, wide fluctuation of cotton production has resulted from the restructuring process until 2016 because the operation of the cotton sector has been upset. The rules in the provision of inputs and marketing have changed several times (Kpadé 2011) and they have affected the quality of input distribution to producers and the level of cotton yield. The mess in the coordination of several cotton ginning companies has even disrupted cotton marketing in villages, to the extent that producers have suffered long delays in payment or even not been paid (Bourdet 2004).

The certainty and the level of income that cotton farming had provided for a long time were being undermined. The financial position of men who grew cotton, and who depended a lot on this crop was weakened, and so was presumably their intra-household position, hence giving room for change in role-sharing among spouses. This study aims at analyzing the extent of women's growing cotton has resulted and with which achievements.

Study Area, Data Collation and Processing

Study area and farm sampling

It was in the far north of the country (Alibori Province) that we heard that women might be growing cotton for themselves. The main advantage they indicated was the guaranteed payment for cotton because of the marketing process. The second advantage was to get the full amount of money in one go, as opposed to the crops they used to grow (vegetables, beans, minor cereals) and they could only sell in the surrounding village fairs in small quantities each time thus making the transaction cost was much higher.

Data were collected in 2014 from four cotton villages in Alibori Province, complemented by three villages in Atacora Province as shown in Figure 1, these two provinces differ in their involvement in cotton production. For many years now, most of the farms in Alibori Province, have been involved in cotton cultivation. In Atacora Province, a small proportion of farms have been involved in cotton growing, and in a variable way over the years. The inclusion of the two provinces was intended to ascertain how the degree of men's involvement in cotton cultivation affected that of women.

Villages were chosen after consultations with local extension services based on the possibility of women being involved in growing cotton of their own. In each village, the farms to be surveyed were identified according to their various degrees of equipment for ox-drawn cultivation and the level of cotton production in the two years preceding the survey (in 2014). In accordance with the purpose of addressing the influence of intra-household negotiation in women's cotton growing, retained farms were those in which men were present, and who were considered as farm heads by customs. Farms operated by widows were hence excluded from the study.

Data collection

The survey included separate interviews of men and women. On each farm, after the man was interviewed, at least one wife had to be interviewed depending on their availability. The questionnaires were designed to focus on the following; characteristics of the farm heads (gender, age, education) and farm families (number of wives, family size), the durable goods owned and the livestock, the structural characteristics of the farm (size, equipment for ox-drawn cultivation), the cropping systems, and the costs and revenues of cotton production. The durable goods considered were motorbikes, bicycles and mobile phones.

The questions the women had to answer were fairly similar but limited to what they were (as wives), what they had (as material goods and livestock), which economic activities they conducted, and what they felt about the benefits of cotton growing for their husbands and for themselves. They were asked about whether they had their say in the decision-taking related to 13 topics in the domains of production (such as management of family labor or the use of production equipment), income use (such as for food, health care or children's education) and preferences (namely the education of boys or girls). When they claimed having a say, they were requested to state the extent of their say by indicating a number of small stones displayed before them, considering that ten stones represented full say. When women reported that they had cultivated cotton for themselves, areas, costs and production were recorded, just as they were for men.

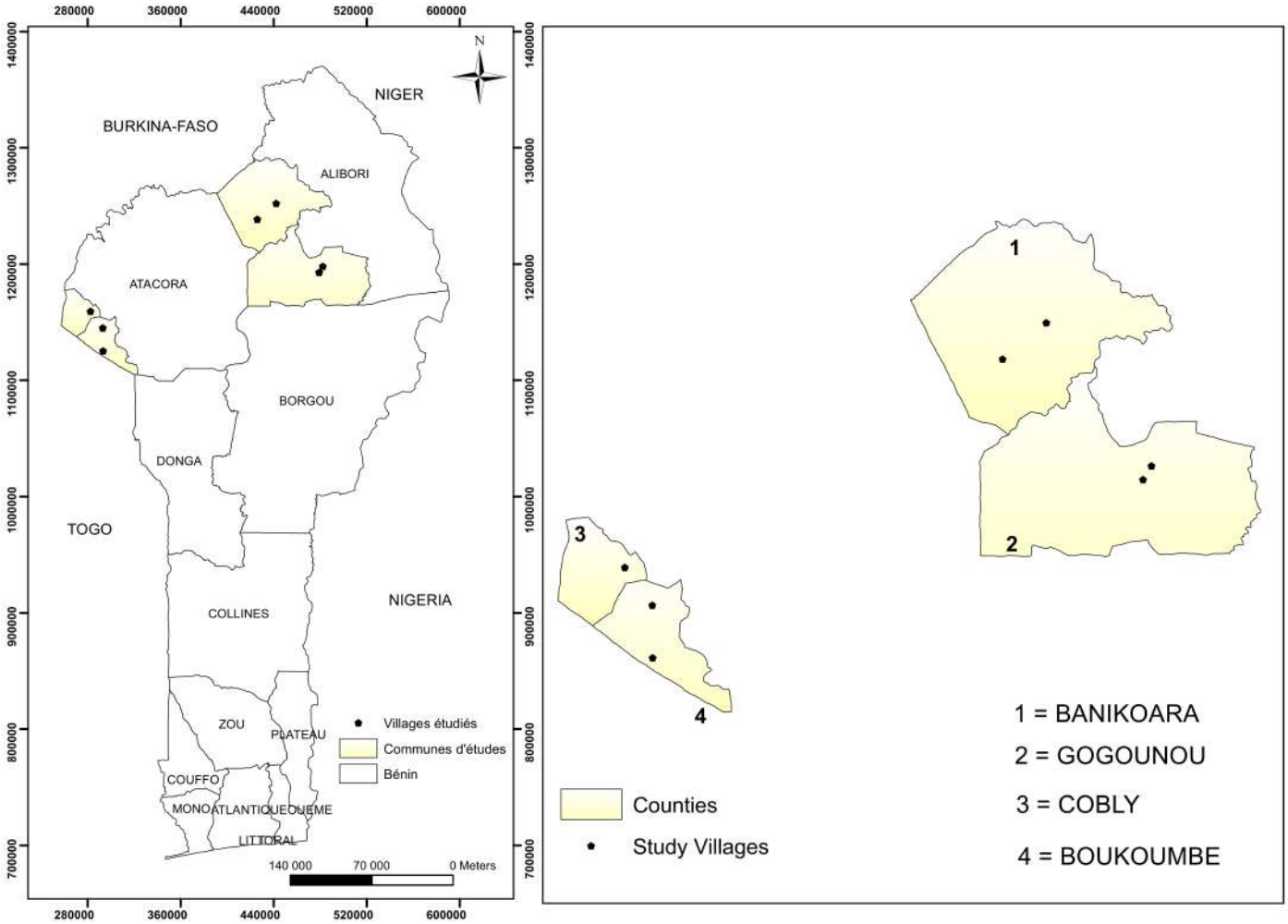

Figure 1 Map of data collections sites. Data were collected from four cotton villages in Alibori Province and three villages in Atacora Province.

In addition, a sub-sample of the interviewed women was followed for their daily time-use over a period of two and a half months on average, between November and February, to cover both cropping and dry seasons. Women's willingness to participate and the agreement of their husbands, has defined the size of the sub-sample. In view of assessing the day period and the duration women spent in their own fields and those of their husbands, the related beginning and ending times were especially recorded.

Data collation complied with the mainly quantitative approach purposely retained in view of complementing qualitative approach generally followed when dealing with women's role in agriculture.

Data processing

The data were processed to provide descriptive statistics with regard to two categories of women and two categories of men that arose from the study topic. The growing of cotton distinguished women who actually grew cotton on their own behalf, or "cotton women", as opposed to "other women" who did not grow cotton. On the other hand, men on farms where women grew cotton for themselves, referred to hereafter as "liberal farmers" were opposed to men whose wives were not "cotton women" hereafter called "other farmers".

In the descriptive analysis, farms managed by "liberal farmers" were compared to those managed by "other farmers" in order to identify any distinctive characteristics of the corresponding farms. We did the same by comparing "cotton women" and "other women" to identify characteristics that might differentiate between them. The two groups of women were compared also with regard to their time-use and their role in decision-taking related to the set of 13 topics.

The variables integrated into the comparisons pertained to farmers' personal characteristics; including the livestock or material assets owned, farm characteristics (such as land, equipment) or cotton plots (area, production costs, yields and profitability indicators). We calculated the proportions of men or women

owing assets by type (animal or material goods), and the numbers possessed. The assets owned were valued at 2014 market prices (renewal values). Nevertheless, ox-drawn devices whose acquisition was very old (more than 20 years on average), were not valued.

The descriptive statistics were supplemented by logistic regressions to identify, on the one hand, the factors that explained the behavior of "liberal farmers" leaving their wives to grow cotton for themselves and, on the other hand, the factors influencing women to grow cotton for themselves. The model used to explain men's behavior as "liberal farmers" was based on the assumption that men in more difficult financial situations, due to their age and/or the structure of their farms, were more inclined to give women the freedom to grow cotton and to depart from customary rules by no longer bearing the financial burden of social and economic expenses in households alone. The one chosen for women was based on the assumption that, in the main, women's financial means allowed them to consider growing cotton, through the possibility of obtaining the needed productions factors from outside their households, without relying too much, if at all, on the assistance of their husbands. Details of the factors taken into account, the expected signs of their effects and the corresponding reasons are summarized in Appendixes 1 and 2.

Results and Discussion

Women and cotton cultivation

In villages where women were effectively involved, they were members of a women's group that had firstly been set up, thanks to the backstopping of the extension services, to claim the right to grow cotton. Women were individually members of cotton producer groups or cooperatives in their village, like men, and alongside their husbands. The activities of women's groups have gradually evolved. These women's groups strove firstly to obtain land from their villages. The land obtained was intended for cotton growing on collective plots to generate collective income. When the size of the land area obtained exceeded that of the desired collective plot, the available land could be allocated to landless members. At the time of the study, women's groups were no longer dedicated only to cotton, but also to soybean and rice. Some groups were owners of production equipment or machines to process agricultural products.

Women's involvement in cotton production has been, and still is, individual on plots of land that each woman has been able to obtain on her own farm, but in connection with an associative process between them. Each woman invests in the factors of production, labor and inputs, and takes control of the resulting income from her cotton plot. She has to participate in field work in the collective plot.

Within her household, each woman has to keep on contributing her labor to the cotton cultivation of her husband. She can either work herself or be replaced by hired labor if she can afford it. She can benefit from the assistance of the household's children, but often only after these children have finished working in the fields of the husband, notably for harvesting.

"Liberal farmers"

The proportion of "liberal farmers" with "cotton women" was low, at 18 percent of all surveyed farmers (Table 1). This result indicates that the influence of gender (men) on decision-making in rural households remains strong as Meijer et al. (2015) emphasized but the positive sign is that it is evolving. These farmers came mainly from three of the four villages in Alibori Province, almost none from the three villages of Atacora Province. Excluding the three villages (out of seven) without "liberal farmers", 28 percent of the farms in the remaining four villages were concerned, which was quite a notable rate. The phenomenon of "cotton women" remained concentrated in villages where farmers had been very dependent on cotton income for many years and whose financial situation had suffered from the vicissitudes of cotton marketing over the last decade. This result confirms that men in vulnerable financial situation are more open to having their wives engaging in more economic activities, such as cotton growing, as observed by Attané (2009) in urban areas in Burkina Faso.

"Liberal farmers" were slightly older than the "other farmers" (Table 1) and headed mostly larger families. This was consistent with the fact that they had longer experience in cotton cropping to be sticking to and that they had older wives who's negotiating power was also greater for achieving the right to grow cotton. These "liberal farmers" were more frequently board members of the cotton producer groups in their villages, almost significantly (Table 1). This position should probably help them to defend the right of their wives in obtaining inputs for cotton cultivation. The influencing role of husbands in favor of women in producer groups had yet to be noticed.

"Liberal farmers" were slightly older than the "other farmers" (Table 1) and headed mostly larger families. This was consistent with the fact that they had longer experience in cotton cropping to be sticking to and that they had older wives who's negotiating power was also greater for achieving the right to grow cotton. These "liberal farmers" were more frequently board members of the cotton producer groups in their villages, almost significantly (Table 1). This position should probably help them to defend the right of their wives in obtaining inputs for cotton cultivation. The influencing role of husbands in favor of women in producer groups had yet to be noticed.

The equipment rate was high for all the surveyed farmers with regard to the material goods included in the study (Table 1), and even in multiple sets. However, the equipment rate was higher for "liberal farmers" in terms of two-wheeled vehicles and furthermore, for mobile phones which were more frequently possessed in a larger number of sets. Our results point out that "liberal farmers" were more "connected", a factor that could not be reported in earlier studies before the popularization of the communication devices considered.

The "liberal farmers" were more frequently equipped, at least for plows and ridging tools (Table 1). This was consistent with

	Characteristics of farmers and farms	Total	Group 1 *	Group 2 *	p Value
1	Number of farmers	213	38	175	
2	Farmers' age	41.6	***45.2***	***40.8***	0.016
3	Proportion being autochtonous, %	98.1	100.0	97.7	0.545
4	Proportion being illiterate, %	46.9	44.7	47.4	0.903
5	Proportion being polygamous, %	30.5	36.8	29.1	0.476
6	Proportion being board members**	17.8	*31.6*	*14.9*	0.059
7	Number of wives	1.4	1.4	1.3	0.276
8	Number of children	6.4	*7.6*	*6.1*	0.063
9	Number of family members	8.7	*10.1*	*8.4*	0.056
10	Proportion having cattle, %	60.1	47.4	62.9	0.118
11	Number of cattle	10.8	9.4	11.0	0.679
12	Proportion having sheeps, %	42.7	39.5	43.4	0.788
13	Number of sheeps	14.7	13.4	15.0	0.746
14	Proportion having motorbikes, %	83.1	*92.1*	*81.1*	0.076
15	Number of motorbikes	1.8	***2.2***	***1.7***	0.041
16	Proportion having bikes, %	89.2	89.5	89.1	1.000
17	Number of bikes	2.4	***3.5***	***2.1***	0.000
18	Proportion having mobiles phones, %	71.4	***89.5***	***67.4***	0.001
19	Number of mobile phones	3.4	***5.1***	***2.9***	0.000
20	Proportion having ploughs, %	70.0	***86.8***	***66.3***	0.004
21	Proportion having ridging device, %	46.5	***65.8***	***42.3***	0.010
22	Proportion having cart, %	14.1	18.4	13.1	0.588
23	Value of animals	1,612,324	1,153,553	1,711,943	0.302
24	Value of material goods[1]	744,648	***1,036,053***	***681,371***	0.003
25	Total value	2,356,972	2,189,605	2,393,314	0.724
26	Total cultivated area, ha	17.6	***24.3***	***16.1***	0.021
27	Area of annual crops, ha[2]	8.4	8.9	8.3	0.722
28	Cotton area, ha[2]	3.8	3.5	3.9	0.609
29	Corn area, ha[2]	3.4	***4.5***	***3.1***	0.023

* Group 1 = farms of "liberal farmers" having wife(ves) growing cotton for their own and Group 2 = farms of "other farmers"; ** Board of producers' groups

[1] Goods taken into account are bicycles, motorbikes and cell phones; [2] Areas of the campaign 2013/4

Table 1 Comparative characteristics of "liberal farmers" and other farmers.

their older age which had enabled them to benefit from equipment operations implemented up to mid-1990 and which were later halted. The implication for women's rights to grow cotton arose from a reduced demand for labor in farming operations, including that of women. The frequencies and numbers of animals (Table 1) appeared to be lower for "liberal farmers", although not significantly so. "Liberal farmers" had a higher value of communication devices, but the lower value of animals was not significant (Table 1) This result seems not to confirm the expectation that the financial situation of "liberal farmers'' was worse. The study nevertheless captured a phenomenon that started a few years ago with farmers having less capital in animals, but who might have been joined by other farmers who were relatively better-off.

"Liberal farmers" had more land than the "other farmers", but with similar areas devoted to annual crops (Table 1) and to cotton (3.8 ha). They had a larger area for corn (Table 1), which was by far the most cultivated cereal.[1] These figures were consistent with their older age and better equipment for ox-drawn cultivation. They also indicated that, first, "liberal farmers" were not reduced in their capacity to grow cotton, even if their wives had their own cotton plots for their part, and, secondly, they seemed not to depart from their customary responsibility of ensuring food security on their farms.

Factors influencing farmers' behavior in being "liberal" were confirmed in the logistic regressions, at least for the signs of their effects; only the effect of men's status as board members of cotton cooperatives was significant (Table 2). The lack of significance might be related to the study sample in which only 18 percent of farmers were liberal. Nevertheless, we believe that the process of farmers being "liberal" towards their wives was no longer in its infancy, so the initial farmers had been joined by other farmers and the effects of the influencing factors identified were less

[1] Figures for sorghum, millet and rice are not presented, because seldom cultivated.

Independent variables	Dependent variables					
	Men being liberal			Women growing cotton		
	Coef. B	Odd ratio	p value	Coef. B	Odd ratio	p value
Characteristics of farm heads and families						
Farm head age	0.130	1.119	0.250			
Value of animals	-0.198	1.157	0.174	***-0.485***	***1.213***	***0.012***
Value of material goods	0.121	1.134	0.337	***0.387***	***1.147***	***0.005***
Status in CPG*						
being board member	***0.247***	***1.129***	***0.042***	-0.019	1.162	0.900
being simple member	0.178	1.152	0.206	-0.094	1.197	0.603
Farm characteristics						
Cultivated area	0.086	1.127	0.470			
Production equipment level**						
No plough	-0.240	1.179	0.146			
Ridging device in addition	0.079	1.141	0.551			
Women's characteristics						
Value of animals				***0.311***	***1.134***	***0.013***
Value of material goods				0.091	1.088	0.291
Available land				0.182	1.121	0.111
Age				0.213	1.144	0.113
Finding cotton growing profitable				***1.149***	***1.239***	***< 0,0001***
Husbands' assistance in						
field works				-0.052	1.234	0.804
technical advice				0.228	1.145	0.093
funding				0.157	1.141	0.234
production equipement				0.231	1.235	0.276
others				-0.113	1.145	0.403
Test significance	Likelihood : Khi2= 22,280 Pr>Khi2 : 0,004			Likelihood : Khi2= 145,89 Pr>Khi2 : <0,0001		

*with reference to not being member ; **with reference to having plough

Table 2 Factors influencing men to be liberal and women to grow cotton through logistic regressions.

strong.

The results provide insight to clarify who the "liberal farmers" were, why they had emerged, and why in Benin and not necessarily in other West African cotton growing countries. Results indicated that "liberal farmers" were rather more traditional cotton farmers, engaged in cotton growing for a long time and who had suffered from the vagaries of the running of the cotton sector in Benin. It was confirmed that men's weakened financial situation has pushed them to become more open to the request of their wives to commit more to economic activities, notably cotton growing. Our observation is consistent with the fact that the phenomenon of women's involvement in growing cotton for themselves is seldom observed in Burkina Faso or in Mali, the main two cotton producing countries in Africa, where traditional cotton farms have not suffered, or have suffered much less, from payment defaulting.

"Cotton women"

The proportion of "cotton women" was almost 20 percent (Table 3). The number of these women was higher than the number of "liberal farmers", indicating that several wives of polygamous farmers were involved. In fact, if we refer to villages where "liberal farmers" were found, 23 percent of women were concerned.

"Cotton women" were older and almost unanimously found cotton cultivation profitable, at a frequency more than double that of "other women" (line 18). The age difference was consistent with the higher intra-household negotiating power of older women. Women's commitment appeared to be related to their positive perception of cotton growing in economic terms. The frequencies at which "cotton women" possessed animals were not higher, but the numbers of animals were larger (Table 3), so the value of animal assets was greater giving a higher value for all the assets considered (Table 3). With regard to communication devices, the frequency of "cotton women" using mobile phones was almost double that of "other women" (Table 3). Results

	Women's Characteristics	Total	Group 1 *	Group 2 *	pValue
1	Number of farms concerned	213	38	175	
2	Number of women concerned	241	47	194	
3	Women's age	31.7	***35.5***	***30.8***	0.000
4	Proportion having bikes, %	25.3	36.2	22.7	0.111
5	Proportion having mobile phones, %	39.0	***63.8***	***33.0***	0.000
6	Proportion having cattle, %	11.6	*21.3*	9.3	0.091
7	Number of cattle	3.4	4.1	3.0	0.374
8	Proportion having sheeps, %	38.6	36.2	39.2	0.830
9	Number of sheeps	5.8	7.2	5.4	0.104
10	Proportion having goats, %	47.3	57.4	44.8	0.161
11	Value of animals	185,796	***321,277***	***153,636***	0.005
12	Value material goods[1]	13,388	17,234	12,475	0.394
13	Total Value	199,184	***338,511***	***166,111***	0.005
14	Land available for use, ha	4.3	5.4	4.0	0.172
15	Proportion benefitting husbands' assistance, %				
16	in field works	70.1	68.1	70.6	0.872
17	in technical advice	36.1	44.7	34.0	0.244
18	in finance	16.2	***29.8***	***12.9***	0.028
19	in production equipment	80.9	85.1	79.9	0.513
20	Proportion finding cotton growing profitable, %	54.7	***95.7***	***44.9***	< 0,0001

* Group 1 and 2 = women growing, or not, cotton for their own account

[1] Goods considered were motorbkes, bicycles, motorized tricycles, mobile phones, machineries to process agricultural products

Table 3 Comparative characteristics of "cotton women" and other women.

confirmed two points on the one hand the observation that women engaging in cash crop production had greater financial means, in line with what was observed for cassava commercialization in Malawi and Nigeria (Forsythe et al. 2016). On the other hand, they confirmed that women actually got positive outcomes (achievements) from cotton growing. In addition, the fact that these "cotton women" were more "connected" through their communication devices, hence getting the possibility of extending more their social network and managing at distance their activities, indicate how transformative the ability to grow cotton is.

Generally speaking, the women in this study had access to land, with available land of more than four hectares (Table 3), which is more than what is usually reported in developing countries and in Africa. They claimed benefitting from the assistance of their husbands either in field work, technical advice, production equipment or financial support (Table 3). Only "cotton women" were more likely to receive financial support from their husbands, although still at a low frequency (Table 3). The financial cooperation of their husbands that women might benefit from is a phenomenon that has been little observed and quantified. Although the phenomenon observed remains only to a small extent, our findings give another dimension of intra-household relationships, cooperation or a search for synergy, as opposed to only contest through bargaining. Factors influencing women to grow cotton on their own behalf were confirmed in the logistic regressions we conducted, at least for the expected signs, though the effects were significant for four factors (Table 2). Two characteristics of farm heads encouraged their wives to engage in cotton growing. First, these farm heads were in a weaker financial situation if we refer to the value of animal assets (as this is a common indicator of wealth in Benin and in most African countries). Secondly, farm heads should be more open-minded if reference is made to the value of their communication devices.

Women's commitment to cotton growing also arose from two of their own characteristics. One was their financial means and the other was their conviction that cotton growing was profitable. We find here the confirmation of the interrelation of resources, agency and achievements. All women might want to alleviate the financial troubles of their husbands, but only those who had sufficient financial means could do so, because they could procure production factors outside the household.

It is noteworthy that, as expected, the effect of men's assistance was not significant, whatever the type of assistance considered. This result indicates that women's commitment to cotton growing was not motivated by the assistance they might expect from, or have been promised by their husbands. When committing to growing cotton, women seemed to rely mainly on their own means.

The opinions given about the benefit of cotton growing provided additional information about who the "cotton women" were. Women gave many answers about the benefits of cotton growing for their husbands (926 answers from 213 women, more than four benefits perceived on average per woman), but "cotton women" did not differ in the frequencies of the various benefits

Benefit	Benefit perceived for men by			Benefit percevied for herself by		
	Cotton women	Other women	p Value	Cotton women	Other women	p Value
Number of answers	189	737		143	119	
Distribution of answers, %						
Family cohesion	24.9	21.4	0.375	30.1	37.8	0.235
Food availability	23.8	21.0	0.477			
Input availability	17.5	21.4	0.247			
Cash availability	19.6	24.6	0.158	25.2	34.5	0.113
Fame	13.2	9.6	0.226	16.1	16.8	1.000
Personal achievement				***28.7***	***10.1***	0.000
Other benefit	0.5	0.1	0.911			
No benefit	0.5	1.8	0.208	0.0	0.8	0.933

Table 4 Distribution of women's opinions about the benefit of cotton growing to men and to themselves.

mentioned (Table 4). Family cohesion ranked first among these benefits, but was followed closely by availability of food, cash and inputs. Women gave relatively fewer answers for the benefits for themselves (262 answers, or 1.2 answers on average), virtually only one answer. Interestingly, "cotton women" frequently mentioned "personal achievement", just slightly less than "family cohesion", hence indicating their entrepreneurship mindset. In other words, if women became involved in growing cotton, they were definitely motivated by the preservation of family cohesion, but they were also motivated by demonstrating their capabilities.

Cotton production accounts of men and women

Among farmers, the performance of "liberal farmers" was equal to if not better (Table 5) than that of the "other farmers". They had a higher yield and therefore a higher production value per hectare and also per farm (as they cultivated similar cotton areas). "Liberal farmers" incurred the same level of costs for inputs, but higher costs for soil preparation and transport, so the gross margin value after the payment of inputs was higher but not when all cash expenses were paid. Hence, "liberal farmers" did not suffer from a reduction in cotton income by allowing their wives to grow cotton alongside them. At farm level, when combining what men and women obtained separately, cotton production was increased and brought in a higher income. This increase in cotton production was also positive from the standpoint of the cotton sector.

When considering farmers taken as a whole on the one hand and "cotton women" on the other, the performance was similar despite different costs and cost structures (Table 5). For inputs, "cotton women" spent more on herbicides and insecticides. Apart from inputs, women had to spend more on temporary labor and transportation. As a result, the values of the gross margin after the payment of inputs and of the gross margin after the payment of cash expenses were lower, but not significantly so. Hence, "Cotton women" achieved a rather equal performance to that of men.

The better conditions of the "cotton women" in terms of animal and material assets indicated that they could afford resorting to other actors if their husbands did not agree to help them, or not at the desired level. Husbands' assistance appeared indeed to have been partial because their wives had to spend more than their husbands on cotton cultivation, particularly on temporary labor and transportation. This was also the case for inputs, suggesting that they might not get what they needed from the village cooperatives and had to pay on the market. Women's performance in growing cotton, rather equal to that of men as mentioned above, was still achieved through a less good access to some production factors.

The distribution of cotton producers according to the gross margin classes after the payment of cash expenses gave a better picture of the profitability and the associated financial risk (Table 6). With regard to men producing cotton, 3.8 percent suffered from negative returns, which corresponded to a rather low risk while 54 percent exceeded a margin above 150,000 CFA francs and even higher for "liberal farmers" (71.8 vs 50.0 percent). When farm heads allowed their wives to grow cotton for themselves, they had more chance of achieving higher returns, while the risk of negative returns was nil and significantly lower than that of "other farmers". For "cotton women", when compared to men, regardless of whether they were "liberal" or not, cotton growing was more risky as the frequency of negative return was four times of that of men, but they were as frequent as men in achieving a gross margin above 150,000 CFA francs. This result could be explained that some women commit with growing cotton beyond their actual capabilities, notably their financial means to hire occasional labor.

Women's decision power

The study shows that there was not any decision topic for which women had no say (Table 7); when they claimed participating in decision-taking, they mostly claimed to have an equal role in decision (result not shown). This result is opposite to the perception that all decision is taken by men in a context marked by patriarchal tradition. Women's decision-making power has not been overestimated as the result is consistent with what Anderson et al (2017) had also observed by giving the opportunity to women to point out, without the presence of their husbands, their role in decision-taking over a series of topics. We rather believe that we provide a more realistic picture of the decision-taking phenomenon in a patriarcal context. Certainly, women would not

claim in public to be the decision-taker but they influence decision, and they know that and prefer that ("backstage influence" as Kabeer recalled in 1999).

There were topics for which women, in general, were more frequent to have no say, it was the case of topics related to the use of income. This result is not surprising because the income mentioned implicitly refers to that obtained from men's economic activities. Women do not interfere much in the use of their husbands' income, so that they would not have to suffer in return the interference of their husbands on the ways they use their own income. "Cotton women" were nevertheless less frequent to have no say about the allocation of resources to education, comparatively to the "Other women". This is consistent with the fact that women are willing to complement their husbands in taking charge of the education fees of their children, and particularly their own children where polygamous families are concerned. All the women surveyed claimed that the concern for the education of their children (implicitly their own children, not that of their co-spouses) was their main motivation to commit in cotton growing. In the area of education preference for boys or girls, only a small share of women had no say. The frequency of "no say" about the education of girls was even smaller. The fact that "Cotton women" had more resources did not lead them to demonstrate a support to the education of girls higher than that of the "Other women". Such a result indicates how the importance of educating children is being appropriated by all women in general.

It was in the domain of production that women, in general, were more frequent to have no say like the use of production equipment, the allocation of production inputs and of management of family labor in line with the traditional and patriarchal functioning of farms in the country. It was in this domain that "Cotton women" demonstrated comparatively more decision power to the "other women", especially in the decision of cultivating cotton, in the management of family labor and in the use of production inputs. This result is consistent with the interrelation of resources and agency in women's empowerment.

Women's time use

During the study implementation, only a sub-sample of 23 women in their daily time-use was followed because the task of recording starting and ending hours of any activity in a day was too much demanding to many. It was also hard to be implemented correctly so that we had to drop down some women who had started recording their time-use. Women's days were long, lasting on average 16.4 hours and slightly longer for "Cotton women" (Table 8). The activity of house chores was executed almost daily by all women and accounted for 3.5 hours, but much less for "Cotton Women", consistently with the functioning in polygamous families where older ladies had alleviated house chores.

Economic activities of women (namely product processing, picking/collecting products in the commons, product selling in village fairs, commerce) were not executed daily, but roughly every three days on average for all women. "Cotton women' could commit in these activities much more frequently than the "Other women", at a double rate, and for the same duration per day. Women worked in their husbands' fields six days out of ten on average regardless of whether they grew cotton or not. The fact that the time-use was not followed only in cropping season impacted on the observed figure. However, "Cotton women" spent less time per day in the fields of their husbands and they were less frequent to start working there at the earliest hours of the day.

Variables	Farm heads (men)				Women	p Value[1]
	Total	Group 1 *	Group 2 *	p Value		
Number of entities	200	38	162		44	
Cotton area, ha	3.8	3.5	3.9	0.562	***0.9***	< 0,0001
Seedcotton yield, kg/ha	1,079	***1,226***	***1,045***	0.020	1,122	0.529
Production Value, CFA/ha	285,939	***324,818***	***276,819***	0.020	297,242	0.557
Non-inpus costs, CFA/ha	41,881	***57,467***	***38,224***	0.022	***60,305***	0.025
Land preparation	25,872	***34,656***	***23,812***	0.021	32,608	0.139
Occasionary labour	2,247	4,443	1,731	0.069	***9,704***	< 0,0001
Transportation	7,502	***12,953***	***6,224***	0.002	***13,328***	0.011
Others	6,259	5,415	6,457	0.699	4,664	0.479
Input costs, CFA/ha	75,751	73,353	76,314	0.654	***95,790***	0.003
Herbicides	11,775	11,207	11,908	0.713	***16,486***	0.009
Insecticides	20,137	22,667	19,543	0.281	***27,050***	0.011
Compound fertilizer	31,443	28,629	32,103	0.194	36,791	0.141
Urea	12,356	10,849	12,709	0.331	15,463	0.065
GMAPI[2], CFA/ha	210,188	***251,465***	***200,505***	0.006	201,451	0.605
GMAPCE[3], CFA/ha	168,307	193,998	162,281	0.084	141,147	0.126

* Group 1 = farms of "loiberal farmers" having wife(ves) growing cotton for their ownand Group 2 = farms of "other farmers" ;

[1] Comparison test between all men and women producing cotton; [2] Gross Margin after payment of inputs; [3] Gross Margin after payment of all cash expenses;

Table 5 Cotton production accounts of men and women.

	Men				Women	
Class of GMAPCE*	Total	Liberal farmers	Other farmers	p Value	Cotton women	p Value
< 0	3.8	0.0	4.6	0.056	***15.9***	0.057
0 to 50,000	7.5	10.3	6.9	0.732	2.3	0.180
50 to 100,000	13.6	***5.1***	***15.5***	0.049	6.8	0.225
100 to 150,000	21.1	12.8	23.0	0.168	18.2	0.807
>150,000	54.0	***71.8***	***50.0***	0.013	56.8	0.859

* Gross margin after payment of cash expenses

Table 6 Distribution of male and female cotton producers according to classes of gross margin after payment of all cash expenses.

	All women	Women growing cotton?		
		Yes	No	p value
Production domain				
Choice of growing cotton	31.1	17.6	34.6	0.065
Choice of growing alternative crops	24.1	18.2	25.6	0.476
Management of family labor	39.2	18.2	44.4	0.002
Use of production equipment	40.4	27.3	43.6	0.103
Allocation of production inputs	38.6	24.2	42.1	0.063
Marketing of products	25.9	21.2	27.1	0.624
Domain of income use				
Allocation of resources to food	37.0	27.3	39.4	0.261
Allocation of resources to savings	48.8	51.5	48.1	0.877
Allocation of resources for investment	37.0	30.3	38.6	0.496
Allocation of resources for health	35.3	26.5	37.6	0.339
Allocation of resources for children's education	41.6	21.2	46.6	0.005
Domain of preferences				
Education of girls	21.0	20.6	21.1	1.000
Education of boys	26.3	23.5	27.1	0.911

Table 7 Percentage of women having no say in decision in a set of 13 topics.

		Women growing cotton?		
	All women	Yes	No	p value
Number of women followed	23	7	16	
Number of days followed	78.0	67.1	82.7	0.225
Day length, hour	16.4	16.6	16.3	<0,0001
House chore, hour	3.5	2.3	3.8	<0,0001
% days with economic activities*	36.6	63.5	30.0	0.000
Number of hour per related day	3.2	3.0	3.3	0.719
% days with work in husbands' fields	59.6	53.3	62.1	0.369
Number of hours per day when working in husbands fields	4.1	2.9	4.5	0.050
Frequency of days according to the starting hour of work in husbands' fields, %				
Before 10 a.m.	76.7	60.5	81.4	<0,0001
Between 10 and 11 a.m.	19.0	23.0	17.9	0.104
% days with work in women's own fields	44.0	34.0	48.4	0.195
Number of hours per day when working in women's own fields	3.0	2.1	3.3	0.054
Frequency of days according to the starting hour of work in women's fields, %				
Before 10 a.m.	56.3	29.0	60.4	< 0,0001
Between 10 and 11 a.m.	20.7	64.7	14.1	< 0,0001

* Processing product, picking/collecting fruits in the commons, going to the village fair to sell products…

Table 8 Women's time-use.

Women were less frequent working in their own fields as compared to those of their husbands, being there four to five days out of 10. The presence of "Cotton women" in their own fields seemed to be even lower in terms of frequency (difference was not found statistically significant probably because of the small sample size) and also of duration per day. "Cotton women" were also less frequent to start working in their fields at the earliest hours of the day. This lower presence could be explained by the financial resources they have so they could afford paying more for labor as it was the case in their cotton fields. With

regard to their commitment in economic activities as examined above, "Cotton women" appeared to be dedicated to conducting income-generating activities and not only to farming; they embarked on cotton cultivation as one of, but not the unique economic activities. The greater flexibility they enjoyed in their time-use seems to be favorable for the conduct of a set of economic activities for better economic outcome, hence confirming again the interrelation of resources, agency and achievements in the empowerment of these women.

Conlcusion

This study has analyzed the phenomenon of women growing cotton as an illustration of empowerment through the interrelation of resources, agency and achievements which has benefitted from an extra-household factor (unstable functioning of the cotton sector in an exacerbated monetization context) that weakened men's financial situation. We set out to identify the characteristics that differentiated between farmers having wives allowed to grow cotton, on the one hand, and those who were not allowed on the other hand, and between the women who grew cotton compared to those who did not. We also analyzed the implications on women's decision power and time-use.

In a region where, by tradition, women committed themselves to growing cotton only in the fields of their husbands, our results showed that women growing cotton for themselves gained in empowerment in terms of better access/use of resources, improved role-sharing with their husbands and better achievements (economic outcome, decision-taking and time use). This empowerment is at the root of a win-win situation which ensures it to last. Indeed, farmers allowing their wives to grow cotton for themselves continued to cultivate cotton at the same level and with a performance equal to if not better than the other farmers. Women growing cotton increased their income and improved the overall income of their household while the cotton sector gains from the increase in the overall cotton production of households. The results give more ground to the advocacy of enabling women to become more involved in cash cropping. In the specific case of cotton production, our results imply that the organizations governing cotton sectors in Africa should consider facilitating women to grow cotton for themselves.

The ability obtained by women in growing cotton is transformative in favor of further empowerment. The economic impacts of women's commitment in growing cotton for themselves were not limited to the income from this crop and impacts went beyond the economic area. Women growing cotton were also more committed in other economic activities. They enjoyed more flexibility in the time spent in the fields, either theirs or those of their husbands, which enabled them to deal better with their other economic activities. The decision power of "cotton women" was improved both in the management of household production factors and also in the allocation of resources in favor of children' education.

The phenomenon of women growing cotton in Benin gives more evidence of the requirement of intra and extra-household changes to improve women's involvement in cash cropping and economic outcome, at least at the onset of the phenomenon. Within households, women's bargaining power has been improved because that of men has been decreased by the financial implications of an unstable cotton sector. Those farmers we called "liberal farmers" were indeed somehow forced to be so. Outside the households, women found ears that were willing to listen to them among people in charge of promoting cotton production so as to complement the variable, if not declining, production achieved by men as a result of the cotton instability and exacerbated monetization. Women having more financial means were more in position to take advantage of the favorable intra and extra-household changes. However, once it was observed that the forced "liberal farmers" did not lose and that their household wholly won, more farmers joined the movement to the extent that the less favorable financial situation was not significant with regard to farmers allowing their wives to grow cotton.

In summary, factors outside households are required for changes in women's intra-household roles, particularly those which weakened men's financial situation or which make more difficult the fulfilment of men's financial responsibilities according to customs, like monetization. Once the changes have occurred, the determination, capabilities and entrepreneurial mindset of some women let them to commit with cotton growing and reach positive achievements which attract more women to get in through a spill-over effect. As monetization is getting exacerbated, women should have more opportunities to gain in empowerment, although the way it will materialize will depend on context.

References

Agarwal, B. (1997) 'Bargaining and Gender Relations: Within and Beyond the Household'. *Feminist Economics*, 3 (1), pp. 1–51. doi: 10.1080/135457097338799.

Anderman, T. L., Remans, R., Wood, S. A., DeRosa, K. and DeFries, R. S. (2014) 'Synergies and tradeoffs between cash crop production and food security: A case study in rural Ghana.' *Food Security*, 6 (4), pp. 541–554. doi: 10.1007/s12571-014-0360-6.

Anderson, C. L., Reynolds, T. W. and Gugerty, M. K. (2017) 'Husband and Wife Perspectives on Farm Household Decision-making Authority and Evidence on Intra-household Accord in Rural Tanzania'. *World Development*, 90, pp. 169–183. doi: 10.1016/j.worlddev.2016.09.005

Attané, A. (2009) 'Quand la circulation de l'argent façonne les relations conjugales. L'exemple de milieux urbains au Burkina Faso'. *Autrepart*, 49(1), pp. 155–171.

Attané, A. (2011) 'La notion d'aînesse sociale a-t-elle encore un sens dans les contextes contemporains ouest-africains?', in Molmy M. S. et L. N. W. (eds.), *Vieillissement de la*

population dans les pays du Sud : famille, conditions de vie, solidarités publiques et privées: état des lieux et perspectives. Paris, France: CEPED, pp. 49–55. Retrieved from http://www.ceped.org/cdrom/meknes/spip550f.html?article19

Bassett, T. (2002) 'Women's Cotton and the Spaces of Gender Politics in Northern Cote d'Ivoire'. *Gender, Place and Culture*, 9 (4), pp. 351–370. doi: 10.1080/0966369022000024669.

Blanchard de la Brosse, V. (1989) 'Riz des femmes, riz des hommes au Guidimaka (Mauritanie)'. *Etudes Rurales,* 115–116, pp. 37–58.

Blundo, G., Pierre, J. and Sardan, O. De. (2001) 'La corruption quotidienne en Afrique de l'Ouest'. *Politique Africaine*, 3 (83), pp. 8–37. doi:10.3917/polaf.083.0008.

Bourdet, Y. (2004) *A Tale of three countries — Structure, Reform ad Performance of the Cotton Sector in Mali, Burkina Faso and Benin*, Country 745 Economic report. Stockholm, Sweden: Swedish International Development Authority.

Doss, C. (2013) 'Intrahousehold Bargaining and Resource Allocation in Developing Countries'. *The World Bank Research Observer*, 28 (1), pp. 52–78. doi:10.1093/wbro/lkt001.

Doss, C. R. (2001) 'Designing Agricultural Technology for African Women Farmers: Lessons from 25 Years of Experience'. *World Development*, 29 (12), pp. 2075–2092. doi: 10.1016/S0305-750X(01)00088-2.

Doss, C. R. (2002) 'Men's crops? Women's Crops? The Gender Patterns of Cropping in Ghana.' *World Development*, 30 (11), pp. 1987–2000.

Droy, I. (2008) *Les femmes productrices de coton bio-équitable au Mali*, Marseille, France: IRD-UMR C3ED

Droy, I. (2011) 'Le coton bio-équitable au Mali: un facteur de transformation sociale pour les femmes?' *Mondes En Développement*, 4 (156), pp. 47–58.

Duncan, B. A. (2010) 'Cocoa, Marriage, Labour and Land in Ghana: Some Matrilineal and Patrilineal Perspectives'. *Africa (Pre-2011)*, 80 (2), pp. 301–321. doi: 10.3366/e0001972010001415

FAO. (2012) *Gender Inequalities in Rural Employment in Ghana: An Overview*, Rome: FAO.

Fok, M. (1993) *Le développement du coton au Mali par analyse des contradictions: Les acteurs et les crises de 1895 à 1993*, Montpellier, France: Université Montpellier.

Forsythe, L., Posthumus, H. and Martin, A. (2016) 'A crop of one's own? Women's experiences of cassava commercialization in Nigeria and Malawi'. *Journal of Gender, Agriculture and Food Security*, 1 (2), pp. 110–128.

Gabre-Madhin, E. Z. and Haggblade, S. (2003) *Successes in African agriculture: results of an expert survey*, MSSD Discussion Paper No. 53, Washington, DC: International Food Policy Research Institute (IFPRI).

Hill, R. V. and Vigneri, M. (2014) *Mainstreaming gender sensitivity in cash crop market supply chains*, ESA Working Paper No. 11–8, Rome, Italy: Agricultural Development Economics Division Food and Agriculture Organization of the United Nations.

Isaacman, A. (1985) 'Chiefs, rural differentiation and peasant protest: the Mozambican forced cotton regime 1938–1961.' *African Economic History,* 14, pp. 15–56.

Kabeer, N. (1999) 'Resources, agency, achievements: Reflections on the measurement of women's empowerment'. *Development and Change*, 30 (3), pp. 435–464.

Kaminski, J., Headey, D. and Bernard, T. (2011) 'The Burkinabè Cotton Story 1992-2007: Sustainable Success or Sub-Saharan Mirage?'. *World Development*, 39 (8), pp. 1460–1475.

Katz, E. (1991) 'Breaking the myth of harmony: Theoretical and methodological guidelines to the study of rural third world households.' *Review of Radical Political Economics* 23 (3–4), pp. 37–56.

Kevane, M. (2000) 'Extra-Household Norms and Intra-Household Bargaining: Gender in Sudan and Burkina Faso', in Spring, A. (ed.) *Women farmers and commercial ventures: Increasing food security in developing countries*, Volume 1. Boulder, Colorado: Lynne Rienner, pp. 89–112.

Kloos, J. and Renaud, F. G. (2014) 'Organic cotton production as an adaptation option in north-west Benin'. *Outlook on Agriculture*, 43 (2), pp. 91–100. doi: 10.5367/oa.2014.0166

Kochhar, K. (2013) *Women, Work, and the Economy: Macroeconomic Gains from Gender Equity*, IMF Staff Discussion Notes, 793 Number 13/10. Retrieved from http://ideas.repec.org/p/imf/imfsdn/13-10.html

Kpadé, P. (2011) *Adaptation de la coordination et nouvelles contradictions entre acteurs du système coton au Bénin face à la libéralisation économique*, Ecole doctorale LISIT 491. Dijon, France: Univrsite De Bourgogne.

Lele, U., Van de Walle, N. and Gbetibouo, M. (1989) *Cotton in Africa: an analysis of differences in performances.* Washington, DC: The World Bank.

Mcphail, K. and Polti, C. (1988). *Evaluation de l'impact économique et social des programmes de développement cotonnier au Burkina Faso, en Côte d'Ivoire et au Togo.* Washington, DC: Département des Evaluations rétrospectives, Banque mondiale.

Meijer, S. S., Sileshi, G. W., Kundhlande, G. and Catacutan, D. (2015) 'The Role of Gender and Kinship Structure in Household Decision-Making for Agriculture and Tree Planting in Malawi'. *Journal of Gender, Agriculture and Food Security*, 1 (1), pp. 54–76.

Me-Nsope, N. and Larkins, M. (2011) 'Beyond crop production: Gender relations along the pigeon pea value chain and implications for income and food security in Malawi'. *Journal of Gender, Agriculture and Food Security*, 1 (3), pp. 1–18. doi: 10.19268/JGAFS.132016.1

Njuki, J., Kaaria, S., Chamunorwa, A. and Chiuri, W. (2011) 'Linking Smallholder Farmers to Markets, Gender and Intra-

Household Dynamics: Does the Choice of Commodity Matter?' *The European Journal of Development Research*, 23 (3), pp. 426–443.

Peltre-Wurtz, J. and Steck, B. (1991) *Les charrues de la Bagoué. Gestion paysanne d'une opération cotonnière en Côte d'Ivoire*, Bondy,France: ORSTOM.

Poulton, C., Gibbon, P., Hanyani-Mlambo, B., Maro, W., Larsen, M. N., ... Zulu, B. (2004) 'Competition and coordination in liberalized African Cotton Market Systems'. *World Development*, 23 (3), pp. 519–536.

Raymond, G. and Fok, M. (1994) 'Relations entre coton et vivriers en Afrique de l'Ouest et du Centre: Le coton affame les populations? une fausse affirmation'. *Economies et sociétés Série Développement agro-alimentaire*, 22 (3–4), pp. 221–234.

Seebens, H. (2011) *Intra-household bargaining, gender roles in agriculture and how to promote welfare enhancing changes*, ESA Working Paper, No.11–10. Retrieved from http://www.fao.org/3/a-am315e.pdf

Somé, B. (2010). *Growing cotton: Household negotiations in export-oriented agriculture in Africa, Burkina Faso*, Dissertation, Chicago, Illinois: University of Illinois. Retrieved from https://www.ideals.
illinois.edu/handle/2142/16957

Tovignan, D. S. and Nuppenau, E.-A. (2004). 'Adoption of organic cotton in Benin: does gender play a role?', C*onference on Rural Poverty Reduction through Research for Development and Transformation*, Berlin, 5-7 October.

Udry, C., Hoddinott, J., Alderman, H. and Haddad, L. (1995) 'Gender differentials in farm productivity: implications for household efficiency and agricultural policy'. *Food Policy*, 20 (5), pp. 407–843. doi: 10.1016/0306-9192(95)00035-D.

Vigneri, M. and Holmes, R. (2009) 'When being more productive still doesn't pay: gender inequality and socio-economic constraints in Ghana's cocoa sector', paper presented at the FAO-IFAD-ILO Workshop on Gaps, trends and current research in gender dimensions of agricultural and rural employment: differentiated pathways out of poverty, Rome, 31 March–2 April.

Vimard, P. (1997) 'Modernisation, crise et transformation familiale en Afrique subsaharienne' *Autrepart*, 2, pp. 143–159.

Wang, G. and Fok, M. (2017) 'Are women less capable in crop managing? Insights from cotton production in northern China'. *Feminist Economics*, 23 (4), pp. 117–142. doi: 10.1080/13545701.2016.1241416.

Zakaria, H. (2017) 'The drivers of women farmers' participation in cash crop production: the case of women smallholder farmers in Northern Ghana'. *Journal of Agricultural Education and Extension*, 23 (2), pp. 141–158. doi: 10.1080/1389224X.2016.1259115.

Appendix 1: Anticipation of the factors influencing farmers to let their wives growing cotton.

	Dependent variable: liberal farmer	
	Expected sign	Reason
Farmers characteristics		
Age	+	Older farm heads have older women whose negotiation power is higher
Values of animal assets	-	Less capital is indicative of harsher financial situation which leads to be more open-minded about women's request for growing cotton for themselves
Values of material assets (motorbikes, bicycles, mobile phones)	+	Indicator of higher connection potential hence of greater mind openness
Role in cotton producers' group	+	Greater role in decision-taking in producers' group is favorable to defend women's right to grow cotton
Farm characteristics		
Size	+	Farms of larger size are those where men have been more dependent on cotton income and whose financial situation has been made more fragile
Equipment level	-	Lower level of equipment implies lower productivity and harsher financial situation

Appendix 2: Anticipation of the factors influencing womens to grow cotton.

	Dependent variable: liberal farmer	
	Expected sign	Reason
Farmers characteristics		
Values of animal assets	-	Less capital is indicative of harsher financial situation of the husbands, pushing women to engage in cotton growing
Values of communication devices	+	Indicator of higher connection potential hence of more mind openness
Role in cotton producers' group	0	Women engage in cotton growing through a collective process without expecting so much to be backstopped by their husbands
Women's characteristics		
Values of animal assets	+	Better financial situation enables women to obtain production factors out of household
Values of material assets	+	Better financial situation enables women to obtain production factors out of household
Available land	+	The more land women have, the more they are attempted to grow cotton
Age	+	Better intra-household negotiation power for older women
Perception of cotton profitability	+	Women's involvement in cotton is motivated by their perception of the relative profitability of cotton growing
Assistance obtained from husband in		
implementing field works	0	Women can obtain the needed assistance out of their household
technical advice	0	Women can obtain the needed assistance out of their household
financial support	0	Women can obtain the needed assistance out of their household
others	0	Women can obtain the needed assistance out of their household
access to equipment	0	Women can obtain the needed assistance out of their household