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GENDER DISPARITY IN COCOA PRODUCTION RESOURCE ACCESS AND FOOD SECURITY IN OGUN STATE, NIGERIA

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ABSTRACT

Understanding gender disparities in production resource allocation is critical for agricultural development and cannot be overstated. The study evaluated farmers' access to cocoa production resources and its implication for food security in Ogun State, Nigeria. The data were collected from 813 respondents with the use of structured questionnaire which involved 420 male and 393 female farmers. Frequencies, percentages, household dietary diversity score (HDDS) and logit regression were used to analyse the data while the hypotheses were tested with t-test. The t-tests showed significant differences in access to labour, credit and extension service but no difference in access to land as farmers have land either through purchase or inheritance. The mean score for access to credit by male farmers was 0.05 and 0.01 by female farmers with a mean difference of 0.04 which was significant at 0.01 level of significance ($t = 4.69$, $p \leq 0.01$). The mean score for access to labour by male farmers was 0.398 and 0.099 by female farmers with a mean difference of 0.298 which was significant at 0.01 level of significance. Lastly, mean score for access to extension service by male farmers was 0.145 and 0.048 by female farmers with a mean difference of 0.096 which was significant at 0.01 level of significance ($t = 4.69$, $p \leq 0.01$). Male dominance was seen in the household with regard to decisions on farm activities. The household diversity score showed that female farmers consumed more food groups making them more food secure than their male counterparts. Age, education, access to labour, farm size and monthly income were found to be significant drivers of food security of farmers in study area. It was recommended that policies that ensure equal opportunities for male and female farmers should be put in place. There is also a need for improvements on credit facilities and extension services.

Key words: Cocoa resource access, Farmers dietary diversity, food insecurity, Gender disparity

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INTRODUCTION

At the centre of global debates, agricultural transformation is recognized as a fundamental driver of economic growth and attainment of food security for many developing countries, Nigeria inclusive. A characteristic of the revitalization of the agriculture sector has been the recognition that past efforts have failed in part because they overlooked women's role in the sector and the role of gender inequalities in reducing agricultural productivity. Food and Agricultural Organization [1] argues that reducing gender inequalities in access to productive resources could produce an increase in yields on women's farms of between 20 percent and 30 percent, which could raise agricultural output in developing countries by 2.5 percent to 4 percent. In discussing agriculture, some key factors that cannot be ignored are land, labour and credit. The ownership, accessibility and sustainability of this access are very crucial for any meaningful agricultural development. Either by design or circumstance, women constitute a large proportion of agricultural workers [2]. Their access and ownership to resources such as land, agricultural inputs and extension services which are important in farm productivity are low due to cultural, social and religious barriers [3]. In the analyses of gender differences, women make up the disadvantaged part in most cases. In most societies of Sub-Saharan Africa, Nigeria inclusive, there are differences between women and men in rights, roles and opportunities in agricultural production [4]. Cocoa production in Nigeria is done in the rural areas by women with little or no education, limited access to extension services, production inputs such as land, credit and labour, as well as low level of production technology as the crop is seen as "male crop" and the attention is on the male farmers who are seen as the actors in cocoa farming [5]. These factors have exposed the female cocoa farmers to high levels of production disparity and low output issues, resulting in low per capita income, poor food and nutrition, and a low standard of living [6]. There is a need to acknowledge the fact that improving farmers' productive power, especially women, would lead to improvements in a variety of wellbeing outcomes for members within the household. This is because women are the main caretakers of the household members and a link to achieving food security in most of the developing countries in Africa [7]. Past studies [3, 4, 7] have shown that when women's productive resources are improved, output increases which in turn increases their income as well as food security status at large. With the increasing roles of rural women in agriculture and contributions to food security and the consequence of inequality in resource access across gender, there is therefore, the need to address the gender disparity in production resources and its implications for food security in Nigeria.

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Production activities in cocoa farming include land clearing, planting, transplanting, weeding, fertilizer application, harvesting, drying and storage. These production activities are segregated along gender line within the farming households. Activities such as farm clearing, planting of seedlings as well as chemical application are mostly undertaken by men while women are involved in activities like transplanting, weeding, pruning, harvesting, drying and storage.

The broad objective of the study is to determine the effect of gender disparity in accessing production resources on food security of cocoa rural farming households in Ogun State. Specifically, the study described the socio-economic characteristics of cocoa farmers and determined the farmers' access to cocoa production resources on gender basis, identified the decision maker concerning farm activities in the household and factors driving the food security of farmers in the study area. The study hypothesized that there was no significant gender difference in farmers' access to production resources and no significant difference in consumption of various food groups between male and female farmers.

This research is especially significant since it reveals variations in farmer access to resources, rural women's engagement in agricultural decision-making, and household food diversity.

It also provides empirical facts that can be used to activate the non-working policies that can help increase women's status, economic and food security, and agricultural transformation.

MATERIALS AND METHODS

The study was carried out in Ogun State, Nigeria. Ogun state covers an area of approximately 16,980 square kilometres, lies within the coordinates 7°00'N 3°35'E and is bounded by Lagos State in the South, Oyo and Osun States in the North, Ondo State and Republic of Benin in the West. The population as of the first quarter of 2021 was 6,153,869. According to climate data, the state falls within the humid tropical lowland region with mean annual temperature for the state varying between 23-35°C and an annual rainfall within the range of 1200-1650 mm. Primary data were collected using a structured questionnaire. From the state's 20 Local Government Areas based on its geographical structure, 4 Local government Areas (LGAs) with high cocoa production capacity namely Ijebu East, Ijebu North, Ijebu North-East and Yewa North were selected. The simple random sampling was used in the selection of ten towns from each of the four LGAs. In each town, ten streets were randomly selected. Using a systematic random sampling technique,

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every third house on both sides of the street was selected to make up the required sample size. In cases where the sample size was not achieved on one street the shortfall is made up for on the next street. A total of 21 questionnaires were assigned for distribution per street bringing the total sample to 840 farmers consisting of 50% male and female, respectively. Eventually, the number of participants was 814 (96.8%) of the number that was intended consisting 420 male and 393 female participants. Data collection was done sometime in October of 2020 and the procedure of collection was carried out according to the conditions set by the ethics committee of the project.

Frequencies, means, percentages, household diet diversity score and logit regression were used to analyse the data. T-test was used to test significant difference in access to resources between male and female farmers.

Applying Baker-French method [8], a 7-day recall with the exemption of festive or harvest periods was used as reference point to measure HDDS for this study. The 7-day recall method was also adopted by Saaki [9]. Also, based on this method, household dietary diversity score was measured by summing up the number of foods or food groups consumed over a period of time A household dietary diversity score (HDDS) was calculated by counting each of twelve food groups consumed over a 7-day period and a score of 1 was assigned if the group of food was consumed, 0 otherwise [8]. Households were classified into low, medium and high diversity. A score equal to or lower than three was considered as poor dietary diversity while a score of six and above represented a varied diet.

The food security status was measured by re-coding the HDDS, where households that fell below the mean were considered to be food secure and assigned a numerical value of 1, and those that fell below mean score were classified as food insecure and assigned a numerical value of 0 based on recommendation by Swindale and Bilinsky [10] and Kennedy *et al.* [11].

The food security status of households, which is bivariate, taking the value of 1 for food secure households and 0 for food insecure households was used as the dependent variable. The factors influencing the food security status of farmers were analyzed using the explanatory variables. The logit regression model was used in the analysis of the factors influencing the food security status of farmers and is defined explicitly as:

$$Y = \beta_o + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + e_i$$

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Where:
Y = vector of dependent variable (1 for food secure households; 0 for food insecure households) {categorical}
X_1 = Gender of respondent (0= Male, 1= Female) {categorical}
X_2 = Age (years) {continuous}
X_3 = Marital status (Single=0, Married=1, Divorced/widowed=3) {categorical}
X_4 = Educational level (Non-formal=0, Primary=1, Secondary=2, Tertiary=3) {categorical}
X_5 = Household size (number of persons) {continuous}
X_6 = Farming experience (years) {continuous}
X_7 = Access to extension services (Number of extension visit in a year) {continuous}
X_8= Access to credit (1=Yes 0, otherwise) {categorical}
X_9 = Access to labor (hours spent on the farm) {continuous}
X_{10} = Land size (hectares) {continuous}
X_{11} = Monthly income (₦) {continuous}

Study Hypothesis
It is important to note that two major hypotheses were tested in this study:
H_1: There is no significant difference in the access to production resources by male and female farmers.
H_2: There is no significant difference in the access of production resources by male and female farmers.

RESULTS AND DISCUSSION

Socio-economic characteristics

Findings on the socio-economic characteristics of the respondents are presented in Table 1. There is a close margin between males and females with the male respondents slightly over half of the total representation (51.7%). This signifies that males dominated the cocoa sector in the study area, and this was so because of the nature of operations involved in its production. The result also revealed a mean age of 54 years for males and 44 years for females. This implies that there are older males than females in cocoa production. Furthermore, the study showed that a larger percentage of farmers had only primary education, especially the women and is consistent with Chayal [6], who confirmed that education level of African farmers is low. Furthermore, both male and female farmers have considerable years of farming experience although most male farmers (40.2%) have more than 30 years as compared to female farmers at 10.2% in this category. This implies that the farmers have adequate technical knowhow on general agricultural

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practices as well as cocoa production, which may positively influence cocoa output. Finally, a little variation was seen in the income capacity of the farmers. A good number (46.6%) of the female respondents were low-income earners, earning within the minimum wage as compared to 28% of male farmers earning above ₦90,000 (117.35 USD). This could be because some of the male farmers having additional off-farm and casual non-farm income.

Difference in access to production resources

The difference in access to production resources such credit, extension service, land and labour between male and female farmers varies. The way the respondents had access to production resources is influenced by their gender as shown by our findings.

Access to Credit

Credit facility is an important catalyst for enhancing farmers' productivity. Access to any form of credit facility or loan (formal or informal) will increase investment potential of farmers, thus increasing productivity. Generally, access to formal credit institutions is low. It was observed that a greater part of the farmers, 96.6%, do not have access to credit facilities and out of the 3.44% who said they have access to credit, 21 (5%) were men while 7 (1.78%) were women. Out of the 3.44% of farmers who have access to credit, 2.58% of them use the credit for cocoa production while 0.86% use the credit obtained for other purposes such as businesses and family upkeep. Farmers get their credit from different sources. Out of 28 farmers who can access loan, 3 (0.37%) reported to get credit from microfinance bank, 13 (1.60%) from cooperative, 8 (0.98%) from money lenders and 4 (0.49%) from family and friends.

Access to Land

Land is considered to be the major factor of production. Although exact response on the number of farmers who have access to land was not gotten, 69.5% of farmers who gave one form of land ownership or the other were assumed to have access to land and those without a form of land ownership (30.5%) were assumed not to have access to land. About 32% of those without land access were male while 29% were female farmers, which means they do not have opportunity to use land or farm as they would want to. The forms of ownership were also examined as secure and direct right to farmland is usually considered to be more beneficial than insecure and indirect right to farmland. The table shows that 25% of both male and female farmers obtained their farmland through purchase and can exercise control over the land, while about 23% of farmers inherited the land for cocoa production. Few, 1.2%, males farmed on a share cropped land, contrasting with 0.8% of the

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females who farmed on share cropped land and 1.4% of men farm on land gifted to them as well as 1.5% of female farmers. More females (6.4%) than males (5.2%) farmed on communal land. Two hundred and seventy eight 278 (70%) women do not have access to land compared to 133 (32%) men who do not have access. The implication is that with constraints in access to farmland, women's numerical strength will not yield any positive result in cocoa production.

The size of land cultivated by both gender groups was examined. Generally, the farmers cultivated small farm size with an average size of 2.3 hectares; however, most female farmers (73.0%) own small farm size of less than one hectare of land with 23% of men having the same size of land while 41% of men cultivate between 1-2 hectares of land.

Access to labour

It was seen that some farmers use a combination of family and hired labour alongside seasonal labour. The reason for the combination of family and external labour could be due to the high cost of labour and shortage of family labour due to engagement of children in school activities, or involvement of other members of the family in other activities like trading or apprenticeship. Hired labour helps with farming activities such as clearing, weeding, planting and harvesting. Table 4 shows number of males and females in the household who work on the farm and number of hours worked per week. Some respondents reported that no male and female family members work on the farm, and this could be as a result of involvement in off-farm activities, then other adult members could be apprentices somewhere else and the younger children have to go to school. As a result, the entire source of labour is the external labour. In all, farmers have access to labour either through family or external labour.

Access to Extension Service

It was observed that inaccessibility to extension service is general. In total, 10% of farmers have access to extension services. While 15% of men responded to accessing services from extension agents, few female farmers (4.8%) reported the same. More women (95%) than men (85%) did not receive services from extension agents in the study area. The highest number of extension service visits per year was 24, which means some extension agents visited two times in a month. Also, services rendered by extension agents were examined. Extension agents trained farmers on agricultural practices as well as use of agrochemicals, inspected their farms and also supplied inputs to cocoa farmers. In all, 50 males (12%) and 12 females (3%) responded to receiving training from extension agents, 3 males (0.7%) and a female (0.25%) had their farms inspected while 10 male (2.4%) and 6

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female (1.5%) farmers received inputs supplied by extension agents. In all, male farmers had greater access to extension agents and their services.

The difference in Access to Production Resources (Credit, Land, Labour and Extension service) by Male and Female Famers

Table 6 shows the test of difference. It has a null hypothesis which assumes that there is no significant difference in the access to resources between both the male and female farmers, and an alternative hypothesis that assumes that there is significant difference. The decision rule is, when the probability value is less than 0.05 ($p \leq 0.05$), the null hypothesis is rejected in favour of the alternative hypothesis and vice-versa. The probability values shown for credit, labour and extension service are greater than 0.05, so the alternate hypothesis is accepted. There is significant difference in access to these resources between the male and female farmers. The probability value for access to land is greater than 0.05, the null hypothesis is accepted. There is no significant difference in access to land.

Extent of Disparity in Intra-household Decision Making on Farm Related Activities

In order to find out the nature of intra-household decision making processes as well as to examine the extent of women's involvement in these processes, farmers were asked questions on "who decides" some farm activities. Table 7 shows the decision makers in the households. As can be seen, the decision on farm activities was taken mostly by the household head. The rest consists of equal share of both household head and spouse and little spousal decision alone. This is in line with the submission of Damisa and Yohanna [12] that farm women's involvement in decision making in agriculture is minimal. Low involvement of spouses in decision making shows that women do not make decisions on farm activities and even when they make decisions, the final decision still comes from the household head except in cases where the household is headed by a female (who is either widowed or divorced).

Food Security Status of Farmers and Factors Influencing it

Food security is ultimately associated with access to nutritionally adequate food at the household level, that is, the ability of households or individuals to acquire a nutritionally adequate diet at all times. The household dietary diversity score was used to evaluate the quality of food consumed by the households as well as a measure of food security. The proportion of households who consumed food from each group revealed that root and tuber crops constituted the food group consumed by most respondents (79.8%) and cereals (grains) was the next most consumed food group (78.2%). Over 50% of households consumed vegetables

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whereas 62% consumed fish. Apart from sweets which were consumed by 3.2%, eggs, fruits and milk were the least consumed (24.4%, 24.9% and 29.0%) by households, respectively. About 77.6% of male farmers and 78.8% of female farmers consumed the grains food group, while 79.5% of male and 80.2% of female farmers consumed the root and tuber crops. Also, about half of the households consumed oil and fat, meat and vegetables. Low percentages were recorded for consumption of eggs, fruits and milk products. This could be that these food groups were not consumed frequently due to health reasons or that they were regarded as "luxury" items. The households' high consumption of carbohydrates and low consumption of livestock and poultry related products such as milk and eggs which are good source of protein, can be very detrimental to the health of the household members especially the children. Animal-derived foods (particularly milk and eggs) were infrequently consumed, whereas cereals/root tubers, legumes and vegetables were consumed by the majority (more than 70%). These findings are consistent with the observation that diets among populations in the developing world are based predominantly on staples and often include only a few animal products at most and only seasonal fruits and vegetables. These findings concur with those of other researchers that rural households subsist on monotonous staple-based diets and lack access to nutritious foods such as fruits, eggs and dairy products [13].

The household dietary diversity score was summarized into three dietary classes with the lowest diversity (3 or fewer food groups), medium diversity (between 4 and 5 food groups), and high diversity (6 or more food groups) based on Swindale and Bilinksy [10], and study by Baliwati *et al.* [14]. Figure 1 illustrates the findings of the consumption frequency. The average HDDS score indicated, on average, each household consumed 5 food groups. It was discovered that about 50.6%% of the households were food insecure and 49.5% were food secure using the HDDS as a proxy, and lack dietary diversity as illustrated in figure 2. Based on their dietary diversity, female farmers (52.2%) were more food secure than their male counterparts (46.9%). This is because rural women also carry out most home food processing, which ensures a diverse diet, minimizes losses and provides marketable products. Women are more likely to spend their incomes on food and children's needs. Women, therefore, play a decisive role in food security, dietary diversity and children's health.

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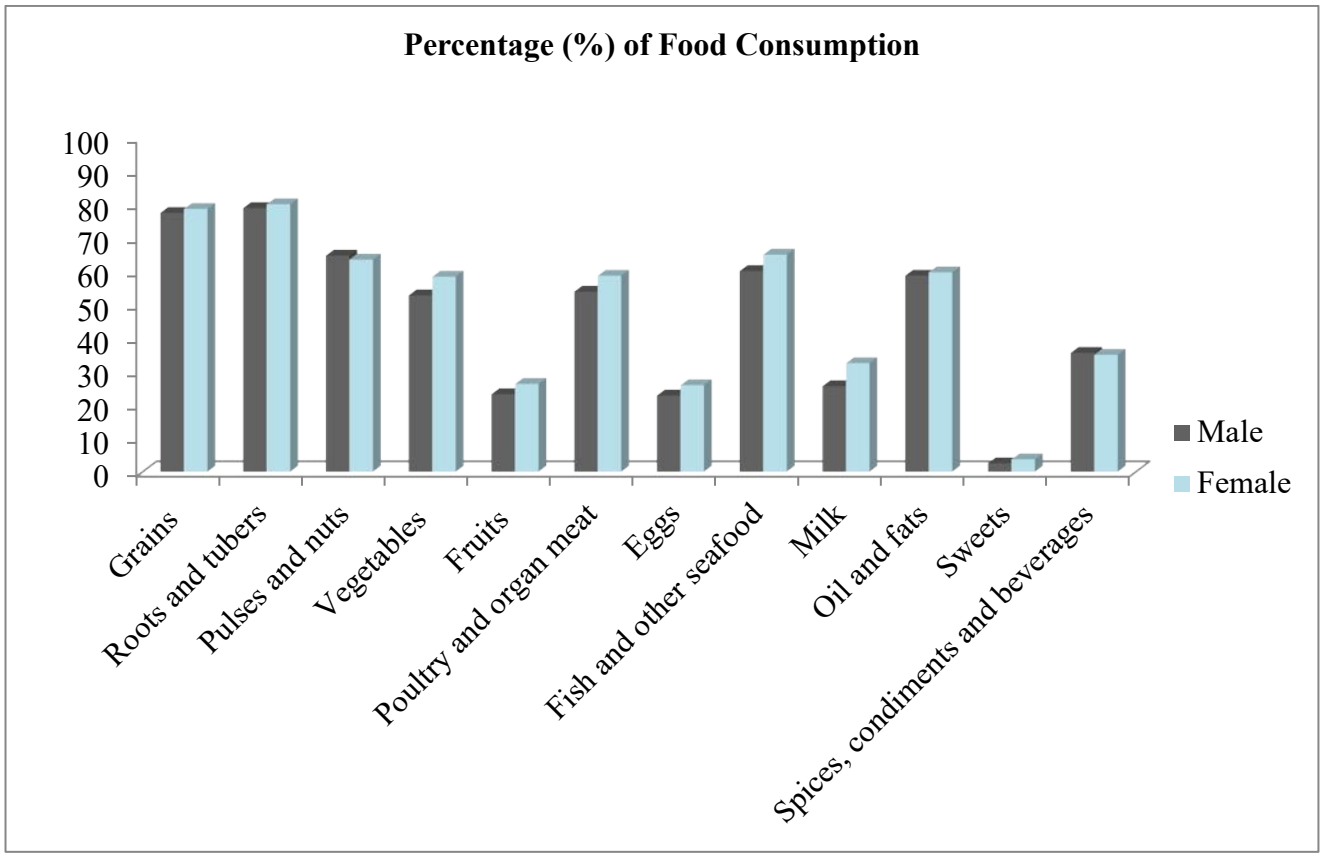

Figure 1: Seven-day frequency food consumption
Source: Field survey

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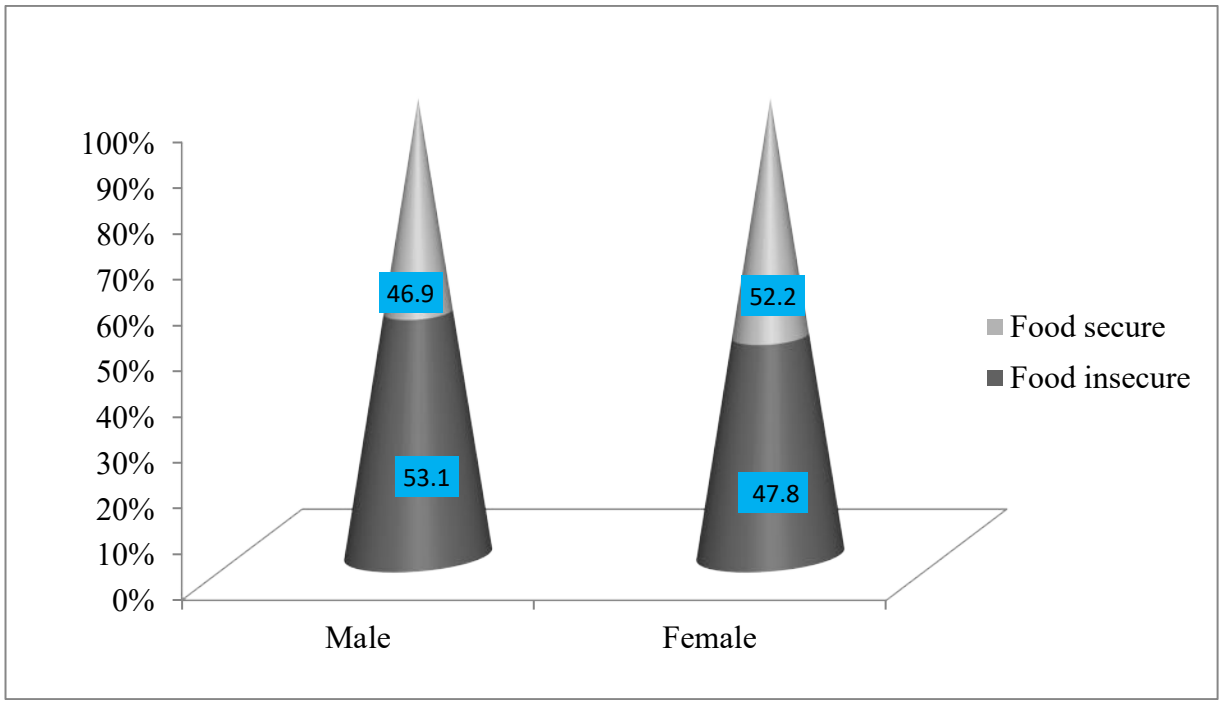

Figure 2: Distribution of food security among farmers

Factors Influencing the Food Security Status of Farmers

Age was found to be negatively related and significant at 5%. This means that if age of the respondents, which negatively affects food security, increases by 1 year, the probability of being food secure is decreased by 0.0059. This is explained by the reason that most of the farmers are in their mid-50s as shown by the mean age and subsequent increase in age could reduce their productivity on the farm, income to purchase food items and in turn, affect their food security status. This agrees with the findings of Agboola [15], who reported that an increase in age of farmers decreases food security but contradicts the results of Arene and Anyaeji [16].

Education was positively associated with an increased probability of being food secure at 10%. This implies that an increment in the education of men and women by 1 year increases the probability of food security by 0.1390. This is consistent with other studies that showed food security to be associated with the level of education [17-20]. Education is a key factor in food access, production and utilization. Moreover, education is associated with better job opportunities and provides farmers with the knowledge of how to meet health and nutritional needs of their families. Higher levels of educational attainment will provide higher levels of welfare (such as food security) for the household.

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Access to labour was also significant at 5%. An increase in man-power could tend to increase farm activities and productivity on the farm, which in turn could help increase the income of farmers. This is in line with the study of Omotesho *et al.* [20].

The size of land cultivated by farmers has a significant and positive relationship with food security at 10%. It can be inferred from its coefficient that an additional hectare of land increases the likelihood of being food secure by 0.0499. This is because an increase in farm size increases farmers' interest in farming business and to likely search for needed information on how to diversify production and increase yield. This result conforms to the findings by Frelat *et al.* [21].
With respect to food security, another variable that was significant at 5% was monthly income of farmers. Monthly income had a positive coefficient which significantly drives that food security of farmers can be positively affected by monthly income. An increase in the income by ₦1 (0.0013 USD) will increase the probability of being food secure by 0.235. This is expected because increased income means increased access to food. This result is in line with the study of Agboola, Adeyemo and Olajide [15, 18] which revealed positive and significant relationship between farmers' income and food security status.

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

Based on the findings from the study, it is seen that even though the female put more into cocoa farming, they still do not have as much resources as their male counterparts, which can help improve their financial and social status and also improve their household food security at large. It can, therefore be, concluded that in the study area, men and women still suffer access and control with respect to production resources. However, women are more disadvantaged, most especially access to credit, labour and extension service. Therefore, there is also need to remove all bottle necks and cultural practices that limit farmers' access to productive resources. Policies that ensure equal opportunities for male and female farmers should be developed. Also, there is need for credit facilities and extension services to be improved on by the government.

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Table 1: Socio-economic characteristics of farmers

Characteristics	Male		Female		
	Freq	%	Freq	%	Mean
Age (years)					
18-25	10	2.38	19	4.58	M-52
26-35	36	8.57	95	24.2	F-44
36-45	106	25.2	129	32.8	
46-55	114	27.1	75	19.1	
56-65	81	19.3	59	15.0	
>65	73	17.4	17	4.33	
Marital status					
Single	13	3.1	5	1.27	
Married	399	95	365	92.9	
Separated	5	1.19	3	0.76	
Widowed	3	0.71	20	5.09	
Educational status					
Non formal	81	19.3	98	24.9	
Primary	193	46.0	200	50.9	
Secondary	119	28.3	84	21.4	
Tertiary	27	6.43	11	2.80	
Farming experience					
<10	39	9.29	212	53.9	M-26.77

10-29	212	50.5	141	35.9	F-10.39
≥30	169	40.2	40	10.2	
Monthly income (₦)					
<10,000	13	3.10	47	12.0	M-67,810
10,000 – 30,000	86	20.5	183	46.6	F-52,220
30,001 – 50,000	113	26.9	66	16.8	
50,001 – 70,000	43	10.2	38	7.12	
70,001 – 9,0000	49	11.7	19	4.83	
>90,000	116	27.6	50	12.7	
Total	420		393		

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Table 2: Gender difference in access to credit

	Male		Female	
Access to credit	**Frequency**	**Percentage**	**Frequency**	**Percentage**
No	399	95	386	98.2
Yes	21	5	7	1.78
Use of credit				
None	399	95	386	98.2
Cocoa production	16	3.81	5	1.27
Other use	5	1.19	2	0.51
Source of Credit				
Government	0	0	0	0
Microfinance	2	0.48	1	0.25
Commercial Bank	0	0	0	0
Cooperative	10	2.38	3	0.76
Money Lender	5	1.19	3	0.76
Family and friends	4	0.95	0	0
Self	0	0	0	0
Total	**420**	**100**	**393**	**100**

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Table 3: Gender difference in access to land

	Male		Female	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Access to land				
No	133	31.7	115	29.3
Yes	287	68.3	278	70.7
Form of ownership				
None	133	31.7	115	29.3
Purchased	106	25.2	100	25.5
Inherited	93	22.1	93	23.7
Share cropping	5	1.19	3	0.76
Rented	55	13.1	51	13.0
Communal	22	5.24	25	6.36
Gift	6	1.43	6	1.53
Size of land cultivated (hectares)				
<1	98	23.3	287	73.0
1.0 – 2.0	171	40.7	48	12.2
2.01 – 3.0	32	7.62	20	5.09
3.01 – 4.0	45	10.7	16	4.07
4.01 – 5.0	26	6.19	7	1.78
5.01 – 6.0	14	3.33	2	0.51
6.01 – 7.0	10	2.38	3	0.76
7.01 – 8.0	7	1.67	0	0
>8.0	17	4.05	10	2.55
Total	**420**	**100**	**393**	**100**

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Table 4: Family Labour

	Male		Female	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Number of males on the farm				
0	17	4.05	15	3.82
1-3	300	71.4	277	70.5
4 – 6	91	21.7	98	24.9
>6	12	2.86	3	0.76
Number of females				
0	280	66.7	265	67.4
1-3	127	30.3	114	29.0
4-6	13	3.10	14	3.56
>6	0	0	0	0
Hours spent on the farm per week				
0	10	2.38	6	1.53
1-5	160	38.1	134	34.1
6-10	237	56.4	229	58.3
11-15	3	0.71	3	0.76
16-20	6	1.43	14	3.56
21-25	2	0.48	2	0.51
>25hours	2	0.48	5	1.27
Total	**420**	**100**	**393**	**100**

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Table 5: Access to extension service

	Male		Female	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Access to Extension service				
Yes	63	15	19	4.83
No	357	85	374	95.2
Number of extension visit per year				
0	357	85	374	95.2
1-5	46	11.0	10	2.54
6-10	10	2.38	5	1.27
>10	7	1.67	4	1.02
Extension services				
None	357	85	374	95.2
Training	50	11.9	12	3.05
Inspection of farm	3	0.71	1	0.25
Input supply	10	2.38	6	1.53
Total	**420**	**100**	**393**	**100**

Table 6: Test of difference

Resource	DF	Male n=420	Female n=393	T	Sig.
Credit	811	0.05 (0.218)	0.018 (0.132)	4.690	0.000***
Land		0.683 (0.023)	0.707 (0.023)	0.744	0.4574
Labour		0.398 (0.490)	0.099 (0.299)	6.760	0.000***
Extension service		0.145 (0.353)	0.048 (0.215)	4.692	0.000***

Values in parenthesis are standard deviation *** significant at 1%

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Table 7: Decision making on farm-related activities

Farm activities	Household head	Spouse	Joint decision
Land clearing			
Male	299 (71.2%)	2 (0.48%)	119 (28.3%)
Female	237 (60.3%)	27 (6.87%)	129 (32.8%)
Planting			
Male	281 (66.9%)	4 (0.95%)	126 (30%)
Female	234 (59.5%)	25 (6.36%)	123 (31.7%)
Weeding			
Male	277 (66.0%)	3 (0.71%)	126 (30%)
Female	230 (58.5%)	27 (6.87%)	124 (31.6%)
Pruning			
Male	271 (64.5%)	3 (0.71%)	123 (29.3%)
Female	226 (57.5%)	24 (6.11%)	122 (31.0%)
Agrochemicals			
Male	281 (66.90%)	3 (0.71%)	120 (29.8%)
Female	235 (59.80%)	25 (6.36%)	123 (31.30%)
Harvesting			
Male	264 (62.9%)	6 (1.43%)	145 (34.5%)
Female	216 (55.0%)	32 (8.14%)	140 (35.6%)
Storage			
Male	260 (61.90%)	10 (2.38%)	150 (35.7%)
Female	251 (53.7%)	34 (8.65%)	137 (34.8%)
Fermentation			
Male	245 (58.3%)	9 (2.14%)	148 (35.2%)
Female	206 (52.4%)	34 (8.65%)	134 (34.1%)
Drying and Bagging			
Male	250 (59.7%)	14 (3.33%)	158 (37.62%)
Female	195 (49.6%)	42 (10.70%)	153 (38.9%)
Wages of hired labour			
Male	275 (65.5%)	9 (2.14%)	129 (30.7%)
Female	228 (58.0%)	26 (6.62%)	130 (33.1%)
Purchase of farm Implements			
Male	276 (65.7%)	10 (2.40%)	137 (32.6%)
Female	234 (59.5%)	32 (8.14%)	125 (31.8%)
Purchase of Land			
Male	250 (59.5%)	3 (0.71%)	139 (33.1%)
Female	212 (53.9%)	17 (4.33%)	135 (34.4%)
Utilization of Income			
Male	239 (56.9%)	10 (2.38%)	172 (40.95%)
Female	195 (49.62%)	29 (7.38%)	169 (43%)

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Table 8: Factors influencing the food security status of farmers

Variable(N=812)	Coefficient	Standard error	p>|z|	Z-value
Sex	0.03410	0.1879	0.856	0.18
Age	-0.0059	0.0548	0.016 **	-0.11
Marital status	0.2880	0.2081	0.916	1.38
Education	0.1390	0.1352	0.100*	1.50
Household size	0.0296	0.1205	0.806	0.25
Farming experience	0.0211	0.0380	0.579	0.56
Access to extension service	-0.0839	0.2430	0.730	-0.35
Access to credit	0.0783	0.3926	0.842	0.20
Access to labour	0.1608	0.5225	0.026**	2.22
Size of land cultivated	0.0500	0.0340	0.100*	1.47
Monthly income	0.1418	0.0465	0.002**	3.05

Source: Data analysis *** denotes significance at 1%. **at 5% * at 10%

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