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Determinants of Women's Contribution to Farming Decisions in Cocoa Based Agroforestry Households of Ekiti State, Nigeria

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Abstract. Women are key players in the agricultural sector of most developing countries of the world. However, despite this major role, men have reportedly continued to dominate farm decision making, even in areas where women are the largest providers of farm labour. This could be counter-productive, because there is bound to be conflict when women, as key players, carry out farm tasks without being part of the decision process, especially when the decisions fail to recognize their other peculiar household responsibilities. Previous efforts at estimating women's role in agriculture have tended to concentrate on evaluating their labour contributions. There has been little farm-level information regarding their role in decision making, particularly in male dominated cash crop environments like cocoa agro-forestry households. This paper identified socioeconomic factors affecting their contribution to farm decision making. The paper is based on farm level data collected in Ekiti State, southwest Nigeria, from 120 randomly selected farm units. The results of the analysis show that the household socio-economic factors that encouraged high women contributions to farm decision making were their number of years of formal education and farming experience, financial contributions to household farming activities, number of hours spent in the farm, and farm size. Also, the societal constraints militating against women's contributions to farm decisions were identified and grouped into (a) techno-institutional constraints such as lack of extension programmes and access/awareness of non-governmental organisation (NGO) programmes for women, insufficient knowledge of farm credit sources etc.; (b) socio-personal constraints such as misconceptions that women farmers do not have farming ideas, women are supposed to be subordinate to men in farming, low self confidence by women etc.; (c) economic/financial constraints such as low or lack of financial contributions to farming activities and access to credit support groups such as cooperatives, unwillingness of women to invest in a male-dominated cocoa farming environment. These observations underscore the need for special programmes that empower and recognise women, especially through education, finance and information.

Keywords. Mennonites, religion, integrated vision, environment, health, microfinance, economics, non-government organization.

1 Introduction

The Nigerian economy is still predominantly agrarian and women are key players in this business of agriculture in the country, especially within rural communities. Women contribute between 40 and 65% of all hours spent in agricultural production and processing and also undertake 60 to 90% of the rural agricultural product marketing, thus providing more than two thirds of the workforce in agriculture (FAO, 1985 cited in Sabo, 2006).

Of great significance to the Nigerian agricultural sector is the agro-forestry sub-sector, which is the integration of trees, food crops and/or animals in an interactive manner (Okadi 2007). It is one of the most popular agricultural practices in

southwest Nigeria. Cocoa-based agro-forestry therefore refers to the practice in which cocoa trees for the production of cocoa beans are the dominant component of the agro-forest and usually inter-planted with other food crops. Cocoa is a high-value cash crop among farmers in the major producing areas in Nigeria. It originated from the Upper Amazon in Latin America, from where it spread to all parts of the world. Its cultivation started in Nigeria about 1879, when a local chief established a plantation at Bonny in eastern Nigeria. However, cultivation in western Nigeria began afterwards. By 1962, Nigeria had become the world's leading producer with about 20% of the world's total production (Amos 2007). Cocoa was among Nigeria's leading source of foreign exchange before the oil boom, and until now it is still Nigeria's largest agricultural foreign trade commodity and has helped to boost the economies of the major producing states in Nigeria.

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Ekiti State is one of the 14 cocoa producing states in Nigeria and contributes significantly to the national cocoa output. For instance, Ondo and Ekiti States combined account for about 53.32% of the total Nigerian cocoa output based on available data from 1976 to 2003 (Folayan, Daramola and Oguntade 2006).

This study focuses on cocoa-producing households, which according to Koppelman and French (2005) is the level at which all farm decisions are made. Decisions have to be made when persons having limited resources have alternative courses of action and therefore must make some choices (Oji, 2002). Farmers make decisions on a number of pre-harvest and post-harvest activities such as what to produce, input use, harvest and post-harvest issues, which according to William (2003) affect production, processing, distribution, prices and costs. Farming decisions are made to maximize farm objectives subject to available material and human resources. However, despite the significant role played by women in agricultural production, processing and marketing in Nigeria (Nweke and Enete 1999, Barasa 2006), the available literature shows that men have continued to dominate farm decision making, even in areas where women are the largest providers of farm labour (Mosha 1992, Anyanwu and Agu 1996, Amaechina 2002). Women have more or less been relegated to playing second fiddle in farm decision making. This could be counter productive, because there is bound to be conflict when women, as key players, carry out farm tasks without being part of the decision process, especially when the decisions fail to recognize their other peculiar household responsibilities. Previous efforts at estimating women's role in agriculture have tended to concentrate on evaluating their labour contributions (FAO, 1995, Enete *et al.* 2004, Barasa 2006). There has been little or no farm-level information regarding their role in farm decision making, particularly in a male-dominated cash crop environment like cocoa agro-forestry households (Amusa 2009). This paper aims to bridge this information gap by identifying the major factors influencing women's contributions to household farming decisions.

2 Method of the study

2.1 The study area

This study was conducted in Ekiti State, Nigeria, which is located between longitudes 4° 45' and 5° 45' East of the Greenwich meridian and latitudes 7° 15' and 8° 15' North of the equator. The state has a climate marked by two major seasons: the rainy season which lasts between April to October, and the dry season lasting from November to March. The prevailing temperature in the state ranges between 21°C to 28°C with high humidity. Topographically, the state is mainly an upland area, rising over 250 metres above sea level (Ekiti State Government, 2008).

The state had a population of 2,384,212 people as of 2006. Agriculture is their main occupation, providing income and employment for more than 75% of the population. The major cash crops grown in the state are cocoa, coffee, kola nut, cashew and oil palm. Arable crops grown are yam, cassava,

maize cowpea and cocoyam (Ekiti state Government, 2007). The major livestock reared in the state include goats, poultry, sheep and pigs.

2.2 Data collection

A multi-stage random sampling method was used for selecting the respondents. Two local government areas were randomly selected from each of the three agricultural zones in the state, for a total of six local government areas for the study. From the selected local government areas, two towns were randomly selected, giving twelve towns for the study. From the list of cocoa farm households, provided by the Ekiti State Agricultural Development Project (ADP), ten households were randomly selected from each of the twelve towns, making a total of 120 farm units for the study. The data, which were collected in July 2008, included household composition and characteristics, the level of contributions of men and women to farm activity decisions, constraints militating against women contributions to farm decisions etc.

2.3 Estimation procedure

An ordered logit model was employed to estimate the influence of household socio-economic factors on the contribution of women to household farming decisions. This was done because the dependent variable was of ordinal categorical nature derived through a likert rating scale which required the respondents to indicate the extent to which women contributed to farm decision making in the household under three categories as: High = 3, Medium = 2 and Low = 1.

The ordered logit model is built around a latent regression in the same manner as the binomial probit model. Let $y^* = \beta'x + \epsilon_i$, where y^* is the underlying latent variable that indexes the level of contributions of women to farm decision making, x is a vector of parameters to be estimated and ϵ is the stochastic error term. The latent variable exhibits itself in ordinal categories, which could be coded as 0, 1, 2, 3, ..., j . The response of category j is thus observed when the underlying continuous response falls in the j th interval as:

$$\begin{aligned} y &= 0 \text{ if } y^* \leq 0 \\ &= 1 \text{ if } 0 > y^* \leq \partial_1 \\ &= 2 \text{ if } \partial_1 > y^* \leq \partial_2 \\ &= 3 \text{ if } \partial_2 > y^* \leq \partial_3 \\ &\dots \\ &\dots \\ &= j \text{ if } \partial_{j-1} \leq y^* \end{aligned}$$

Which is a form of censoring, with the ∂ 's being unknown parameters to be estimated with β (Green 2000).

The exploratory factor analysis procedure was employed in identifying the major societal constraints militating against women contributing to household farming decisions. The constraints enumerated by the respondents were grouped using principal component analysis with iteration and varimax rotation. The cut-off point for constraint loading was **0.30**, such that constraint loading less than **0.30** or variables that load in more than one constraint were discarded (Ashley, *et al.* 2006; Madukwe 2004). The model is represented as:

$$\begin{aligned}
 Y_1 &= a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n \\
 Y_2 &= a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n \\
 Y_3 &= a_{31}X_1 + a_{32}X_2 + \dots + a_{3n}X_n \\
 * &= * \\
 * &= * \\
 * &= * \\
 Y_n &= a_{n1}X_1 + a_{n2}X_2 + \dots + a_{nn}X_n
 \end{aligned}$$

Where: Y_1, Y_2, \dots, Y_n = observed variables / constraints to women contributions to household farming decisions; $a_1 - a_n$ = constraint loading or correlation coefficients.

X_1, X_2, \dots, X_n = unobserved underlying factors constraining women from making contributions to household farming decisions.

3 Results and Discussion

3.1 Socioeconomic characteristics of the women

The majority (about 60 %) of the women fell within the 21-50 years age bracket, while about 40% of them were above 50 years of age. In general, therefore, the women were within the economically active age. Adetunji *et al* (2007) and Gray (2001) observed that cocoa farmers in West African countries in general have an average age of 50 years and above.

None of the women was single. About 61% of them were married while 7% and 32% of them were divorced and widowed, respectively. This trend seems to agree with the findings of Fabiyi *et al* (2007) in Gombe State, where they observed about 50% of their sampled women being married, while 13% and 17% were divorced and widowed, respectively.

About 37% of the women had no formal education, while 63% of them had formal education. However, the majority of this 63% (44%) only attended primary school, 17% attended secondary school, while only 2% attended higher institutions at the Nigerian Certificate in Education (NCE) level. Their average number of years of formal education was 4 years. This implies that the majority of them only attempted to finish a primary school education or other equivalent. Fabiyi *et al* (2007) made similar observations in Gombe State.

The average number of years of farming experience of the women was 28 years. Less than 7% of them had less than 10 years of farming experience; about 14% had between 11-20 years of experience, while 78% of them had above 21 years of experience. This finding shows that the majority of the women had a high number of years of farming experience.

3.2 Household socio-economic factors affecting the contribution of women to farming decisions

Table 1 presents the estimates of the parameters of ordered logit regression on the factors influencing the contribution of women to household farming decisions. The explanatory power of the factors as reflected by Pseudo R2 was relatively high (60%). The overall goodness of fit as reflected by Prob > Chi² (0.0000) was also good. Threshold parameters ∂_1 and ∂_2 were significant at 1%, implying the three categories in the response were indeed ordered. In terms of consistency with *a priori* expectations on the relationship between the dependent variable and the explanatory variables, the model seems to have behaved well.

The level of education of women was positively and significantly related with their level of contribution to household farming decisions. In other words, highly educated women were likely to make higher contributions to farming decisions than less educated ones. Enete *et al* (2002) reported that educated women may be more aware of their rights and responsibilities in the household and may be more assertive about them than uneducated ones.

Years of farming experience was also positively and highly significantly related with women's level of contribution to farming decision. Experience most often comes with age, and in traditional societies, the older a woman gets, the more her opinion is respected and sought after, in decision making. Moreover, experienced women farmers may be more versatile with regards to the production systems and may therefore be better able to assess the risks involved in farming than inexperienced ones (Enete *et al*. 2002).

The financial contribution from women to farming activities was positive and important in explaining the level of

Table 1. Result of ordered logit regression model.

Explanatory variables	Coefficient	Z-ratio
Years of Education	0.21	2.28**
Years of Experience	0.13	3.67***
Women's financial contributions	2.46	2.97***
Hours spent in the farm per day	1.07	3.75***
Farm size	0.66	3.39***
Number of male farmers in the household	-0.33	-1.43
∂_1	9.54	4.10***
∂_2	15.36	5.45***
Statistics: No. of observations	120	
Chi ²	151.52	
Prob > chi ²	0.000	
Pseudo R2	0.59	

Note: *** denotes $P \leq 0.01$, ** denotes $0.01 < P \leq 0.05$

women's contributions to household farming decisions. This indicates that the smaller the financial contribution of a woman to the household's farming activities, the lower the weight of her contributions to farming decisions. CIAS (2004) reports that women's financial contributions to farm activities increase their involvement in decision making on allocation of farm resources.

The average number of hours spent in the farm by women also influenced positively and significantly their level of contribution to farming decisions. In farming households where most of the women's responsibilities are in favour of domestic activities at the expense of farming, the number of hours spent by the women on the farm per day may tend to decrease.

The size of the household farm was positive and important in explaining the level of women's contributions to farming decisions. Resource requirements (including management decisions) for household farms will certainly increase with the size of the farm. Women are therefore likely to contribute more to decision making in households with larger farms than in those with smaller farms.

The number of adult males in the household was negatively but not significantly related with their level of contribution to farming decisions. The negative relationship is to be expected as men usually assume leadership and decision making roles in the household. However, its non-significance is surprising, although these days in Nigeria, commercial motorcycle riding has become a more profitable venture for young men than farming. Many of them may therefore have abandoned the house and farm to the women.

3.3 Major societal constraints militating against women's contributions to household farming decision

Table 2 shows the varimax-rotated constraints militating against women's contributions to farming activity decision making among cocoa-based agroforestry households in the study area. From data in the table, three (3) major constraints were extracted based on the responses of the respondents. Only variables with constraint loadings of **0.30** and above at 10% overlapping variance (Ashley, *et al* 2006; Madukwe, 2004) were used in naming the constraints. Variables that loaded in more than one constraint as in the case of variables 1, 5 and 16 were discarded, while variables that have constraint loading of less than **0.30** were not used. The next thing to do as reported by Kessler (2006) was giving each constraint a denomination that best describes or characterises the set of variables contained in the constraint. In this regards, the variables were grouped into three (3) major constraints as: constraint 1 (Techno-institutional constraint), constraint 2 (Socio-personal constraint) and constraint 3 (Economic/financial constraint).

Under constraint 1 (Techno-institutional constraint), the specific constraining variables against women's contributions to household farming decision include: lack of extension programmes for women's development (0.457), lack of awareness and access to NGO programmes for women's

development (0.439), low technical know-how of farm women in handling mechanized equipment on the farm (0.324), insufficient knowledge of credit sources to support farm work (0.401), lack of government policies to empower women farmers (0.399), and lack of adequate information and awareness of modern farming methods for women through relevant institutions (0.458). These suggest that institutional programmes – be they extension services, technical know-how, credit sources or information – do not consider women's special needs, both at the design and implementation stage. Women therefore lack adequate access and opportunities for relevant farm information and technical training. Rafferty (1988) reported that agricultural extension programmes and other supporting services have traditionally concentrated more on educating male farmers, and hence farm women still largely depended on their husbands for information on farm inputs and other resources necessary for farm decision making. This was further supported by Eboh and Ogbazi (1990), who concluded that women suffer from institutional neglect and planner's indifference towards their plight. For the farm women to be more relevant and productive in agriculture, an effective institutional framework should be developed through programmes that address their training needs.

Variables that loaded under constraint 2 (socio-personal constraint) include: the misconceptions that women farmers do not have farming ideas (0.421), the general belief by society that farm women are subordinate to their male counterparts in farming (0.334), domestic violence between the women and their male counterparts (0.435), the low-self confidence of farm women in taking certain farming decisions (0.356), negligence on the part of women not to become involved in farm decision making (0.424), multiple domestic responsibilities of the women (e.g. cooking, taking care of homes, caring for household members etc) (0.393), and a high number of male farmers in a cocoa farming household (0.400). This constraint reveals attitudinal barriers against women in farming societies. Attitudinal barriers against women as reported by Amaechina (2002) are deeply rooted in patriarchal-based socialization where men are considered superior to women in socio-economic activities, resulting in low women presence in decision making bodies.

The main constraints as perceived by the respondents limiting farm women's contribution to farming decisions under constraint 3 (economic/financial constraint) include: low/lack of financial contribution to farm operations by the women (0.532), lack of access to credit support groups like cooperatives (0.653), unwillingness of women to invest in male dominated cocoa farming (0.357), involvement of the women in some jobs off the farm for their economic support (e.g. trading, artisans etc) (0.348), and lack of collateral security required to secure loans to support farm operations (0.460). This agrees with the report of CIAS (2004) that women are faced with many constraints which range from lack of access to farm credit, loans, low level of income, to shortages of input supply and other economic resources, thereby limiting their contributions to household farming decisions.

Table 1. Varimax rotated factors/variables constraining women from making contributions to farming decisions.

Constraining Variables	Constraint 1 (Techno-institutional factor)	Constraint 2 (Socio-personal Factor)	Constraint 3 (Economic/ financial Factor)
1 **Illiteracy of the farm women	0.491	0.334	-0.160
2 Lack of extension programmes directed to women farmers' needs	0.457	-0.238	0.105
3 Poor access of the women to farm information	0.183	0.040	-0.207
4 Traditional/cultural limitations against women	0.123	-0.467	0.125
5 **Far distance of household cocoa farms	-0.146	0.364	0.479
6 Misconceptions that women do not have farming ideas	0.230	0.421	-0.036
7 Low/lack of financial contributions by farm women	-0.090	-0.050	0.532
8 Lack of access to credit support groups, e.g cooperatives	-0.199	0.118	0.653
9 Tedious nature of cocoa farming activities	-0.365	0.070	-0.143
10 The belief that farm women are less informed than men	0.050	0.056	-0.362
11 Unwillingness of women to invest in farming risks	0.070	0.170	0.357
12 The belief that women are subordinate to male counterparts	-0.134	0.334	0.261
13 Domestic violence between farm women and male counterparts	-0.371	0.435	-0.252
14 Low self confidence of women in making farm decisions	-0.050	0.356	0.169
15 Age of the farm women as either too old or young	-0.196	0.064	0.044
16 **Poor access to & control of farm resources, e.g land	-0.020	0.361	0.406
17 Negligence of farm women in becoming involved in farm decision	0.175	0.424	0.162
18 Lack of access about NGO programmes for women's development	0.439	0.252	-0.344
19 Multiple domestic responsibilities of farm women	0.050	0.393	0.228
20 Low technical-know-how of women in farming	0.324	-0.220	-0.092
21 High number of male farmers in farming households	-0.615	0.400	-0.206
22 Marital status of farm women	-0.340	0.169	-0.075
23 Involvement of farm women in jobs off the farm	0.122	-0.116	0.348
24 Insufficient knowledge of farm women of credit sources	0.401	-0.060	-0.480
25 Religious beliefs of the farming household	0.040	-0.533	-0.111
26 Number of women farmers in a farming household	-0.090	0.219	0.099
27 Lack of government policies to empower women farmers	0.399	0.074	-0.015
28 Small scale production of the cocoa farming household	0.197	-0.525	-0.174
29 Lack of awareness of the farm women of modern farming methods	0.458	-0.316	-0.138
30 Lack of collateral security to secure loans to support farming	-0.354	0.114	0.460

Note: Factor loading of 0.30 is used at 10% overlapping variance. Variables with constraint loadings of less than 0.30 were not used. **Variables that load in more than one constraint were discarded

4 Conclusions

The household socio-economic factors, identified in this study, which encouraged high women contributions to farm decision making were their number of years of formal education and experience, financial contributions to household farming activities, number of hours spent on the farm, and farm size. In addition, the number of adult males in the household and number of years of women's farming experience discouraged their contributions to farm decision making. Also, the societal constraints militating against women's contributions to household farm decision making were identified and grouped into: (a) techno-institutional constraints such as lack of extension programmes for women, lack of access and

awareness of NGO programmes for women, insufficient knowledge of farm credit sources etc.; (b) socio-personal constraints such as misconceptions that women farmers do not have farming ideas, women are supposed to be subordinates to men in farming, low self confidence by the women etc.; and (c) economic/financial constraint such as low or lack of financial contributions to farming activities, lack of access to credit support groups such as cooperatives, and unwillingness of women to invest in male dominated cocoa farming environment. These observations underscore the need for special programmes that empower and recognise women, especially through education, finance and information.

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