Nexus Between Poverty And Livelihood Diversification Among Rural Households In Nigeria: A Multidimensional Poverty Index Approach

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Abstract: Rural households are facing high incidence of poverty which have adversely affected their standard of living, in other to overcome this challenge, people tends to diversify their livelihood source to improve their purchasing power for basic necessities, this study was carried out to analyse the effect of livelihood diversification on the poverty status of rural households in Oyo west Local Government Area, Oyo state, Nigeria, data for this study were obtained through the use of structured questionnaire from 120 diversified farmers using two stages sampling techniques, data were analysed using descriptive, Simpson index of diversification(SID), multidimensional poverty index(MPI) and Tobit regression model, the result of SID showed that there was average level of livelihood diversification in the study area, the result of MPI revealed that the multidimensional headcount ratio was 31%, the incidence of poverty was 50% and the MPI was 0.16, implying that the rural households were deprived in 16% of the total deprivation it could experience overall, the result of Tobit regression revealed that gender (p<0.01), level of diversification (p<0.05) and membership of cooperative society (p<0.1) negatively affect MPI while years of formal education (p<0.1) positively affects MPI, this study recommended that awareness and skills acquisition programmes should be targeted towards women and youths as this will be instrumental in alleviation of poverty, rural household heads were also encouraged to form cooperative societies in other to have access to credit facilities to purchase basic necessities of life, this would go a long way in reducing their poverty level.

Key words: Poverty, Livelihood Diversification, Multidimensional Poverty Index, Tobit regression

Introduction

Poverty is a problem facing every nation of the world as pointed out by (1), most rural households in Africa have been suffering from poverty, figures from FAO reported that over 214 million people in Sub-Saharan Africa (SSA) suffer from chronic hunger (2) , however, in Nigeria, 70% of the population are living below the poverty line and Nigeria has risen from a low poverty level status in the 1960's to become the country with the highest poverty level in the world (3), farming which is a primary source of income has failed to guarantee sufficient livelihood for most farming households in Sub-Sahara African countries (4), this is because the agricultural sector in the Sub-Saharan African countries is highly characterized by decreasing farm sizes, low levels of output per farm, and a high degree of subsistence farming (5), furthermore, agriculture which is the main source of livelihood in Nigeria is afflicted with various problems such as; very small land-holdings, drought, floods, crop loss due to pest and/or disease, poor road status and gaps in market access in rural areas, as a result most of the rural households diversify their livelihoods into off-farm and non-farm activities as a source of reliable income. Diversification is an increase in the number of income sources or the balance among different sources, Livelihood diversification refers to attempts by individuals and households to undertake diverse income generating activities (both on- and off -farm activities) over time in order to secure survival and improve standards of living (6), the two main factors that drive diversification into off-farm activities among farm households in developing countries are broadly classified into "pull factors" and "push factors". (7) Opined that the reasons why a farm household can be pulled into the off-farm sector include higher returns to labour and or capital and the less risky nature of investment in the off-farm sector, (8) found out that the need to increase family income when farm income alone cannot provide sufficient livelihood is a push factor that drives off-farm income diversification. The growing interest in research on rural off-farm and non-farm income in rural economies shows that rural people's livelihoods are derived from diverse sources and are not as overwhelmingly dependent on agriculture as previously assumed (9), the household income effect of livelihood diversification is particularly important for poor farm households, this is because non-farm income provides flows of cash income that can be used to purchase farm inputs and hire labour for agricultural production. (10) Found out that local non-farming income contributes between 30 to 40% of rural household income in the developing world. Furthermore, (11) suggested that diversification is the most important source of poverty

reduction among small scale farmers, though the rural farm households are involved in diverse livelihood activities, it is still unclear whether livelihood diversification is an ideal solution to improve the poverty status of rural households in Nigeria, it is on this background this research is carried out, evidence of the importance of livelihood diversification on multidimensional poverty status is scarce in Nigeria, , available study such as (12) rely on income measure of poverty but poverty is not unidimensional, besides, the study conducted by (13) use multidimensional poverty index to analyse multidimensional poverty and it's determinants in rural Nigeria, apart from the study above, there is no recent and related studies that have analyse the effect of livelihood diversification on multidimensional poverty status of rural households particularly in Oyo state using Simpson index and Multidimensional poverty index to determine the extent of diversification and multidimensional poverty status of rural households, in view of the foregoing, this study seeks to provide answers to the following questions;

   i. What are the socioeconomic characteristics of rural households in the study area?
   ii. What is the extent of livelihood diversification among rural households in the study area?
   iii. What are the multidimensional poverty indices of rural households in the study area?
   iv. What is the effect of livelihood diversification on multidimensional poverty status of rural households in the study area?

Therefore, the main objective of this study is to analyse the nexus between poverty and livelihood diversification among rural households in the study area, the specific objectives of this study are to;

   i. Describe the socioeconomic characteristics of rural households in the study area.
   ii. Determine the extent of livelihood diversification among rural households in the study area.
   iii. Determine the multidimensional poverty status of the rural households in the study area.
   iv. Analyse the effect of livelihood diversification on multidimensional poverty level of the rural households in the study area.

Methodology

Study Area
The study was conducted in Oyo west local government area of Oyo state, Nigeria. Oyo state is an inland state in south-western Nigeria, with its capital at Ibadan. It is bounded in the north by Kwara State, in the east by Osun State, in the south by Ogun State and in the west partly by Ogun State and partly by the Republic of Benin. Oyo West is a Local Government Area in Oyo State, Nigeria. Its headquarters are in the town of Ojongbodu. It has an area of 526 km² and a population of 136,236 at the 2006 census. Agriculture is the main occupation of the people of Oyo west, the climate of Oyo west favours the cultivation of crops like; maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew etc.

Sampling Techniques and Sample Size
A two stage sampling techniques was used for this study, the first stage involved a random selection of six villages from Oyo west Local Government Area, the selected villages were; Ilu aje, Alapata, Idi araba, Kelebe, Fabola and Ajegunle, the second stage involves a purposive selection of 20 diversifying farmers from each of the selected six villages making a total sample size of 120 respondents. Purposive sampling techniques was employed as there was no enough information on sample frame of diversifying farmers in the study area.

Source of Data and Method of Data Collection
The data for this study was from primary source, primary data was collected from diversified rural farmers through the use of questionnaire, the questionnaire was designed to elicit information from the farmers, the data collect were on the socio-economic characteristics such as; age, level of education, gender, years spent in school, household size, etc. data was also collected on the various off-farm and non-farm activities engaged in by the household head, data was also collected on welfare of the farmers households such as; their health, living standard and education.

Analytical Techniques and Model Specification
The data collected from the field was analysed using descriptive techniques and inferential techniques, the descriptive techniques used were; frequency counts, percentages, standard deviation, means, the inferential techniques used were Simpson index of diversification, multidimensional poverty index and Tobit regression.

Simpson Index of Diversification
Simpson index of diversification was used to capture the livelihood diversification of the rural household heads because of its computational simplicity, robustness and wider applicability, following (14), (15) and (16), the Simpson Index of Diversification (SID) is mathematically expressed as;

$$SID = 1 - \sum_{i=1}^{n} p^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

Where;
SID is a measure of income diversification and
P is equal to the proportion of income, and P is expressed mathematically as;

$$P = \left(\frac{mi}{mt}\right)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

Where; n is the number of income sources; m_i is the income from each activity, and m_t is the household's total income.
The value of SID is within the range of 0 and 1.
When SID is less than 0.01 (no diversification), SID is equal to 0.01–0.25 (Low diversification), SID is equal to 0.26–0.50 (Average diversification), SID is greater than or equal to 0.51 (High diversification).

Multidimensional Poverty Index
The Multidimensional Poverty Index has supplanted the Human Poverty Index, which had been included in the annual Human Development Reports since 1997. Like development, poverty is multidimensional. The Multidimensional Poverty Index (MPI) complements money-based measures by considering multiple deprivations and their overlap. The index identifies

deprivations across the same three dimensions as the HDI and shows the number of people who are multidimensionaly poor (suffering deprivations in 33% of weighted indicators) and the number of deprivations with which poor households typically contend. The MPI is composed of three dimensions made up of ten indicators, associated with each indicator is a minimum level of satisfaction, which is based on international consensus (such as the Millennium Development Goals (MDGs). This minimum level of satisfaction is called a deprivation cut-off.

Table 1: Dimension, Indicators threshold and Weight of Multidimensional Poverty Index (MPI)

S/N	Dimensions	Indicators	Weight
1	Health	At least one household member is malnourished	1/6
		Household had one or more children dead	1/6
2	Education	No household member has completed five years of school	1/6
		At least one school-age child is not attending school	1/6
3	Standard of living	Household is connected to the national electricity grid.	1/18
		Household have access to clean drinking water (i.e. boreholes, hand pumped, tap water, covered well, protected spring or rainwater and it is within a distance of 30 minutes' walk (round-trip).	1/18
		Household have access to adequate sanitation (i.e. water closet, pit latrine, pan/ bucket latrine)	1/18
		Household uses "dirty" cooking fuel (dung, wood or charcoal)	1/18
		Floor of home is with a dirt floor (uncemented floor, mud or thatched floor)	1/18
		Household own not more than one of these assets; • Car • Truck or similar motorized vehicle • Bicycle • Motorcycle • Radio • Refrigerator • Telephone or Television • Farm assets • Ownership of home	1/18

Source: Alkire and Santos (2004)

Multidimensional poverty index was used to measure the poverty status of the rural households, following (17), Multidimensional Poverty Index (MPI) is mathematically expressed as;

$$MPI = H \times A \quad \text{………………(3)}$$

Where;
H is the multidimensional headcount ratio
A is the intensity of poverty
The multidimensional head count ratio (H) is expressed as;

$$H = \frac{q}{n} \quad \text{………………(4)}$$

Where;
q is the number of people who are multi-dimensionally poor and
n is the total population.
The intensity of poverty (A) is expressed as;

$$A = \frac{\sum_{i=1}^{n} C_i (K)}{q} \quad \text{……………(5)}$$

Where;
$c_i (k)$ is the censored deprivation score of individual i and
q is the number of people who are multi-dimensionally poor.
A rural household is considered to be multi-dimensionally poor if the sum of the weighted deprivations is 33 per cent or more of possible deprivations.

Tobit Regression Model

The Tobit model is an extension of probit model and it is one of the approaches dealing with the problem of censored data (18). Tobit analysis was employed to determine the effect of livelihood diversification on the poverty status of the rural farming households in the study area. The Tobit model is expressed based on (19):

$$y_i = y_i^* = X_i\beta + e_i \quad \text{………………(6)}$$
$$y_i = 0 \text{ if } y_i^* \leq 0 \quad \text{………………(7)}$$
$$y_i = y_i^* \text{ if } y_i^* > 0 \quad \text{………………(8)}$$
$$i = 1, 2, 3, 4 \ldots\ldots\ldots n$$

Where;
y_i is the observable but censored variable measuring both the probability of being poor and intensity of poverty
y_i^* is the latent variable indicating that poverty intensity may or may not be directly observable. Hence,
Poverty is observed if $y_i^* > 0$ and unobservable if $y_i^* \leq 0$
X_i are set of explanatory variables
The independent variables were specified as follows;
X_1 is the age of the respondents (years)
X_2 is the years of formal education
X_3 is the household size (number of persons)
X_4 is the farming experience (years)
X_5 is the gender of the respondents (1=male, 0=female)
X_6 is the marital status of the respondent (1=married, 0=otherwise)
X_7 is the level of diversification (0=no diversification, 1=low, 2=average, 3=high)

X_8 is the membership of cooperative (years of membership)

X_9 is the family type (1=monogamous, 0=otherwise)

X_{10} ownership of farm (1=own farmland, 0=otherwise)

β vector of Tobit maximum likelihood estimates

e_i is the independently distributed error term

Results and Discussion

Socioeconomic Characteristics

The socioeconomic characteristics of the rural households in the study area was analysed using frequency counts, percentage, mean and standard deviation, table 1 below revealed that majority (62.50%) of the rural households were headed by males while 37.50% of the rural households were headed by females, this is so because most farming activities are carried out by males while females were involved in most processing activities, this may have influence on their poverty level because male have access to productive assets than their female counterparts, most (25.83%) of the rural households heads were within the age bracket of 51-60years, 8.33% were less than 30years, 25% were within 41-50years, 19.17% were within 61-70years while 4.17% were more than 70years, the mean age is approximately 51years, this implies that most of the rural household heads were aged and their level of productivity might have begun to drop, this may have an influence on their poverty level. Majority (88.33%) of the rural household heads were married, 7.50% of the rural household heads were widowers while 4.17% of the rural household heads divorce, most of the rural household were married and this may influence their poverty status, majority (31.67%) of the rural household heads had primary education, 26.67% of the rural household heads had no formal education, 25% of the rural household heads had secondary education while 8.33% of the rural household heads had tertiary education, the result showed that majority of the household heads had formal education and this may affect their poverty level, majority (70.84%) of the rural household heads practices farming as their major occupation, 13.33% of the rural household heads were traders, 8.33% of the rural household heads were civil servants while 7.50% of the rural household heads were into other occupation. Majority (50%) of the rural farmers have 6-9members in their households, 35.83% of the rural farmers have 2-5members in their households, 10% of the rural farmers had 10-13members in their households while 4.17% of the rural farmers have more than 13members in their households the mean household size in the study area was approximately 7members, the result shows that most of the farmers have large household size in other to help them on their farms.

Table 2: socioeconomic characteristics of the respondents

Variable	Frequency	Percentage	Mean	Standard deviation
Gender				
Female	45	37.50	0.623	0.49
Male	75	62.50		
Total	120	100.00		
Age				
<30years	10	8.33	50.48	12.61
30-40years	21	17.50		
41-50years	30	25.00		
51-60 years	31	25.83		
61-70 years	23	19.17		
>70years	5	4.17		
Total	120	100.00		
Marital Status				
Married	106	88.33	1.28	0.78
Widowed	9	7.50		
Divorced	5	4.17		
Total	120	100.00		
Educational Qualification				
None	32	26.67	1.57	1.06
Primary	38	31.67		
Secondary	30	25.00		
Tertiary	10	8.33		
Total	120	100.00		
Major occupation				
Farming	85	70.84	1.55	1.17
Trading	16	13.33		

Services	10	8.33		
Others	9	7.50		
Total	120	100.00		
Household size				
2-5members	43	35.83	6.79	2.93
6-9members	60	50.00		
10-13members	12	10.00		
>13members	5	4.17		
Total	120	100.00		

Source: Field Survey, 2018.

Level of Livelihood Diversification

The Simpson Index of Diversification was used to group the rural farmers into different levels, the result on table 3 below showed that most (48.33%) of the rural farmers have averagely diversified livelihood source, 9.17% of the rural farmers does not diversify their livelihood source, 17.50% of the rural farmers have low diversified livelihood source while 25% of the respondents have a highly diversified livelihood source, this implies that most of the rural farmers diversify their livelihood source and this may influence their level of poverty, the result conform with a similar research carried out by (15) that found out that there is average level of livelihood diversification among Kiri dam residents of Adamawa state.

Table 3: Distribution of livelihood diversification of the respondent

Level of diversification	Frequency	Percentage
No diversification	11.00	9.17
Low diversification	21.00	17.50
Average diversification	58.00	48.33
High diversification	30.00	25.00
Total	120.00	100.00

Source: Field Survey, 2018.

Multidimensional Poverty Indices of Rural Households

Multidimensional poverty index was used to determine the poverty level of rural households in the study area, the result on table 4 showed that the multidimensional headcount ratio is approximately 0.31, this shows that 31% of the rural households in the study area are multi-dimensionally poor, the implication is that 31% of the people are in household with a malnourished person, no clean water, a dirt floor and un-improved sanitation. This result agrees with a similar research carried out by (20) that found out that the incidence of poverty in Oyo state was 29.4%, this is also in line with a study carried out by (12) who found out that 30% of the farm households in Giwa local government area of Kaduna state are poor. The intensity of poverty among rural house is 0.50, this shows that on average the poor rural people are deprived 50% of the weighted indicators, that is they are deprived 50% of electricity, clean water, improved sanitation, etc., this result conform with a research carried out by (20) that found out that the intensity of poverty in Oyo state was at 52.7%. The multidimensional poverty index is 0.16, this implies that the rural households in the study area were deprived in 16% of the total deprivation it could experience overall, this result is in line with a study carried out by (20) that found out that in Oyo state, the multidimensional poverty was 15.5%.

Table 4: Multidimensional poverty indices of rural households

Variable	Value
Multidimensional headcount ratio	0.31
Intensity of poverty	0.50
Multidimensional poverty index	0.16

Source: Field Survey, 2018.

Effect of Livelihood Diversification on Multidimensional Poverty Level

Tobit regression was used to estimate the determinant of multidimensional poverty level of rural households in the study area with emphasis on level of diversification, the result on table 5 below shows that the sigma is significant at 1% level of probability (p<0.01), this shows the model is fit, also the value of probability of F statistics is lower than the critical value of 1% probability level (p<0.01) this shows the overall significance of the model, the pseudo R squared revealed that 84.9% variation in poverty status of the rural households was jointly explained by the

significant variables, the result revealed that years of formal education, gender of household heads, level of diversification and memberships of cooperative society were the significant variables that affect the multidimensional poverty status of rural households in the study area, the coefficient of years of formal education is positive and significant at 10% probability level ($p<0.1$), this implies that as the number of years of formal education increases there is likelihood that the poverty level of the rural households would increases, however, this is contrary to a priori expectations, the result is also contrary to a research carried out by (13) that found out that years of education had a negatively significant relationship with poverty level in rural Nigeria, this may be because majority of the rural households were not taught entrepreneurial skills, the coefficient of gender was negatively significant at 1% probability level ($p<0.01$), this implies that households headed by males are less likely to be poor compared with households headed by females, this may be because female have access to less productive and capital assets than their male counterparts, this result is in line with the findings of (21) and (13). The coefficient of level of diversification is negatively significant at 5% probability level ($p<0.05$), this implies that as the level of diversification increases there is a likelihood that the poverty level of the rural households would decreases, this is so because increase in the number of livelihood activities increases the income source of the rural farming households and this would invariably increase their purchasing power to purchase basic necessities of life such as food, shelter, cloth, education and improved health care services, etc. which would translate to improvement in their standard of living, this result is in line with a similar research carried out by (12), that found out that the number of livelihood diversification activities involved in by rural farming household heads had a negative relationship with their poverty level and it is statistically significant at 1% probability level ($p<0.01$), similarly, (13) found out that that a rise in the wages obtained from non-agricultural activities will reduce the poverty level of rural households by 0.6%. The coefficient of membership of cooperative society is negatively significant at 10% probability level ($p<0.1$), this shows that household heads that belongs to one or more cooperative societies are less likely to be poor compared to their counterparts that does not belong to cooperative societies, this is because cooperative membership popularizes market participation by making farmers cross fertilize ideas, experiences and affords access to sources of information regarding credit facilities, knowledge and skills with a view to improving their livelihood thereby stamping out poverty. However, as expected age has a negative relationship with poverty level though not significant, this implies that as the age of the household head increases there is likelihood that the household would be poor, similarly the coefficient of household size and marital status followed a-priori expectations.

Table 5: Tobit regression estimates of the determinants of poverty

Variable	Coefficient	Standard Error	t-value
Constant	0.584***	0.103	5.680
Age	-0.002	0.002	-1.050
Years of formal education	0.005*	0.003	1.860
Household size	0.015	0.010	1.470
Farming experience	-0.00028	0.002	-0.140
Gender	-0.150***	0.029	-5.100
Marital status	-0.055	0.048	-1.160
Level of diversification	-0.042**	0.018	-2.420
Membership of cooperative society	-0.143*	0.078	-1.830
Family type	0.018	0.026	0.700
Ownership of farmland	-0.036	0.057	-0.640
Diagnostic Test			
Sigma	0.160***	0.017	9.456
Probability > F	0.000		
Pseudo R^2	0.849		
Log pseudo likelihood	47.333		

Source: Field Survey, 2018.
***P< 0.01, **p< 0.05, *p< 0.1

Conclusion and Recommendation

Studying the effect of livelihood diversification on multidimensional poverty status of rural households is important because the off-farm and non-farm livelihood diversification strategies help rural households employ labour hours particularly during the slack period of agricultural activities as a result farm households can increase their source of income which would result to increase in their purchasing power to purchase basic necessities of life which would invariably translate to improvement in their living standards. The result of this study revealed that there is average level of livelihood

diversification among rural households in the study area, based on the findings of this study it can be concluded that 31% of people in the study area live in a household with a malnourished person, no clean water, a dirt floor and un-improved sanitation, etc. the result of the study also revealed that on average the poor rural people are deprived 50% of the weighted indicators, that is they are deprived 50% of electricity, clean water, improved sanitation, etc., also the result concluded that rural households in the study area were deprived in 16% of the total deprivation it could experience overall, the result also concluded that years of formal education, gender, level of diversification and membership of cooperative society significantly influence poverty status of rural households in the study area, gender of the household heads and membership of cooperative society negatively affect the poverty status of rural households, implying that households heads that belong to cooperative societies and headed by males are less likely to be poor than their counterparts, livelihood diversification has statistically and negative effect on the poverty status of the rural households, livelihood diversification by rural households decreases the probability of being poor, this implies that livelihood diversification offers an opportunity for alleviating poverty among the farm households in the study area through numerous streams of income as a result of diversification, the study recommended that awareness and skills acquisition programmes should be targeted towards women and youths as this will be active in alleviation of poverty in the study area because they were the most vulnerable groups. Rural household heads were also encouraged to form cooperative societies in other to have access to credit facilities to purchase basic necessities of life; this would go a long way in reducing their poverty level.

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