

Kumase, Wokia-azi N.; Bisseleua, Herve; Klasen, Stephan

**Working Paper**

## Opportunities and constraints in agriculture: A gendered analysis of cocoa production in Southern Cameroon

Discussion Papers, No. 27

**Provided in Cooperation with:**

Courant Research Centre 'Poverty, Equity and Growth in Developing and Transition Countries',  
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*Suggested Citation:* Kumase, Wokia-azi N.; Bisseleua, Herve; Klasen, Stephan (2010) : Opportunities and constraints in agriculture: A gendered analysis of cocoa production in Southern Cameroon, Discussion Papers, No. 27, Georg-August-Universität Göttingen, Courant Research Centre - Poverty, Equity and Growth (CRC-PEG), Göttingen

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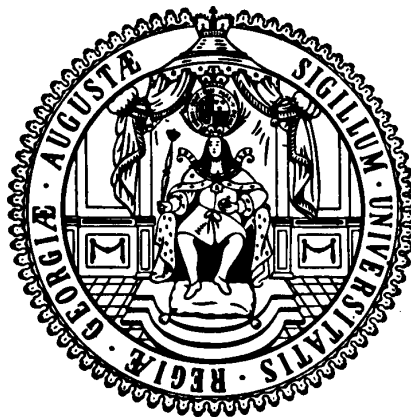
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# **Courant Research Centre**

## **'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'**

**Georg-August-Universität Göttingen**  
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Discussion Papers

**No. 27**

**Opportunities and constraints in agriculture:  
A gendered analysis of cocoa production in Southern  
Cameroon**

**Wokia-azi N. Kumase, Herve Bisseleua, Stephan Klasen**

**March 2010**

Platz der Göttinger Sieben 3 · 37073 Goettingen · Germany  
Phone: +49-(0)551-3914066 · Fax: +49-(0)551-3914059

Email: [crc-peg@uni-goettingen.de](mailto:crc-peg@uni-goettingen.de) Web: <http://www.uni-goettingen.de/crc-peg>

# **Opportunities and constraints in agriculture: A gendered analysis of cocoa production in Southern Cameroon**

Wokia-azi N. Kumase<sup>1</sup>, Herve Bisseleua<sup>2</sup>, Stephan Klasen<sup>1</sup>

March 2010

**Abstract:** In this paper we examine gender differences in cocoa production in Cameroon using a survey of about 1000 cocoa producers in Southern Cameroon. We find that women farmers have access to land (of similar size to men), but through different mechanisms than men. They are strongly disadvantaged when it comes to access to extension services and marketing and control of proceeds. Despite these disadvantages, the productivity in terms of output per unit of land is similar to that of their male colleagues. Productivity analyses suggest that a slight disadvantage in productivity on female plots turns into a slight advantage when controlling for all the factors affecting productivity. The policy message from this is quite clear: Independent women farmers are a reality in Cameroon that need equal access to inputs and technologies, and support. If given equal opportunities, their productivity is at least as high as that of men.

**Keywords:** Gender inequality, cocoa farming, Cameroon

**JEL Codes:** J71, Q12, O13

## **Acknowledgements:**

We would like to thank Barbara Haeming and Michael Grimm for helpful comments on an earlier version of this paper. Funding from the BMZ via GTZ in support of this work is gratefully acknowledged.

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<sup>1</sup> Department of economics, University of Göttingen

<sup>2</sup> Department of crop science, University of Göttingen



**Photo: Häming B., GTZ Cameroon**

## 1 Introduction

It is now common knowledge that men and women both play substantial – though different – economic roles in African economies; and that gender inequality in education and employment directly and indirectly limits economic growth in Africa (Klasen, 2002, Klasen and Lamanna, 2008, World Bank, 2001, Blackden et al, 2007).

The question arises if the removal of these gender-based barriers in agriculture (taking the Cocoa sector as a case study) will make a substantial contribution to realizing Cameroon's agricultural growth potential. To answer this question, the paper starts with the hypothesis that gender inequality in education and in access to important resources and inputs for agricultural production would lead to inefficient allocation of resources and may reduce productivity. This is based on analyses of Blackden and Canagarajah (2003) and Blackden et al. (2007), and Udry (1997) which show that reducing gender-inequality in access to and control of key productive resources necessary for growth, is a concrete means of accelerating and diversifying, making growth more sustainable, and ensuring that the poor both contribute to, and benefit from, that growth. Several studies have reported that in many countries, it is more difficult for females to have access to capital, land and financial or other assets that permit them to be entrepreneurs or improve their productivity (Blackden and Bhanu, 1999, ILO, 1995).<sup>1</sup> Given the importance of agriculture to growth and poverty reduction in many Sub Saharan African countries, including Cameroon, it is particularly worthwhile to investigate to what extent inequalities in access to resources and inputs limit efforts to improve agricultural productivity in Cameroon. Given the importance of the cocoa sector for Cameroon's agriculture, our empirical analysis will focus on that sector.

### 1.1 Objectives

Using gender as an analytical approach, that is, viewing resources and benefits as being distributed within society and its institutions, including the family, market and the government on the basis of gender (roles, relations), the purpose of this paper is to:

- a) identify the influence of gender in different aspects of cocoa production,
- b) assess the impact that gender disparities have on productivity,
- c) study gender differential in cocoa marketing and control over proceeds

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<sup>1</sup> There is also some literature that claims that households with boys tend to use purchased fertilizers and insecticides more intensively compared with households with girls and that households with boys also tend to have larger land holdings, and use animal and human labor to a greater extent than households with girls, there is no positive correlation drawn between these bias in favor of boys to total productivity (Bhagowalia et al., 2007).

in order to arrive at recommendations for promoting a more gender-equitable “pro-poor growth” in the agricultural sector.

In this paper, we draw on results from a 2007 survey of male and female cocoa producers in Southern Cameroon<sup>2</sup> to investigate to what extent there are gender differences in access to land, inputs, extension services, productivity, and control of proceeds. The results of the study clearly indicate that women farmers, contrary to our expectations and the subordinating role suggested in some studies (Sikod, 2007 and Bryson, 1981, 1979) are experiencing improved opportunities for independent cocoa production. At the same time, a male bias in participation in cocoa cultivation, ease in land acquisition, more regular contacts with extension officers and amount of money spent on land preparation remains. The regression results confirm that land productivity on female farms is slightly lower than that of males and that plot size, variety of cocoa cultivated as well as amount of money invested in land preparation are very important factors determining productivity. There are important differences, however, between single, widowed and married female producers in these gender-based inequalities. When controlling for these inequalities, however, land productivity on female farms is equal to that of male farms, suggesting that these inequalities are responsible for reducing their output. Our results also suggest that women are particularly disadvantaged when it comes to the marketing of cocoa and control over the proceeds.

## **1.2 The importance of agriculture in Cameroon**

The choice of the agricultural sector and cocoa in particular to measure the impact of gender inequality on economic growth is due to its importance in the Cameroonian economy. Besides that, women play a pivotal role in African agriculture; they act as producers, processors and marketers (Staudt, 1982). The agricultural sector takes the front stage when one examines the economic and poverty situation in Cameroon. The main cash crops, which provide about 40 percent of Cameroon’s exports, are cocoa (Cameroon is the world's fifth-largest producer), coffee and cotton. Before Cameroon began exporting oil in 1977, cocoa and coffee was the mainstay of the economy, contributing about 80% of the country's GDP. But after two decades (1980-2000) of neglect and a poorly handled economic liberalization policy, the share of agriculture in GDP has fallen drastically (see fig. 1) and the two sectors represent only 1.5% of GDP (Amin, 2001). The production and exportation of cocoa and coffee had declined precipitously after 1989 in response to the government cut of producer prices and subsidies (Courade and Alary, 1994, Janin, 1996, Mama, 1996, Bamou and Masters, 2006). This decline in cash crop production could be explained by the shift in small-scale production from export crops to food crops due to an

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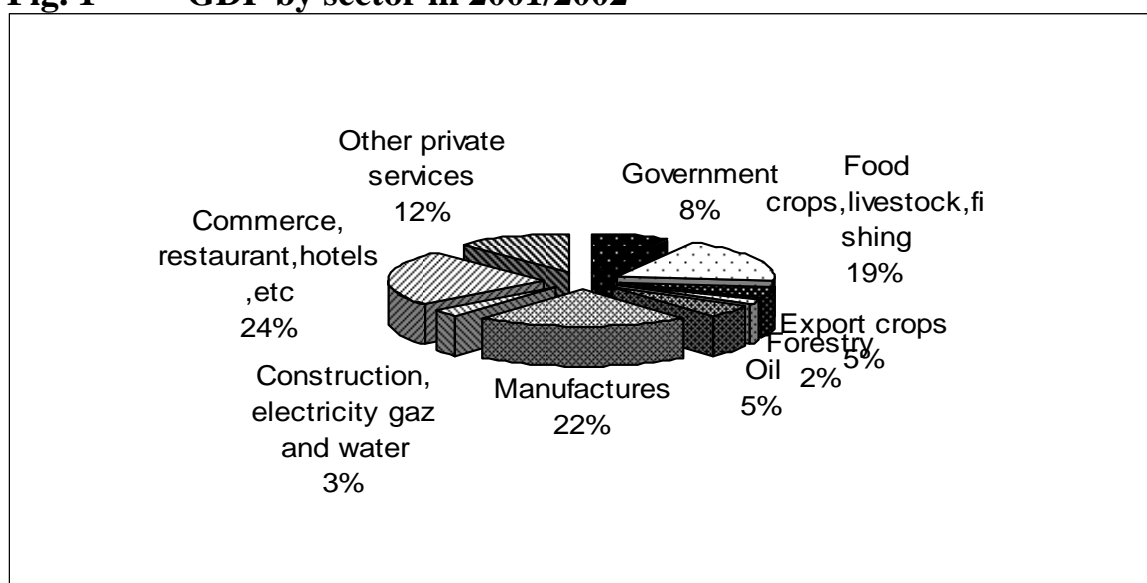
<sup>2</sup> Southern Cameroon for the purpose of this paper refers to the following Provinces: Centre, Littoral and South West.

increase in demand of food crops, increased input cost caused by a government phase-out in the subsidies for fertilizers, pesticides and herbicides programs (Ndoye and Kaimowitz 2000, Sunderlin et al. 2000). Fig. 2 below shows the trends of Cameroon's cash and food crop production and fig. 3 shows the trend of cocoa exports as well as assistance given to cultivators of the various crops. As shown, cocoa exports have fallen and direct assistance has turned negative.

As the cocoa sector shrank, Cameroon's economy developed a heavy dependence on oil in the early 80's. Petroleum output share which accounted for 20% of GDP in 1980 dropped to 5.6% by 1998/99. Though the big rise in oil prices in 2000 doubled the share of oil in GDP, this was dampened by a 4.7% drop in the volume of production (AEO, 2003). This increase in oil share of GDP in the early 80's led to a reduction of agricultural share in GDP from 42.3% in 1962 to 33.4 % in 1991, 30 percent in 1998 (Amin, 2001) and 26% in 2002 (AEO, 2003).

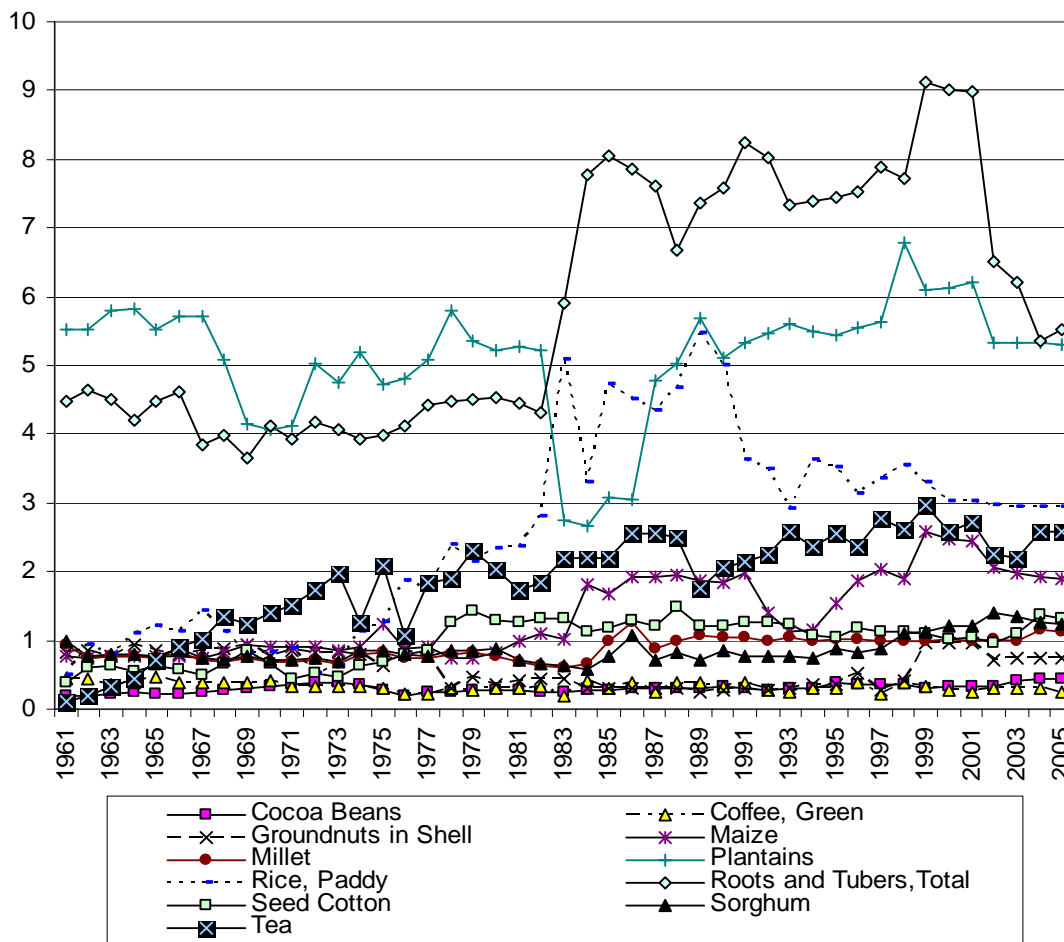
Though services and manufacturing (figure 1) and to some extent oil continues to assume an important role in Cameroon's economy, agriculture still remains the main economic activity for the majority of the population, and particularly for the poor. Over two-third of the working population are employed in agriculture, and the sector contributes about a quarter of value added and brings in a third of export earnings (AEO, 2003; Amin, 2001). In this regard, cocoa was selected to examine the impact of gender inequality on productivity and to develop recommendations as to how improving gender equality could contribute to pro-poor growth.

**Fig. 1 GDP by sector in 2001/2002**



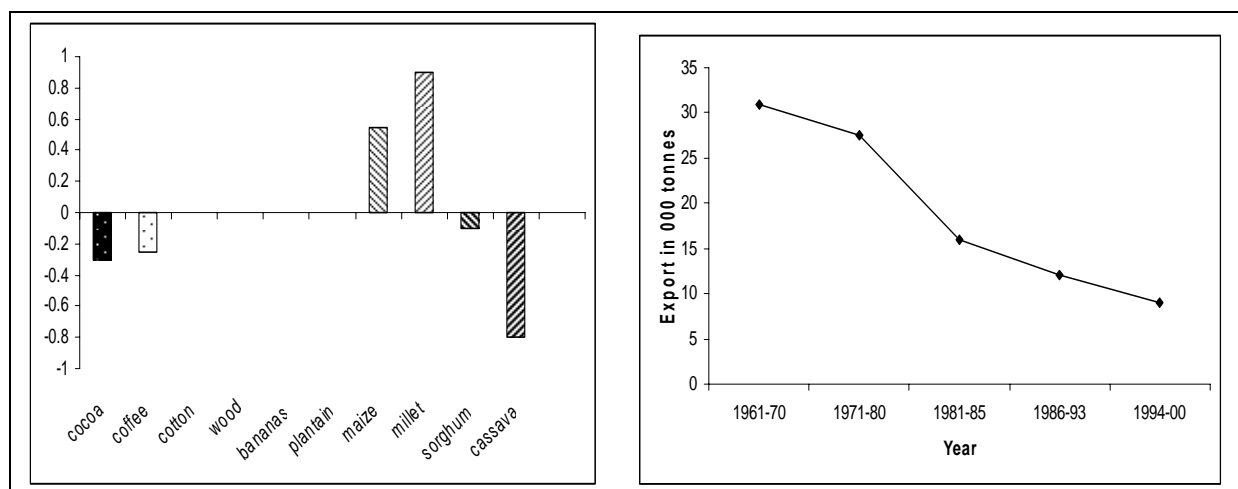
Source: African Economic Outlook, 2003

**Fig. 2** FAO estimates of average yields for major food and cash crops, 1961-2005 (mt/ha)



Source: Bamou and Masters, Oct. 2006

**Fig. 3a** Direct Rate of Assistance by commodity Cameroon (2000-2004) **Fig. 3b** Cocoa exportation trend Cameroon (1961-2000)



Source: Bamou and Masters

Source: Constructed from data by Lade Dada



### **1.3 Study site and data presentation**

Twelve communities were selected from six main cocoa growing sub-divisions: Ngomedzap, Obala, Mbangassina and Bokito in the Centre province, Boumyebel in the Littoral province and Kumba in the South West province. A number of villages were chosen for the survey from these communities based on their population density (Appendix 1). Regions in the Centre are located between 3°35'N and 11°48' and 11°15' E with a mean annual rainfall that varies between 1400 and 1900 mm, while Kumba is positioned between 4 ° 30'N and 9 °25 E with a mean annual rainfall ranging between 2500 and 4000 mm. Rainfall seasonality and altitudinal range characterize the local ecosystem as that of a tropical wet forest life zone and suitable for cocoa cultivation (Kotto-Same et al., 1997).

The communities were small, representative of rural villages in Cameroon (500 - 5000 inhabitants), yet differing in many respects. Villages in Kumba and Mbangassina are mainly composed of migrants, who are more market-oriented and less concerned with land accumulation than their indigenous counterparts. Women in these communities are more engaged in commercial activities that require them to leave their households for distant market places. Communities in Bokito, Boumyebel, Ngomedzap and Obala are mainly composed of indigenous people that are less market oriented. Women in these communities are also involved in small income generating activities, but unlike their counterparts in Kumba and Mbangassina, they generally carry out their trade within their homes and generate considerably fewer earnings. The farming system in all the communities is based on long fallow and slash-and-burn techniques in a forest environment using the short handled hoes as described by Duguma et al. (2001).

Agriculture in all communities consisted of smallholdings where men, particularly senior men, occupy central positions. In these villages, descent is traced patrilineally and control over productive resources is corporate. Age and sex are important characteristics in social, political, and economic contexts, with elders dominating juniors and men typically holding more power than women and marriages being frequently polygamous.

## **2 Gender differences in cocoa cultivation**

The study based on a survey of 1030 cocoa farmers shows that customary land tenure institutions are gradually evolving towards individualized systems. Though difficult to quantify, many more females can purchase and own land and this provides incentives to invest more in cocoa cultivation. The individualization of land tenure is strengthening women's land rights, thus breaking one of the strongest barriers to cocoa cultivation by women, which is

access to land. Many husbands are also circumventing traditional practice by enabling their wives to inherit land through “indirect means”, which are often explained as rewards to wives for helping their husbands plant and cultivate cocoa since cocoa production is very labour intensive. Women are usually in charge of the corresponding weeding and pruning which are very important to ensure the proper growth of cocoa.

**Table 1 Land acquisition methods**

Land acquisition	Percent	
	Male	Female
Forest clearing	12.1	1.8
Heritage	77.2	57.8
Gift	2.5	3.7
Purchase	8.2	20.6
Marriage		16.1

**Source:** Authors’ calculation from survey data

Table 1 indicates that there is a major difference in land acquisition methods between men and women. The majority of men acquire land by heritage and forest clearing, whereas women in possession of land claimed to have obtained their land by heritage, purchase and marriage, in that order. More women acquire land through purchase than men. In addition, by circumventing traditional practices (women not being allowed to inherit or own land), men also permit women to obtain land by marriage. Looking only at females (table 2); it is surprising to see that the majority of married women acquired land through purchase, while the majority of single women and widows actually acquired their land through heritage. Widows and singles have more control over land than married women with regard to passing on or renting land to others.

**Table 2 Land acquisition by marital status (Women)**

	Married	Single	Widow
Cleared Forest	1.3	4.2	1.8
Heritage	35.4	75	68.2
Gift	8.9	4.2	0
Marriage	12.7	0	22.7
Purchase	41.7	16.6	7.3

**Source:** Authors’ calculation from survey data

If men are traditionally land owners in Southern Cameroon, it is also worth noticing that land titling which would have strengthened their land rights at women’s expense is not an issue since most people have no land title for the land they own. Only 15.5% of the cocoa farmers were in possession of a land title.

**Table 3** Level of education by sex and marital status

	Male			Female		
	Married	Single	Widower	Married	Single	Widow
None	28.1	22.8	67.9	54.8	41.6	70
Primary	65.2	68.4	25	42.7	50	30
Secondary	4.5	3.5	0	1.2	0	0
Tertiary	2.1	5.3	7.1	1.2	8.4	0

**Source:** Authors' calculation from survey data

Table 3 indicates that though education does not seem to be an issue in these village communities, there is a large disparity regarding the education attainment level between male and female cocoa farmers in Southern Cameroon. This gender bias in educational outcomes is a constraint women face which holds them back from adopting new methods of cultivation, thus limiting their chances of benefiting from economies of scale or fully participating in marketing channels higher up stream. Klasen (2002) and Knowles et al. (2002) remarked that in an economy where there is inequality in girls' education, the average level of human capital is likely to be low, resulting in lower returns on investment and economic growth.

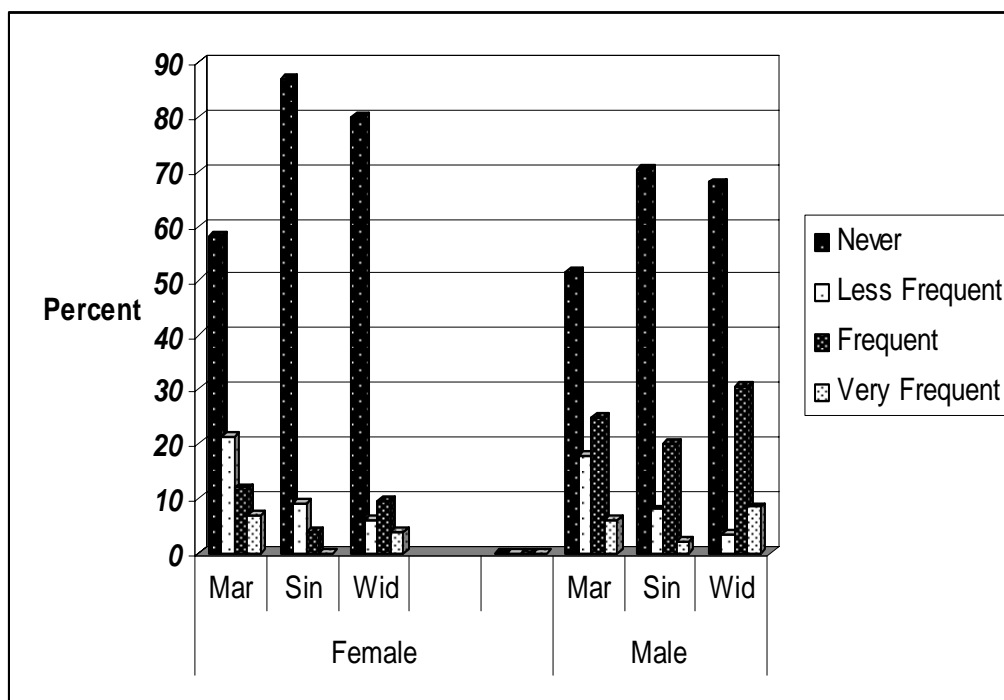
The total area cultivated with cocoa exhibits no major differences between males and females in size, with the average area cultivated being estimated at 5.5 hectares). The major problem here is the secondary role women occupy in these activities and their limited opportunities to productive assets. Women spend almost 50% less income than men on land preparation; have fewer contacts with extension officers as shown below (table 4) and are also pre-occupied by food crop cultivation since they have to cater for the food self sufficiency of the family. Distinguishing contacts with extension officers by sex and marital status, it is observed that there is no major disparity between married men and women; whereas single women and widows on average have fewer or no contacts with extension officers (see fig. 4).

**Table 4** Contact with extension officers

Frequency	Male	Female
Never	53.3	72.4
Less Frequent	16.3	12.2
Frequent	25.3	10.7
Very Frequent	5.1	4.7

**Source:** Authors' calculation from survey data

**Fig. 4 Contact with extension officers by sex and marital status**



**Source:** Authors' calculation from survey data

Another very important factor is the number of hours and days cocoa cultivators spend on the cocoa farm. Males spend twice the number of days on farm as females, but both sexes spend the same number of hours on average per day on farm (5hrs/day).

Cocoa cultivators combine their activities with other food crop production. Particularly women do so in order to satisfy the food sufficiency of their households. Due to the barriers they face in accessing cocoa cultivation and controlling the marketing and revenue from cocoa, it is also seen that women prefer to engage in the less profitable food crops which they can control<sup>3</sup>. It is seen that women prefer to associate cassava, maize, cocoyam and groundnuts in that order to cocoa production whereas men prefer maize, plantain, cassava and groundnuts in that order<sup>4</sup>. Table 5 below indicates that women sell more of their

<sup>3</sup> Women normally market and control the revenue from their food crop production whereas women involved in cocoa cultivation seek assistance from male relatives to market their cocoa for them in the absence of a spouse. Thus losing control over the marketing and the revenue generated.

<sup>4</sup> Women principally prefer to associate those crops with cocoa which require further processing thus increasing their market value. Cassava is transformed into several other staples consumed by households known locally like garri, fufu, bobolo etc. Men's choice of crops associated with cocoa could be explained by the fact that these are crops which are less demanding in time and control, like maize and plantains. When asked why they associated plantains to

crops associated with cocoa than males. Since they have little access to revenue from cocoa cultivation in which they actively participate, they sell most of the food crops associated to cocoa cultivation in order to generate income for themselves.

**Table 5 Share of crop associated with cocoa sold**

	Male	Female
Cassava	65%	72%
Cocoyam	0	60%
Maize	57%	77%
Plantain	80%	0
Groundnut	58%	42%

**Source:** Authors' calculation from survey data

The difficulties faced by women does not reduce the productivity of their land as there is no clear indication that men harvest more per hectare than women. This holds true at least for the married and widowed. For the married couples, this could be explained by the difficulty in separating their yields between themselves, but we start recording slight surpluses in yield from men when we consider only widows and singles. The difference is particularly large among singles. Further analysis will be required to have a clearer picture on output by sex to see if the difficulties women have in accessing land, education, and extension services are counteracted by some other advantages or greater inputs in other areas (see below).

**Table 6 Total harvest by sex and marital status**

	Average harvest in bags per hectare	
	Male	Female
Married	4.2	4.3
Widows	4	3.8
Single	3.5	2.4

**Source:** Authors' calculation from survey (A bag = 85Kg)

Marketing the products is used as an indicator of control over revenue. For the cocoa producing areas of Southern Cameroon, figures from the tables below indicate a gap between male and female cocoa cultivators when it comes to marketing the products. The disadvantaged situation of women is even made clearer when one disintegrates marketing and revenue control by marital status. 95.7 % of male cocoa cultivators do the marketing by themselves against 61% of female cultivators. The lack of control over the marketing and, consequently the lack of revenue are clearer when looking at married cocoa cultivators. Only 1.8% of wives market cocoa for their husbands, whereas 26.5 % of men have

cocoa most farmers declared that this paid as much as cocoa or even better. The only problem with plantains was the high risk because it easily dies off, thus giving an advantage to cocoa cultivation which even when poorly taken care of does not die off but only suffers from a reduction in yield.

control over the marketing for women with cocoa plantations (see table 7a). Generally, men have more control on the revenue generated from marketing. Even the majority of women claiming to market their products, also indicated they gave the revenue generated to their partners for management. Table 7b goes further to show the extent to which women are marginalized in the control over revenue generated from agriculture. Looking only at females, it is clear that widows have more control over the marketing and thus revenue than married women. While 97% of married males control marketing, only 54 % of married females do.

**Table 7a Control over marketing of cocoa products by sex**

Marketing	Male	Female
Self	95.7	61
Spouse	1.87	26.5
Son/daughter	1.49	7.43
Other rel.	0.94	5.07

**Source:** Authors' calculation from survey

**Table 7b Marketing Cocoa by sex and marital status**

	Male			Female		
	myself	wife	other	myself	husband	other
Married	97	1	2	54	43	3
Single	95	-	5	100	-	-
widower	85	-	4	77	-	23

**Source:** Authors' calculation from survey

The descriptive analysis so far suggests that women have access to land, though they get this access differently than men. They are particularly disadvantaged when it comes to education, access to extension services, and control over marketing and proceeds. On the other hand, the output on their land does not appear to be noticeably lower than that of men, an issue that deserves closer attention and will now be investigated.

### 3 The model and measure of productivity

Contrary to the traditional household models which assume that farm households function like a single unit for productivity and consumption and that there is a consensus among household members on allocation of resources and benefits and that all- household member's interest and problems are identified (Cloud, 1987), the concept of gender goes further to provide evidence for the fact that, production in farm households is determined mainly by intra-household differences. That is, differences in the roles, incentives and constraints of men and women in the household affect production decisions. Household members are likely to have conflicting preferences in regard to the intra-household distribution of effort and reward. Men and women allocate their

resources to activities that best enable them to fulfil their obligations rather than to activities that are most productive from an aggregate household perspective. A very clear example of this is the case of cash crops combined with cocoa cultivation. Although women and men collaborate on some tasks on all plots, there are clearly defined plots that are managed by women and plots that are managed by men; each decide largely on their own on all aspects of production on their respective plots (although men then end up having more control over the marketing also of output from ‘female’ plots). Rather than viewing the household as a single unit, only the head of farm units were surveyed to capture their practices<sup>5</sup>. That is farm heads use the resources at their disposal to maximize output. Pareto efficiency in production would imply that marginal products should be the same on all plots planted to the same crop within a given year. Gender inequalities will be observed by comparing the differences in productivity on plots controlled by women and men.

What measure of productivity to use is certainly an open question? Most studies have used either a production function approach or used land productivity (aggregate output divided by farm size). This measure is subject to criticism as giving too much importance to one input, land. In the Cameroonian context where land for agriculture and the difficulty faced by women to obtain land are important for poverty reduction, a focus on land is appropriate. Though land productivity is also often criticized for not being an accurate measure of efficiency, the issue of technical efficiency will not be examined. This is defensible in the context of Cameroon as the cocoa sector in Cameroon makes very little use of modern technology.

The hypothesis is that gender inequalities reduce the productivity of females. The impact of gender inequalities on productivity is tested by regressing land productivity (farm revenue from cocoa divided by farm size) on farm characteristics, farm management factors, and intensity of inputs. It is worth noticing that we cannot control for important aspects like climate and soil fertility, which also influence productivity. The specification used is as follows:

$$\log Y_i = \mu + \alpha X_i + \beta D_i + \varepsilon_i$$

where  $i$  refers to the  $i^{\text{th}}$  individual. The dependent variable  $Y_i$ , represents yearly land productivity. On the right hand side,  $\mu$  is a constant,  $X_i$  is a matrix that contains continuous explanatory variables-i.e., plot size, household size, age, hours spent on farm and amount spent on land preparation.  $D_i$  represents a

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<sup>5</sup> If a farmer is married, the spouse was not interviewed but information on his/her participation in the farming activities was obtained from the farmer.

vector of qualitative dummy variables, i.e. sex, marital status and contact with extension. The regression equation can be explicitly written as:

$$\log Y_i = \mu + \alpha_1 \text{sex}_i + \phi \text{age}_i + \kappa \text{hsize}_i + \nu \text{plotsize}_i + \xi \text{xlapre}_i + \gamma_1 \text{mar}_i + \gamma_2 \text{wid}_i + \psi_1 \text{Hrfarm}_i + \delta \text{cox}_i + \varepsilon_i$$

in which  $\text{sex} = 1$  if the individual is female, 0 if male.  $\text{mar} =$  married,  $\text{wid} =$  widow and  $\text{sin} =$  single.  $\text{sin}$  is left out like the comparison group.  $\text{cox} = 1$  if the individual had contacts with extension services and 0 if not.  $\text{Hrfarm}$  is the number of hours spent on farm per year.  $\text{xlapre}$  is the total expenditure on land preparation and pesticides.

Table 8 below presents the descriptive statistics for the dependent and independent variables used in the regression analysis. Note that women tend to have slightly smaller plot sizes, have much lower contact with extension officers, are slightly older, spend fewer hours on the farm, but spend more money on land preparation.

**Table 8 Descriptive Statistics on Cocoa Cultivation by Sex**

Variable	Male	Female
Land Productivity (bags/Ha.)	4.1	3.9
Age	49.3	51
Household size	7.2	6.2
Sex (Female=1 and male=0)	78%	22%
Plot size (Ha./household)	5.9	5.5
Hours spent on farm/year	1150	1052
Contact extension office(cox)	47.8%	29.7%
Marital status:		
1. Married	88.8%	37.6%
2. Widow	3.8%	51.4%
3. Single	7.4%	11.0%
Exp land preparation/Ha. (CFA)	84 488	91360

**Source:** Authors' calculation from survey

## 4 Results and Discussion

We begin with a simple regression of land productivity on sex which indicates a slightly lower productivity for women although the coefficient is rather small (suggesting 4.4% lower land productivity per hectare for women) and not significant (table 9). In the next model, all the other variables are included (age, household size, marital status, plot size, expenditure on land preparation and pesticides, contact with extension services and hours spent on farm). There is an inverse relationship between plot size and land productivity which is highly significant; smaller plots have a higher land productivity, which is in line with evidence from elsewhere (e.g. Binswanger, Deininger, and Feder, 1995).



Expenditure on land preparation is estimated to significantly increase land productivity. So, the more a farm spends on land preparation, the higher land productivity that farm will enjoy. Labour input is captured in our model by the log of hours spent on farm. There is a positive and significant correlation between hours spent on farm and productivity. Contact with extension services significantly increases land productivity. Contrary to our expectation, education which we expected to increase land productivity, since knowledge should improve farming ability was highly insignificant and this could be explained by the generally low level of education among the cocoa farmers in the study site. For this reason, education was left out of the regression. Even the inclusion of household size and age considered as important factors representing labour support and experience and capable of influencing productivity were also insignificant. Married couples enjoy higher and significant productivity than singles (comparison group). Widows indicate a higher productivity than singles but the difference is insignificant. The number of hours spent on the farm is significant and positively influences the productivity of the farmers.

After controlling for all these factors which we consider could be playing a major role in influencing the productivity of the farmers, it is shown that sex is not significant in determining productivity though there is a small edge in favour of women of 0.4%. That is to say, controlling for other factors, plots managed by women are at least as productive as those by men, when controlling for all factors affecting productivity, particularly also those where women are disadvantaged.

Table 10 below shows the complete results of the regression after including all the independent variables. The coefficient of sex is influenced by the introduction of other variables though it remains insignificant.

**Table 9 Survey regression of land productivity of cocoa plots**

	Coefficient	Robust Std. Err.
Sex	-0.044	0.066
Intercept	11.68***	0.086
R-Squared = 0.00		
# of Observation = 812		

(\*significant at 10% \*\*significant at 5%, \*\*\*significant at 1%)

**Source:** Authors' calculation from survey data

**Table 10 Survey regression of land productivity of cocoa plots**

	Coefficient	Robust Std. Err.
Sex	0.004	0.084
Log of plotsize	-0.351***	0.039
Log xlapre	0.065***	0.018
Mar	0.237*	0.129
Wid	0.108	0.147
Cox	0.173***	0.059
Hsize	-0.006	0.006
Log Hrfarm	0.082**	0.041
Age	0.003	0.002
Intercept	10.44***	0.379
R-Squared = 0.13		
# of Observation = 812		

(\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%)

**Source:** Authors' calculation from survey data

## 5 Conclusion

Despite the complexity encountered in separating 'difficulties' faced by farmers and 'preferences' made by these farmers, several interesting conclusions come out of this study. Generally, agriculture and in particular cocoa production was and still remains an underexploited opportunity to generate income and contribute to pro-poor growth in Cameroon. The low participation of women in cocoa cultivation though they are equally as productive as men and the non-use of modern technology are some of the factors limiting the exploitation of the opportunities in cocoa cultivation. According to the farmers, this is due to the absence of adequate government support to cocoa farmers as well as the poor liberalization of the sector cited by Amin (2001).

Limited contacts to extension services hinder the access of farmers to modern methods of cocoa cultivation. It is identified that, though most of the constraints experienced by cocoa cultivators are common to men and women, access to extension services for women is much lower, thereby negatively influencing their agricultural output and limiting their chances of getting out of poverty through agriculture. Women encounter more difficulties than men in acquiring land necessary for agriculture. They are generally less educated than men and this limits their ability to apply simple economic principles or to fully participate in marketing channels. Women's double 'work day', identified in other studies causes them to spend fewer number of days on the farm than men though they spend the same number of hours per day on the farm. It is also seen from the data that work is equally shared between men and women in cocoa cultivation, but there is a gross imbalance at the level of control of marketing and the revenue that ensues.

The most important aspect of this study was to identify the impact of gender on productivity. First, sex's overall impact on productivity is small. Once controlling for the most important factors affecting productivity, including those where women are disadvantaged, women's slight disadvantage turns into a small advantage. This slight disadvantage in productivity which turns into a slight advantage for women after controlling for certain factors can be explained by the greater attention and care women give to their farms. Table 5.8 indicates that women spend on average more on land preparation than men. Expenditure on land preparation consisted of expenditure on pesticides, herbicides and labour recruitment for clearing and preparation of the farm. Since some other important factors have not been controlled for (in particular, land quality), it may even be the case that women are actually more productive when given equal opportunities. This conclusion would be warranted if women are operating in general on land of lower quality.

A consistent result of this study is that expenditure on land preparation and pesticides significantly and positively influences productivity. The coefficient of contact with extension officers makes the case for better access to extension services and training programs in new and modern methods of cultivation. In the absence of modern technology, the negative and significant correlation that exists between plot size and productivity is understandable.

It is no stretch to say that the argument for promoting gender equality in access to land, inputs, and technologies is bolstered by this study. The insignificance of sex in determining productivity is a clear case being made in favour of the eradication of the notion that there are male crops (cocoa) and female crops and that with equal opportunities, women could even be more productive. Particularly worrying is that women have little control over the marketing and proceeds of cocoa. The impact this has on household decisions and family welfare has not been investigated here, but is an urgent further research priority.<sup>6</sup>

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<sup>6</sup> In line with literature summarized in World Bank (2001), it seems likely that their lower control over the proceeds has negative impacts on household welfare.

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**Appendix 1: Distribution of study sites in Southern Cameroon**

Districts	Communities	Villages surveyed
Ngomedzap	NNomNNam	Akok, Ayene, NNomNNam, Bilon, Tiga
	Abod-Mveng	Abod-Mveng, Nkolbewa, Meva'a Mebot, Nkolmbong, Bikonong, Adzap
Boumyebel	Libel-ligoï	Libel-ligoï North and Libel-ligoï South
	Simanyai	Simanyai I, Simanyai II, Pan-Makak, Pan-Kombe, Pan-So-Makonde
Obala	Etong-Bidjoe	Etong-Bidjoe, Ekabita-Esele, Zima, Kouradeng, Legom, EfoK, Nkometou
	Nkol-Obang	Nkol-Obang, Etoud'Ayos, Elig-Nkouma, Lékié-Assi, Oyama, Nkomassi, Nkoa-Akom
Mbangassina	Talba	Talba, Iyambouni, Mpi, Etam-Nyat, Kwassara, Okola
	Biakoa	Biakoa (centre and village), Goura (centre and village), Mbangassina (centre and village)
Bokito	Kedia	Kedia, Ediolomo, Bokito, Tobagne
	Bakoa	Bakoa, Yorro, Begni, Assala I
Kumba	Kossala Ikiliwindi	Kossala, Kumba Ikiliwindi, Ikiliwindi mile 10

## **Appendix 2: DATA COLLECTION**

The survey was conducted from October through November 2007 in the selected communities. In each community, 100 farmers (men and women), all members of the cocoa farmer organizations (Common Initiative Group), were randomly selected with the initial objective to select 50 women and 50 men per community. However, this objective was not met due to the poor involvement of women in cocoa farming in most communities. The questionnaire was pre-tested in two communities (Obala and Ngomedzap) and revised prior to use in the study areas. The pre-survey was performed with key informants and focus groups. The resulting observations were used to inform the French version of the original English questionnaire. From the total of 1150 questionnaires administered, 1030 cocoa farmers (807 males, 223 females) were finally selected as our sample and the rest discarded for incoherence in response. Farmers answered to the questions during one-on-one meetings with interviewer which took between 30 and 60 min per interviewee. For some villages, the interviewer was accompanied by village officials. All answers by farmers were regarded as correct and efforts were made to prevent farmers from perceiving the survey as an “examination”. Twelve interviewers were selected among university students of diverse background and were trained in general issues in cocoa production, livelihood asset analysis and survey research techniques. The interviewers also received information of a socio-cultural nature on the farming communities with whom they were to be working in order to become more familiar with the individuals they will encounter. That is, their farming systems and farming behavior from a gender perspective.

The survey tool, designed for multiple purposes, consisted of several sections. The first section was to provide a demographic and socio-economic profile of farmers in each community. In the second section, farmers were assessed on their mode of land acquisition, land title and property rights. The third section of the survey focused on cocoa management and production constraints. Here the varieties grown, the type of farm sanitation activities, pest and disease management practices, pesticides and the labor used were documented. The fourth and fifth sections assessed other farming activities and extension support. The last section of the survey covered farmers’ yield variation from 2005 to 2007 as well as cocoa marketing and other agricultural and non-agricultural products.