

INTEGRATING THE WOMEN'S LABOR INVESTMENT INTO THE PERFORMANCE ASSESSMENT OF OX-DRAWN COTTON PRODUCTION IN CÔTE D'IVOIRE

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1 Introduction

Cotton production in Francophone African countries has been considered as one of the few success stories (Gebre-Madhin and Haggblade 2003) lying greatly on the development of ox-drawn mechanization (Campagne and Raymond 1994) which remains somehow labor intensive. Women do contribute to the labor mobilized in cotton production in Africa, but their role was only coped with in a few qualitative analyses, having highlighted that cotton development had implied more women's involvement in cotton fields (Peltre-Wurtz and Steck 1991), up to reduce their capacity to conduct their own fields (Bassett 1988).

This communication is a first study attempting to quantitatively assess the impact of women in cotton production performance. It explicitly takes into account the extent of polygamy of farm heads –for its direct implication on women's availability and that of their offspring for field works.

2 Materials and Methods

This communication is based on a study conducted in 2013 in Northern Cote d'Ivoire through a one-way survey along a sample of 223 farmers in a major cotton producing province ("Département de Korhogo") represented by four of its counties ("Arrondissement").

Given the fact that most farmers were illiterate and no written records were kept at the farmers' level, the survey was conducted by enumerators calling upon farmers' memories. It was not realistic to ambition capturing perfectly the absolute values of time allocation, but the gap calculated for two labor investments (e.g. in distinct types of fields or in distinct periods) could be quite liable.

In each sampled farm, farm heads (males) were interviewed to capture the farmers' characteristics (age, education level), the farm features (size, ox-drawn equipment...) as well as production and costs. When dealing with the composition of families, the involvement of family members in field activities and their possible responsibility in managing plots for their own account were recorded. Women were interviewed in addition to capture their own assets (notably mobile phones and bicycles) and to address factors that could potentially impact their labor contribution in the fields of their husbands: size of their cultivated lands, time spent daily in their fields and in those of their husbands, and the number of days in ten-day period they were allowed to work in their own fields. Women were also asked whether their husband should keep on growing cotton, their opinion was interpreted as reluctance to cotton production in case of negative or absence of answers.

In data processing, descriptive analysis was complemented by multivariate regressions encompassing independent variables related distinctly to characteristics of farm heads, farms and women.

3 Results and discussion

There were more polygamous farm heads than monogamous, although only one fourth of them had more than two wives. The more farm heads had wives, bigger were their families, higher was the number of family members in fields, greater was their frequency to have at least two complete sets of ox-drawn equipment as well as were the cultivated and cotton areas. In terms of production performance indicators, either technical (farm cotton production, yield) or financial ones (gross income or surplus), superiority was found only for farms having more than two wives, while no difference was observed between farms having one and two wives, respectively. These results confirm and are more precise about the positive relationship observed formerly between cotton development and women, as above mentioned.

With regard to women, they kept on having land cultivated for their own. Furthermore, lower was the number of wives within a farm holding, bigger was the size of land women could manage for their own, and higher was the frequency they had a bicycle if not a cell phone. However, regardless of the number of women within a farm, the time women had to dedicate daily to the plots of their husbands far exceeded that allocated to their own plots. Hence, women lacked more time than land to produce for their own.

In multivariate regressions, the significant influence was only found for a relatively small number of variables either for

technical performance indicators or financial ones, likely because of the limited size of the study sample. The influence of the number of wives was confirmed for technical performance indicators. The absence of effect of input intensification could be related to the little variation between farms in this intensification. With regard to the financial performance indicators, the influence of the number of wives vanished if not reversed somehow. The women's reluctance to see their husbands engaged in cotton production could be a reason. Allowing more days to women to go and care for their plots –for short duration– seemed to be positive.

Table 1. Farm characteristics and performance according to the number of wives of the farm heads (the presentation of a few variables is omitted for lack of place)

	Number of wives of the farm head			Total	p value
	1	2	> 2		
Number of farms	90	96	37	223	
Age of farm heads	39,4	41,2	41,9	40,6	0,242
% of illiterate farm heads	84,3%	73,7%	88,2%	80,2%	0,070
Number of family members	6,5 c	10,0 b	13,8 a	9,2	< 0,0001
Number of family members in fields	5,3 c	7,0 b	8,1 a	6,5	< 0,0001
Degree of implementation of ox-drawn agriculture					
% of farms with one complete equipment set ¹	15,6%	18,8%	5,4%	15,2%	0,158
% of farms with at least two complete equipment sets ²	10,0%	19,8%	37,8%	18,8%	0,001
Total cultivated area, ha	18,9 b	20,6 b	31,9 a	21,8	0,000
Cotton area, ha	3,8 c	5,5 b	8,5 c	5,3	< 0,0001
Few characteristics of women in farm					
Area of women's land, ha	3,4 a	3,2 a	2,1 b	3,1	0,018
Hours per day in husband's field	5,8	5,8	6,0	5,8	0,619
Hours per day in her fields	1,1	0,9	0,7	0,9	0,285
% women with cell phones	42,2%	31,3%	37,8%	36,8%	0,297
% women with bicycles	44,4%	29,2%	16,2%	33,2%	0,005
Cotton performance					
Seedcotton yield, kg/ha ¹	1118 b	1200 b	1873 a	1 285	0,010
Gross income after payment of inputs, FCFA/ha ¹	157835 b	160612 b	339614 a	190 775	0,017
Non-input cash expenses, FCFA/ha ¹	16988 b	20361 ab	25137 a	19 820	0,050
cost of occasional labour, FCFA/ha ¹	9069 a	12645 a	15247 a	11 653	0,041
Gross surplus, FCFA/ha ¹	140638 b	139444 b	314477 a	170 513	0,027

¹At least two oxen and a plough; ² At least four oxen and two ploughs. Different letters are attached to means when different

Table 2. Multivariate regressions of technical and financial performance indicators (the presentation of integrated independent but non-significant variables is omitted for lack of place)

Independent variables	Farm cotton production, kg		Yield, kg/ha ¹		Gross margin, CFA			
					per ha		per ha and family labour	
	Coef.	p value	Coef.	p value	Coef.	p value	Coef.	p value
Zonal effect relatively to Mankono county								
Boudiali county	-0,085	0,469	-0,018	0,886	0,031	0,022	-0,199	0,032
Ferke county	-0,079	0,436	-0,031	0,772	0,043	0,000	-0,240	0,003
Korhogo county	-0,067	0,564	-0,015	0,905	0,030	0,024	-0,201	0,030
Effects related to the farm and its head								
Head's education ¹	0,078	0,285	0,033	0,671	-0,019	0,036	-0,065	0,302
Number of ox-drawn ploughs	0,281	0,000	0,119	0,149	-0,003	0,738	0,118	0,081
Effect of the number of wives relatively to more than two								
Only one wife	-0,349	0,001	-0,280	0,016	0,025	0,068	0,318	0,001
Two wives	-0,319	0,003	-0,272	0,016	0,006	0,653	0,095	0,299
Effects related to women's features in farms								
Having enough days in their fields ³	-0,011	0,872	0,009	0,902	0,019	0,030	0,239	0,000
Reluctance to their husband's cotton ⁴	-0,051	0,581	-0,063	0,526	-0,041	< 0,0001	-0,043	0,551
Performance and costs								
Yield, kg/ha					0,994	< 0,0001	0,446	< 0,0001
Probability > F value	0,000		0,391		< 0,0001		< 0,0001	

¹ Having been to school ² Having cattle of at least 15 heads ³ Women declaring having at least 5 days out of ten to work in their own fields

⁴ Reluctance interpreted through their absence of answer to the question whether their husband should grow cotton

4 Conclusions

Women's labor contribution is real and its influence to cotton production could be quantitatively appraised even through a one-way survey. The technical performance is under influence of the number of wives within a farm holding but the financial performance depends more on factors of good will from women which could nevertheless be captured.

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