Analysis of Food Security and Poverty Status amongst Farming Households in Abia State, Nigeria

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A R T I C L E I N F O	ABSTRACT
Key Words Food Security, Poverty, Welfare, Livelihood, Farming Households	This study analysed the food security and poverty status amongst farming households in Abia State, Nigeria. A multi-stage sampling procedure was employed to select 120 respondents used for the study. Data were collected through the aid of a structured questionnaire and interview schedule. The analytical technique used was descriptive statistics and logit regression model. The findings showed that 46.67% of the respondents were married while 30.83%, 11.67% and 10.83% were single, widowed and divorced respectively. 87.11% of the respondents were between the ages of 26-40 years, implying that the majority of the respondents were still at their active productive age. 62% of the farm households were poor while 30% were food secure. Age of household head,(0.092) household size(0.002), farm income(0.002), access to credit(0.004), property ownership(0.490 and annual farm income(0.164) were significant determinants of food security, while, farm size(-6.935), level of education(-2.233), off farm income(-4.040), household size(4.001), farming experience(-6.935), credit use(-2.725), sex(-2.412) and age of household head(-1.7011) were significant determinants of poverty. The study calls on government and non-governmental organizations to recognize the existing poverty alleviation strategies being utilized by farming households, improve on farmers' initiatives by setting up community development associations and village development committees. These developments will help the farming household in their efforts to come out of poverty cycle.

Introduction

Poverty is a great enemy to human happiness, it certainly destroys liberty and makes some virtues impracticable and others extremely difficult (Samuel, 2015). Absolute poverty is a condition of life so limited by illiteracy, malnutrition, disease, high infant mortality and low life expectancy as to prevent realization of the very potentials of human genes with which one is born. It is life at the margin of existence (Robert, 2015). Poverty is present when basic capability failure arises because a person has inadequate command over resources, whether through market or non-market sources (Sen, 2004). Poverty is more easily recognized than defined (Foster *et al,* 2010). Therefore a universally accepted definition of the term poverty has remained elusive (Nsikak-abasi and Solomon, 2010). However, poverty can be regarded as the inability to adequately meet the basic human necessities such as food, shelter, clothing and Medicare (I B R & D, 2010).

Food security exists when all people at all times have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2002). To achieve food security, food should be available, accessible and properly utilized at all times. Availability relates to the supply of food through production, distribution and exchange while food access refers to the affordability of and allocation of food as well as the preferences of individuals and households (FAO, 2010). Even when people are able to obtain food, it must be properly utilized- that is must be able to satisfy their dietary needs and preferences. The term utilized means the use of food for the body's nutrition.

Research Methods

The study was conducted in Abia State, Nigeria. Abia State is situated within the south eastern

Nigeria and lies between longitude 04^0 45' and 06^0 07' north and latitude 07^0 00' and 08^0 10' east. Abia State is bounded is bounded by Imo state at the western border; Ebonyi and Enugu states at the North; Cross River and Akwa Ibom State at the east and Rivers State at the south. Its population as at 2006 stood at 2,833,999 per 5243.7sqkm allocated by the national population commission (NPC, 2006). Abia State is divided into administrative blocks called Local Government Areas which is grouped into three (3) agricultural zones namely Ohafia, Umuahia, Aba, zones. About 70% Abians are mainly farmers and have the potentials for the production of crops (both arable and permanent) and Animals (ABSG, 1992) this is supported by the rich soil in most parts of the state.

The population of the study comprise of all farming households in Abia State. However a multi-stage random technique was used to select the sample size of 120 respondents. Three (3) Local Government Areas (Ikwuano, Isialangwa south and Bende) were randomly selected from the three geographical zones. Three villages were randomly selected from each local government area and 10 farming households were selected randomly. This gives the total sample size of 120 farming households

Data collection and Analytical Technique

Data was collected from the 120 respondents with the aid of a structured questionnaire. The data collected include socio- economic characteristics which include information on household head (gender, age, and marital status), household size, savings pattern and specific poverty indices such as household income and expenditure.

The analytical techniques or tools used in the analysis of this work include descriptive statistics, and Logit regression model.

The FGT index (Foster Greer Thobecke) was used to determine the poverty status of households and was represented using descriptive statistics (Tables). It is computed with the mathematical formula stated below:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{Z - y}{Z} \right]^\alpha$$

(1)

Where; Z = poverty line

Poverty line = $\frac{1/2(\sum HI)}{n}$ (following Obike *et al.,* 2007)

$\sum HI$ =summation of household income, n = total Sample, H = the number of poor, Y = average household monthly per capita expenditure, α = poverty index which takes value of 0, 1 and 2

1. When α = 0, the poverty index (PID) becomes Head Count Ratio or Poverty Incidence Index (HCR or PII) i.e. the proportion of people below the poverty line. It is used to determine the number of households having *per capita* income below the poverty line. It is stated as: Po = H/n. where H is the head count. The PII (P0) gives the prevalence of poverty at a point in time.

2. When α = 1, PID becomes the Poverty Gap Index (PGI) i.e. the aggregate short fall in income of the household from the poverty line. It measures the difference between actual income and minimum non-poverty income. The proportion of the poverty line (value) that the average poor require to meet the poverty line; the lower the value, the lower the poverty gap. The PGI (P1) gives the depth of poverty at a point in time.

Food security status was estimated using the index by Omonona, Oni, and Akpan, (2007).

Food index formula is given as;

$$F_i = \frac{\text{per capital food expenditure for the ith household}}{2/3 \text{ means per capital food expenditure of all household}}$$

(2)

Where F_i = food security index; When $F_i \geq 1$ = food secure i^{th} household; $F_i \leq 1$ = food insecure i^{th} household.

Logit regression model was used to analyze the determinants of food security.

$$Y_1 = f(x_{ij}, \mu_i)$$ (3)

Where

$Y_i = ln$=f1/1-f1, P1 – households food security status (I if poor, 0 if non-poor); Xij = vector of socio-economic variables of household; µi = random error term

Explicitly,

Y = ß0 +ß$_1$X$_1$ + ß$_2$X$_2$ +………… ß$_{ii}$X$_{ii}$ + µ

X$_1$ = Marital status; X$_2$ =Age of household head; X$_3$ =household size; X$_4$= farming experience

X_5= farm income; X_6=credit amount; X_7= farm size; X_8= property ownership; X_9= extension contact; X_{10}= nearness to market; X_{11}= use of improved technology; X_{12}= off farm income; X_{13}= gender and μ = stochastic error term.

The logit regression model was also used to assess the determinants of farm household poverty. It is expressed as :

$$Y1= f(Xij, \mu i) \qquad (4)$$

Where; $Yi = ln = p1/1-p1$

P1 – households poverty status (I if poor, 0 if non-poor), and Xij = vector of socio-economic variables of household, μi = random error term;

Explicitly, $Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta5X5 + \beta6X6 + \beta7X7 + \beta8X8 + \beta9X9 + \beta10X10 + \mu$

Where, $Y = Y_1$ – as defined previously ; X_1 = Gender of household head (1 – male, 0- female)
X_2= Age of household head (years) , X_3 = Marital status of household head (1- married, 0- otherwise), X_4 = Educational qualification of household head (years spent in school), X_5 = Farming experience (Years) ; X_6 = Off –farm activities (1- Yes, 0- otherwise) , X_7=Farm size (ha) ; X_8 = Household size (persons) ; X_9 = Credit use; X_{10} = Membership of organization, ln = natural log and μ = stochastic error term.

RESULTS AND DISCUSSION

Socio-economic characteristics of farm households

Results of the socioeconomic attributes of the farmers are presented in Table 1. From the results obtained, about 46.67% of the respondents were married while 30.83%, 11.67% and 10.83% were single, widowed and divorced respectively. This result is in accordance with Gordon and Craig, (2001) who noted that rural household was dominated by married couples. The married are able to take joint decision affecting the farm and the farm households' food security more efficiently. This also increases the ability of the households to supply the needed labour in the farm that would guarantee adequate food availability to curb poverty and food insecurity. Marriage also depicts responsibility among the married couples.

It is shown that 30.7% of the respondents were within the age of 26 – 30 years whereas 38.2%, 19.2% , 7.5% and 0.8% of them were within the

age range of 31-35 years, 36-40 years, 41 – 45% years and 46 - 50 years respectively. This indicate that the respondents were still young, active and in their productive age. Within this age range (26-30 and 31 -35), the respondents are expected to be very active on the farm and more responsive to agricultural extension programmes. This could also lead to a boost in agricultural activities as Anyanwu *et al.* (2001) recognized that young people are more likely to be energetic and have the capacity to use innovation. The younger the farmer is, the higher the zeal and will to diversify into more lucrative farming activities that will assist in running away from poverty and guarantee food security. The age distribution of the rural household is important in two different aspects; the first is increased in productivity and the second is in the ability to diversify into different farm and off-farm activities (Smith, 2000) which have effect on food security and poverty reduction.

An estimated 68.5% of them had household sizes of between 1-5 members, while 33.3% and 0.8% of them had between 6-10; and above 11-15 persons respectively. According to Olayemi (1998) and Ali (1994), the urban and rural poor do spend a high proportion of their income on social services and only a little could be left for the purchase of food, or investment in production. The consequence is more serious when the income is 'low' and family size is 'high'as portrayed by this study.

Being literate enables the rural household farmers to obtain useful information from magazines, radio and other veritable sources. A fair proportion of the farmers (50%) had no form of education while 25%, 16.7% and 8.3% of the respondents had primary, secondary and tertiary education respectively. This implies that the study area was fairly dominated by farmers who are n o t educated. This situation has serious consequences on the level of agricultural production and hence food security at household level. Bzugu *et al.* (2005) and Idrisa *et al.* (2007) had earlier recognized that low level of formal education among farmers make the introduction of improved agricultural technologies by extension agents difficult.

It was found that 55%, 28% and 17% of the peasant farm households generated an annual income of below N500, 000, between 500,000-N1, 000, 000 and above N1,000,000 respectively.

Table 1. Frequency Distribution Table of Socioeconomic attributes of the farmers

Characteristics		Frequency	Percentage (%)
Marital Status			
Single		37	30.83
Married		56	46.67
Widowed		13	11.67
Divorced		14	10.83
Total		**120**	**100**
Age			
26 – 30		37	30.7
31 – 35		51	38.2
36 – 40		22	19.2
41 – 45		9	7.5
46 – 50		1	0.8
Total		**120**	**100**
Household size			
	01-May	79	65.8
	06-Oct	40	33.3
	Nov-15	1	0.8
Total		**120**	**100**
Educational Status			
No formal education		60	50
Primary		30	25
Secondary		20	16.7
Annual Household farm Income			
Less than 500,000		66	55
500,000 – 1,000,000		33	28
Greater than 1,000,000		20	17
Total		**120**	**120**
Annual Non Farm Income			
Below N500,000		26	35
N500,000 – N1,000,000		68	55
Above N1,000,000		16	10
Total		**120**	**100**

The result further showed a mean an annual income of N680, 000, implying that the farmers there were basically low income farmers; thus peasant farmers. This confirms that most of the respondents are poor and in line with Ellis, (2000) who observed that most developing countries have high poverty level given their income status

The farmers had non-farm income of below N500, 000 while 55% and 10% had monthly non-farm income of N500, 000 – N1, 000, 000 and above N1, 000, 000 respectively. This finding also shows that greater percentage (55%) of the farmers belonged to the middle income grouped unlike that of farm income where greater percentage of them belonged to the low income group. This result further suggests that non-farm income is still low on average and still could not guarantee food security.

Table 2: Food Security Status of farming households

Poverty status	Frequency	Percentage
Food secured	40	30
Food insecure	80	70
Total	*120*	*100.0*

Source: Field survey, 2016.

Poverty profiles of farm household in Abia State, Nigeria

The indices of poverty are reported in Table 3. The results showed that the incidence of poverty, also known as the head count ratio, for the farm household was 0.62. This implies that 62.0% of farm households in the study area was poor. This is because their incomes fell short of the mean household expenditure used as the poverty line (₦26, 728.00 on average for the households). This allows for the assessment of the depth of poverty among the farm households (Ezeh, 2007).

Table3: The poverty profiles of farm household in Abia State, Nigeria

Poverty indicators	Farm Household
Poverty line	26,728.00
Poverty incidence (%)	0.62
Poverty gap (%)	0.47

Table 4: Determinants of farm households' food security

Variables	B	SE.	Wald	Sig.	Exp (B)
Marital status	-.355	1.274	.077	.781	.702
Age	-.127	.075	2.844	.092[*]	.881
Household size	-2.158	.855	6.969	.002***	.116
Farming experience	-3.132	2.253	1.933	.164	.044
Farm income	4.022	2.421	2.759	.097*	55.78
credit amount	6.424	2.437	6.949	.004***	.022
Farm size	2.227	1.130	3.885	.049**	9.268
Property ownership	2.396	1.644	4.123	.045**	10.976
Extension contact	-.419	.370	1.285	.257**	1.521
Nearness to market	.371	1.371	.073	.787	1.449
Use of improved technology	.000	1.749	.000	1.000	1.12
Off farm income	.001	.000	4.260	.039**	1.01
Gender	12.248	.004	.000	1.000	0.199
Use of improved technology	.000	1.749	.000	1.000	1.12
Off farm income	.001	.000	4.260	.039**	1.01
Gender	12.248	.004	.000	1.000	0.199
Log-likelihood ratio test	115.909				
Pearson Chi-square	91.684				
Cox and Snell R^2	0.63				
Nsegel kerke R^2	87.9				
H-L model significant test result	8.1				
Correctly predicted overall sample (%)	93.43				
Correctly predicted food secure (%)	87.44				
Correctly predicted food insecure (%)	96				

Source: *Field survey*, 2016 based on analysis with The E-views 8.0 .

The result revealed that the poverty gap index was 0.47. This showed that poverty was very much endemic among the farm households in the study area and required deliberate measures to emancipate them from poverty. This means that they require at least 48.0% of the poverty line to get out of poverty Nwankwo (2004). Osondu *et al.* (2014) also obtained similar result.

Factors determining farm households food insecurity in Abia State

Results of analysis on factors affecting household insecurity in the study are presented in Table 4.

The model results showed that the binary logit model correctly predicted 93.4% of the food security status of households. The model chi- square value with 91.684 shows that inclusion of the explanatory variables contributed to improvement of the full model. The Cox and Snell and Nagel kerke pseudo R-square values were 0.632 and0.8744, respectively. The Hosmer-Leme (H-L) show test result reported chi- square value of 8.1 with p-value of 0.904 which is greater than 0.10 and 0.05 levels showing that there is no difference between the observed and the predicted values and hence estimates of the model fit the data very well in an acceptable level. As a result, out of the hypothesized variables which were included in the binary logit model,7 variables showed statistically significant relationship with household food security. These are age of household head, household size, farm income, access to credit property ownership and annual off farm income.

The age of a household head negatively and significantly affected food security of households at 10% probability level showing an inverse relationship with household food security. This means for every unit increase in farmer's age, the odd ratio is in favor of household's food insecurity by a factor of 0.881, keeping other variables constant. The finding was consonant with Basher (2012) who demonstrated that age of household head has negative relation with household food security status. The policy implication is that young aged household heads are more likely to be innovative and are engaged in multidimensional livelihood strategies. In doing so, they relatively have better food security status than old aged household heads.

The coefficient of household size is negative and in significant relationship with household food security at1%probability level. This means that the larger the household size in adult equivalent the more likely they are to be food insecure. Keeping other variables constant, a unit increase in household size in adult equivalent reduces the odds of household food security by a factor of 0.116. Consequently, a unit decreases in the household size in adult equivalent increases the odds ratio of a household food security by11.6%. Importantly, household size in adult equivalent increases the number of consumers putting pressure on household resources; particularly food and household with high dependency ratio are prone to food insecurity.

Also the coefficient of farm income is positively signed and significant at 10% alpha level implying that as household farm income increases, the old ratio of becoming food insecure decreases and vice versa provided that all other factors remain constant. The sign of the coefficient of access to credit showed a positive relationship with food security and is significant at 1% probability level. The positive relationship implies that households with access to credit service have more chance to be food secure than households without access to credit. The result is fully inconformity with the prior expectation. This is due to the fact that credit gives the household an opportunity to be involved in income generating activities so that derived revenue increases and purchasing power of the household to escape from risk of food insecurity advances. Moreover, it helps to smooth consumption when household face with temporary food problem. Holding other variables constant, the odds ratio in favor of food security increases by a factor of 0.022 as household's access to credit increases by one unit. The findings coincide with similar study conducted by Yeshark (2014).

The coefficient of access to extension services is statistically significant at 5% significant level and has a negative relationship with food security status of a household. This implies that households with access to extension services tended to be food insecure than those that did not have such access and vice versa. In principle, extension services are meant to enhance the chances of a household having access to better crop production techniques, improved inputs, and production incentives that positively affect farm productivity and production. However, leaving height business aside, extension agents are engaged in collecting fertilizer and improved seed credit. As a result, it was easily

observed that high level of technical inefficiency among small holder farmers highly attributable to low availability of extension services and information about technical aspects of crop technologies. Other variables remain constant, the odds ratio in favour of being food secure decrease by a factor of 1.521 as access of households to extension service within a year increases by one unit. The result is therefore in contradiction to the hypothesized positive role extension service would play in the reducing food insecurity at household level.

The coefficient of farm size has positive sign and statistically significant at the 5% probability level, meaning that farm size exhibits a positive relationship with the food security status of a household. The implication is that the probabilities of being food secure increases with farm size. That is, households with larger farm sizes tend to be more food secure than those with smaller sizes, and vice versa. This is possibly because that the size of landholding is a proxy for a host of factors including wealth, access to credit, capacity to beer risk and income .Larger farms are associated with greater wealth and income and increased availability of capital, which increase the probability of investment in purchase of farm inputs that increase food production and ensuring food security. One could observe that greater efficiencies in the use of farm resources are associated with the large farms than the smallholding farms. They pointed out that the smallness of holdings determines the use of modern inputs due to lack of purchasing power in the hands of small farmers. The odds ratio for the variable implies that, holding other variables constant, as increasing one hectares of cultivated land increases food security status of the households by a factor of 9.268.

The total off farm annual income was hypothesized to have positive influence on food security. In agreement with the hypothesis, its coefficient came out to be positive and significant at 5% probability level .The probable explanation is that those farmers who have better access to different types of income sources are less likely to become food insecurity. Keeping other variables constant, the odds ratio in favor of food secure increases by a factor of 1.01 for a unit increases in household total annual income.

Factors determining the poverty status of farm households in Abia State

Table 9 presents the results of logit regression on the determinants of farm household's poverty status amongst farm households in Abia State.

Table 5: Maximum likelihood estimates of logistic model for factors determining the poverty status of farm households in Abia State

Variables	Coefficients	Std Error	t-ratio	Marginal Effect
Constant	6.019	0.680	-6.935	-0.0753
Farm size	-0.683***	0.033	-2.668	-0.0348
Education level	-1.903***	0.141	-2.233	-0.0242
Farming experience	-0.582**	0.012	-6.935	-0.0753
Age	0.065*	0.051	-1.7011	-0.0172
Gender	-1.163**	0.103	-2.412	-0.0141
Off farm income	-0.031***	0.018	-4.040	0.0427
Household size	0.722***	0.053	4.001	0.0121
Membership of organization	-0.155	0.400	-0.423	-0.0221
Credit use	-0.154**	0.021	-2.725	-0.0459
Log-likelihood	-225.138			
Likelihood ratio df(12)	53.221***			
Pseudo R^2	05286			

Source: Field Survey, 2017.

This method was adopted in line with other studies by Okurut et al.(2002), Alemayehu et al.(2005),Anyanwu(2010)and Masood and Nasirlqbal (2010).The estimated coefficients for the likelihood ratio chi-square was significant (1% alpha level) for the State with chi-square value of 53.22. The model accounted for 53% of the variation in poverty status of the farm households in Abia state.

The result of the logit regression indicates that farm size (1% alpha level),level of education (1% significant level), off-farm income (1% significant level), household size (1% alpha level),farming experience (5% significant level), household size (5% significant level),credit use (5% significant level), Sex (5% significant level) and age of household heads (1% significant level) significantly influence the probability that heads exert positive effect on whether a household will be poor or non-poor. However, while household size and age of household variables exerts negative effect which conforms to apri or expectation.

The results obtained from the State further revealed that the likelihood event of being poor were more with large households. Evidence from other studies point the same direction between poverty and house hold size (Okurut e tal.(2002), Gang et al.(2002), Bokosi(2006), Anyanwu(2010) and Masood and Nasirlqbal(2010). The larger the household size the poorer the household is likely to be because more of the household members will likely be children who are unproductive and yet take a big proportion of household income in terms of school fees, medical bills, food and clothing. Therefore, a unit increases in the size of the farm household increases the probability of the farm households being poor by 1.21%.

Education is vital for boosting the productivity of the human factor and making people more aware of opportunities for earning a living or income generation from non-farm sources. In this wise, farm households sampled in the State with educated heads were found to be less likely to be poor when compared with those that are not educated. Bastos et al.(2009) further corroborated that labor is by far the most important asset of the poor and increasing their education will in turn increase labor productivity and wages which ultimately will reduce their poverty. Further evidence was given by Grootaert(1997), to confirm that there is a link between educational attainment, the income earning potential of the household and poverty. He pointed out that there is a minimum level of education necessary to enhance appreciation and adoption of new technologies that can be instrumental in increasing household productivity, and thereby earn more income. The increased income will enable the households to move out of poverty. Therefore, a unit increase in the level of education of farm household heads increases the probability of the households to escape poverty or being non-poor by 2.4%. Access to credit by farm households has significant negative relation with poverty status and this will aid the households to escape from poverty. This is in line with the general belief that credit is an anti-poverty strategy because of the important role it plays among rural populace (Adeyeye, 2001).Credit assists the farm households in the purchase of farm inputs such as fertilizer, herbicides, improved seeds and investment demand which will ultimately increase their productivity. Therefore, a unit increase in credit access by farm household in Abia State will increase the probability of the households being non-poor by 4.59%.

The age of the household heads sampled was also found to be positively correlated to the poverty status indicating that as the household heads get older, the likelihood of being poor also increases. This position is consistent with those of Gang et al.(2002), Datt and Jolliffe(1999), and Rodriguez (2002) that poverty increases with old age as the productivity of the individual decreases. The number of adult members in the households also has strong negative relation with poverty status. This showed that the number of male and female adults involved in income generation activities in a household can because to escape from poverty. Hence, the household characteristics and composition play an important role to determine the poverty status of a household. The more the number of educated farm households, the more the opportunity to generate more income which will be available for consumption and the more the likelihood to escape from poverty. The marginal effect is 2.8% in Abia state. Other significant variables having negative impact are farm size, farming experience and farm income.

Conclusion
It could be concluded from this project report that majority of farm households in the study are poor and also food insecure. Ultimately, the main reason why most people are unable to feed themselves is not that food is unavailable but that they cannot afford it. We found that socioeconomic attributes of the farmers largely contributed to their poverty status and fod insecurity status. Specifically it was found that farm size, level of education, off-farm income, household size, farming experience, credit use and age of household heads significantly influenced the probability of a household being poor or non-poor. Meanwhile household size and age of household variables exerted negative effects on poverty which conforms to apriori expectation. It is therefore recommended that government of Abia State and Nigeria plus other stakeholders in economic development should focus on interventions that will reduce both poverty and hunger. In particular efforts should be made to reduce gender disparity in income levels of farmers; while youth employment and income generating programmes should be launched and sincerely implemented to reduce the poverty level of farm households in the state.

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