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Livelihood Diversification Strategies as a Means to Poverty Reduction among Rural Farming Households in Adamawa State, Nigeria

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Abstract: The study examined livelihood diversification strategies as a means to poverty reduction among rural farming households in Adamawa State, Nigeria. Specifically, the research objectives were to: describe the socio-economic characteristics of the respondents, identify the livelihood activities of the respondents, assess the level of diversification of livelihood activities of the respondents and determine the poverty status of the respondents. Data used for the studies were generated from 305 respondents, who were selected using multi-stage random sampling technique. The analytical tools used were descriptive and inferential statistics such as Simpson index of diversity and Foster-Greer-Thorbecke (FGT). Hypothesis was tested using Pearson correlation coefficient to measure a relationship between poverty status and livelihood activities. Findings of the study revealed that, the majority (89.18%) of rural farming household heads were men, married (85.90%) with the mean age of 44.77 years; 79.69% had one for of formal education or the other, 76.72% had farm size between 1 - 3 hectares, 38.36% had farming experience between 15 – 20 years with mean household size of 8 people, while majority (84.92%) of the respondents do not have access to credit. The distribution of respondents by nature of likelihood activities revealed that 95.08% were involved in arable cropping 50.49% were into livestock sales, 18.69% were civil servants and 69.4% were involved in one form of non-farm activities or the other. On the extent of livelihood diversification, 54.75% of the farming household had low diversification, 42.30% of farming households moderately diversified and only 2.95% of the respondents were highly diversified. Respondents' distribution by poverty status showed that, poverty incidence (Po), poverty depth (P1) and poverty severity (P2) were 0.38, 0.17 and 0.10 respectively. The result of hypothesis test indicated that, the variables are positively correlated (r = 0.540) and statistically significant at P<0.01 level, imply that increase in livelihood activities increase the likelihood of being non-poor and vice versa. Based on findings of the study it was recommended that: Skills acquisition centers should be establish for rural farming households, sufficient resources should be provided to develop infrastructure, there should be access to credit facilities, and this would help to reduce poverty.

Keywords: livelihood; diversification; poverty reduction; Simpson index of diversity; Foster-Greer-Thorbecke (FGT); Pearson correlation coefficient

1. Introduction

Diversification is a risk management technique that mixes a wide variety of investments within a portfolio. The rationale behind the technique contends that a portfolio constructed of different kinds of investment will, on average, yield higher returns and pose a lower risk than any individual investment found within the portfolio. Diversification is the single most important source of poverty reduction in developing countries, for rural people in Africa and Nigeria in particular diversified their economic activities to encompass a range of productive areas that include farm and non-farm income generating activities (Idowu et al., 2014).[1] Livelihood diversification can be referred to as a process in which households voluntarily or involuntarily increase the number of economic activities they are involved in so as to improve household income

(Zhao & Barry, 2013).[2] As pointed out by Abera et al., (2021)[3] there are different approaches of characterizing household livelihood strategies such as asset, activity and the allocation of productive resources among different income generating activities, both on-farm and non-farm. Drafor (2017)[4] defined income diversification as a means of increasing the number of sources of income or stabilizing the different sources of income for households. Livelihood diversification among rural farmers is geared towards improving their household standard of living (Senadza, 2014).[5] Moreover Feliciano (2019)[6] defined income diversification as a means of increasing the number of sources of income or stabilizing the different sources of income for household. One definition refers to an increase in the number of sources of income or the balance among the different sources (Ijaiya et al., 2010).[7] A second definition concerns the switch from subsistence food production to commercial agriculture. This

also implies an increasing mix of income activities on the farm. Thirdly, livelihood diversification is often used to describe expansion in the importance of non-crop or non-farm income. Fourthly, income diversification can be defined as the process of switching from low-value crop production to higher-value crops, livestock and non-farm activities (Ibrahim & Onuk, 2009).[8]

According to Cornelius (2011),[9] Livelihood diversification is generally regarded as the micro-level response to risky environments on one hand and to economic opportunities on the other hand and can also be regarded as a form of self-insurance in which people exchange some foregone expected earnings for reduced income variability achieved by choosing a kind of assets and activities that have low or negative correlation of incomes. Fabusoro et al., (2010),[10] defined livelihood diversification as attempts by people to pursue new means in order to increase household income and reduce risks, which differ sharply by the degree of freedom of choice, whether to diversify or not and the reversibility of the outcome. Achiba (2018)[11] states that diversification is linked to the drivers and consequent household strategies to engage in additional income pursuits outside of the primary livelihood activity which he describes it as a process by which households participate in a wide variety of income activities and social support capabilities as survival strategies for risk reduction and overcoming income instability caused by seasonality and low production output in order to improve their welfare.

Poverty refers to the inability to attain minimum standard of living. It is a social condition characterized by the inadequacy of access to basic human needs (food and non-food) for the sustenance of 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 (Ike & Uzokwe, 2015).[12]

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).[13] The tendency for rural households to engage in multiple occupations is often noticeable, but it is pertinent to link income diversification in a systematic way to rural poverty reduction and food security policies. Also, less emphasis has been given to household level choices and especially to the explanation of differences of strategies among households in terms of income-source diversification.

Households may diversify their farm activities by growing different crops, rearing different kinds of livestock, working on other farms or engaging in natural resource related activities (Losch et al., 2012).[14] They may also diversify into non-farm activities by engaging in waged labour, self-employment or labour migration (Afodu et al., 2019).[15] Some households may even between farm and non-farm activities over time depending on the opportunities and constraints they face (Djurfeldt et al., 2013).[16] The diversity of rural livelihoods in low income developing countries is receiving increased attention

in discussions about rural household strategy to secure survival, minimize risk, finance farm inputs, reduce income variability, or simply an involuntary response to cope with crises or shocks (Arslan, 2018).[17] Livelihood diversification is, hence, one of the livelihood strategies (coping mechanisms) and defined as "the process through which rural families build a diverse portfolio of activities and social support capacities in their struggle for survival and improving their living standard" (Adepoju & Obayelu, 2013;[18] Ayana, Megento & Kussa, 2021).[19]

Rural people have diversified their livelihood means and income earning portfolio across farm, non-farm and off-farm activities. Thus non-farm income generating activities have become an essential component of livelihood strategies among rural households (Bezu et al., 2012;[20] Khatun et al., 2012;[21] Agyeman et al., 2014).[22] According to Ovwigho (2014),[23] farmers particularly, the rural farm families usually engage in different non-farm income generating activities apparently to balance the shortfall of income due to the seasonality of primary agricultural production and create a continuous stream of income to cater for the various household needs. Off-farm employment is defined as the participation of individuals in remunerative work away from a plot of land, which can be seen to play a progressive role in sustainable development and poverty reduction, especially in rural areas (IFAD, 2011).[24] Non-farm income generating activities include all economic activities in rural areas except agriculture, livestock, fishing and hunting. It includes all off-farming activities, processing, marketing, manufacturing, wage and causal local employment in the rural villages (Igwe, 2013;[25] Arslan, 2018).[17]

Past studies (Ajie & Ewubare, 2013,[26] Adefila 2014,[27] Davis et al., 2017)[28] reported that it would be more appropriate to introduce an integrated farm and non-farm sectors development planning approach together which should be holistic in nature. In short, the concerned approach calls for identification of various potentially viable non-farm activities and development linkages that the identified non-farm activities are possessing with the diversification of different components of farm sector in different locations. Also, identify right approaches and under what manner to be initiated for systematically achieving the development of both sectors simultaneously along with planning for expansion of different activities. This would go a long way for integrating farm and rural non-farm enterprise development. This study analysed livelihood diversification strategies as means to poverty reduction among rural farming households examined their poverty status using monetary indicators such as household food and non-food expenditure.

2. Statement of the Problem

The term "Economic Diversification" relates to the production of diverse goods and services in a production boundary. In turn, it also relates to pursuance of diverse economic activities by the people of a geographic domain for producing larger range of goods and services. Eventually, the diversity of production and economic activities of the people results into income flows from diverse sources. Such diversification is triggered by the use of resources for production of goods and services from available alternative choices (Mehta, 2009).[29] In Adamawa state where agriculture remains the main

livelihood source of the residents (Samuel et al., 2011),[30] most of the farmers diversify in crop production, animal production activities and on off-farm activities thereby alleviating their poverty. The study aims at a better understanding of the role of farm supplementary activities in rural villages in sub-Saharan Africa that have achieved limited economic growth during the last four decades on the agenda for research on and development of rural livelihoods (Ogundipe et al., 2019).[31] Yet, by insufficiently identifying factual economic opportunities in the non-farm sectors, the same studies do not explain the persistent nature of poverty in low-income developing countries and fall short in making specific policy recommendations. Household activity diversification is widespread in rural sub-Saharan African but it has not generated the expected economic growth of the local economy (Cervantes-Godoy & Dewbre, 2010;[32] Ogunniyi, et al., 2017;[33] Abraham & Pingali, 2020).[34]

Poverty is a global phenomenon but the effects manifest most in the rural areas of sub Saharan Africa and South East Asia (Uchechi & Okewale 2010).[35] Nigeria one of the sub-Saharan Africa despite its natural resources endowment, yet poverty keeps on spreading widely. This is true when it is realized that according to Iheke (2010).[36] The National Bureau of Statistics (NBS) recently released the "2019 Poverty and Inequality in Nigeria" report, which highlights that 40 percent of the total population, or almost 83 million people, live below the country's poverty line of 137,430 naira ($381.75) per year (NBS, 2020).[37] Poverty as reported by Omoniyi (2018)[38] relates to physical deprivation in terms of health, nutrition, literacy and education, disability and lack of self-confidence. Economic deprivation is the lack of access to property, income, assets, factors of production and finance, while social deprivation is the denial of socio-political and economic participation. Cultural deprivation is the lack of access to values, beliefs, knowledge, information and attitudes, which deprives people of the opportunity to control their own destinies; political deprivation is the inability to lend one's view in the political decision-making process.

The effect of poverty in rural households are disturbing as they (household) are easily predisposed to negative changes in environmental, socio-cultural, political and economic conditions which make them more impoverished. These conditions according to Federal Office of Statistics (FOS) 2011[39] and Iheke (2010),[36] include worse hit by food insecurity, risk averse to avoid losing the meagre resources at their disposal, earn low income because of poor social amenities and unfavourable government policies.

The high vulnerability of the rural households to poverty necessitated on the need to alleviate their poverty status through among others initiating programmes that will boost their source of livelihoods. In most rural areas of sub Saharan Africa, agriculture is their major vocation and the need to raise the productivity of the 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 & Okewale 2010).[35] In Adamawa state 70.9% of the male-headed households and 82.6% of female headed household are classified as poor (Samuel et al., 2011).[30]

In Nigeria, successive governments have formulated numerous poverty alleviation programmes and policies. Chiefly among them, include Agricultural Development Programmes (ADP), the National Agriculture and Land Development Authority (NALDA), and the Strategic Grains Reserves Programmes (SGRP) (Hussaini, 2014).[40] Despite these numerous poverty alleviation programmes and policies in Nigeria, no significant impact had been recorded on the welfare of the people. The reasons for this include corruption and poor targeting at the poor among the rural populace who were supposed to benefit (Kadurumba et al., 2010).[41]

Most of the research works carried out on issue related to household diversification are relatively broad and consider it from the national and international point of view (Chhetri, 2017;[42] Donye, 2014;[43] Mehta, 2009;[29] Tashkalma et al., 2015;[44] Amurtiya et al., (2016)[45,46] Odoh & Nwido, 2016).[47] Rural non-farm income is usually reinvested in improved agricultural technology. Empirical evidence shows that non-farm income is indeed the main source of investment for raising farm productivity (Igwe et al., 2020).[48] The contribution of non-agricultural activities to household income in the developing world in general and sub-Sahara Africa (SSA) in particular is substantial. Adepoju & Obayelu (2013)[18] observe that local non-farm income contributes between 30 to 40 per cent of rural household incomes in developing world. In Nigeria, studies have shown that non-farm activities account for over 50 percent of rural income (Babatunde & Qaim, 2009;[49] Adefila, 2014).[27]

However, despite the increasing global and national concern of diversifying income to reduce poverty among rural farming households, most rural households dwell in poverty. There also exists a gap in knowing the level of engagement in different livelihood activities by the rural farm households and the reasons for that could it be, because they lack access to sufficient land to make agriculture a viable income strategy or because of market failures for credit and insurance that push them into non-farm activities to diversify their risk and seek sources of liquidity to be used in agriculture? Therefore, in order to formulate effective policies for promoting poverty reduction, it is imperative to assess livelihood diversification strategies as a means to poverty reduction among rural farming households in Adamawa State, Nigeria.

3. Objectives of the Study

The broad objective of the study was to "Examine Livelihood Diversification Strategies as a Means of Poverty Reduction among Rural Farming Households in Adamawa State, Nigeria". The specific objectives were to:

   i.   describe the socio-economic characteristics of the rural farming households,

  ii.   identify the livelihood activities of the respondents,

 iii.   assess the level of diversification of livelihood activities by the respondents,

 iv.   determine the poverty status of the respondents in the study area.

Hypothesis:

H_0 = Diversification of livelihood activities does not affect the poverty status of respondents

4. Methodology

4.1. Study Area

The study was conducted in Adamawa State of Nigeria. Adamawa State is located at the North Eastern part of Nigeria. It lies between Latitudes 7° and 11°N of the equator and between Longitudes 11° and 14° E of the Greenwich Meridian. The state covers a land area of 38,741 square kilometres with the population of 3,175,950 according to 2006 national census. Adamawa State is divided into twenty-one (21) Local Government Areas. The state has tropical climate marked by dry and rainy seasons the rainy season starts in April and ends in October. The dry season starts in November and ends in April. Mean monthly temperature in the state ranges from 26.7°C in the south and 27.82°C in the north eastern part of the state. The mean annual rainfall ranged from 700 mm in the North West to 1600 mm to south east. General mean annual rainfall is less than 1000 mm in the central and north western part of the state. On the other hand, the north eastern strip and the southern part have over 1000 mm. The soils of Adamawa State are classified as ferruginous tropical soil of horizons with abundance of free oxides usually deposited as yellow or red concretion. The vegetation comprises of Southern Guinea savannah, the northern Guinea savannah and Sudan savannah types (National Population Census NPC, 2007;[50] Adebayo, 2020;[51] Adebayo & Zemba, 2020;[52] Ray, 2020;[53] Akosim, et al., 2020).[54]

4.2. Sampling procedure and Sampling Size

Multi stage sampling technique was employed in selecting respondents for the study. Adamawa State is divided into four agricultural zones of Agricultural Development Programme (ADP) namely Mubi Zone (Zone 1), Gombi Zone (Zone 2), Mayo-Belwa Zone (Zone 3) and Guyuk Zone (Zone 4). In the first stage three out of the four agricultural zones was random selected. In the second stage two local government areas were randomly selected from each zone and one block each from local government were randomly selected. The third stage was the random selection of four cells from each block making a total of twenty-four cells. Finally, 305 rural farming household was randomly selected from the twenty-four cells proportionate to the number of the household in each cell.

4.3. Method of Data Collection

The data used for the study was from primary sources. The primary data was collected with the use of structure questionnaire which was administered on rural households in the study area.

4.3.1. Analytical Technique

Both descriptive and inferential statistics were used to achieve the research objectives of the study. Descriptive statistics was used to describe the socioeconomic characteristics of the respondents and their livelihood activities.

The Simpsons Index of Diversity (SID) was used in this study to estimate the degree of income diversification among rural households. The SID takes into consideration both the number of income sources as well how evenly the distributions of the income between the different sources are (Minot, et al., 2006;[55] Joshi, et al.

2004).[56] This reason justifies the choice of the SID as applied in this study over other measures of diversification such as the Herfindahl, Shannon etc. The SID ranges between Zero (0) and One (1). Thus, 0 denotes specialization and 1 the extremity of diversification. The more the SID value is closer to one, the more diversified the household is.

The SID general formula is given as:

$$SID = \sum_{i=1}^{n} P_i^2 \tag{1}$$

Where: SID = Simpson Index of Diversity, n = number of income sources, P_i = Proportion of income coming from the source i, the value of SID ranges from Zero (0) to One (1), however, if there is only one source of income, P_i =1, then SID = 0.

The SID model is expressed as:

$$SID = 1 - \sum_{i=1}^{8} \left[\left(\frac{cpi}{thi}\right)^2 + \left(\frac{livsti}{thi}\right)^2 + \left(\frac{fwi}{thi}\right)^2 + \left(\frac{nfwi}{thi}\right)^2 + \left(\frac{sei}{thi}\right)^2 + \left(\frac{csi}{thi}\right)^2 + \left(\frac{rei}{thi}\right)^2 + \left(\frac{othersi}{thi}\right)^2 \right] \tag{2}$$

Where: cpi = Crops income (Naira)
$livsti$ = Livestock income (Naira)
fwi = farm wage income (Naira)
$nfwi$ = Non-farm wage income (Naira)
sei = self-employment income (Naira)
csi = civil service income (Naira)
rei = remittance income (Naira)
thi = Total household income (Naira)
$othersi$ = other income sources (Naira), such as carpentry, brick laying, barbing, tailoring, butchery, mechanic, grinding, trade and revenue on leasing out land/rent.

4.3.2. Foster, Greer and Thorbecke (FGT) Poverty model

One of the methods that were 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 livelihood diversification. 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: the so-called poverty line. 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-Thorbecke (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)[57] 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 poverty gap and for $\alpha = 2$, we have poverty severity index.

Following Greene (2003)[58] as well as Adigun et al., (2015)[59] general class of a poverty measure which combines these three characteristics of poverty can be written as:

$$P_{\alpha}(y, z) = \frac{1}{n} \sum_{i-1}^{q} \left(\frac{z - y_i}{z} \right)^{\alpha} \qquad (3)$$

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
$\left(\frac{z - y_i}{z} \right)$ = Proportionate shortfall in income below the poverty line
α takes on the value 0, 1, and 2, to determine the type of poverty index.
When $\alpha = 0$, the expression reduces to

$$P_o = \left(\frac{1}{n} \right) q = \left(\frac{q}{n} \right) \qquad (4)$$

Where:
P_o = 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 criticized 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 4) reduces to:

$$P_1 = \left(\frac{1}{n} \right) \sum_{i-1}^{q} \left(\frac{z - y_i}{z} \right) \qquad (5)$$

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 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

$$P_2 = \frac{1}{n} \sum_{i-1}^{q} \left(\frac{z - y_i}{z} \right)^2 \qquad (6)$$

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 (7) is called 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 poverty line. This measure all the three indicators of the poverty stated above.

4.4. Testing of Hypothesis

Hypothesis was tested using Pearson correlation coefficient to measure a relationship between poverty status and livelihood activities. The correlation coefficient is a number that summarizes 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:

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{n} \right] \left[\sum Y^2 - \frac{(\sum Y)^2}{n} \right]}} \qquad (7)$$

Where:
r = Pearson's correlation coefficient
n = number of paired scores
X = number of livelihood activities 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 = Diversification of livelihood activities does not affect poverty status of the respondents
H_1 = Diversification of livelihood activities affects the poverty status of the respondents
The data will indicate which of these opposing hypotheses is most likely to be true. We can thus express this test as:

$$H_0 : \rho = 0$$
$$H_1 : \rho \neq 0$$

Table 1. Socio-economic characteristics of the respondents (N=305)

Socio-economic characteristics	Frequency	Percentage
Age		
20 – 29	40	13.11
30 – 39	108	34.41
40 – 49	85	27.87
50 – 59	35	11.48
60 and above	37	12.13
Mean	**44.77**	
Sex		
Male	272	89.18
Female	33	10.82
Marital Status		
Married	262	85.90
Divorced	13	4.26
Widowed	30	9.84
Educational Level		
Non formal education	62	20.33
Primary education	108	35.41
Secondary education	99	32.46
Tertiary education	36	11.80
Household Size		
1 – 5	119	39.62
6 – 10	130	42.62
11 – 15	38	12.46
16 – 20	12	3.93
21 and above	6	1.97
Mean	**8**	
Primary Occupation		
Farming	205	67.21
Civil servant	57	18.69
Business	43	14.16
Farm Size (Ha)		
<1	15	4.92
1 – 3	235	76.72
4 – 6	56	18.36
Mean	2.33	
Farming Experience		
1 – 10	85	27.87
11 – 20	150	49.18
21 – 30	70	22.95
Access to Credit		
Yes	46	15.08
No	259	84.92

Source: Field Survey 2019

The Pearson product-moment correlation coefficients can values between -1 through 0 to +1. If the value is near ±1, then it is said to be perfect correlation, as one variable increases, the other tends to also increase (if positive) or decreases (if negative). That is if the correlation is positive when one variable increases so does the other. If the correlation is negative, when one variable increases the other variable decreases, if it is zero it means there is no correlation at 95% degree of freedom.

5. Results and Discussion

5.1. Respondent's socio-economic characteristics

The socio-economic characteristic of the respondents here is presented in Table 1. The respondents in this age categories constituted majority (76.39%) with less than 50 years of age with the mean age of 44.77 years. This result agrees with Pur et al. (2016)[60] which shows that people between 20 – 50 years of age are in their economical active age to undertake various livelihood activities.

The results showed that 89.18% of the household heads were male, while 10.82% were female. The finding also agrees with Igwe (2013)[25] which revealed that there are more male-headed households in rural Nigeria than female-headed households. Majority (85.90%) of the respondents were married, 4.26% were divorced and 9.84% were widow/widower. This indicates that married people constitute bulk of household heads in the rural areas. Married people have enormous responsibilities by virtue of their status, which could make them engage in various livelihood activities to generate funds to cater for their families. This agrees with Uchechi and Okewole (2010)[34] and Igwe (2013)[25] who reported that married people could imply larger household size with more mouths to feed. This could aggravate poverty. It also shows that household heads with no formal education constitute 20.33% of the respondents, while the majority (79.67%) had one form of formal education or the other. The result revealed that majority of the respondents were literate and this can enhance the level of diversification of respondents. This agrees with the study conducted by Okoro (2009)[61] and Ume and Ochiake (2016)[62] that education plays a vital role in formal orientation on livelihood activities, a condition which could create better insight into livelihood activities.

The result on household size reveals that, majority (42.62%) were between 6 – 10 people, about 39.02% were household size between 1 – 5 people, whereas those with 12.46%, 3.93% and 1.97% were between 11 – 15 people, 16 – 20 people and 21 and above people in their household respectively. This indication implies that a large household size those mostly engaged in livelihood activities since the needs of each member of the family has to be met. This conclusion is in line with the result of studies carried out by Olawuyi and Rahji (2012);[63] Pur et al. (2016);[60] Asfir, (2016);[64] Tamerat, (2016)[65] and Mentamo and Geda, (2016)[66] who observed family size was positively affecting livelihood diversification. This is due to the presence of large families to practice multiple activities as household labourer to diversify their livelihood strategies.

The results indicate that 67.21% of the respondents were engaged in farming as their primary occupation which includes both arable cropping and rearing of livestock. About 18.69% of the respondents were civil servants only 14.10% were engaged in one business or the other as their primary occupation. This implies that major occupation of most of the household heads in the study area was farming. This finding corroborates with the finding by Babatunde and Qaim (2010);[67] Adetayo (2014),[68] Ike and Uzokwe (2015),[12] and Odoh and Nwibo (2016)[47] who posited that most rural family in Nigeria are engaged in farming as their primary occupation.

The result shows that majority (76.72%) of the respondents had farm size between 1 – 3 hectares, while 18.36% had farm size of 4 – 6 hectares and 4.94% had less than 1 hectare respectively. The mean farm size of the respondents is about 2.33 hectares. This is an indication that the farmers in the study area are small-scale farmers; hence food production will be in subsistence level which could lead them to diversify into non-farm livelihood activities. This finding corroborates with the finding of Oni and Fashoghan (2013)[69] and Fadipe et al. (2014)[70] that majority of rural farmers in Nigeria are small-scale farmers who cultivate less than 5 hectares of land. The result indicates that 49.18% of the respondents had between 11 – 20 years farming experience, while 27.87% and 22.95% had between

Table 2. Distribution of the Respondents According to Nature of Livelihood Diversification

Livelihood Activities	Frequency*	Percentage
Farm Activities		
Arable Cropping	290	95.08
Livestock Sales	154	50.49
Non-farm Activities		
Civil Service & Private Salaried	57	18.69
Wage on Agricultural labour on other people's farm	65	21.31
Revenue from leasing out land / rent	40	13.11
Trade	24	7.87
Carpentry	31	10.16
Tailoring	27	8.82
Remittances income	11	3.61
Grinding	31	10.16
Mechanic	13	4.26
Butchery	18	5.90
Barbing /hair dressing / platting	24	7.87
Brick laying	25	8.20

Source: Field Survey, 2019
*Multiple Responses were allowed, Percentage total greater than 100

Table 3. Distribution of Diversification Index among Rural Farming Households

Diversification Index	Frequency	Percentage
Low (up to 0.5)	167	54.75
Moderate (0.51 – 0.69)	129	42.30
High (0.70 and above)	9	2.95
Total	305	100
Mean	0.51	

Source: Field Survey, 2019

1 – 10 years and 21 – 30 years of farming experience respectively. This indicates that the farming households' heads had farming experience that can help them improve their productivity on the farm by knowing the correct practices. It also revealed that 84.92% have no access to credit facilities and only 15.08% have access to credit. Their lack of access to credit facilities is as a result of them not being in any registered cooperative or farmers association. This study is in agreement with the study conducted by Sekumade and Osundare (2014)[71] who posited that only few in the rural communities in Nigeria had access to credit.

5.2. Distribution of Respondents According to Nature of Livelihood Diversification Activities

Farming household combine a range of activities to make a living since barely any household was found to depend on one activity but used a host of activities and opportunities offered by farm and non-farm sectors. All the farming households reported non-farm income for the survey either in employed activity or participating part-time when not in farming work. The result in Table 2 shows the distribution of rural farming households based on their livelihood activities engaged in and an average annual income on each activity. It was found that on farm activities 95.08% were engaged in arable cropping and 50.49% were engaged in livestock sales.

Also based on those engaged on non-farm activities it was found that 21.31% were engaged in wage on agricultural labour on other people's farm, 18.69% were in civil service or private sector, 13.11% were engaged in leasing out land and renting out properties, 10.16% were engaged in carpentry, 8.82% were engaged in tailoring, 7.87%

were engaged in trading, 7.87%, were engaged in barbing/hair dressing/plaiting, 10.16% were engaged in grinding, 5.90% were engaged in butchery, 8.20% were engaged in brick laying, while 4.26% were engaged in repairs o motor cycle and car (Mechanic) and 3.61% were collecting remittances from the children and relatives. The result showed that agriculture still remains the major source of rural income for rural farming households. This study agrees with study conducted by Babatunde and Qaim (2010)[67] and Oyewole, et al., (2015)[72] who find out that on patterns of livelihood diversification in rural Nigeria arable crop production which is mainly subsistence in nature is the most important single source of income to most rural households.

5.3. Rural Farming Household Degree of Livelihood Diversification

This shows the degree of livelihood diversification in the study area. It looks at how many livelihood activities a rural farming households is engaged in. Table 3 revealed that majority (54.75%) of the rural farming households had low diversification (depend on one sources of livelihood), while 42.30% of the rural farming households moderately diversify (depend on two sources of livelihood) and only 2.95% of rural farming households were highly diversified (more than two sources of livelihood) indicating that the richest households derive the largest income share from off-farm. This is not surprising, because establishing and owning business will require huge amount of capital. It should be noted that diversification in this context of this study means that having other sources of livelihood in addition to your primary occupation. The study shows that rural farming households in the study area do not depend on one source of livelihood. This strategy is adopted to ensure secure livelihood and reduce poverty. Diversification makes smooth flow of income to the household by reducing both predictable and unpredictable fluctuations. Predictable seasonal fluctuations in income can be enhanced by combining enterprises and activities that generate returns during different times of the year. Unpredictable fluctuations are those which create an unexpected loss in income, may be reduced by a diversified portfolio of economic activities (Saha & Bahal, 2014).[73] This result does not agree with the studies conducted by Idowu et al. (2014)[1] and Oyinbo and Olaleye, (2016)[74] which revealed that farming households mostly had moderate diversification of livelihood.

Table 4. Poverty Indices of the Respondents

Poverty Indices	Estimates
Household Food Expenditure	66,621,240.00
Household Non-food Expenditure	76,115,520.00
Total Household Expenditure	142, 736, 760.00
Per Capita Household Expenditure = $\frac{\text{Total household Expenditure}}{\text{Number of Household members}}$	42,983,916.00
Mean Per Capita Household Expenditure	N140,930.93
2/3 Mean Per Capita Household Expenditure (Poverty line)	N93,953.93
1/3 Mean Per Capita Household Expenditure	N46,976.97
Poverty incidence (Po)	0.38
Poverty depth (P1)	0.17
Poverty severity (P2)	0.10
Poor Households	38%
Non Poor Households	62%

Source: Field Survey, 2019

Table 5. Correlation Result of the Relationship between Livelihood Activities and Poverty Status.

Variable		Poverty Status	Livelihood Activities
Poverty Status	Pearson Correlation	1	.540***
	Sig. (2-tailed)		.000
	N	305	305
Livelihood Activities	Sig. (2-tailed)	.000	
	N	305	305

Source: Field Survey, 2019 ***. Correlation is significant at the 0.01 level (2-tailed)

5.4. Poverty Indices of the Rural Farming Households

The value for the poverty measures the poverty incidence (P0), Poverty gap index (P1) and Poverty severity (P2). From Table 4, a relative poverty line of N93,953.90 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 the N93,953.90 was considered non-poor, those with average annual expenditure between N46,976.97 and N93,953.90 were considered moderately poor while those having annual average expenditure less than N46,976.97 were considered very poor. Thus the result of the poverty incidence (Po) is 0.38 which indicate about 38% variability in the poverty of farming households were poor which means 62% of the farming household were not poor. That is out of the 305 rural farming households' interview 115 of them was 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 0.17 indicating the gap between the poor and poverty line was 17%, therefore the poor will require 17% rise in their per capita expenditure to become non-poor which translate into N15,972.17 increment to the per capital expenditure of the poor. The poverty severity index (P2) of the rural farming households was 0.10. This indicates that out of 115 poor households' interview only 30 of those households were extremely poor. This implies that poverty is not severe among poor farming households with about 10% of the farming households constitute 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. This can be compared with the poverty gap index of 0.12 for south-east geographical zone in 2004 reported by Omonona (2010).[75] It is a measure of poverty deficit of the entire population. Poverty severity index was 0.108, this takes into account not only the distance separating the poor from non-poor households but also the inequality among the poor. The result is similar with the findings of Asogwa, Okwoche & umeh (2012)[76] who reported a poverty gap of 0.27 and poverty severity of 0.15 among farming households in Nigeria.

5.5. Hypothesis Test

The hypothesis of the study tested the relationship between livelihood activities and the poverty status of households using Pearson's correlation, and the result is presented in Table 5. The result indicated the variables are positively correlated (r = 0.540) and statistically significant at P<0.01 level of significance, imply that increase in livelihood activities increase the likelihood of being non poor and vice versa. Livelihood diversification is an attempt by individuals and households to find new ways to raise incomes and reduce environmental risk (Seera, 2014).[77] A diverse portfolio of activities contributes to the sustainability of a rural livelihood because it improves its long-run resilience in the face of adverse trends or sudden shocks (Zhao & Barry, 2013).[2] The implication of this finding is that rural household having diverse livelihood sources tends to be less vulnerable to poverty compared to their counterparts with fewer livelihood sources.

6. Conclusion and Recommendation

The study revealed that the majority of rural farming household heads were men; married with the mean age of 44.77 years most of them were engaged in crop production were mostly low diversifiers with the non-farm livelihood activities as additional source of livelihood in relation to farming. In assessing the level of poverty among farming household, the results showed that poverty incidence is 0.38 which indicate about 38% in variability of poverty of households of rural farming household within the poor. The poverty gap indicates that the poor will require 17% rise in their expenditure to become non-poor which translate into ₦15,972.17. The poverty severity index of the farming households shows 10% of the farming households that constitute the poorest among the farming household. This implies that poverty is not severe among poor farming households. The result of the hypothesis indicated that the variables are positively correlated (r = 0.540) and statistically significant at P<0.01 level of significance, imply that increase in livelihood activities increase the likelihood of being non poor and vice versa. Based on the findings of this study the following recommendations were made: Intervention is needed for the female headed households to enable and empower them to participate in different livelihood diversification activities, Government non-governmental organization should establish skills acquisition centers for rural farming households to acquire more skills to diversify more into non-farm activities so that income realized will be channelled back to agriculture, Encouraging the farming households to engage in educational programmes such as adult education and workshops in order to increase their adoption behaviour, managerial skills and policy makers should formulate and ratify appropriate rural development policies and strategies based on existing situation of rural livelihood to boost development of the rural community.

Conflicts of Interest

The authors declare no conflict of interest.

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