

RESEARCH ARTICLE



A gender analysis of determinants of poverty among rural farming households in Nigeria

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Abstract

The study identifies the determinants of poverty among male and female-headed households in Kwara State using a randomly selected 510 representative farming households. Descriptive statistics, Foster, Greer and Thorbecke class of poverty indices as well as Tobit regression model were used as analytical tools. The robustness of the estimated Tobit parameters were also verified using stochastic dominance analysis. The results of the Foster, Greer and Thorbecke poverty measures show that the female-headed households were poorer than their male-headed counterparts. At varied poverty lines of 70-145% of the estimated line, the female-headed households were also poor. The different determinants of poverty for the two categories of households were among others, household size, highest educational attainment of the household heads and membership of cooperative society. The study recommends that poverty reduction strategies in the study area should be gender specific and should focus mainly on variables that influence the poverty status of each category of households.

Keywords: Poverty measures, gender analysis, Tobit regression

1. Introduction

In Nigeria as in many other Sub-Saharan African countries, poverty is predominantly a rural phenomenon. Among its numerous causes is low or fluctuating levels of labour productivity in agrarian-based-livelihoods [15]. Poverty in Nigeria is on the increase and its incidence and severity more in agricultural sector than other sectors of the economy. The inter-linkages between gender and poverty have also been major issues in the role and effectiveness of policy interventions in poverty reduction in developing countries. Women disproportionately suffer from hunger, disease, environmental degradation and impoverishment. Gender affects vulnerability to poverty in periods of insecurity, and women are likely to find it more difficult to escape from poverty [8]. This has made gender equality an important aspect of many development projects recently. This culminates from the fact that gender inequalities and a lack of attention to gender in agricultural development have contributed to lower productivity, higher levels of poverty and under-nutrition [20]. It is a known fact that differences exist between female and male headed households with respect to access to key productive assets such as land, labour, technology, credit, and extension services [35]. [35] reports that failure to recognize the roles of men and women, and the differences and inequalities

that exist between them pose a serious threat to the effectiveness of agricultural development strategies. It is worthy of note that there is a significant increase in the percentage of female-headed households than hitherto the case in Africa due to deaths of male heads, conflicts and rural-urban migration among others. Recognition must therefore be given to this category of households for any meaningful poverty reduction to take place. The positive effects that present renewed interest in agriculture might bring may not reach this category of households directly if a genuine attention is not paid to them [32]. This study therefore carried out a gender differentiated isolation of the determinants of poverty among rural farming households in Nigeria using Kwara State as a case study. The other objectives of the study are: examination of the socio-economic characteristics of the rural farming households based on gender of the household heads as well as presentation of the expenditure patterns of the farming households also based on gender of the household heads. The results emanating from the study indicate that households' experiences of poverty differ greatly in the study area based on gender of the household heads. The factors influencing poverty status of the two categories of households are also somewhat different and should be tackled headlong for meaningful poverty reduction in the state.

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The rest of the paper is organized as follows: section 2 summarises some past studies on poverty, Section 3 describes the methodology for results presentation in section 4. Section 5 concludes.

2 Review of Literature

[12] reports gender as a key determinant to vulnerability to poverty in Bayelsa State, Nigeria. Using National Bureau of Statistics 2009-2010 NLSS data the study assessed poverty and its vulnerability in the state with a constructed poverty line of ₦22393.62. The results of the Foster, Greer and Thorbecke weighted poverty indices show the incidence, gap and severity of poverty of households in the state to be 25, 14.26 and 8.6 percent respectively. About sixty-percent of the households were also vulnerable to poverty. The major determinants of poverty in the state aside from gender were household size and per capita expenditure on education, health care and food. [1] uses data spanning 15 years to study subjective and consumption poverty in urban Ethiopia. The study finds out that despite rapid economic growth and declining poverty, subjective poverty remains largely unchanged in the country. Households with history of poverty continue to perceive themselves as poor despite improved level of consumption. The relative economic position of households is a strong determinant of subjective poverty in the country. Having some type of employment also makes households less likely to perceive themselves as poor even if they remain in objective poverty. The study concludes that subjective poverty should be included in measurement of impact of growth on welfare in the Kenya. [10] stress the existence of gender based income gaps across African production systems. Household level data from 21 regions across eight African countries, collected in 2002 and 2008 were used to analyze production dynamics, market participation, and nonfarm linkages. It was found that gender gaps were absent in 17 of the regions regardless of the overall regional income level. Their

results suggest that neither poverty nor growth in general discriminates against female headed

households, but that causes of gender discrimination need to be found in specific regional contexts. [11] uses estimates from Ghana Living Standard Surveys to measure vulnerability to asset-poverty in Sub-Saharan Africa. The results of the study show that expected asset- poverty is a reliable proxy for expected consumption- poverty. The study also finds that households in rural areas are more vulnerable to poverty than those in urban areas using demographic health surveys in eight Sub-Saharan African countries.

3. Methodology

This study was conducted in Kwara State, an essentially agrarian area with about 80 per cent of her population living in rural areas. The entire rural farming households in the state were the target population for the study. Primary data obtained through a set of pre-tested structured questionnaire administered with the aid of 16 trained enumerators in 2007 were used for the study. The bulk of the information collected was mainly on weekly households' consumption expenditure and income. Information was also obtained on socio-economic and demographic characteristics of the households. Kwara State is divided into four agricultural zones by the State Agricultural Development Project (KWADP). A two stage simple random sampling technique was used for selecting the representative farming households for the study. The first stage was a random selection of 36 villages from the four agricultural zones. Based on the farming household listing by the local authority, 10% of the population in each village was selected using random sampling technique; this was the second state (Table 1). The cooking pot definition of household was adopted and as such households that conformed to this consumption-based definition of households were used. All in all a total of 510 rural farming households were used for the study.

Table 1: Selected Villages and Households Distribution

<i>Zones</i>	<i>Number of Selected Rural Villages</i>	<i>Number of Farming Households in Each of the Rural Villages</i>	<i>Number of Selected Households</i>
A	6	700	70
B	5	550	55
C	15	2200	220
D	10	1650	165
Total	36	540	510

Source: Field Survey, 2007

Poverty Assessment

Poverty refers to the lower decile or quintile of the distribution of economic welfare which is consumption expenditure per adult equivalent for the purpose of this study. Foster, Greer and Thorbecke class of weighted poverty indices were used to profile the poverty status of the rural farming households in the State [17]. The formula, following Foster, Greer and Thorbecke (FGT) is given as:

$$P_r = 1/n \sum_{i=1}^q (z - y_i / z)^\alpha \quad (1)$$

Where P_r is the weighted poverty index; n is the number of households; y_i is the expenditure per adult equivalent of i th household; z is the poverty line defined as 2/3 of mean consumption per adult equivalent of the sampled population [16]; q is the number of the sampled household population below the poverty line; α is the aversion to poverty (a coefficient reflecting different degrees of importance accorded to the depth of poverty and it ranges from 0 to 2. The FGT measure of poverty has been criticized for its inability to capture all dimensions of poverty since poverty is a multi-dimensional phenomenon. The quantitative measure of poverty such as the FGT only helps to provide partial information about poverty. No single approach to poverty appraisal can capture all the essential aspects of poverty. The mixing of quantitative and qualitative skills in poverty appraisal therefore gives a better result [35].

Determinants of Poverty

Isolation of the determinants of poverty for the farming households was achieved with Tobit regression model. The Tobit censored regression model is given as:

$$S_i = S_i^* = \beta X_i + e_i \quad \text{if } S_i^* > 0 \quad (2)$$

$$0 = \beta X_i + e_i \quad \text{if } S_i^* < 0 \quad (3)$$

$$i = 1, 2, 3, \dots, 20 \quad (4)$$

Where: S_i is the limited dependent variable, it is discrete when the households are not poor (it assumes zero value in this case) and continuous when they are poor that is equal to S_i^* . S_i^* is the poverty gap defined as $(Z - Y_i / Z)$ and Z is the poverty line; X_i is the vector of explanatory variables; Y_i consumption expenditure per adult equivalent; β vector of unknown parameters; e_i is independently distributed error term. The Tobit regression model is however limited in its

heavy reliance on normality and homoskedasticity in the underlying latent variable S^* , in case of heteroskedasticity however one never knows what the maximum likelihood estimates is actually estimating [Greene] Nonetheless the Tobit regression model is preferred above Logit model for its ability to measure the depth of poverty as well as isolate its determinants. The independent variables hypothesised as determinants of poverty following [19] and with some modification are classified into demographic, farm related, institutional and living condition. They are presented in Table 2.

The empirical models were used to draw inferences on the probability of and the determinants of poverty for the two categories of households. Following a Tobit decomposition framework suggested by [24], the effect of changes in the explanatory variables (X_i) on the probability and depth of poverty of the households were obtained.

3. Results and discussion

Descriptive Statistics of Key Variables based on Gender of the Household Heads

Table 3 shows the summary of the descriptive statistics based on gender of the household heads. Expectedly male-headed households (84%) were more than female-headed households (16%) in the study area. The presence of female-headed households was due to death of male heads, migration, divorce and economic reasons. The mean age for the household heads for the two categories of households were 51.9 and 54.0 years for male and female-headed households respectively. Usually in rural settings in Nigeria households constitute usually more than one generation; the young married adults and their children live with their parents and often time eat from the same pot. The heads of the households in such cases are usually the male or female grandparents. This explains the high average age for the two categories of households. Another reason for high average age is the fact that farming business is usually carried out by the elderly in Nigeria due to rural-urban migration. In terms of years of schooling, 60 percent of adult household members in the female-headed households had informal education while only forty percent of adult household members in the male-headed households had no formal education.

Table 2: Fitted Variables for the Tobit Regression Model

Demographic Variables	Age of household head X_1 Measured in years. It is assumed to be positively related to poverty [31]. D=1 if the head is a male, 0 if otherwise.	Gender of the household head X_2 Expected to be negatively related to poverty D=1 if head is a male, 0 if otherwise [23].	Average years of schooling of adult household members X_3 Average years of schooling completed by adult household members that is, those above 15 years of age, is expected to be negatively related to poverty [23]	Male-monogamous X_4 A dummy indicating the gender and marital status of the household head. D=9 if male and has one wife, 0 if otherwise.
	Male-polygamous X_5 Also a dummy indicating gender and marital status of the head. D=1 if the head is married and has more than one wife.	Female-married X_6 A dummy indicating the marital status and gender of the household head. D=1 if the head is a female with absentee husband that is away most of the time, 0 if otherwise.	Female-divorced X_7 A dummy indicating the gender and marital status of the household head. D = 1 if a female and a divorcee, 0 if otherwise.	Female-widowed X_8 A dummy indicating the marital status and gender of the household head. D=1 if female and widowed, 0 if otherwise.
	Child dependency X_9 Proportion of children under 15 years that are not drawn into household labour. It is expected to be positively related to poverty [9].	Adult dependency X_{10} Proportion of adults above 65 years in relation to the household size and also a measure of the level of dependency.	Adjusted household size X_{11} Measured in adult equivalent and expected to be positively related to poverty [23].	Ratio of food expenditure to total expenditure X_{12} Engel index, it measures the ratio fraction of total expenditure spent on food. It is expected to be negatively related to poverty [29] Remittance Access X_{13} A dummy indicating access to remittances from friends and relations. It is expected to be negatively related to poverty. D=1 if there is access, 0 if otherwise.
Farm Related Variables	Farm size X_{14} Measured in hectares and is expected to be negatively related to poverty [33]	Land access X_{15} A dummy showing access of farming households to land D=0 if yes and 0 if otherwise [5]	Amount of credit utilized for farming X_{16} Amount of credit utilized for farming in naira per season, it is expected to be negatively related to poverty [6]	Number of income earners in the household X_{18} Shows the number of working members in the households, it is expected to be negatively related to poverty [19]
	Major occupation X_{17} A dummy indicating the major occupation of the household head. D=1 if farming is the major occupation and 0 if otherwise.			Non-farm income X_{19} Amount of non-farm income in naira per month.
Institutional Variables	Membership of cooperative society X_{20} A dummy indicating membership of a cooperative society. It is expected to be negatively related to poverty. D=1 if yes, 0 if otherwise.		Number of visits by extension agents per month X_{21} It is expected to be negatively related to poverty.	
Living Condition Variables	Clinic Distance in kilometres X_{22} Longer distance to	Plastered wall X_{23} A dummy denoting if household place of	Distance to potable water source in kilometers X_{24} An indicator of welfare measure. The closer the source of water, the better for the households,	

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	source of medical facility might discourage utilization and result in low level of welfare [29]	dwelling is plastered it is expected to be negatively related to poverty [9]. D=1 if yes, 0 if otherwise.	measured in kilometres. It is expected to be positively related to poverty [9]
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Source: Field Survey, 2007

Table 3: Descriptive Statistics based on Gender of the Household Heads

<i>ITEMS</i>	<i>MALE-HEADED</i>	<i>FEMALE-HEADED</i>	<i>ALL HOUSEHOLDS</i>
	n=430	n=80	n=510
Gender	430 (84)	80 (16)	510 (100)
Age:			
25-44	73(17)	15 (19)	88 (17)
45-64	328 (76)	49 (61)	477 (74)
>64	29 (7)	16 (20)	45 (9)
Mean Age	51.9	54.03	52.19
Standard deviation	9.46	9.61	9.15
Marital Status			
Single	17 (4)	-	17 (3.3)
Married	411 (96)	32 (40)	443 (87)
Widowed	1 (.5)	46 (58)	47 (9.2)
Divorced	1 (0.5)	2 (2)	3(0.6)
Educational Status			
No formal education	175 (41)	48 (60)	223 (44)
Arabic	104 (24)	3 (4)	107 (20)
Primary	54 (13)	15 (19)	69 (14)
Secondary	70 (16)	11 (13)	81 (16)
Tertiary	27 (6)	3 (4)	30 (6)
Mean years (Eng. Lang.)	4.21	3.5	4.09
Standard deviation	5.18	4.91	5.19
Post Primary Education			
Yes	102 (24)	14 (17)	116 (23)
No	328 (76)	66 (83)	394 (77)
Post Secondary Education			
Yes	27 (6)	3 (4)	31 (6)
No	403 (94)	77 (96)	479 (94)
Major Occupation			
Farming only	280 (65)	42 (53)	322 (63)
Farming and Trading	45 (10)	35 (44)	80 (16)
Farming and artisan	81 (19)	-	81 (16)
Civil service and farming	24 (6)	3 (4)	27 (5)
Farm Size			
<1 Ha	21 (5)	14 (18)	35 (7)
1-2 Ha	343 (80)	66 (82)	409 (80)
Land Access			
Yes	350 (81)	26 (33)	404 (79)
No	80 (19)	54 (67)	106 (21)
Input access			
Yes	230 (53)	38 (48)	268 (67)
No	200 (47)	42 (52)	242 (47)
Extension Access			
No visit	286 (66)	56 (70)	342 (67)
1-2 visits	137 (32)	21 (26)	158 (31)
>2	7 (2)	3 (4)	10 (2)
Mean	0.48	0.45	0.47
Standard deviation	0.76	0.83	0.77
Loan Amount per Cropping Season			
Nil	257 (60)	51 (64)	308 (60)
<25,000	85 (20)	14 (17)	99 (19)
25,000-50,000	70 (16)	15 (19)	85 (17)
>50,000	18 (4)	-	18 (4)
Mean	10,725	14,293.02	13,733
Standard deviation	15,648.01	26,480.46	25,113.64

Cooperative Membership			
Yes	140 (33)	17 (21)	157 (31)
No	290 (67)	63 (79)	353 (69)
Farm Income			
Nil	87 (20)	27 (34)	114 (22)
0-25,000	133 (31)	28 (35)	161 (32)
25,001-100,000	148 (35)	18 (23)	166 (32)
>100,000	62 (14)	7 (8)	69 (14)
Mean	108,526.57	64,054.19	101,550.51
Standard deviation	117,131.01	74,434.69	112,629.28
Non-Farm Income (₦) per month			
Nil	302 (70)	55 (69)	357 (70)
0-2,500	99 (23)	17 (21)	116 (23)
2,501-5,000	17 (4)	8 (10)	25 (5)
>5000	12 (3)	-	12 (2)
Mean	992.56	630	767.06
Standard deviation	2,069.52	1,131.42	1,952.42
Household Size			
Small (1-5)	35 (8)	28 (35)	63 (12)
Medium (6-10)	216 (50)	49 (61)	266 (52)
Large >10	179 (42)	3 (4)	181 (36)
Mean	10.10	6.39	9.52
Child dependency Ratio			
Nil (0)	10 (2)	2 (3)	12 (2)
0.01-5	271 (63)	37 (46)	308 (60)
0.51-1.0	149 (35)	41 (51)	190 (37)
Mean	0.49	0.54	0.50
Standard deviation	0.18	0.19	0.18
Adult Dependency Ratio			
Yes	56 (13)	6 (8)	62 (12)
No	374 (87)	74 (92)	448 (88)
Remittance Access			
Yes	194 (45)	61 (76)	255 (50)
No	236 (55)	19 (24)	255 (50)
Ratio of Food Expenditure to Total Expenditure			
0-0.5	39 (9)	5 (6)	44 (9)
0.61-1.0	391 (9)	5 (6)	44 (9)
Mean	0.64	0.64	0.64
Standard deviation	0.14	0.16	0.15

Source: Field Survey, 2007.

More adult members in the male-headed households had post primary and post secondary education (24% and 6%) than the female-headed households (17% and 4% respectively). This corroborates earlier reports by [34, 28]. The gender differentials in education were also evident in the mean years of schooling of the adult members in the male-headed households (4.21 years) as against 3.50 years in the female-headed households (literacy in English language). Generally, educational attainment is lower for females than for males in Nigeria, as in most of Africa; these inequalities persist but are also diminishing [26, 28].

Sixty-five per cent of the male-headed households engaged in full time farming; while 42 per cent of the female-headed households took farming as means of livelihood. The percentage of livelihood diversification varied with gender of the household

heads. Forty-four per cent of the households headed by females were into farming and trading while ten per cent of the households-headed by male engaged in farming and trading. Rural farming households' involvements in civil service were relatively small in the study area; 6% and 4% respectively for male and female-headed households. Nonetheless, farming as a means of livelihood is still the major occupation in rural Kwara for the two categories of households. [26] reported a similar finding.

Expenditure Pattern of Rural Farming Households based on Gender of the Household Heads

The expenditure pattern of the rural farming households in the study area is presented in this section based on gender of the household heads. The mean consumption expenditure per adult equivalent

for the female-headed households was ₦2410.375 against ₦2984,41 for the male-headed households. The means are statistically different from each other (Table 4).

Table 4: Disaggregation of Consumption Expenditure based on Gender the Household Heads

<i>Items</i>			<i>All Households</i> <i>n=510</i>	<i>Male-Headed</i> <i>Households</i> <i>n=430</i>	Female-Headed Households n=80
<i>Mean</i>	<i>Real</i>	<i>Consumption</i>	₦2568.95	₦2584.41*	₦2410.38*
<i>Expenditure</i>	<i>Per</i>	<i>Adult</i>			
<i>Equivalent(MPAEHE)</i>					

Source: Field Survey, 2007. The tests are for differences by gender of the household head. *denotes significance at 1%.

The mean per adult equivalent household expenditure for all households was ₦2,557.11

Poverty Profile of Rural Households in Kwara State based on Gender of the Household Heads

The results of the poverty indices of the rural farming households in the study area are presented in Table 5 based on gender of the household heads. The head count indices are 63 and 59 per cent respectively

for the female and male-headed households. The indices are significantly different from the whole group indices at 1%. This is in conformity with [23] for Cape Verde. Female-headed households are particularly disadvantaged due to poor access to productive resources than their male-headed counterparts. They are also less educated and lack asset that can serve as economic security and collateral for credit facilities to advance their course.

Table 5: Foster, Greer and Thorbecke Poverty Indicators for Rural Farming Households in Kwara State based on Gender of the Household Head

<i>ITEM</i>	P_0	P_1	P_2	q	n	<i>Contribution to</i>		
						P_0	P_1	P_2
Gender								
Female	0.63**	0.18**	0.06**	50	80	0.17	0.18	0.19
Male	0.59**	0.16**	0.05**	251	430	0.83	0.82	0.81
All Households	0.58	0.15	0.05	301	510			

Source: Field survey, 2007. The tests are for differences from whole group.**denotes significance at 1% level, * denotes significant at 5% level.

Determinants of Rural Farming Households in Kwara State Based on Gender of the Households' Heads

The results of the Tobit regression model is presented in Table 6 based on gender of the household heads. The following variables significantly influence the poverty status of the male-headed households in the study area. These are: average years of schooling of adult household members, membership of cooperative societies by the household heads, farm size, child dependency ratio, ratio of food expenditure to total expenditure, farming as the only occupation of the household heads, access to farm land, quality of accommodation of the households, household size, distance to water and medical facilities and amount of non-farm income earned per month by the household. Age of the household head, distance to water and

medical facilities, child and adult dependency ratios, farming as the only occupation of the households as well as ratio of food expenditure to total expenditure had positive relationship with poverty status of male-headed farming households in Kwara State. The remaining significant variables however affected their poverty status negatively. Average years of schooling of adult household members and the size of the household had significant negative and positive marginal contribution of -0.053 and 0.014 respectively to poverty status of rural male-headed households in the study area. Male-headed households in the study area had large household size (42% had above 10 members per household, Table 2). Large household size has been reported as a positive correlate of poverty. [27] confirms this assertion. High educational attainment on the other hand had negative relationship with poverty. Households with more educated

members will be able to adopt new yield improving technologies and have better ability to manage farm effectively and efficiently *ceteris paribus*. Such households will also be able to engage in off-farm

activities. This could result in high level of income and eventual higher level of consumption for such households.

Table 6: Maximum Likelihood Estimates of Tobit Regression for Poverty based on Gender of the Household

Item	Heads			
	Male-Headed		Female-Headed	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Demographic Variables				
Age of the household heads	0.002 (1.76)	0.002 (1.77)	0.005*** (2.01)	0.004*** (2.03)
Years of Schooling	-0.078** (-3.103)	-0.053** (-3.143)	-0.033*** (-2.700)	-0.028*** (-2.708)
Child Dependency	0.174** (3.20)	0.118** (3.20)	0.057 (0.69)	0.049 (0.69)
Adult Dependency	0.221 (1.10)	0.150 (1.10)	-0.669 (-1.26)	-0.579 (-1.28)
Adjusted-Household Size	0.020*** (6.65)	0.014*** (6.53)	0.036*** (4.53)	0.031*** (4.57)
Food Ratio	0.281*** (4.23)	0.190*** (4.25)	0.344*** (3.52)	0.297*** (3.57)
Marital Status	-	-	-0.150** (-2.420)	0.083** (-2.56)
Socio-Economic Variables				
Farm Size	-0.078*** (-4.45)	-0.053*** (-4.646)	-0.192*** (-3.830)	-0.166*** (-3.938)
Major Occupation	0.021*** (2.97)	0.014*** (2.996)	0.0186*** (2.549)	0.0161*** (2.55)
Cooperative	-0.086*** (-4.19)	-0.058*** (-4.21)	-0.056 (-1.43)	-0.048 (-1.44)
Land Access	-0.045** (-2.28)	-0.030 (-2.27)	-0.026 (-0.85)	-0.022 (-0.86)
Extension	-0.015 (-1.25)	-0.010 (-1.25)	-0.056*** (-2.35)	-0.035*** (-2.56)
Other working members	-0.028 (-1.89)	-0.019 (-1.88)	-0.091*** (-3.61)	-0.079*** (-3.94)
Non-Farm Income	-0.135E-2** (-2.60)	-0.112E-2** (-2.60)	-0.304E-2** (-2.10)	-0.263E-2** (-2.19)
Loans Amount	0.326E-3 (-0.95)	0.221E-3 (0.95)	-0.1098E-3 (-1.2)	-0.9498E-3 (-1.20)
Remittances	-0.031 (-0.65)	-0.026 (-0.66)	-0.023** (-2.10)	-0.20** (-2.42)
Living Condition Variables				
Clinic Distance	0.036*** (6.50)	0.025*** (6.57)	0.049*** (3.797)	0.042*** (3.92)
Plastered Wall	-0.035** (-2.02)	-0.023** (-2.1)	-0.008 (-0.29)	-0.022 (-0.36)
Water Distance	0.158 *** (4.34)	0.109*** (4.31)	0.164*** (2.09)	0.085*** (2.1)
Constant	0.411*** (2.98)		0.580*** (2.86)	
Sigma (\uparrow)	0.438*** (22.45)		0.872*** (21.9)	

Results of the Tobit Regression for Poverty. *** Denotes Parameters significant at 1% , ** Denotes significant at 5% and * Denotes significant at 10%. Figures in parentheses are robust Z-statistics.

The isolated determinants of poverty in the female-headed household category were age and marital status of the household heads, average years of schooling of adult household members, farm size, ratio of food expenditure to total expenditure, adjusted household size, number of extension visits per month, farming as the only occupation of the household head, amount of non-farm income per month, distance to water and medical facilities, number of income earners in the household and access to remittances

from friends and relations. Other included variables were not statistically significant in influencing the poverty status of the female-headed households in the study areas. Similarly, the marital status of the female-headed households significantly influenced their poverty status negatively with significant marginal value of -0.083 at 5% level. This gave an indication

that marriage reduced the poverty status of the female-headed households in the study area.

Determinants of Poverty Status for All Farming Households Put Together.

Fourteen variables were statistically significant at 1, 5 and 10% and these are: gender of the household head, adjusted household size and amount of non-farm income per month (Table 7). Others are average years of schooling of adult household members, farm size, age of the household head, distance to modern medical facility and potable water supply, child dependency ratio, number of income earners in the

households, ratio of food expenditure to total expenditure, farming as the only occupation of the households, membership of cooperative societies by household head and access to farm land.

Average age of adult household members, ratio of food expenditure to total expenditure, adjusted household size, distance to modern medical facility and potable water supply as well as child and adult dependency ratios affected the poverty status of rural households in the study area positively. The remaining significant variables however affected their poverty status negatively.

Table 7: Maximum Likelihood Estimates (MLE) of Tobit Regression for Poverty

<i>Variables</i>	<i>Coefficients</i>	<i>Marginal Effects</i>
Demographic Variables		
Age of the household heads	0.008**(2.424)	0.002**(2.439)
Gender of the household head	-0.011***(-2.442)	-0.008***(-2.442)
Years of Schooling	-0.077** (3.383)	-0.053**(-3.430)
Child Dependency	0.149** (3.184)	0.1035**(3.170)
Adult Dependency	0.281 (1.515)	0.195 (1.518)
Adjusted Household Size	0.0172*** (6.229)	0.012*** (6.227)
Food Ratio	0.2637*** (4.412)	0.1823*** (4.471)
Marital Status of Female Head:		
Married	-0.043***(-3.022)	-0.022*** (3.411)
Farm Related Variables		
Farm Size	-0.085** (-5.064)	-0.059**(-2.296)
Land Access	-0.035**(-2.066)	-0.024**(-2.057)
Loan Amount ₁₁	-0.1464E-3(-0.448)	-0.102E-3(-0.448)
Occupational Variables		
Remittance access	-0.023 (-0.131)	-0.016(0.131)
Major Occupation	0.014** (2.728)	0.011** (2.728)
Other working members	-0.031** (-2.304)	-0.022** (2.296)
Non-Farm Income	-0.927E-2**(-2.441)	-0.833E-2**
Institutional Variables		
Cooperative	0.08*** (-4.207)	-0.054*** (-4.268)
Extension	-0.019 (-1.857)	-0.013 (-1.858)
Living Condition Variables		
Clinic Distance	0.021*** (5.465)	0.021*** (5.465)
Plastered Wall	-0.0251(-1.773)	-0.173(1.766)
Water Distance	0.1457*** (4.412)	0.1011*** (4.404)
Constant	0.412*** (4.385)	0.286*** (4.442)
Sigma (†)	0.4949***23.613	

Source: Results of Tobit Regression model. ***, **, * Denote significant at 1%, 5% and 10% respectively.

The result revealed that adjusted household size influenced the poverty status of rural households in the study area with a significant coefficient of 0.0172 at 1% level. This conformed to empirical and theoretical expectations that the larger the household size the more the level of consumption *ceteris paribus*. Household size had been found to be a major determinant of poverty. [27, 23] report similar findings. Farming as the only occupation was also a significant factor that affected the poverty status of the rural households in the study area. This is due to low

labour productivity in agriculture compared to other occupations [4]. This results from dependency of agricultural enterprises on natural input like rainfall, soil fertility and sunshine. [15] confirms the fact that households with farming as a major occupation tend to be poor. Gender of the household heads influenced the poverty status of rural households in Kwara State with significant coefficient of 0.011 at 1% level. Gender of the household heads had been reported as a major determinant of household poverty [28]. Where male heads are married with working spouses to help

off-set part of household expenditure, such households are not poor [7]. Where there are no male heads to assist in household expenditure, such households are poor [Kennedy and Haddad]. [26] however reports male-headed households to be poorer than their female-headed counterparts in Nigeria.

Elasticity of Poverty among Rural Farming Households in Kwara State

The responsiveness of the rural farming households' poverty to changes in each of the significant variables affecting it is presented in Table 8. Following Tobit decomposition framework and as suggested by [24], the effect of changes in the regressors (X_i) on the probability and intensity of poverty were calculated.

Table 8: Elasticity Coefficients of Probability and Intensity of Poverty among Rural Farming Households in Kwara State

<i>Variable</i>	<i>Elasticity of Probability of Poverty</i>	<i>Elasticity of Extent of Poverty</i>	<i>Total Elasticity</i>
Total years of schooling	-0.136	-0.198	-0.334
Farm Size	-0.577	-0.867	-1.444
Other worker	-0.072	-0.088	-0.160
Child Dependency	0.325	0.469	0.794
Food Ratio	0.730	1.052	1.782
Adjusted Household Size	0.621	0.893	1.514
Water Distance	0.281	0.386	0.667
Clinic Distance	0.460	0.664	1.124
Non Farm Income	-0.383	-0.580	-0.963
Age	0.657	0.986	1.643

Source: Estimated from the result of Tobit Regression.

Using percentage rather than the unit of measurements, the coefficient for the elasticity of the probability of poverty for the household size was 0.621 that is inelastic (Table 8); this means that a ten per cent increase in adjusted household size would increase the probability of poverty by 6.21 percent. Also the coefficient of the adjusted household size for the poverty extent was 0.8930, which means that the intensity of poverty would increase by 8.930 per cent for a 10% increase in household size. Also the elasticity coefficient for the probability of being poor for the ratio of food expenditure to total expenditure was 0.730 (inelastic); which connotes 7.30 per cent increase in the probability of poverty for a ten per cent increase in food ratio. The coefficient for the extent of poverty for the food ratio was 1.052 (elastic) implying a 10.52 per cent increase in the extent of poverty for a ten per cent increase in food ratio. The analysis further shows that an increase in food ratio increased the poverty extent than its probability. The coefficients of probability of poverty and its intensity for distance to potable water and modern medical facility were also positive and inelastic and therefore follow the same explanation.

However for the negative coefficients such as years of schooling, farm size, non-farm income, number of extension visits, and number of income earners in the households, their coefficients were less

than unity and were therefore inelastic. The probability of and intensity of poverty of the farming households would be reduced by the magnitude of these coefficients for a unit increase in these explanatory variables. Generally for all the significant variables the change in the intensity of poverty was more than for the probability of poverty for a unit change in any of the explanatory variables. Also the response of farming households' size to probability and extent of poverty was third highest after food ratio and age of the household head in the study area. Large household size contributed to poverty in the study area.

Sensitivity Analysis of the Estimated Relative Poverty Line of Rural Farming Households in Kwara State

There is the need to test for the robustness of the estimated Tobit regression parameters to choice of the poverty line used due to subjectivity in the choice and selection of a poverty line. The regression model was again run for six different poverty lines to show the robustness of the regression parameters to changes in these simulated poverty lines. Table 9 shows the variables that were significantly different from zero for each of the poverty lines. The results of the simulation showed that at different poverty lines the male and female-headed households were poor

although with different levels of sensitivity. At eighty-five per cent of poverty line that is 85 per cent of ₦1704.74 which equaled ₦1463.7, fifty-nine per cent of the female-headed households were poor.

Table 9: Sensitivity Analysis of Poverty Line of Rural Farming Households in Kwara State

70%Z	85%Z	115%Z	130%Z	145%Z	Sample
₦1206.1	₦1463.7	₦1722	₦1981,38	₦2239.82	2498.26
Male-Headed : 94(22) 195(45) 251(58) 253(59) 258(60) 258(60) 430					
Female-Headed: 21(26.3) 40(59) 50(63) 50 (63) 50(63) 50 (63) 80					
All Households: 115(23) 235(46) 301(59) 303(59) 309(61) 309(61) 510					

Source: Field Survey, 2007. Figures in parentheses are percentages of households that are poor

Table 10: The Significant Tobit Variables at Simulated Poverty Lines

<i>Demographic Variables</i>	Proportion of poverty line					
	0.7	0.85	1.00	1.15	1.30	1.45
Age	*	**	**	**	***	***
Gender	**	**	***	***	***	***
Average years of Schooling of household	**	**	**	***	***	***
Child Dependency Ratio	*	*	**	**	**	**
Adult Dependency Ratio						
Adjusted Household Size	***	**	***	***	***	***
Food Ratio		**	***	***	***	***
Farm Related Variables						
Farm Size in hectares	**	**	***	***	***	***
Land Access	***	**	**			
Loans Amount in naira per season						
Occupational Variables						
Major Occupation	**	**	**	**	**	**
Other working members		*	**	**	**	**
Non-Farm Income per month	*	*	**	*	*	*
Remittance				*	*	*
Institutional Variables						
Cooperative membership	*	*	***	***	***	***
Number of visits by Extension Agents				*	**	**
Living Condition Variables						
Clinic Distance in Kilometres	*	**	***	***	***	***
Plastered Wall				***	**	**
Water Distance in Kilometres	*	**	***	***	***	***
Constant	**	**	***	***	**	**
Sigma (\uparrow)	*	*	***	***	***	***

*** denotes statistics significant at 1%, ** denotes significance at 5% and * denotes significance at 10%. Obtained from the results of the Tobit Regression

The headcount index reduced to 21 per cent at 70 per cent of the estimated poverty line. It however increased to sixty-three per cent of the farming households population at 145% of the estimated poverty line meaning that a forty-five per cent increase in the estimated relative poverty line rendered sixty-three per cent of the female-headed rural farming households in Kwara State poor. At the

estimated poverty line the headcount index for the male-headed households was 58 per cent of the population. The figure reduced to 45 per cent at 85 per cent of estimated poverty line. At varying percentages of poverty lines the female-headed households were poorer than their male-headed counterparts (Table 9). This confirmed the robustness of the poverty measures used for the study.

Determinants of Poverty at Different Simulated Poverty Lines

At the simulated poverty lines the determinants of poverty for the pooled data were identified. The various significant variables affecting the poverty status of rural households in the state are shown in Table 10. Child dependency ratio, average years of schooling of adult household members, ratio of food expenditure to total expenditure, non-farm income per month, farm size, access to farm land, adjusted household size, gender of the household heads, number of extension visits per month, membership of cooperative societies by household heads, major occupation of the household heads, number of income earners in the households, distance to potable water and modern medical facilities as well as whether the dwelling place of the households was plastered or not determined the welfare status of rural farming households in Kwara State at almost all the simulated poverty lines.

The results seem to be robust to the choice of the poverty line specified; nonetheless the independent variables were sensitive to the choice of the poverty line. The coefficients of some of the regressors were however not statistically different from zero at some of the simulated poverty lines.

4. Conclusion

The study confirms earlier notion that poverty exists in the rural areas of Nigeria and that it impacts male and female-headed households differently. The female headed-households were particularly more disadvantaged using money-metric and capability measures. This is due to poor access to education and productive resources that could improve their well being. Access to extension services and remittances from friends and relations played a part in poverty reduction for the female-headed households. The impact however was not strong enough to bring them at parity with their male-headed counterparts. Large household size resulting from polygamy affects the male-headed households' poverty status positively; this and heterogeneous household nature in the study area put a high pressure on the households' well being. Poverty reduction strategies in the study area should therefore be multi-pronged. Equal access to productive resources will bring the female-headed households at par with their male-headed counterparts. Focus of the stakeholders should also be on the common causes of poverty for the two categories of households such as level of education

and household size. Adult literacy classes and primary health care centres can be provided by government for improved level of education and manageable household size through family planning. This will ensure meaningful poverty reduction in the study area. Poverty is a multidimensional phenomenon that requires a multi-pronged approach in its measurement and analysis, attempt was made by this study to look at various dimensions to poverty but a cohesive Multidimensional Poverty Index (MPI) introduced in the 2010 Human Development Report, [2] was not employed, this could be an area for further research.

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