GENDER IMPACTS OF SMALL-SCALE FARM HOUSEHOLDS ON AGRICULTURAL COMMERCIALISATION IN OYO STATE, NIGERIA

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Abstract

Commercialization of subsistence agriculture in developing countries has led to different levels of production and consumption changes for men and women. This study therefore investigated the gender impacts of farm household resource allocation on agricultural commercialization in Nigeria. Results revealed that the majority of the household heads were male (65%) with an average age of 47years. 96% were married, 2% were single, 2% were divorced with an average household size of 6 members. The majority of the farmers operated on a small scale level. The linear regression result showed that farm size, income, land tenure, food security, level of education in relation to gender factor were variables that had impact on agricultural commercialization at 1%, 5%, and 10% levels of significance respectively. Food security and labor cost had a negative relationship with agricultural commercialization. It was concluded that gender positively affects small-scale farm household agricultural commercialization of food crops in Oyo state, Nigeria. The study recommends improvement of price policy and farm income through provision of subsidies to farmers.

Keywords: Market participation; farmers; market; marketable surplus; commercialization and Nigeria.

1. INTRODUCTION

The fact that commercialization of subsistence agriculture in developing countries leads to different production and consumption changes for men and women has been well established for at least two decades. The productive contributions and constraints of African women farmers were largely ignored in the development policies, programs, and projects that effectively restructured small-scale commercial agriculture during the open-market or planned-economy modernization drives of the 1950s, 1960s, and 1970s [1]. Women were largely excluded from public land reform programs that enabled small-scale producers to own or use lands formerly held by less productive large estates [2]. State and donor-funded programs designed to increase commercial output in the smallholding sector channeled technology, credit, and marketing assistance to men, while women's programs focused on homemaking and supplemental income- earning activities [3]. Agricultural commercialization can be defined as the transition from subsistence farming to increased market-oriented production. It is commonly measured as the ratio of percentage value of marketed output to total farm production [4]. It serves as a means of correcting external payment imbalances caused largely by secular declines in the per capita food production and the concomitant reductions in marketed food surpluses and improvement of the economic growth and development [5,6].

In Sub- Sahara Africa, Asia and South and Central America, small scale agriculture remains the major source of rural employment but, confronted with changes in world trade and falling commodity prices [7]. Although, previous studies attributed the low market participation to different challenges, there is seldom any framework for ranking the impediment at village level and as a result, privatization and adaptation of intervention becomes difficult. Consequently, there is duplication of efforts and resource wastage,

leading to a rise in food insecurity and widespread poverty [8]. Improvements in market participation are necessary to link smallholder farmers to markets in order to increase agricultural production as well as set opportunities for income generation [9]. Enhancing the ability of smallholder and resource- poor farmers to access market opportunities and diversify their links with markets is one of the most pressing developmental challenges facing both governments and non- governmental organizations [10]. Market orientation enhances consumers' purchasing power for food, while enabling re– allocation of household income by producers to high value non – food agribusiness sectors and off farm enterprises [11]. The rationale for enhancing participation in commercial agriculture also stem from the potentials to accelerate attainment of the Millennium Development Goal (MDG) on food security and poverty reduction through utilization of untapped opportunities in commodity value chains [12]. A review of studies on how agricultural innovation affects women shows mixed results, depending on the type of technology introduced [13]. Projects that have incorporated time saving technology (for example, pumps, carts) as part of farm commercialization have benefited women, who have used the time saved to engage in, for example, income-generating activities. Also, a disproportionate increase in women's work as a result of commercialization may occur only for the poorest farm households or only until households achieve a level of production and income that allows them to hire extra labor [14]. Closely related to the increased time women spend in agriculture is the concern that women lose control of the products of their labor during commercialization. The introduction of cash crops has traditionally increased the economic status of men, while decreasing the autonomy of women, largely because it has been primarily men who have received the training and the new technologies. A focus on training men in the production of introduced cash crops, for which they controlled the income earned, has left women farmers insufficient time to continue their traditional income-earning activities, for which they controlled the income earned (for example, local marketing).

Commercialization can also undermine women's traditional control over certain agricultural crops. A project in The Gambia which introduced a new irrigation system for rice production transformed rice from a "woman's crop" to a male-controlled crop [15]. Failure to consider gender roles in income generation and control can lead to project failure. A pyrethrum (pesticides) project in Kenya, which sought to organize a co-operative society to generate income from the sale of the flowers failed when women reduced their participation to protest the fact that men were the only ones who received payment [16].

For women and their families, the household and individual health and nutrition consequences of commercialization are related changes in time and income. Traditionally, women have been the ones who allocated household income for food, child care, health, and to a certain extent, education. When women lose control over income -as it increasingly becomes cash income from food cropping-they have less income under their direct control for food, health, and other household essentials. An example of this is an irrigated rice project in Kenya in which the earnings from the crop were given only to the men. As a result, household incomes rose but nutritional levels fell because the women were dependent on their husbands for expenditures [17]. It has been observed that daily standard of living and nutritional levels depend more on women, who earn small, steady incomes which they tend to spend on small, regular purchases of food.

Social and demographic changes worldwide are resulting in women heading more households and being the principal decision-makers. From a policy and program

perspective, it has long been recognized that female-headed households are different than male or joint-headed households [13]. Some attentions have been given to the impact of off-farm work of male farmers on agricultural commercialization. [18] provided support for the hypothesis that a greater involvement in off-farm labor markets of farmers decreases on-farm efficiency which will later affect agricultural commercialization. [18] further explored the extent to which farmers participate in off-farm work changes intensity on fertilizer and crop protection use. According to [13], the opportunity cost of males farming effort is high. This has significant socio-cultural and economic implications, including changes in patterns of gender relationships within household and the community in general, problem of inequality of decisions on gender basis in the process of allocating scarce resources on the farm to boost marketable surpluses, low growth of marketable surplus and marketing problem, problem of the food quality control, mal-nutrition and disease in children. The shift has different costs and benefits for men and women farmers according to local context-related factors.

The study therefore identified gender related factors and their impacts on commercialization by small-scale farmers in Nigeria. Specific objectives of the study are:

- examine the level socio-economic characteristics of the small-scale farm households in the study area;
- Determine the rate and level of agricultural commercialization of small-scale farm households in the study area
- Identify the gender related factors and their impacts on commercialization by small-holders in the area.

2. HYPOTHESIS

The under mentioned hypothesis was formulated and tested in this study:

H_0: Gender related factors impact negatively on agricultural commercialization among smallholder households in Osun State, Nigeria.

3. MATERIALS AND METHODS

Ido Local Government Area is one of the 26 Local Government Councils in Oyo state Nigeria. It has extensive fertile soil which is suitable for agriculture. The basic occupation of the people is farming. There are pockets of grass land which are suitable for animal rearing, vast forest reserves and rivers. The people grow a variety of crops such as cocoa, Kola nut, Palm oil, Oranges, Pineapple, Plantain, Maize, Cassava, Banana, Mango and other wide range fruit. Also, vegetables such as tomatoes, Okro, Ewedu (Chochorus olitorus) and other wide vegetable are grown. Ido Local Government can be aptly referred to as the food basket of the state. Apart from farming, the Local Government has also gained tremendously from industrialization processes. Industries such as the Nigeria wire and Cable Industries Limited, Nigerian National Petroleum Corporation (NNPC) and Nigeria Mining Corporation, (NMC), manufacturer of burnt bricks are all located in the local Council. The area also enjoys the services of medium and small scale industries for processing agricultural products like cassava and cashew nuts.

4. DATA AND DATA COLLECTION

Only primary data were used for this study. Cross sectional primary data were collected through the use of well-structured questionnaire. Variables considered in the construction of

and structuring of the questionnaire were age of the respondents, sex, marital status, family size, amount of time spent on the farm and years of experience, income realized, occupation etc.

4.1 Sampling Technique

The study population comprised small-scale farmers who are residents of the study area. Stratified random sampling was used in selecting the respondents. The wards in the local government were stratified into ten with a total of 100 questionnaires distributed equally among the strata. Ten questionnaires each were distributed to ten farmers in the ten wards of the local government area. The stratification was done based on the richness of the soils in the local government, as some parts of the local government make use of fertilizer to support the growth of their crops, some other parts do not use fertilizers yet their output is still as much as those using fertilizers. All of the 100 questionnaires shared equally in the Local Government Area were all retrieved.

4.2 Analytical Techniques

The data obtained for this study was analyzed by using, mean, percentages and linear regression model to present the results. A linear regression model was used to show the effect of all of the determinants on agricultural commercialization relating to gender factors. However, frequency table was used to describe the data.

4.3 Model Specification

At the end of the introduction section, the study identified gender related factors and their impacts on commercialization by small-holders. Ideally, the ordinary least square (OLS) model is applicable when all households participate in the market but in reality not all households participate or at the same level in the markets. Some households may not prefer to participate in a particular market in favor of another, while others may be excluded by market conditions. If the OLS regression is estimated excluding the non-participants from the analysis, a sample selectivity bias is introduced into the model. Such a problem is overcome by following a two-stage procedure as suggested by [19] or Tobit procedures. These procedures has been discussed broadly in Tobin [20,21,22] and [23] and applied in several instances such as [24]. Both Heckit and Tobit procedures also addressed this concern. The Heckit procedure is a consistent but not an efficient way to control for selectivity bias, while Tobit procedure is efficient and consistent. Technically, if Heckit specification was run using a Maximum likelihood Estimation (MLE) procedure without lambda, the results would be identical to Tobit-MLE selection models with iterations constrained to one. The results obtainable from the Tobit procedure are the MLE or maximum likelihood estimates, as well as the marginal effects. The marginal effects indicate the amount of the sales resulting from a unit change in the explanatory variables. The marginal effects account for the probability of the level of market participation. They have the same interpretation as the OLS coefficients. It is sometimes pertinent to compare the marginal effects and OLS coefficients, though the latter are distorted. Data providing for market participation tend to be censored at the lower limit of zero. That is, the household may sell some of its produce, while another may not sell at all. If only probability of selling is to be analyzed, Probit or Logit models would be adequate techniques for addressing probability questions. Although it is interesting to know factors that influence the level of sales, at the same time, there is a need for a model that is a hybrid between the Logit or

Probit and the OLS.

The model postulates that the probability (Pi) that a farm household commercializes its crop production is a linear function of all the explanatory variables, Xi.

$$Pi (Y) = F(Xi) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$
$$X_i = X_1, X_2, X_3, X_4 \dots\dots\dots\dots\dots, X_{15} \dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

The explanatory variables, X_i's, in addition to the linear property, also summarize a set of the farm, market, demographic, individuals and household characteristic. X_i's variables are related to gender resource and time allocation within the household.

$$Y = bo + \beta_1 X_1 + b_2 X_2 + \dots + \beta_n X_n \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

The probability of commercialization is given by

$$P_i(Y=1) \tag{4}$$

Non-commercialization probability is

$$Q_i (Y=0) \tag{5}$$

Where (P_i = Probability of farm household commercializing) $P_i(Y=1)$ $Q_i (Y=0)$ (Probability of farm household not commercializing).

Y = Dependent variable which is dummy; if farm household commercializes, Y=1 and if otherwise, Y=0.

X_1 = Household income in Naira X_2 = Land size in hectares

X_3 = Land tenure (Dummy variable), if owned = 1, otherwise = 0

X_4 = Male off farm time in hours (number of hours of work spent on non-agricultural production)

X_5 = Female off farm time in hours X_6 = Male farm time in hours

X_7 = Female farm time in hours X_8 = Farm household size

X_9 = Male education in years X_{10} = Female education in years

X_{11} = Cost of hired farm labor in Naira

X_{12} = Cost of purchased farm inputs in Naira

X_{13} = Livestock owned (Dummy), if owned=1 and if not =0. X_{14} = Experience of farmers in years

X_{15} = Food security of farm household in Naira (home allocation of the farm produce for family use and consumption)

U_i = Error term.

$$Y = b_O + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + b_{11} X_{11} + b_{12} X_{12} + b_{13} X_{13} + b_{14} X_{14} + b_{15} X_{15} + U_i$$

5. RESULTS

5.1 Socio-economic Characteristics of Farming Households

Table 1 describes the socio-economic characteristics of farming households. Most of the respondents were within the age group of 46-55 with (about 31%) while very few were within the age group 66-76 (7%). This revealed that the mean age of the respondents was 47.1 years. The implication of this finding was that most of the respondents were at their middle age which means that they were still active in their farm production activities. They have accumulated enough experience for farm production over the years. The farmer's

strength and energy were still highly productive, which affected their farm activities positively as opined by [25]. The farmers' age is an important factor in influencing their level of farm output especially in peasant farming which is characterized by high labor requirements. The older farmers (about 7%) are gradually giving way for the young and enterprising ones who take the job as business. According to [26], older farmers view farming as a way of life rather than as a business and have a strong emotional or almost biological connection with farming, land and little or no contact with the outside world. For farmers producing on a larger scale, their active period fell within the most productive age group which thereby favored high marketable surplus growth (i.e. agricultural commercialization). Male participation in agricultural production in the study area was greater than that of the female with 65% of the respondents being male while 35% were female. This might be due to the fact that females do more of the marketing than the males, or the females do engage more in the house chore works. Most of the females that responded as farmers have small farm holdings given to them by their husband or inherited the land to practice subsistence farming. The implication of this is that land resource is poorly secured a on gender basis which might have a negative impact on agricultural commercialization due to the decision taken in committing it into use. [14] opined that some of the worst apparent failure of agricultural commercialization cited in the literature, such as the eviction of farmer-tenants can be traced mainly to the poorly defined land rights on gender basis rather than to the process of commercialization. This is clearly observed and supported by this study.96% of the respondents were married, 2% were single and 2% also were divorced. The implication of this finding was that most of the farmers were married and they make use of family members as labor. This act increased their productivity to favor high marketable surplus (agricultural commercialization) and to reduce their labor costs. Being married determined the capability of the farm households to allocate all their resources efficiently on both farm and non-farm activities to boost the household income. Most of the farmers did not cultivate more than 4 hectares with 93% of the farmers cultivating pieces of land less than or equal to 0.1-2 hectares. Only 7% of them cultivated land between 3.1-4 hectares. The average farm size cultivated was 1.24hectares. This showed that most of the farmers in the area cultivated on a low scale level despite commercialisation. [27], stated that recent studies emphasized that farm enlargement is a factor to achieve greater commercialization and diversification. Its implication is obvious in that the level of commercialization is also limited which is clearly observed and supported by this study.

Table 1. Socio-economic characteristics of the farming households

Category	Frequency	Percentage	Cumulative percentage
A. Age distribution of respondents 26 — 35	19	19	19
36-45	26	26	45
46-55	31	31	76
56-65	17	17	93
66- - 75	7	7	100
Total	100	100	
B. Gender distribution of respondents Female	35	35	35
Male	65	65	100
Total	100	100	
C. Marital status of respondents Married	96	96	96
Single	2	2	98

Divorced	2	2	100
D. Household size of respondents 1-3	6	6	6
4-6	80	80	86
7-9	12	12	98
>9	2	2	100
E. Educational level of respondents None	24	24	24
6	48	48	72
12	23	23	95
16	5	5	100

Source: Field survey, 2010

Average household size was 6 persons per household. The household size is a crucial determinant of the available labor for the farming activities especially in the sub-Saharan Africa, which is predominantly family labor dependent, and labor intensive at the subsistence level. Larger households with more dependents are likely to have a lower level of commercialization as confirmed by [28] with a propensity to commercialize decline with number of household members. This is because more of the farm produce is likely to be allocated for home consumption rather than the market. Most of the farmers were literate with 48% attending primary school, 23% attending secondary school and only 5% had tertiary education. On the other hand, only 24% had no formal education at all. This result had a great effect on the level of diversification of farmers to minimize risk, generate more income and increase their production volume to favor agricultural commercialization.

5.2 Regression Analysis Results

The linear regression technique was employed to estimate the impact of the gender related factors on the agricultural commercialization. The dependent variable Y (agricultural commercialization) and the independent variables X_1-X_{15} were used for the analysis. The results of the analysis were presented in the Table 2.

Table 2. Regression analysis results

	Coefficients				
	None standardized coefficients		Standardized coefficients		
Model	Beta	Std. Error	Beta	T B	Sig. Std. Error
Constant	.960	.245		3.922	.000
Family size	.028	.025	-.136	-1.108	.271
Farming Exp.(years)	8.416E-6	.003	.000	.003	.998
Farm size(ha)	.286	.077	.739	3.725	.000*
Gross income (₦)	-5.431E-7	.000	-.709	-2.235	.028**
Land ownership	.134	.070	.206	1.924	.058***
Livestock owned	-.126	.085	-.154	-1.474	.144
Labor cost(₦)	-5.735E-7	.000	-.125	-.210	.834
Cost of inputs (₦)	9.609E-7	.000	.350	.492	.624
Food security(₦)	-1.349E-6	.000	-.207	-1.713	.090***
Male off farm time per year (hrs)	1.027E-5	.000	.031	.146	.885
Female off farm time per year (hrs)	3.193E-5	.000	.095	.440	.661
Male farm time per year (hrs)	-3.853E-5	.000	-.128	-.527	.599
Female farm time per	-3.589E-5	.000	-.085	-.319	.751

year (hrs)					
Level of education (yrs)	.016	.009	.264	1.845	.069***
FR^2= 0.768			1.572		.09

Adjusted R^2= 0.76

Source: Field Survey, 2010

*significant at 1% ,**significant at 5% and ***significant at 10%

The coefficient of determination of the linear regression was 0.768 with an adjusted value of the coefficient of determination of 0.760.This implied that about 76.80% of the variability in the agricultural commercialization was explained by different variables used in the model. The F-ratio was significant at 10% implying that the whole model was fitted. Gross income (X_1) was significant at 5% and negative which means that the higher Gross income realized, the lower the commercialization of agriculture by 70.9%. It also implied that farmers that realized more of the Gross income tended to produce little agricultural produce since more time was allocated to the off-farm activities as reflected by the results of the analysis and thereby reduced the market allocation which reduced involvement in agricultural commercialization. Farm size (X_2) was also significant at 1% and positive, indicating that a further increase in the farm size would increase output which would in turn encourage agricultural commercialization by 73.9%. Farmers with large expanse of land would plant more crops and the allocation to the market would increase, leading to high agricultural commercialization. X_3 (land ownership), was also found to be significant at 10% and positively related to the agricultural commercialization. This implied that as the Land ownership increased by 1%, the agricultural commercialization increased by 20.6%. It might be inferred from this result that as farmers tended to commit their owned land for agricultural purpose, there would be an increase in the farm products which would lead to increase in agricultural commercialization. X_9 (level of education) had a positive relationship with agricultural commercialization and was significant at 10%. An increase in the level of education by 1% would lead to a 26.4% increase in the agricultural commercialization. X_{15} (food security) had a negative relationship with agricultural commercialization and significant at 10%.An increase in the food security by 1% would lead to a decrease in the agricultural commercialization by 20.7%. This is due to the fact that the peoples' home allocation of the farm produce would increase and the market allocation would decrease leading to the decrease in the agricultural commercialization.

6. CONCLUSION

This study approached the issues of gender **impacts** of small-scale farm households and issues of the allocation of the total farm outputs into the home consumption and the marketable surplus. Major crops grown in the area were cassava, maize, cocoyam, yam, banana, plantain, pineapple, orange, vegetables (okra, amaranthus, Corchorus olitorus, celosia, tomatoes, and pepper.). All the farmers made use of both hired labor and the family labor. The linear regression result concludes that farm size, income, land tenure, food security, level of education in relation to gender factor were the variables that had impact on agricultural commercialization at 1%, 5 % and 10% levels of significance respectively. The study established that gender impacts on the farm household's resource allocation on the agricultural commercialization of food crops in Ido Local Government Area of Oyo state, Nigeria. The marketable surplus of the farm households reflected their market orientation through the impact of the gender related variables on the co-efficient of the agricultural

commercialization. The result generated through this study had policy implications on the home consumption, marketable surplus allocation and the co-efficient agricultural commercialization of the farming households in the study area.

RECOMMENDATIONS

Since most of respondents were small scale farmers, land expansion policy should be encouraged to make agricultural land available for the farm households. This would have a positive impact on agricultural commercialization and help increase their scale of production and economies of scale. Also improvement of farm income through provision of subsidies to the farmers and price policy targeted to reduce farm inputs price and increase farm outputs price to enhance increased gross farm income should be vigorously pursued.

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