



ANALYSIS OF INCOME DIVERSIFICATION AMONG RURAL HOUSEHOLDS IN JOS SOUTH AND RIYOM LOCAL GOVERNMENT AREAS OF PLATEAU STATE, NIGERIA

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ABSTRACT

The study analyzed income diversification among rural households in Jos South and Riyom Local Government Areas of Plateau State, Nigeria. A multi-stage sampling technique was used in selecting 275 respondents for the study. Data were collected using questionnaires administered, 275 respondents out of which 258 were retrieved and analysed using both descriptive and inferential statistics. The results revealed that the mean age of the respondents was 34.5 years, 50.80% were male, majority (60.50%) were married with a mean household size of 5 persons and more than half (56.20%) of the respondents had tertiary education. The results further revealed that the mean farm size of the respondents was 2.27 hectares, 40.3% acquired their land through inheritance, with mean farming experience of 9 years and mean monthly income of ₦53, 922.48. In addition, the results also revealed that, non-farm wage labour (42.60%), farm related employment (40.70%) and non-farm self-employment (16.70) were the primary economic activities of rural households in the study area. The results of Tobit regression analysis of the determinants of income diversification showed that farm size ($P < 0.05$), household size ($P < 0.01$), educational level ($P < 0.05$) and extension contact ($P < 0.05$) significantly influenced income diversification among the rural households. It was concluded that rural households diversified their income sources and income diversification has significant influence on socio-economic variables. It is therefore recommended that policies aimed at improving rural households should strengthen non-farm sectors through the provision of adequate capital, functional institutions and social amenities.

Keywords: Income Diversification, Determinants, Rural Households.

INTRODUCTION

Income diversification has been a long-standing debate in Nigeria, and it is no doubt that Nigeria needs diversification now than ever before, because we are in a time where the reliance on a particular resource is depreciating and there is high uncertainty. Income diversification involves strategies employed to earn cash income in addition to primary economic activity. It refers to an increase in the number of sources of income as well as to ensuring a balance among them. Therefore, a household with two sources of income would be adjudged more diversified than a household with just one source. Also, a household with two income sources, each contributing half of the total, would be more diversified than a household with two sources such that one accounts for 90 percent of the total (Joshi *et al.*, 2003; Ersado, 2003). Income diversification is believed to be a strategy primarily intended to offset risk. Babatunde and Qaim (2019) noted that income diversification is not only a risk management strategy in rural Nigeria, but a means to increase overall income. In the real world, few people collect all their income from one source, hold all their wealth in a single form of asset, or use their assets in one activity. Thus, we can say diversification is the norm. Rural households in many countries worldwide have been found to diversify their income sources thereby allowing



them to spread risk and smooth consumption (Yenesew *et al.*, 2015, Yishihake, 2016). This is necessary in agriculture-based peasant economics because of risk such as crop diseases, price shock, unpredictable rainfall etc. This consequently leads to low farm production which continually traps them in the vicious cycle of poverty. The risk minimization motive of income diversification was justified by Benmehaia and Brabez (2016) that if the profits from agricultural activities are negatively correlated with each other, it is possible to reduce the variability (risk) of total income by diversifying the risk to various non-farm activities.

Plenty of evidence is available that diversification on average contributes around half of all rural incomes in low-income countries (Gautam and Anderson, 2016; Davis *et al.*, 2014). Those farm households with relatively higher income often diversify by choice whereas the majority and poor ones diversify as a necessity (Davis *et al.*, 2014). Diversification possesses positive attributes for poverty and vulnerability reduction. It increases human capital in terms of experience, skills and willingness to innovate. It generates earnings by widening the options open to the household and increases the liquid asset in the form of cash resources that can be flexibly used. It contributes to lessening vulnerability by improving risk and reducing the adverse consumption effects of seasonality. In general, income diversification improves the livelihoods of many rural people (Stifel, 2010). Most development economists, advocating mainstream economic thinking, assumed that farm output growth would create plentiful non-farm income-earning opportunities in the rural economy via linkage effects. However, this assumption is no longer justifiable; for many poor rural families, farming on their own are unable to provide a sufficient means of survival (Davis *et al.*, 2014). Given the potential role of income diversification in stabilizing and improving household income as well as alleviating rural poverty, governments in developing countries have increasingly been interested in promoting diversification. It is well recognized that income diversification plays such an important role in the early stage of rural transformation and income growth. However, patterns and determinants of income diversification may vary across countries, regions and social groups. Specifically the study was conducted to describe the socio-economic characteristics of households, identify and describe the primary economic activities of the rural households and analyse the determinants of income diversification among households and constraints to households' income diversification in the study area.

METHODOLOGY

The Study Area

The study was carried out in Jos South and Riyom Local Government Areas of Plateau State, Nigeria. Jos South Local Government Area lies between Latitudes 8°41'00" - 8°59'00" East and Longitudes 9°36'00" to 9°55'00" North. The LGA has a land area of 510km² with an estimated population of 458,100 in 2022 and annual growth rate of 2.73%. While Riyom Local Government Area is located between Latitudes East and Longitudes 9°22'00"-9°45'00" North. It has an area of 807 km² and an estimated population of 198,554 in 2022. The area is about 1,230m above sea level with average annual rainfall of 1400mm which spans from April to October (NRCRI, 2015). The climate is characterised by two distinct seasons, the rainy season, and the dry season, which falls between November and March. High temperatures are recorded in the months of March – May while the lowest temperatures, popularly called the harmattan months are between December and January. These seasons are suitable for potato production because they meet the required 15°C for tuber formation. Other crops produced in the region include tomato, cabbage, carrots, lettuce, cucumber, green beans and onions. Cereal crops such as maize, sorghum and millet are also grown in the area (Akpan and Okeke-Agul, 2019). The Area is predominantly occupied by the Berom tribe.



Sampling Technique and Sample Size

A multi-stage sampling technique was used in selecting the respondents for the study. In the first stage, three (3) major districts each from Jos South and Riyom Local Government Areas were selected for the study. In the second stage, one (1) village was randomly selected from each district making a total of six (6) villages for the study. In the third stage, a proportion of 10% was used to get the required number of farming household from the list of farming families in the selected villages. This was adopted based on the insight provided by Singh (2006) who suggests that researcher should select 10- 20 percent of the accessible population for the sample. Additionally, Mugenda and Mugenda (2013), states that if the accessible population is less than 10,000, a researcher can select 10-30 percent to be the representative sample size. Therefore, a sample of 275 farming households were used as the sample size for the study as presented in Table 1. The number of farming families was obtained from the list of farmers in Jos South and Riyom Local Government Areas (PSADP, 2020).

Table1: Sampling Procedure and Sample Size

Local Government Areas(LGAS)	Districts	Villages	Sample Frame	Sample Size (10%)
Jos South	Du	Dong	509	51
	Gyel	Tanchol	469	47
	Vwang	Vom	398	40
	Sub total	3	1376	138
Riyom	Ganawuri	Bum	356	36
	Bachi	Wereng	489	49
	Riyom	Tigi	520	52
	Sub total	3	1365	137
Total	6	6	2741	275

Source: Reconnaissance survey, 2022

Method of Data collection

Data for the study were collected with the aid of a well-structured questionnaire comprising both open and close ended questions. Information on households' socio-economic characteristics, household income and determinants of income diversification among households were sought from the respondents.

Method of Data Analysis

The data collected were analysed using descriptive and inferential statistics. Descriptive statistics such as mean, percentages and ranking while Tobit regression was used to analyse the determinants of income diversification. The model specification is presented below;

Model Specification

Tobit regression was used to analyse the determinants of income diversification. The model is specified as:

$$Y = \beta_0 + \beta_1FSZ + \beta_2AGE + \beta_3EHH + \beta_4GEN + \beta_5DFM + \beta_6EXT + \beta_7CRE + \beta_8HHS + \beta_9OCC + \beta_{10}PVS + e_i \quad \dots (1)$$

Where:

Y = The share of income from off-farm activities Y = 0 if the share of income from diversifying to off-farm is $\leq 5\%$, and Y = 1 for which income share from off-farm is greater than 5%.

FSZ = Farm size of household (hectares)



AGE = Age of household head (years)

EHH = Level of education (No. of years spent in school)

GEN = Gender of household head (binary variable: male =1, female = 2)

DFM = Distance of farm from main market (km)

EXT = Number of contacts with extension agents during the last cropping season (Numbers)

CRE = Credit use by farm household (₦)

HHS = Household size (Numbers)

OCC = Occupation (Number of occupations)

PVS = Poverty status of the household head (poor = 1, non- poor = 0)

β_0 = Intercept to be estimated

$\beta_1 - \beta_{10}$ = coefficients to be estimated

e_i = error term

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Respondents

The socio-economic characteristics considered in this study include age, sex, marital Status and household size, educational level, farm size, farming experience, land ownership and monthly income. The results are presented in Table 2. The results revealed that 39.50% and 31.80% of the respondents were within the age brackets of 26-36 and 36-46 years, respectively. The also revealed that 19.00% and 9.70% of the respondents were within the age bracket of 16- 26 and 46years with a mean age 34.5years. This implies that most of the respondents were within their youthful active age of production and were expected to take appropriate decision towards income diversification of farm activities so as to achieve maximum income. This result corroborates with the findings of Babatunde and Qaim (2019) who reported that a household with more economically active adults, other things being equal, will be more likely to have more income sources.

The results also showed that more than half (50.80%) of the respondents were male. This shows that almost equal households were headed by male and female farmers. The result also revealed that majority (60.50%) of the respondents were married with mean household size of 5 persons. Married farmers have additional household responsibilities which will definitely lead to search for additional income in order to meet their domestic responsibilities. This is in similar to the findings of Omotayo (2016) who reported that most (92.50%) of the respondents were married with mean household size of 8 persons. This is also in conformity with Ibekwe *et al.* (2014) who reported that large household size has a positive implication on income diversification because farmers with large household size need additional income to meet family needs.

The result further revealed that more than half (56.20%) of the respondents had tertiary education, 23.60%, 10.50%, 7.0% and 2.70% had secondary primary adult/literacy and no formal education, respectively. This implies that most of the respondents were educated which attributes to the need to diversify their income through application of knowledge and technology to improve their living standards. According to Pingali *et al.* (2005) education assists farmers in reducing the transaction costs for accessing and interpreting information regarding alternative income-generating activities. Additionally, the result in Table 2 showed that majority (75.60%) of the respondents had a farm size of 1.1–2 hectares, while 8.10%, 6.20%, 5.00%, 4.30% and 0.80% of the respondents had farm size of 2.1-3 , 3.1-4 , 4 .1 -5 , 5.1 – 6 and 6.1 – 7 hectares, respectively with a mean farm size of 2.27 hectares. This implies that majority of the respondents were small scale farmers. The implication of this is that farmers were likely to engage in off-farm wage employment and/or off-farm self-employment in order



to cater for their household members, hence diversification of income sources is encouraged by small scale production. This finding agrees with the findings of Fabusoro *et al.* (2014) who reported that about 90 % of Nigeria's food is produced by small scale farmers who cultivate small plots of land of 0.1-2.0 hectares with crude implements and depend on rainfall rather than irrigation system. The result however disagreed with Oluwatusin and Sekumade (2016) who reported a mean farm size of 4 hectares.

The result also showed that more than half (55.80%) of the respondents had a farming experience of 1-7 years, while 19.40% and 15.10% of the respondents had a farming experience of 8-14 years and 22-28 years. Only 8.10% and 1.60% of the respondents had a farming experience of 15-21 and 29-35 years, respectively with a mean farming experience of 9 years. This implies that most of the respondents had reasonable years of experience in farming which is likely to influence their need to diversify their income as agricultural activities are mostly seasonal and the produce are not enough to meet up with their domestic needs. Furthermore, the results revealed that 40.30% and 19% of the respondents acquired their land through inheritance and purchase, while 15.90% and 10.10% of the respondents acquired their land through rent and lease. Only 8.50%, 4.70% and 1.60% of the respondents acquired their land through communal, gift and government, respectively. This implies that the respondents had access to land through different methods of land tenure system. Land is a primary factor of production especially in agriculture, and therefore access to land is a significant factor that helps households to acquire land for agricultural and non-agricultural purposes. The result also revealed that majority (88.80%) of the respondents had a monthly income of ₦1,800-₦101,440 and 6.60% had a monthly income of ₦101,440-₦201,080 while 2.70%, 1.20% and 0.80% of the respondents had a monthly income of ₦300,720-₦400,360, ₦201,080-₦300,720 and 400,360-₦500,000, respectively with a mean monthly income of ₦53,922.48. This implies that most of the respondents had a reasonable monthly income as indicated by the mean of more than ₦50,000. This agrees with the finding of Oluwatusin and Sekumade (2016) who reported farmers minimum and maximum households' income of ₦116,000 and ₦1million and average income of ₦467,252.



Table 2: Socio-Economic Characteristics of the Respondents (n = 258)

Variables	Frequency	Percentage	Mean
Age			
16-26	49	19.0	34.5 years
26-36	102	39.50	
36-46	82	31.80	
46-56	18	7.00	
56-66	7	2.70	
Sex			
Male	127	49.20	
Female	131	50.80	
Marital status			
Single	79	30.60	
Married	156	60.50	
Widowed	12	4.70	
Divorced	11	4.20	
Household size			
1–8	230	89.10	5 persons
8–15	26	10.10	
15–22	2	0.80	
Educational level			
Primary	27	10.50	
Secondary	61	23.60	
Tertiary	145	56.20	
Adult and literacy education	18	7.00	
Non formal education	7	2.70	
Farm size (ha)			
1.1–2	195	75.60	2.27 hectares
2.1 –3	21	8.10	
3.1 –4	16	6.20	
4.1 –5	13	5.00	
5.1 –6	11	4.30	
6.1 –7s	2	0.80	
Farming experience			
1–7	144	55.80	9 years
8–14	50	19.40	
15–21	21	8.10	
22–28	39	15.10	
29–35	4	1.60	
Land ownership			
Inheritance	104	40.30	
Purchased	49	19.00	
Communal	22	8.50	
Rent	41	15.90	
Leased	26	10.00	
Gift	12	4.70	
Government	4	1.60	



Monthly income (₦)

1,800-101,440	229	88.70	53,922.48
101,440-201,080	17	6.60	
201,080-300,720	3	1.20	
300,720-400,360	7	2.70	
400,360-500,000	2	0.80	

Source: Field survey, 2023

Primary Economic Activities of Farming Households

Primary economic activities, particularly farming, form the backbone of rural livelihoods in many regions, including Plateau State, Nigeria. The result in Table 3 showed the various economic activities of the respondents in the study area. The finding revealed that 42.60% of the respondents obtained their income from non-farm wage labour while 40.70% and 16.70% of the respondents obtained their income from farm related employment and non-farm self-employment, respectively. The implication of this finding is that respondents had diversified their economic activities, relying on farm work such as livestock, crops and non-farm activities with the majority earning their income from non -farm wage labour. This could also imply that most of the respondents had different sources of economic activities apart from on farm sources of income which helped respondents to sustain and improve their living standards in the study area. This result is not in consonance with Cropperstedt (2016) and Awoniyi and Salman (2019) who had a higher Non-farm income than farm income in a similar study conducted in South West zone of Nigeria. Oluwatusin and Sekumade (2016) also reported that the majority (62.50%) of the respondents diversified into production of two or more crops as sources of income while 12.5 percent went into production of crops and livestock in order to have more than one sources of income. Also, 20.8 percent of the households diversified their sources of income by growing crops and engaging in off-farm activities. Only 4.2 percent of the respondents went into livestock production and engaged in off-farm activities in order to help diversity its income sources.

Table 3: Distribution of Respondents According to Primary Economic Activities

Income source	Frequency	Percentage
Farm related employment	105	40.70
Non-farm self-employment	43	16.70
Non-farm wage labour	110	42.60
Total	258	100.0

Source: Field survey, 2023

Determinants of Income Diversification

The Tobit regression analysis of the determinants of income diversification among the respondents is presented in Table 4. The results showed that educational level and extension contacts were positive and significant factors ($P < 0.05$) in influencing income diversification among the respondents. This implies that as educational level and contact with extension increases income diversification also tends to increase and vice-versa. This could be attributed to the fact that as educational level increases ideas and innovations and extension contacts increases awareness and knowledge on better ways of diversifying and improving their living standards. This is consistent with Oluwatayo (2019), Ibekwe *et al.* (2014) and Adebayo *et al.* (2017) who all established a positive relationship between farm households' educational level and income diversification. Farm size ($P < 0.01$) and household size were negative and



significant, ($P < 0.01$), which implies that increase in farm size and household size will lead to decreases in livelihood diversification/income diversification. The possible reason could be that households with relatively large farm size would be more concerned and therefore concentrate more of their efforts to increase their farming activities than engage in non-farm work and wage employment. This result is in consonant with the findings of Coster *et al.* (2021) and Sallawu *et al.* (2016) that farmers with relatively larger area of farm land tend to involve more in farming activities than those farmers who had smaller areas of farm land to cultivate. The likelihood ratio (30.37) showed that the data fit the model and the model is statistically significant for analysis.

Table 4: Tobit Regression of Determinants of Income Diversification

Variable	Coefficient	Std. Error	T	p>t
Farm size	-.3968057	.1525615	-2.60	0.010***
Age	.0134055	.0250987	0.53	0.594
Educational level	.5594082	.2449853	2.28	0.023* *
Sex	.1983005	.4053717	0.49	0.625
Distance to farm	.1709665	.1281123	1.33	0.183
Extension contacts	.2351619	.1032517	2.28	0.024**
Credit used	-.0560341	.8209078	-0.07	0.946
Household size	-.2225058	.0650617	-3.42	0.001***
Occupation	-.2145001	.1281285	-1.67	0.095
Poverty status	.0083306	.7104608	0.01	0.991
Constant	3.177202	1.128818	2.81	0.005

Log likelihood = -544.28596

LR chi2(10) = 30.37***

Pseudo R² = 0.0271

*significant at 5% and ***significant at 1%

Constraints to Households' Income Diversification

The result in Table 5 showed the constraints to income diversification among respondents in the study area. The findings revealed that the major constraints faced by the respondents were inadequate infrastructure and unstable electricity which were ranked 1st, respectively. The results also showed inadequate capital and insecurity were ranked 3rd, respectively while climate change, inadequate access to loan and high investment cost ranked 5th, respectively. Others constraints to livelihood diversification among the respondents in the study area were lack of vocational skills and high cost of business premises ranked 8th, respectively. This study is in agreement with the finding of Etuk *et al.* (2018) who reported unstable electricity, inadequate access to loan, inadequate skilled labour and high cost of business premises among the major constraints to livelihood diversification. Khatun and Roy (2017) also reported inadequate credit, inadequate infrastructure, awareness and training and poor asset base as major problems to livelihood diversification.



Table 5: Distribution of Respondents According to their Constraints to Income Diversification

Constraints	*Frequency	Percentage	Rank
Inadequate capital	178	69.0	3 rd
Inadequate infrastructural facilities	179	69.4	1 st
Insecurity	178	69.0	3 rd
Unstable electricity	179	69.4	1 st
High investment cost	175	67.8	5 th
Climate change	175	67.8	5 th
Inadequate access to loan	175	67.8	5 th
Lack of vocational skills	154	59.7	8 th
High cost of business premises	154	59.7	8 th

Source: Field survey, 2023

* Multiple responses

CONCLUSION AND RECOMMENDATIONS

The study concludes that despite farming being the dominant economic activity in the study area, rural households are gradually diversifying their source of income from farm to off farm activities. Educational level, extension contacts, farm size and household size were the major factors influencing income diversification among rural households. Greater economic prospect awaits rural household, if all identified constraints are properly addressed.

Based on the findings of the study, it is recommended that:

- Financial Institutions, Government and its development partners should strive to boost the capital base in rural area by ensuring access to credit and production inputs. Or farmers themselves should place emphasis in developing cooperative bodies. s
- Private, Government and non-governmental organizations (NGOs) and Financial Institutions should carefully draft and implement skill acquisition programmes for rural populace to provide multiple streams of income (income diversification) for the households and prevent rural urban migration.
- It is critical for the Financial Institution, Private and Government to improve the existing social amenities (especially road, market and electricity) in rural areas in order to promote income generation and sustained livelihood.
- Financial Institutions, Policy makers, Private organizations and Government should also intensify its effort at enhancing human capital development through formal education, vocational training and extension programmes for the farmers so as to enlighten them about the benefit of income diversification to improved well-being.

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