



Determinants of Poverty among Groundnut Farming Households in Jigawa State, Nigeria

Duniya KP^{1*} and Rekwot GZ¹

¹Department of Agricultural Economics and Rural Sociology, Institute for Agricultural Research, Ahmadu Bello University, Zaria, Nigeria.

Authors' contributions

This work was carried out in collaboration between all authors. Author DKP designed the study wrote the protocol and supervised the work. Author RGZ carried out all the field work, performed the statistical analysis and wrote the first draft of the manuscript. Author DKP managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This research was undertaken to investigate the determinants of poverty among groundnut farming households in Jigawa State. Primary data were obtained through the use of well-structured questionnaire from a sample size of 227 groundnut farming households. The data were analyzed using Foster-Greer-Thorbecke's (FGT) Weighted Poverty Index and Tobit regression model. The results of the (FGT) Weighted Poverty Index showed that the poverty headcount, poverty gap and poverty severity of poor groundnut farming households were 42%, 46% and 77% respectively using an estimated poverty line of 46,320.53. The factors that significantly influenced the poverty intensity of groundnut farming households in the study area were found to be age of household head which was negative and significant at 10%, marital status of household head was negative and significant at 1%, education was negative and significant at 5% and membership of cooperative was negative and significant at 5%. These factors significantly decreased poverty which was in line with *apriori* expectations while that of farming experience and extension contact were positive and significant at 1% and 5% respectively. Government should improve in the educational opportunities of the farmers which will lead to increased income, there is also need for regular sensitization and increased mobilization of groundnut farming households to join farmers' cooperative group especially for those who do not belong to any group.

*Corresponding author: E-mail: kalatduniya@yahoo.com;

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1. INTRODUCTION

Poverty is becoming an increasing issue of concern to the world's human population. According to [1], the population of the poor in the world was about 1 billion in 1994, 1.3 billion in 1995, 1.74 billion in 1997, 2.04 billion in 2000, and 2.56 billion in 2002. This has continued to increase despite all developmental effort put in place by both the government and Non-Government Organizations (NGOs) to eradicate poverty [2]. The rising profile of poverty in Nigeria is assuming a worrisome dimension as Nigeria has at least half of its population living in abject poverty [3]. The scourge of poverty in Nigeria is an incontrovertible fact, which results in hunger, ignorance, malnutrition, disease, unemployment, poor access to credit facilities, and low life expectancy as well as a general level of human hopelessness [4].

Nigeria is richly endowed and the country's wealth potentials manifest in the forms of natural, geographical and socio-economic factors [5]. With this condition, Nigeria should rank among the richest countries of the world that should have no business with extreme poverty. On the contrary, the population of the country in poverty is given as 68.7 million as of 2004 [6]. Nigeria is one of the most resource-endowed nations in the world, but socio-economically, Nigerians are also among the poorest in the world [7]. Hence, there is a persisting paradox of a rich country inhabited by poor people, which has been the subject of great concern for many years, but more especially in the last decade [8].

The choice of groundnut farmers for this study lies in the fact that Nigeria is the largest groundnut producing country in West Africa accounting for 51% of the production in the region, the country produces 10% and 39% of the World and Africa's total production respectively. Prior to 1980s, groundnut production declined significantly due to rosette incidence and drought [9]. However, since 1984, production has been increasing at a growth rate estimated to 8% resulting both from area expansion (6%) and increased productivity of 2% [10]. Despite the existing empirical information on poverty in Nigeria, there still exists a gap documented on policy related to determinants of poverty among farmers with respect to groundnut farming households in Jigawa state. This makes it difficult to effectively set and implement

sustainable anti-poverty policies among groundnut farming households. Hence, the study focused on the following objectives: to determine the poverty status of groundnut farming households; and to estimate the factors that influence the poverty intensity of groundnut farming households in the study area.

2. MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Jigawa State, Nigeria (between latitude 11°N and 13°E and longitudes 8°N and 10°35'E). Major economic activity of the people in the area is farming, as about 80% of the population is engaged in farming.

2.2 Sampling

Multi-stage sampling technique was employed in selecting the groundnut farming households for this study. The first stage was a purposive selection of four Local Government Areas from the study area (one Local Government from each of the four ADP zones in the state) on the basis of being the prominent groundnut producing areas of the state. Secondly, eight villages were purposively selected (two villages from each of the four selected local government areas) on the basis of their high intensity of groundnut production activities. Thirdly, simple random sampling was employed in selecting 227 groundnut farming households for enumeration.

2.3 Data Collection

Primary data were obtained through the use of well-structured questionnaire administered to household heads. The data collected were on socio-economic characteristics such as age, farming experience, farm size, farm income, access to credit, number of extension contacts, membership of cooperation, level of education of household heads and the household size as well as data on household expenditure (food and non-food expenditure) for estimating the poverty status of the households.

2.4 Data Analysis

The data were analysed using the Foster-Greer-Thorbecke's (FGT) Weighted Poverty Index and the Tobit regression model.

2.5 The Foster, Greer and Thorbecke (FGT) Model Specification

The Foster, Greer and Thorbecke (FGT) measures of poverty [11] as used by [12,13,14,15] was used to determine the poverty status of the farmers. Poverty head count index, poverty gap index and squared poverty gap index will be computed to measure the incidence, depth and severity of poverty of the farming households. The General Foster, Greer and Thorbecke (FGT) poverty index (P_{ai}) can be expressed as:

$$P_{ai} = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y_i}{z} \right)^\alpha \dots\dots\dots(1)$$

When $\alpha=0$, that is, poverty incidence or head count, then

$$P_0 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y_i}{z} \right)^0 = \frac{q}{n} \dots\dots\dots(2)$$

When $\alpha=1$, that is, poverty gap or depth, then

$$P_1 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y_i}{z} \right)^1 \dots\dots\dots(3)$$

When $\alpha=2$, that is, poverty severity, then

$$P_2 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y_i}{z} \right)^2 \dots\dots\dots(4)$$

Where:

- n = number of households in a group
- q = the number of poor households
- Z = poverty line = 2/3 of Mean Per Capita Household Expenditure (MPCHE) of the groundnut farming households)
- y = the per capita expenditure (PCE) of the i^{th} household,
- α = degree of poverty aversion (0, 1 and 2)

2.6 The Tobit Regression Model

Tobit regression model as used by [16,17] and [18] among others was used to achieve objective 2 of the study. The model is expressed as:

$$Y_i^* = \alpha + X_i\beta + e_i \dots\dots\dots(5)$$

$$Y_i = 0, \text{ if } Y_i^* \leq 0 \dots\dots\dots(6)$$

$$Y_i = Y_i^* \text{ if } Y_i^* > 0 \dots\dots\dots(7)$$

$$i = 1, 2, 3 \dots \dots n$$

Y_i^* is the limited dependent variable. It is discrete, when the households are not poor and continuous, when they are poor,

- X_i = vector of explanatory variable,
- β = vector of unknown coefficients,
- Z = poverty line,
- I = mean household food expenditure per adult equivalent,
- e_i = independently distributed error term.

The independent variables specified as determinants of poverty are defined thus:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \beta_{10} X_{10i} + e_i \dots\dots\dots(8)$$

Where,

- X_1 = Age of household head (years)
- X_2 = Marital status (married =1, single =0)
- X_3 = Farming experience (years)
- X_4 = Education (years of formal schooling)
- X_5 = Household size (number)
- X_6 = Farm size (hectares)
- X_7 = Amount of credit obtained (naira)
- X_8 = Membership of cooperative (years)
- X_9 = Farm income (Naira)
- X_{10} = Extension contact (number of contacts within the production season)
- e_i = Stochastic error term

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics of Variables

Descriptions of the variables employed in the model with their summary statistics are given in Table 1. The values of the standard deviations show how far or close the variations are from/to the mean. These values however are lower than the mean values. These imply that the variations with respect to each of the variable are close to the means. This is because the lower the standard deviation, the closer are the distributions to the mean.

3.2 Poverty Profile of Farming Households

The result of the poverty profile of groundnut farming households is presented in Table 2.

From the estimates of the FGT weighted class of poverty indices, the proportion of poor groundnut farming households was found to be 42% using an estimated poverty line of ₦46, 320.53 The poverty head count (poverty incidence) of groundnut farming households was 0.42. The depth of poverty (poverty gap index) of poor groundnut farming households was found to be 0.46, while the degree of inequality (poverty severity) among the poor farming households was 0.77.

3.3 Determinants of Household Poverty Status

The maximum likelihood estimates (MLE) of the Tobit regression results of factors influencing household poverty status among farming households is presented in Table 3. The result revealed a sigma (σ) value of 1.001, with a t-value of 10.661. This was statistically significant at the $P < 0.01$ level, thus indicating that the model had a good fit to the data. Furthermore, the value of the intercept was 0.991, meaning that the autonomous poverty intensity was 0.991 in the study area. 6 out of the 10 explanatory variables related to groundnut farming households included in the model were statistically significant at different levels ($P < 0.01$, $P < 0.05$ and $P < 0.1$).

Age of household heads was found to be negative and significant at 10% probability level with an odd ratio of 0.936 which indicates that a unit increase in age of household heads will decrease the intensity of poverty of groundnut farming households by a factor of 0.936. This implies that older household heads have a lower poverty intensity than the younger household heads. This is because the older the farmers the more experience they are which enhances their productivity, hence reducing their poverty status. This result is contrary to the findings of [17] which revealed a positive and significant relationship of farmers' age with peri-urban farming in Nigeria.

Farming experience was significant and positive in influencing the poverty status of groundnut farming households at 1% probability level. The coefficient of farming experience is 0.033, implying that poverty intensity of household will be increased by 0.033 as farming experience increases by one unit. This is attributable to the fact that as farming experience increases, the age of the household head also increases. This however, leads to a reduction in the farming operations with subsequent reduction in farming income and welfare. Findings are synonymous with [7,19].

Table 1. Description and Summary Statistics of Variables Employed

Variables	Measurement	Mean	SD	Min	Max
Age of farmer	Number of years	37.4	7.22	20	80
Marital status	Married =1, Single =0	1.00	0.00	0	1
Farming experience	Number of years	15.08	11.64	2	50
Formal education	Number of years	7.27	1.17	0	25
Household size	Number of persons	9.72	3.82	1	22
Farm size	Hectare	0.76	0.35	0.5	50
Credit obtained	Amount in naira	32325.00	15242.30	0	100000
Cooperative membership	Number of years	2.76	1.13	0	5
Household Income	Annual income in naira	56300.00	31167.26	25000	120000
Extension contact	Number of contacts	4.14	0.35	0	7

SD =Standard Deviation, Min=Minimum, Max=Maximum

Table 2. Poverty profile of groundnut farming households

Items	Households
Poverty line(₦)	46320.53
Poverty headcount	0.42
Poverty gap	0.46
Poverty severity	0.77
Poor (%)	42.00
Non-poor (%)	58.00
Number of observation	227.00

Table 3. Tobit regression estimates of the factors influencing household poverty Status

Variable	Coefficient	t- value
Constant	0.991***	2.524
Age of household head	-0.017*	-1.670
Marital status	-0.936***	-2.942
Farming experience	0.033***	3.230
Formal education	-0.033***	-2.179
Household size	-0.002	-0.087
Farm size	0.011	0.760
Amount of credit obtained	0.107E-04	1.146
Membership of cooperative society	-0.423**	-2.496
Household Income	0.142E-06	0.665
Extension contact	0.032**	2.164
Log likelihood	-188.4006	
Sigma	1.0011	

***P<0.01 **P<0.05 *P<0.10

Education was significant and negative in influencing the poverty intensity of groundnut farming households at 5% probability level. The coefficient of years of formal education is -0.033, this means that the poverty severity is decreased by 0.033 for individuals in families whose household heads have formal education. This may be attributed to the fact that highly educated household heads have the ability to adopt improved farming practices faster than the non-educated ones. This increases the productivity and incomes of the educated household heads with subsequent improvement in welfare amongst them. Similar findings were reported by [8,20].

Membership of cooperative was negative and significant at 5% .The coefficient of household membership of farmer association is -0.423. This means that household membership of farmer association would reduce poverty intensity by-0.423. This implies that the intensity of poverty was lower in a household whose head was a member of a cooperative society or any other farmers' association than in one whose head did not belong to such an organization. This might be as a result of various benefits accruable to members of cooperative societies, such as credit facilities, access to improved production inputs and access to information that could enhance their productive capacity. Similar findings were reported by [15,19].

Extension contact was found to be positive and significant at 5%. The coefficient of extension contact is 0.032. This means that the MHPCE is increased by 0.032 as extension contact increases by one unit. A plausible explanation for this is that the method of delivery of extension

service to farmers may not be appropriate or the farmers are mis-informed during extension visits by extension agents who are not properly trained. Although this finding disagrees with [19,21] who found that availability of extension services improved farmers' productivity and profitability and hence reduced poverty, it can be attributed to the fact that the farmers' awareness are probably not translated into actual performance. Hence, the extension contact tends to be counterproductive.

The non-significance of farm size and credit in influencing the poverty intensity of groundnut farming households agrees with the findings of [21] who also found out that farm size and accessibility to credit were not significant in influencing the poverty level of yam farming households. Household size was not significant in influencing the poverty intensity of groundnut farming households and this is in line with the findings of [22] who established that livelihood assets among farming households in the rural areas was not significant in influencing their poverty level. Household income was not significant in influencing the poverty intensity of groundnut farming households and this study agrees with [20] who noted that there was no significant relationship between non-farm income and poverty intensity in the sudan savannah of Nigeria.

4. CONCLUSION

The results revealed that about 42 percent of the respondents were still below the poverty line. The poverty headcount, poverty gap, poverty severity of poor groundnut farming households were 42%, 46%, 77% respectively using an

estimated poverty line of ₦46, 320.53. Based on the results, the most important factors that influenced poverty status in the study area were age of respondent, education and membership of cooperation which had significant effects in reducing the poverty intensity in the study area, while farming experience and extension contact were factors that significantly increase the intensity of poverty in the study area. Arising from the findings of this study, it is recommended that the government should enhance the educational status of the farmers through adult education which will lead to increased income from farming and improvement in their quality of life and hence, poverty reduction. There is also need for regular sensitization and increased mobilization of groundnut farming households to join farmers cooperative group especially for those who do not belong to any group because of the immense benefits accruable from participation in farmers association.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Angaye GS. Poverty amid plenty in Nigeria Rivers, *Journal of Social Science*. 2005;1(2):13-46.
2. United Nations Development Programme (UNDP). *Human Development Report*, Oxford University Press, New York; 2005.
3. Ojo EO. Imperatives of Sustaining Democratic Values. In Ojo EO (ed), *Challenges of Sustainable Democracy in Nigeria*. Ibadan: John Archers Publishers Limited. 2008;3-24
4. Abiola AG, Olaopa OR. Economic Development and Democratic Sustenance in Nigeria. In E. O. Ojo (ed), *Challenges of Sustainable Democracy in Nigeria*. Ibadan: John Archers Publishers Limited. 2008;25-34.
5. Omotola JS. Combating Poverty for Sustainable Human Development in Nigeria: The Continuing Struggle. *Journal of Poverty*. 2008;12(4):496-517.
6. United Nations Development Programme (UNDP). *Human Development Report Nigeria 2008-2009. Achieving Growth with Equity*; 2010. United Nations Development Programme.
7. Etim NA, Edet GE and Esu BB. Determinants of poverty among peri-urban Telfera Occidentalfarmers in Uyo, Nigeria. *Journal of Agricultural and Social Science*. 2009;5:49-51.
8. Etim NA and Patrick IV. Estimating the determinant of poverty among fishing households in Akwa Ibom State, Nigeria. *Journal of Agriculture and Social Science*. 2010;6:61-63.
9. Ndjeunga J, Ntare BR, Waliyar F, Echekwu CA, Kodio O, Kapran I, Diallo AT, Amadou A, Bissala HY and Da Sylva A. Early adoption of modern groundnut varieties in West Africa. Working Paper Series no. 24. Sahelian Center, BP 12404 Niamey, Niger: International Crops Research Institute for the Semi-Arid Tropics. 2008;62.
10. Ndjeunga J, Ibro A. Groundnut trends and prospects in west and central africa. Technical report, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Unpublished Paper; 2010.
11. Foster J, Greer J and Thorbecke E. A Class of Decomposable Poverty Measures. *Econometrica*. 1984;52:761–766.
12. Dontsop-Nguezet PM, Diagne A, Okoruwa VO and Ojehomon V. Impact of improved rice technology on income and poverty among rice farming household in Nigeria: A Local Average Treatment Effect (LATE) Approach. Contributed paper prepared for the 25th conference of the Centre for the Studies of African Economies (CSAE). St Catherine College, University of Oxford, UK. 2011;1–31.
13. Moyo S, Norton GW, Alwang J, Rhinehart I and Demo MC. Peanut research and poverty reduction: Impacts of variety improvement to control peanut viruses in Uganda. *American Journal of Agricultural Economics*. 2007;89(2):448–60.
14. Omilola B. Estimating the Impact of Agricultural Technology on Poverty Reduction in Rural Nigeria. IFPRI Discussion Paper 00901. 2009;1 -30.
15. Amaza PS, JK Olayemi, AO Adejobi, Y Bila and I Iheanacho. Baseline Socioeconomic Survey report: Agriculture in Borno State, Nigeria. International Institute of Tropical Agriculture, Ibadan, Nigeria. 2007;84.
16. Mignouna DB, Mutabazi KDS, Senkondo EM and Manyong VM. Contributions of agricultural improved technologies to rural

- poverty alleviation in developing countries: case of imazapyr-resistant maize in western Kenya, 55TH Annual AAERS National Conference. 2012;1-19.
17. Asogwa BC, Umeh JC and Okwoche VA. Estimating the Determinants of Poverty Depth among the Peri-Urban Farmers in Nigeria. *Current Research Journal of Social Sciences*. 2012;4(3):201-206
18. Adejobi A O and Akinola CA. An Analysis of the Effects of Agricultural Output Commercialization on Household Welfare in Osun State of Nigeria. Paper presented at the International Conference of the African Association of Agricultural Economists (ICAAAE) held in Tunisia. 2012;73-78.
19. Umeh JC, Asogwa BC. Econometric Model of Poverty for the Farming Households in Nigeria: A Simultaneous Equation Approach. In: Xuan, L., (Ed.), 2nd International Conference on Agricultural and Animal Science (CAAS 2011), Maldives. International Proceedings of Chemical, Biological and Environmental Engineering. 2011;22:82-87.
20. Damisa MA, Sanni, SA, Abdoulaye T, Kamara AY and Ayanwale A. Household typology based analysis of livelihood strategies and poverty status in the Sudan Savannah of Nigeria: Baseline conditions. *Learning Publics Journal. Agricultural*. 2011;2(1):146-160.
21. Ogbonna MC, Onyenweaku CE and Nwaru JC. Determinants of Rural Poverty in Africa: The case of yam farm Households in Southeastern Nigeria. *International journal of agricultural and rural development*. 2012;15 (2):1129–1137.
22. Lawal JO, Omonona BT and Oyinleye OD. Effects of Livelihood Assets on Poverty Status of Farming Households' in Southwestern, Nigeria. Paper prepared for presentation at the EAAE 2011 Congress Change and Uncertainty Challenges for Agriculture, Food and Natural Resources; 2011.

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