

*Original Research Article***Determinants of poverty among rural farming households in Maiha Local Government Area, Adamawa State, Nigeria**Yahaya Zira **Dia**¹, Daniel Stephen **Oaya**¹, Jaafaru **Joshua**²¹Department of Agricultural Extension and Management, Adamawa State College of Agriculture P.M.B. 2088, Ganye, Nigeria²Department of Agricultural Economics and Extension, Modibbo Adama University Yola, P.M.B. 2076 Yola, Adamawa State, Nigeria**Correspondence to:****Y. Z. Dia**, Department of Agricultural Extension and Management, Adamawa State College of Agriculture, P.M.B. 2088, Ganye, Nigeria; e-mail: yahayadia6@gmail.com**Abstract**

Poverty is a critical factor affecting subsistence of farmers in Nigeria, especially in rural areas. The study examined determinants of poverty among rural farming households in Adamawa State, Nigeria. Specifically, the research objectives were to: describe the socio-economic characteristics of the respondents, determine the poverty status of the respondents, and examine the determinants of poverty among the respondents. Primary data used for the studies were generated from 255 respondents, who were selected using a multi-stage random sampling technique. The analytical tools used were descriptive, Foster-Greer-Thorbecke (FGT), and Logit regression models. The findings of the study revealed that the majority (90.98%) of rural farming household heads were men, married (90.20%) with a mean age of 38.42 years, educated (76.48%), with a mean farm size of 2.65 ha and mean household size of 5 people. The majority (85.88%) of the respondents had no access to credit. The study further revealed that respondents' distributions by poverty status were 0.42, 0.23, and 0.16 for poverty incidence (Po), poverty depth (P1), and poverty severity (P2), respectively. The result of the Logit regression model revealed that sex, formal education, primary occupation, access to credit, total income, and annual remittances had a positive influence on poverty status, while age, marital status, and household size had a negative influence on poverty status among farming households and were statistically significant at various levels. Hence the study recommends need for the farming households to have access to credit schemes. This could increase the off-farm activities that could generate more income for the household and thereby reduce their poverty.

Keywords: Poverty status; farming household; access to credit; annual remittances**INTRODUCTION**

Poverty refers to the inability to attain a minimum standard of living. It is a social condition characterised by the inadequacy of access to basic human needs (food and non-food) for the sustenance of a socially acceptable minimum standard of living in a given society. Some of these basic determinants of well-being among others are adequate food, shelter, potable water, health care,

education, and employment opportunity. As access to most of these facilities is largely market-determined income or disposable resources available to individuals or households invariably determine who has what. A household or individual without enough income to meet the minimum levels of these needs in a given society is generally said to be poor (Ademola and Abang, 2015; Ike and Uzokwe, 2015).

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Needless to say that poverty is a global problem; however, the menace of poverty is most devastating in the developing countries of the world. Particularly, during the last decade, human conditions in most developing countries have grossly deteriorated, real disposable income has declined steeply and malnutrition rates have risen sharply. Food production has hardly kept pace with population size and the quantity as well as the quality of health has also massively deteriorated (Ume and Ochiaka, 2016). The incidence of poverty among farmers and farm labourers is related to the broader society in which they live. Poverty is a result of low levels of assets, coupled with low returns. The poor have very few assets beyond their own labour, which is inevitably spent in tedious, backbreaking, low-paid work. Poverty breeds poverty. A poor individual or family has a high probability of staying poor. Low incomes carry with them high risks of illnesses, limitations on mobility, and limited access to education (Adekoya, 2014).

Hagan (2018) defined poverty as a result of a low level of assets, coupled with low returns. Poverty exists when one or more persons fall short of the level of economic welfare deemed to constitute a reasonable minimum, either in some absolute sense or by the standard of a specific society (Jude et al. 2020). The rate of poverty with its attendant effects on the nation and the rural populace specifically is on the increase. It is reported that one out of five in the world's population lives in extreme poverty. Mood and Jonsson (2016) described poverty as the inability to adequately meet basic human necessities, such as food, shelter, clothing, and medicare. It is also a state of deprivation of human needs to which a person, household, community, or nation can be subjected. It is a broadly multidimensional, partly subjective phenomenon, often viewed as both the cause and symptoms of underdevelopment. It is manifested in many ways including the lack of capability by individuals or groups to function and feed well in society.

"Globally, about 1.2 billion people are in extreme poverty, living on less than a Dollar per day" (International fund for agricultural Development [IFAD], 2017). Majority of these people are in developing countries, 44% in South Asia, 24% each in sub-Saharan Africa and East Asia, and 6.5% in Latin America and the Caribbean (IFAD, 2017). Within these regions, poverty is largely a rural phenomenon with an average of between 62 and 72% of the population living on less than a dollar a day. In comparison, rural poverty also tends to be deeper than urban poverty in these regions (IFAD, 2017).

Poverty is a general phenomenon in Nigeria, too. It is a common problem that cannot be easily wiped off except available basic needs and resources are acquired and eventually distributed among the citizens to alleviate them, and this requires some concerted effort by the government and individuals to shift the status to a more positive direction through training, work, and opportunities (Igwe, 2013). The National Bureau of Statistics (NBS, 2020) reported that poverty is also strongly influenced by education and location. In Nigeria, poverty is seen as a rural problem with the majority of inhabitants engaged in agricultural production as a means of livelihood. IFAD (2017) reported that poverty in Nigeria tends to spread evenly across the country but is worse in some zones such as the northern area bordering Niger which is arid. Poverty is especially severe in rural areas, where social services and infrastructure are limited or non-existent. Despite the growing importance of farm and off-farm activities, very little is known about the role they play in the income-generation strategies of rural households in developing economies like Nigeria (Ibekwe et al., 2010). The tendency for rural households to engage in multiple occupations is often noticeable, but it is pertinent to link diversification of livelihood in a systematic way to rural poverty reduction and food security policies.

Statement of the problem

Poverty is global but its effects manifest most in the rural areas of sub-Saharan Africa and South East Asia (Uchechi and Okewale 2010). In Nigeria, one of the sub-Saharan African countries, despite its natural resources endowment, poverty keeps on spreading widely. This is true when it is realised that according to Ademola and Abang (2015), over 70% of the Nigerian population is classified as poor with 35% living in absolute poverty. Poverty, as reported by Adigun et al. (2015), has many manifestations and dimensions and these include joblessness, over-indebtedness, economic dependence, lack of freedom, inability to provide the basic needs or own assets, and lives in dirty localities. These put pressure on the physical environment contributing to environmental degradation.

The effect of poverty in rural households is disturbing as households are easily predisposed to negative changes in environmental, socio-cultural, political, and economic conditions which make them more impoverished. These conditions according to the Federal Office of Statistics (FOS, 2019) include worse hit by food insecurity, risk-averse to avoid losing the meagre resources at their disposal, earning low income because of poor social amenities and unfavourable government policies.

The high vulnerability of rural households to poverty necessitated the need to alleviate their poverty status through among others initiating programmes that will boost their source of livelihood. In most rural areas of sub-Saharan Africa, agriculture is their major vocation, and the need to raise the productivity of agriculture through the use of improved technology and to improve their capability to market and distribute their products to enhance their income is essential (Uchechi and Okewale 2010). In Nigeria, in 2019, the poverty headcount rate was 40.09% which is 40.1% of total population classified as poor. In Adamawa State, the poverty headcount was 75.4%¹, poverty gap index was 27.64%, and squared poverty gap index (severity) was 13.21% with 70.9% of the male-headed households and 82.6% of female-headed households classified as poor (NBS, 2019).

The objectives of the study

- i) describe the socio-economic characteristics of the respondents
- ii) determine the poverty status of the respondents in the study area,
- iii) examine the determinants of poverty among the respondents.

Hypothesis

H_0 = there is no significant relationship between the income of the farmer and their poverty status.

MATERIALS AND METHODS

Study area

The study was conducted in the Maiha Local Government Area (LGA), Adamawa State of Nigeria. It lies between Latitudes 9°31' and 10°09'N of the equator and between Longitudes 13°02' and 13°17' E of the Greenwich Meridian. It covers a land area of 1,385 square kilometres with a projected population of 156,033 in 2018. Maiha LGA has a tropical climate marked by dry and rainy seasons. The rainy one starts in April and ends in October. The dry season starts in November and ends in April. The annual average minimum and maximum temperature of the area ranges between 19.0 °C to 32.3 °C. The mean annual total rainfall is 1,000 mm. The soils of Adamawa State are classified as ferruginous tropical soil of horizons with an abundance of free oxides usually deposited as yellow or red concretion. The vegetation comprises Southern Guinea savannah, the northern Guinea savannah, and Sudan savannah types (NBS, 2019; Adebayo and Zemba, 2020; Akosim et al. 2020; Ray, 2020).

Sampling procedure and sample size

A multi-stage sampling technique was used to collect primary data from 255 rural farming households in the study area using a questionnaire. Maiha LGA is made up of five districts. In the first stage, three districts were purposively selected due to the concentration of farming families in the area. The second stage involved the selection of ten farming communities, namely, Belel, Sarau, Boloko, Pakka, Vokuna, Mbilla, Hudu, Bwade, Dukku and Mayogulli, respectively, where 255 respondents were randomly selected from each community proportionate to the number of the households in each community.

Analytical technique

Both descriptive and inferential statistics were used to achieve the research objectives of the study. Descriptive statistics were used to describe the socio-economic characteristics of the respondents while inferential statistics such as the Foster, Greer and Thorbecke (FGT) poverty model and Logit regression model to determine their poverty status and the effect of livelihood diversification and some socio-economic characteristics on poverty.

Foster, Greer and Thorbecke (FGT) poverty model

One of the methods that was used in the study is the popular FGT measures of poverty. This was used to determine the Poverty Status of the farming households in the study area. The poverty status of the farmers was measured based on their consumption/expenditure from the sources of their livelihood. The consumption/expenditure level that separates the poor from the rest of the population is called the poverty line. The poverty line helps us in classifying the poor and non-poor and then calculates the poverty indices for rural households in the study area. The first step in calculating the consumption/expenditure-based index is to assess a level of consumption/expenditure below which an individual is defined as poor. It is well known that if consumption/expenditure is divided into two categories, food consumption/expenditure, and non-food consumption/expenditure; the poorer people are, the higher the proportion of their overall expenditure that is accounted for by food consumption/expenditure. In determining consumption/expenditure levels that can be used to separate the poor from the non-poor, food consumption/expenditure is the most significant measure. Thus a food poverty line (a minimum level of food consumption/expenditure) is first calculated. A non-food minimum allowance is then calculated and added to the food poverty line to provide the total

poverty line. This poverty line was used to determine the magnitude and intensity of poverty among the farming household in the study area.

The Foster-Greer-Thorbeeke (FGT, 1984) indices were used to measure the magnitude, depth, and severity of poverty. The P_α class of poverty according to Foster et al. (1984) can be addressed in respect of poverty incidence, ($\alpha = 0$); depth of poverty ($\alpha = 1$); and severity of poverty ($\alpha = 2$), the higher the value of α , the greater the weight given to the severity of poverty. For ($\alpha = 0$), FGT reduces to headcount ratio (H) and when $\alpha = 1$, it reduces to the poverty gap, and if $\alpha = 2$, we have poverty severity index.

Following Adigun et al.(2015) general class of a poverty measure which combines these three characteristics of poverty can be written as:

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

where:

n = Total number of households in a population

q = The number of poor households

z = The poverty line (Naira)

y_i = Household per capita expenditure (Naira)

α = Poverty aversion parameter and takes values, 0, 1, 2

$$\left(\frac{z - y_i}{z} \right) = \text{Proportionate shortfall in income below the poverty line}$$

α takes on the value 0, 1, 2, to determine the type of poverty index.

When $\alpha = 0$, the expression reduces to

$$P_0 = \left(\frac{1}{n} \right) q = \left(\frac{q}{n} \right) \tag{2}$$

where:

P_0 = poverty incidence

n = total number of households in a population

q = the number of poor households

This is referred to as the Headcount Ratio (poverty incidence) describing the proportion of the population that falls below the poverty line. This measure gives equal weight to all poor irrespective of the intensity of their poverty. The headcount ratio has been criticised for focusing only on the number of the poor being insensitive to the severity of poverty and changes below the poverty line. That is, it treats all the poor equally whereas not all the poor are equally poor. Also, neither a transfer from the less poor to poorer, nor a poor person becoming poorer would register in the index, since the number of the poor would not have changed.

Where $\alpha = 1$, the expression in the equation (equation 1) reduces to:

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

where:

P_1 = poverty gap

n = total number of households in a population

q = the number of poor households

z = the poverty line (Naira)

y_i = expenditure of the poor household less than the poverty line (Naira)

And this is called the Poverty Gap (depth of poverty) each poor is weighed by his or her distance from the poverty line, relative to z .

Where $\alpha = 2$, the expression now becomes

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

where:

P_2 = poverty severity

n = total number of households in a population

q = the number of poor households

z = the poverty line (Naira)

y_i = expenditure of the poor household less than the poverty line (Naira).

Equation (4) is called the poverty severity index. In this measure, the weight given to each poor is proportional to the square of his or her income shortfall from the poverty line. This index weighs the poverty of the poorest individual more heavily than those just slightly below the poverty line. This measures all three indicators of poverty stated above.

Binary logit model

The Binary Logit (BNL) Model was employed in this study. In this model, the data on the dependent variable (poverty status) is bi-variate, that is, poor or non-poor. The BNL model was therefore employed due to the nature of the decision variable. For such a dichotomous outcome, the BNL model is the most appropriate analytical tool (Pur et al.2016). The implicit form of the model is expressed as:

$$Y = \ln \left(\frac{\varnothing_1}{1 - \varnothing_1} \right) = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + \varepsilon_i \tag{5}$$

where:

Y = Dependent variable (i.e, the binary variable; $Y = 1$ for a household that diversified livelihood activities and $Y = 0$ for otherwise.

β_0 = Intercept
 β_i = Estimated parameters
 X_i = Explanatory variables
 $i = 1, 2, 3, \dots, n$ number of explanatory variables
 ε_i = the matrix of unobserved random effects,
 $\frac{\varnothing_i}{1-\varnothing_i}$ is “odd”, and $\ln\left(\frac{\varnothing_i}{1-\varnothing_i}\right)$ is the logarithm of “odds”.

The explicit form of the model is expressed as:

$$Y = \ln\left(\frac{\varnothing_1}{1-\varnothing_1}\right) = \beta_0 + \sum_{j=1}^k \beta_j X_j + \beta_9 X_9 + \varepsilon_i \quad (6)$$

Y = Dependent variable (i.e, the binary variable; $Y = 1$ for poor and $Y = 0$ for non-poor.

The independent variables are defined in Table 1.

Testing of hypothesis

The hypothesis was tested using the Pearson correlation coefficient to measure the relationship between income of the farmers and their poverty status. The correlation coefficient is a number that summarises the direction and degree (closeness) of linear relations between two known variables. The correlation coefficient is also known as the Pearson Product-Moment Correlation Coefficient (PPMCC). Mathematically expressed as:

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{n}\right] \left[\sum Y^2 - \frac{(\sum Y)^2}{n}\right]}}$$

where:

- r = Pearson’s correlation coefficient
 - n = number of paired scores
 - X = income of the respondents
 - Y = poverty status of the respondents
 - XY = the product of the two paired scores
- To do this test, the null hypothesis was formulated against alternative hypothesis as follows:

- H_0 = Income does not affect poverty status of the respondents
- H_1 = Income affects the poverty status of the respondents

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The socio-economic characteristics of the respondents are presented in Table 2. A majority (79.22%) of the respondents were less than 50 years of age with the mean age of 38.42 years. The results show that 90.98% of the household heads were male. Majority (90.20%) of the respondents were married. This indicates that married people constitute bulk of household heads in the rural areas. Married people could imply larger household sizes with more mouths to feed, and this could aggravate their poverty. It also shows that the majority (76.48%) of the respondents had one form of formal education or the other. The results reveal that the majority of the respondents were literate and this can enhance the level of productivity. The mean household size was 5 people. The results indicate that 70.98% of the respondents were engaged in farming as their primary occupation which included both arable cropping and rearing of livestock. This implies that the major occupation of most of the household heads in the study area was farming. The result shows that the majority (80.79%) of the respondents had farm size between 1–3 hectares with a mean of 2.65 hectares. This is an indication that the farmers in the study area are small-scale farmers, hence food production will be at a subsistence level. It also revealed that 85.88% had no access to credit facilities. Their lack of access to credit facilities is as a result of not being in any registered cooperative or farmer associations.

Table 1. Exogenous variables in the binary logit regression to test poverty status

| Variable | Measurement | Expected sign |
|-------------------------------|--|---------------|
| Age (X_1) | In years | ± |
| Sex (X_2) | Binary variable (1 = male, 0 = otherwise) | + |
| Marital Status (X_3) | Binary variable (1 = married, 0 = otherwise) | + |
| Households Size (X_4) | Number | + |
| Formal Education (X_5) | Years | ± |
| Primary Occupation (X_6) | Binary (1 = farming, 0 = otherwise) | ± |
| Access to Credit (X_7) | Binary (1 = yes, 0 = No) | ± |
| Total Annual Income (X_8) | Naira | + |
| Annual remittances (X_9) | Naira | + |

Table 2. Socio-economic characteristics of the respondents (N = 255)

| Socio-economic characteristics | Frequency | Percentage | Mean |
|--------------------------------|-----------|------------|-------|
| Age | | | |
| 20–29 | 24 | 9.42 | |
| 30–39 | 108 | 42.35 | 38.42 |
| 40–49 | 70 | 27.45 | |
| 50–59 | 33 | 12.94 | |
| 60 and above | 20 | 7.84 | |
| Sex | | | |
| Male | 232 | 90.98 | |
| Female | 23 | 9.02 | |
| Marital Status | | | |
| Married | 230 | 90.20 | |
| Divorced | 10 | 3.92 | |
| Widowed | 15 | 5.88 | |
| Educational Level | | | |
| Non formal education | 60 | 23.52 | |
| Primary education | 100 | 39.22 | |
| Secondary education | 69 | 27.06 | |
| Tertiary education | 26 | 10.20 | |
| Household Size | | | |
| 1–5 | 105 | 41.18 | |
| 6–10 | 98 | 38.43 | |
| 11–15 | 36 | 14.12 | 5 |
| 16–20 | 12 | 4.71 | |
| 21 and above | 4 | 1.56 | |
| Primary Occupation | | | |
| Farming | 181 | 70.98 | |
| Civil servant | 44 | 17.26 | |
| Business | 30 | 11.76 | |
| Farm Size (ha) | | | |
| < 1 | 11 | 4.31 | |
| 1–3 | 206 | 80.79 | 2.65 |
| 4–6 | 38 | 14.90 | |
| Access to Credit | | | |
| Yes | 36 | 14.12 | |
| No | 219 | 85.88 | |

Source: Field Survey 2021

Analysis of expenditure of respondents and determination of poverty line

The result presented in Table 3 shows the household food and non-food expenditure, total expenditure, per capita expenditure, mean per capita expenditure, and the poverty line. The poverty line was constructed as two-thirds of the mean per capita household expenditure of all households. This approach has been used by many researchers and institutions (Oyakhilomen and Kehinde, 2016; NBS, 2020). Households were then classified into their poverty status based on the poverty line.

Hence, non-poor households were those whose per capita expenditure was above or equal to two-thirds of the mean per capita expenditure (poverty line) of all households while those households whose per capita expenditure were below two-thirds of the mean per capita expenditure were classified as poor. Based on this, the poverty line constructed as two-thirds of the mean per capita expenditure of all the households was ₦91,746.67. This implies that households whose annual per capita expenditure fell below ₦91,746.67 were classified as poor while households whose per capita expenditure equalled or above the poverty line was classified as non-poor.

Table 3. Analysis of expenditure of respondents and determination of poverty line

| Item | Amount (₦ / Annum) |
|--|--------------------|
| Household Food Expenditure | 56,730,360.00 |
| Household Non-food Expenditure | 67,550,730.00 |
| Total Household Expenditure | 124,281,090.00 |
| Per Capita Household Expenditure = $\frac{\text{Total household Expenditure}}{\text{Number of household members}}$ | 38,792,822.00 |
| Mean Per Capita Household Expenditure (MPCHE) | 137,620.00 |
| 2/3 MPCHE (Poverty line) | 91,746.67 |

Source: Field Survey, 2021

Table 4. Poverty indices of the respondents

| Poverty Indices | Estimates |
|--|-------------|
| Mean Per Capita Household Expenditure | ₦137,620.00 |
| 2/3 Mean Per Capita Household Expenditure (Poverty line) | ₦91,746.67 |
| 1/3 Mean Per Capita Household Expenditure | ₦45,873.33 |
| Poverty incidence (P _o) | 0.42 |
| Poverty depth (P ₁) | 0.23 |
| Poverty severity (P ₂) | 0.17 |
| Poor Households | 42% |
| Non Poor Households | 58% |

Source: Field Survey, 2021

Poverty indices of the rural farming households

The values for the poverty measures the poverty incidence (P_o), Poverty gap index (P₁), and Poverty severity (P₂). From Table 4, a relative poverty line of N91,746.67 was established from the annual food and non-food expenditure of the rural farming households. This implies that a household having an average annual expenditure above N91,746.67 was considered non-poor, those with an average annual expenditure between N45,873.33 and N91,746.67 were considered moderately poor while those having annual average expenditure less than N45,873.33 were considered very poor. Thus the result of the poverty incidence (P_o) is 0.42 which indicates about 42% variability in the poverty of farming households were poor which means 62% of the farming household were not poor. That is out of the 255 rural farming households interviewed, 107 of them were poor. This indicates that poverty was not predominant among the rural farming households which might be due to the fact that most of the household heads diversify their livelihood activities to earn more income to meet their daily needs.

The poverty gap index (P₁) results revealed was 0.23 indicating the gap between the poor and the poverty line was 23%, therefore the poor will require a 23% rise in their per capita expenditure to become non-poor which translates into ₦21,101.73 increase to the per capital expenditure of the poor. The poverty severity

index (P₂) of the rural farming households was 0.17. This indicates that out of 107 poor households interview only 18 of those households were extremely poor. This implies that poverty is not severe among poor farming households with about 17% of the farming households constituting the poorest among the respondents. In other words, the squared poverty gap takes into account not only the distance separating the poor from the poverty line, but also the inequality among the poor. The result is similar to the findings of Morris et al. (2021) who reported that poverty severity among rural farmers in Michika, Adamawa State, Nigeria is 17%, and Asogwa et al. (2012) who also reported a poverty gap of 0.27 and poverty severity of 0.15 among farming households in Nigeria.

Determinants of poverty among farming households in the study area

A Logit regression was employed to determine the determinants of poverty among farming households in the study area (Table 5). The usual regression diagnostics for the binary logistic regression models were computed to assess the fit of the individual observations. In this study, the result of the goodness of fit test shows that the overall goodness of fit is reflected in a non-significant of Pearson Chi-square p-value which is 0.9822. This implies that the data have a good fit in explaining the relationship. The model adequacy test shows the p-value for hat to be 0.000 which is highly

significant and the p -value for hatsq is 0.726 which is non-significant. The non-significance of hatsq suggest good model adequacy.

The result showed that The log-likelihood function (-80.01) shows that the estimated model including a constant and the set of explanatory variables fit the data better. This implies a better relationship between the odds ratio, probability of factors influencing poverty status (dependent variable), and the explanatory variables included in the model collectively contribute significantly to the explanation of farmers' influence in adopting a livelihood diversification strategy. R^2 (coefficient of determination) is 0.5612, suggesting that the model has a good fit for the data. This indicates that 56% of the variation in poverty in the study area is explained by variations in the specified explanatory variables on the changes in poverty among the respondents.

The results of logit regression indicate that age ($p < 0.01$), sex ($p < 0.10$), marital status ($p < 0.01$), household size ($p < 0.05$), formal education ($p < 0.01$), primary occupation ($p < 0.01$), access to credit ($p < 0.05$), annual income ($p < 0.10$), and annual remittances from children and relatives ($p < 0.05$) significantly influence the probability that a household will be poor or non-poor.

The result showed that the marginal effect (0.83) of the age of the household heads was found to have a negative effect on the level of poverty and was significant at the $p < 0.01$ probability level. This implies that older respondents are more likely to become poor compared to their younger counterparts. This is consistent with Adekoya (2014) who posited that when the household head gets older, the likelihood of being poor also increases.

Sex had a positive effect on the level of poverty with a marginal effect of 9.248604 and was significant at $p < 0.10$ level of probability. This implies that male household heads are nine times more likely to become poor compared to their female counterparts because the male counterpart shoulder more responsibility than the female from both cultural and religious points of view. This agrees with the study conducted by Ike and Uzekwe (2015) who posited that most females in rural Nigeria depend on male counterparts for productive resources.

Marital status had a negative effect on poverty with a marginal effect of 0.0334461, and statistically significant at $p < 0.01$ probability level to poverty. These results show that monogamous marriage, divorce/separation, and widowhood are negatively and significantly correlated with the probability of being poor. This

implies that monogamous marriage has a probability of reducing poverty. This agrees with Anyanwu (2014) who posited that monogamous marriage has the largest probability of reducing poverty in Nigeria

The household size had a negative marginal effect of 0.788 and was significant at $p < 0.05$ probability level. That implies that a unit increase in household size increases the likely event of being poor 78%. This agrees with studies by Masood and Nasir (2014) who posited that the larger the household size the poorer the household is likely to be because more of the household members would likely be children who are unproductive and yet take a big portion of household income in terms of school fees, medical bills, food and clothing.

Formal education in years has a positive impact on the level of poverty and is significant at $p < 0.01$ level of probability. The marginal effect of formal education is 1.12111, which implies that an increase at the level of education by a year will reduce the level of poverty in the study area by 1.12. The positive relationship is consistent with Ume and Ochiaka (2016) who opined that education helps to make one to be objective in evaluating innovation which will positively influence his farm output for more income. More so, education diminishes poverty while poverty restricts access to education.

Primary occupation of the respondents in the study area has a positive effect on poverty and is significant at $p < 0.01$. The marginal effect of primary occupation is 2.2199545. This indicates that the more the respondents engaged in the primary occupation the lower will be the probability of being poor. This result coincides with the finding of Kadurumba et al. (2010) who opined that commitment of household heads to their primary occupation helps in reducing poverty.

Access to credit by rural farm households is significant at $p < 0.05$ level of probability and has a positive effect on poverty status with a marginal effect of 1.309137. This implies that when the farmers have access to credit facilities it will aid their households to escape poverty. Credit assists the farm households in the purchase of farm inputs such as fertilisers, herbicides, improved seeds, and investment demand which ultimately increase productivity. Therefore, a unit increase in credit access by farm households in the study area will increase the probability of the households being non-poor by 130%. This is in line with the finding by Oyakhilomen and Kehinde (2016) who reported that access to credit has a positive influence on income diversification thereby reducing poverty.

Table 5. Logit regression result on determinants of poverty status among the respondents

| Variable | Coefficient | Standard Error | Z-Statistics | Marginal Effect |
|---|-------------|----------------|--------------|-----------------|
| Constant | 4.469983 | 2.379919 | 1.746540** | |
| Age (X₁) | -0.177876 | 0.328858 | -5.322948*** | 0.8370466 |
| Sex (X₂) | 2.224473 | 1.30109 | 1.699064* | 9.248604 |
| Marital Status (X₃) | -3.397821 | 1.332753 | -2.469408*** | 0.0334461 |
| Household size (X₄) | -0.237333 | 0.996969 | -2.402986** | 0.7887286 |
| Formal Education (X₅) | 0.1143196 | 0.428117 | 2.650309*** | 1.12111 |
| Primary Occupation (X₆) | 0.7973022 | 0.1900775 | 4.427717*** | 2.219545 |
| Access to credit (X₇) | 0.2693681 | 0.1276916 | 2.184346** | 1.309137 |
| Total annual income (X₈) | 5.75e-06 | 3.47e-06 | 1.669291* | 1.000006 |
| Annual remittances (X₉) | 0.8577934 | 0.4299538 | 2.260443** | 2.357952 |
| Diagnostic Statistics | | | | |
| Chi-square | 204.67*** | | | |
| Log-likelihood | -80.007398 | | | |
| Pseudo R² | 0.5612 | | | |
| Specification test | | | | |
| Hat | 1.054068 | 0.1459811 | 7.22*** | |
| Hatsq | 0.0350925 | 0.0418009 | 0.84 | |
| Goodness-of-fit test | | | | |
| Pearson chi² (294) = 245.34 | | | | |
| Correctly classified 98.22% | | | | |

Source: Computed Field Data, 2021

Note: *** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%

Household total annual income of the respondents in the study area in naira was significant at $p < 0.10$ level and has a positive effect on poverty with a marginal effect of 1.000006. This implies that the higher the level of income of the household heads the lower will be the probability of being poor by 100%. This finding is supported by Duniya and Sanni (2015) who posited that increase in income from various income-generating activities reduces household poverty.

Annual remittance from children and relatives has a positive effect on poverty status with a marginal effect of 2.357952 and is statistically significant at $p < 0.05$. This signifies that a unit increase in remittances will two times reduce the poverty of the household. This implies that an increase in the amount of transfer reduces the possibility of a household becoming poor. This is due to the fact that remittances contribute to household income and would lead to an increase per capita food expenditure and consequently improved food security status of the households. This finding corroborates Odoh and Nwibo (2016) who revealed that households with access to remittances have a lower probability of being poor.

Hypothesis

Pearson correlation analysis was carried out to examine how the income of household heads affects their poverty status as presented in Table 6.

A positive correlation at 1% was found to exist between the income and poverty status of the respondents. This implies that an increase in income of the respondents reduces their poverty status and vice versa.

Table 6. Correlation result of the relationship between income and poverty status of the respondents

| Variable | Poverty Status | Income |
|-----------------------|---------------------|---------|
| Poverty Status | Pearson Correlation | 1 |
| | Sig. (2-tailed) | .643*** |
| | N | 255 |
| Income | Pearson Correlation | .643*** |
| | Sig. (2-tailed) | 1 |
| | N | 255 |

Source: Field Survey, 2021

*** Correlation is significant at the 0.01 level (2-tailed).

CONCLUSION AND RECOMMENDATION

Based on the findings of this study, it can be concluded that the majority of farming households are male, married, and attended a certain level of formal education. The study further revealed that respondents' distributions by poverty status were 0.42, 0.23, and 0.16 for poverty incidence (Po), poverty depth (P1), and poverty severity (P2), respectively. Age, sex, marital status, household size, formal education, primary occupation, access to credit, annual income, and annual remittances from children and relatives were the factors that significantly influence the probability that a household will be poor or non-poor in the study area. Therefore it is recommended that there is a need for sufficient resources to develop infrastructure which includes roads network, electricity, water, and telecommunication for easy evacuation of farmers' output to urban areas and transportation of inputs into the rural areas. There is a need for farming households to have access to credit schemes. This could increase the off-farm activities that could generate more income for the household and thereby reduce their poverty.

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CONFLICT OF INTEREST

The author declared no conflicts of interest with respect to the research, or authorship publication of this article.

ETHICAL COMPLIANCE

The authors have followed ethical standards in conducting the research and preparing the manuscript.

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