Volume 7, Number 2, June, 2024 ISSN (Print): 2651-6144; ISSN (Online): 2651-6365 Website:http://www.jasd.daee.atbu.edu.ng DETERMINANTS OF LIVELIHOOD DIVERSIFICATION AMONG FARMING HOUSEHOLDS IN NIGERIA

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ABSTRACT

The study examined the determinants of livelihood diversification among farming households in Nigeria. Secondary data from the generalized household survey (GHS) 2018/2019 wave 4 was used in for study. The GHS survey used a two-stage stratified sample selection process to generate its data. Descriptive statistics, Herfindahl index, and Tobit regression model were used for data analysis. The result shows that majority (88.49%) of the farming households were headed by male, who were married (86.42%) with a mean household size of 9 persons, mean age of 51 years and mean farm size of 1.2 hectares. About 65.31% of these households had one form of educational attainment or the other and 9.32% belonged to cooperatives, while only 18.07% had access to credit. Majority (98.09%) of the farming households engaged in livelihood activities outside agriculture with a Herfindahl index of 0.36. The Tobit regression result also showed that age, sex, marital status, tertiary level of education, household size, income, and the location of a household were factors that significantly affected the ability of the households to diversify their livelihood activities. In conclusion, the study established that farmers in the research area engaged in livelihood diversification in order to improve their household welfare and therefore recommended that agricultural activities be improved through the provision of new technologies, irrigation and credit facilities. This will bring about increased incomes for the farming households. Thereby, encouraging the farmers to engage more into agricultural activities other than non-farm activities.

Keywords: Activities, Diversification, Farming, Households and Income

INTRODUCTION

Among the many hazards that come with farming as a means of sustenance are changes in the environment, droughts, pests and illnesses, unstable policy, and price swings. Nigeria and other Sub-Saharan African nations experience a greater severity of this issue. Over 70% of the nation's population depend on agriculture for a living which over the years due to its crude and sedentary nature has failed to generate the required income for the farming households (Etuk et al., 2018). Farming households who are involved in the production of crops and livestock have therefore sought for means of escape from vulnerabilities in agriculture by inclining to diversification of their activities in and out of the farm sector (John et al., 2020). Agriculture as the main source of livelihood for most Nigerians comprises of crop production, livestock, forestry, and fishing, where 70% of Nigerian households practice crop farming. In South-south Nigeria 7.3% of households practice fishing whereas 69.3% of households in the Northwest own or raise livestock (Statista, 2021). Livelihood diversification is one of the peculiar characteristics of rural livelihoods. It is said to be the process by which rural families engage in diverse undertakings to survive and enhance their living standard. It is a documented fact that more than 50% of the income of farming communities in the rural areas of developing nations are sourced from non-farm activities (Gautam and Anderson, 2016; John et al., 2020).

According to Mahama and Nkegbe (2021), diversification of livelihood is a prevalent occurrence among homes with several sources of income, which might differ among households with varying socio-economic and geographic characteristics. It could be used for adaptation, survival or as a strategy in the management of risk to stabilize income in the face of livelihood vulnerabilities. Thus, it serves as a way of raising people's standard of living which would in

Volume 7, Number 2, June, 2024

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turn improve the food and nutritional security of farming households. Empirical studies have also shown with consistency that since two thirds of the world's impoverished and food insecure people of low-income countries are characterized by subsistence farming therefore diversification as a livelihood strategy enables farming households to have increased income, increase agricultural production, enhance food security and to cope better with environmental pressures (Gautam *and* Andersen, 2016). In the light of the above assertions, there is the need to investigate the factors influencing farmers' participation in livelihood diversification or livelihood activities as a means of improving their family incomes and providing food for their family members in the face of the current economic hardship being faced in the country.

MATERIALS AND METHODS

The study Area

The study was conducted in Nigeria. Nigeria is a country in West Africa that is roughly 923,768 square kilometers in size. Its boundaries are shared by the Atlantic Ocean and Lake Chad to the south, the Niger Republic to the north, Cameroon to the east, and Benin to the west. Nigeria lies on latitude 10°00' N and longitude of 8°00' E. The average yearly temperature on the plateau is typically between 21°C and 27°C, whereas it is typically higher than 27°C in the inner lowlands. Nigeria has an average yearly temperature of 26.9°C, with monthly averages ranging from 24°C in December and January to 30°C in April. Precipitation averages 1,165.0 mm per year. Nigeria experiences rainfall all year round, with April through October seeing the most significant amounts and November through March seeing the least amount (World Bank, 2021). Worldometer's elaboration of United Nations statistics led to an estimated 221,364,133 people living in Nigeria. The North-Central, North-East, North-West, South-East, South-South, and South-West geopolitical zones make up the regions in the nation. The research made use of secondary data. The necessary variables were taken out of Wave 4 of the Living Standard Measurement Survey-Integrated Survey on Agriculture (LSMS-ISA) with a sample size of 4,881 from the General Household Survey Panel 2018-2019 Data (GHS-Panel).

Model Specifications

Descriptive statistics, herfindahl index and tobit regression model was used for the study.

Herfindahl Index

Herfindahl index (HI) is a popularly used index for measuring economic diversity (Roy and Basu, 2020). It takes into account the sources of revenue as well as their relative magnitude. It is equal to the square of the household's overall income from non-farm sources. It also measures the level of livelihood diversification of households. Equation (1) below shows the model's generic form:

$$D_{ij} = \beta_0 + \beta_i X_i + \mu$$

...(1)

In this case, β_0 is a constant, β_i is the parameter vector, Xi is the vector containing the independent variables, and μ is the error or disturbance term. D is the dependent variable, showing the diversification of household i as measured in the number of activities j.

 $HI = \sum_{i=1}^{n} (S_i^2) \qquad \dots (2)$ In Equation (2), S_i stands for the share of each livelihood activity, *i* is the overall income of the household. The value of HI goes from 0 (indicating a high degree of diversity or a large number of economic activities) to 1 (indicating a low degree of diversity or full specialization). **Tobit Model**

Tobit Model

The Tobit model, also known as the censored regression model, is a model in which only a specific range of values for the dependent variable (the Herfindahl Index) is observed, with some values clustered at a set limit, typically zero. As a result of mapping all negative values to zero, observations from the lower limit are presumably censored. (Adeoye *et al.*, 2019). The mathematical expression of the model is stated in the equation below:

Volume 7, Number 2, June, 2024

... (3)

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Where z_i represents the vector of regressors and β the corresponding vector of parameters, and Yi*'s are the latent variables produced by the classical regression model. It is assumed that the model errors (ε_i) follow an independent, normal distribution.

 $Y_i^* = \beta_0 + \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \beta_4 Z_4 + \beta_5 Z_5 + \beta_6 Z_6 + \beta_7 Z_7 + \beta_8 Z_8 + \beta_9 Z_9 + \beta_{10} Z_{10} + e \qquad \dots (4)$ Where:

 $\begin{aligned} &Y_i^* = \text{Livelihood diversification index (number)} \\ &\beta_{0=} \text{ constant} \\ &Z_1 = \text{Age (years)} \\ &Z_2 = \text{Age square} \\ &Z_3 = \text{Sex (male = 1, female =0)} \\ &Z_4 = \text{household size (number of persons)} \\ &Z_5 = \text{educational status (years)} \\ &Z_6 = \text{marital status (married =1, not married = 0)} \\ &Z_7 = \text{farm size (ha)} \\ &Z_8 = \text{Income (} \\ \hline \\ &Z_9 = \text{membership to cooperative (Yes =1, No = 0)} \\ &Z_{10} = \text{Geopolitical zones (reference/baseline category variable)} \\ &\mu = \text{error term} \end{aligned}$

RESULTS AND DISCUSSION

Socio-economic characteristics of the farming households

Result in Table 1 shows that 28.76% of the respondents who reported diversifying their sources of income were in the 41 - 50 age range, which implies they are in their middle and active age, while 26.16% were within the age range of 51 and 60 with a mean age of 51 years. This revealed that even though a greater percentage of these farmers are still in their productive and active years for those that are middle aged which could enhance diversification, yet there could be a decline in their ability to diversify, that is, they may be limited to one livelihood means because of the aged amongst them. This is because the more aged farmers are, the less productive and active they become which could make them less prone to diversification as opined by Sanni et al. (2016) and Muibat et al. (2016). The study disclosed that a greater percentage of the respondents (88.49%) in the study area were male, while 11.51% were female, showing that the male household heads dominated the study area which could increase chances of livelihood diversification. The result also indicated that 86.42% of the farming households were married, while 13.58% were unmarried. This finding is in congruent with that of Amurtiya et al. (2016) and Sanni et al. (2016), who reported in their findings that households with male and married dominated household heads engaged more in livelihood diversification. Minority of the respondents were people who had no formal education (34.69%) with 34.67% having just primary education, 26.31% with secondary education and only 4.34% with tertiary education, this reveals a higher level of diversification based on their level of education, and this is in agreement with the findings of Oladimeji et al. (2019), who was of the opinion that poor level of education by farming households could result in their inability to embrace improved livelihood strategies and practices, while high level of education is an advantage to livelihood diversification. A greater number of the farming households (49.68%) had a household size that ranged from 6-10 persons with an average household size of 9 persons, implying a large number

Volume 7, Number 2, June, 2024

<u>ISSN (Print): 2651-6144; ISSN (Online): 2651-6365</u><u>Website:http://www.jasd.daee.atbu.edu.ng</u> of household size to perform various livelihood activities as household size can provide labour for a wider range of activities.

This was consistent with the results of Obasi and Enyia (2017), who opined that large household sizes lower the cost of hired labour, guarantee labour availability, increase farm size and supports diversification of livelihood activities. The result also showed that majority (60.40%) of the respondents have farm size that is lower than one hectare with a mean farm size of 1.2 hectares which implies that they are small scale farmers, thereby, encouraging diversified livelihoods to increase household income. Also, from the results, it was shown that majority of the respondents (81.93%) lacked access to credit which implies that the finance needed to expand their farming activities were not available, thus, the need to diversify. This aligns with the results of Sanni *et al.* (2016) who states in their findings that low-income farming households had no access to credit probably because of lack of collateral for credit. From the result, 90.68% of the farming households were not members of a cooperative society which should have been an avenue to enlighten farming households on the benefits of livelihood diversification.

Variables Frequency		Percentage (%)	Mean	
Age (Years)				
≤ 30	270	5.53		
31-40	840	17.21		
41- 50	1,404	28.76	51	
51-60	1,277	26.16		
>60	1,090	22.33		
Sex				
Male	4,319	88.49		
Female	562	11.51		
Marital status				
Unmarried	663	13.58		
Married	4,218	86.42		
Educational Status				
No formal education	1,693	34.69		
Primary education	1,692	34.67		
Secondary education	1,284	26.31		
Tertiary education	212	4.34		
Access to Credit				
Yes	882	18.07		
No	3,999	81.93		
Farm size (Ha)				
<1	2,948	60.40		
1-5	1,749	35.83	1.2	
>5	184	3.77		
Household size				
1-5	1,142	23.40		
6-10	2,425	49.68	9	
>10	1,314	26.92		
Cooperative membership				
Yes	445	9.32		
No	4,426	90.68		
Total	4,881	100		

Table 1: Socio-economic characteristics of the farming households

Source: Author's computation from GHS Data (2018/2019)



Volume 7, Number 2, June, 2024

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Livelihood diversification activities of the farming households

The results of the livelihood activities practiced by the farming households is as shown in Table 2. From the results, the percentage of farming households that engaged in off farm activities, manufacturing of food and forest products, manufacturing of equipment and machineries, repair and construction, trading, transport, other services, and entertainment were 1.91%, 12.85%, 2.34%, 3.08%, 48.62%, 6.43%, 24.67% and 0.14% respectively. Trading had the highest percentage of 48.62%, revealing that the farming households diversified more into trading activities among other activities. Thus, implying that irrespective of the fact that farming households are agriculture oriented, there is an increasing level of livelihood diversification to non-agricultural income generating activities to raise the households' quality of living. The result aligns with the work of Muibat *et al.* (2016). The result also showed that 24.67% of the respondents engaged in other services such as daily paid menial jobs, while 12.85% engaged in the manufacture of food and forest products, thus, revealing that a greater percentage of the respondents engaged in trading, services, and manufacturing of food and forest products. This goes further to agree with Ayantoye *et al.* (2017) findings, who opined that farming households diversified mostly into trading activities and had their income sources from non-farm activities.

Livelihood activities (n=4,881)	Frequency	Percentage
Off farm activities	93	1.91
Manufacturing food and forest products	627	12.85
Equipment and machineries	114	2.34
Repair and construction	149	3.05
Trading	2,373	48.62
Transport	314	6.43
Other services	1,204	24.67
Entertainment	7	0.14

|--|

Source: Author's computation from GHS Data (2018/2019)

Level of livelihood diversification among the farming households

The distribution of livelihood diversification indices of the farming households as obtained from the herfindahl index is as shown in Table 3; this is an indication of the level of livelihood diversification among the farming households. The Herfindahl index (HI) estimates revealed that the non-farm sector (trading, manufacture of food and forest products, and services) is proven to be highly significant to farming households. The herfindahl index result of 0.36 (36%) revealed a high degree of diversification. This implies that as the value of HI moves nearer to zero, the more the households are diversified in their livelihood strategies. This is in congruent with the results of Clement (2014) and John *et al.* (2014), who opined that majority of households to a large extent are involved in some agricultural activities, but derive their livelihood largely from non-farm sources.

Table 3: Level of livelihood diversification of the farming Households

Livelihood Activities (n=4,881	Income	Share	Share ²
Off farm activities	1.59E+07	5.58E-02	3.11E-03
Manufacturing of Food and Forest Products	2.38E+07	8.35E-02	6.97E-03
Manufacturing of Equipment and Machineries	9.07E+06	3.18E-02	1.01E-03
Repair & Construction	8.36E+06	2.93E-02	8.61E-04
Trading	1.60E+08	5.61E-01	3.15E-01
Transport	1.51E+07	5.30E-02	2.81E-03
Other services	5.09E+07	1.79E-01	3.19E-02
Entertainment	1480000	5.19E-03	2.70E-05
Total	2.85E+08	HI	3.62E-01

Source: Author's computation from GHS Data (2018/2019); *HI = Herfindahl Index



Volume 7, Number 2, June, 2024

ISSN (Print): 2651-6144; ISSN (Online): 2651-6365 Website:http://www.jasd.daee.atbu.edu.ng Factors influencing livelihood diversification among the farming households in Nigeria

From the Tobit regression results in Table 4, the probability value of 0.0000 (p<0.01) and log likelihood of 1306.26, demonstrated the model's good fit. It could be seen from Table 4 that the variables that had a positive significant influence on livelihood diversification among farming households include, sex, marital status, tertiary education, and income, while those that had negative significant influence on livelihood diversification were, age, household size, and location. Age of the respondents was discovered to be negatively significant at p<0.1. This implies that as a farming household head advances in age there is going to be decrease in their ability to diversify as the level of productivity is significantly related to age. This is consistent with the research results of Adepoju and Oyewole (2014) and Sanni *et al.* (2016), who suggested that elderly individuals are less active and less open to new agricultural technologies, hence they adopt inefficient production routines and practices, thus implying a decline in livelihood diversification as their age increases.

The result also showed that respondents' sex was positively significant at p<0.1. Thus, implying that the more male headed household the more an increased engagement in livelihood diversification than female headed households. The marital status of the respondents was seen to be positively significant at p < 0.1, thus implying that the probability of being a married household head influenced engagement in livelihood diversification positively and significantly than the unmarried. The implication of this is that as compared to the unmarried, the married household heads have larger households, thus, higher responsibilities that demand higher financial expenditure. Therefore, the need to increase the family income streams to cover households' expenses. This is as opined by Donye et al. (2016), who opined that a larger household size increases the responsibilities of a farming household head to seek for other means of catering for his household instead of relying solely on one livelihood activity. The level of education of the respondents was shown to be positively significant at p < 0.1. This demonstrates that the farming household heads' level of education had a greater impact on their level of engagement in livelihood diversification. This agrees with Donye et al. (2016), who opined that the more educated faming households are, the more likely they are to access and utilize useful livelihood information, thus, bringing about a higher level of livelihood diversification.

However, household size was seen to be negatively significant at p < 0.05, thus, revealing that an increased household size had a declining influence on livelihood diversification. This finding however, contradicts the results of Donye et al. (2016), who opined that, apart from the fact that an increased household size provides labour and other needed support it could also be noted that an increased household increases the responsibilities of a farming household head to seek for other means of catering for his household instead of relying solely on one livelihood activity so as to combat the pressures of household needs (food, clothing, shelter, medical care) and other day-to-day requirements and that of Echebiri et al. (2017), who concluded that increased household size creates more pressure on household food and non-food expenditure which should bring about livelihood diversification. Income of the farming households was shown to be positively significant at p < 0.05, thereby implying that a unit rise in income would bring about a significant and positive increase on livelihood diversification. This is so because the ability to diversify depends primarily on a household's capital which includes money and other assets, also as a household's income increases the tendency to invest into other livelihood activities increases (Adepoju and Oyewole, 2014). The result also showed that geopolitical zones though significant (p < 0.01), yet negatively affect livelihood diversification. Thus, revealing that a household's location could affect its ability to diversify or not. Also, livelihood diversification in the various locations where the farming households' dwell could be dependent on the availability of diverse livelihood activity opportunities in that location.



Volume 7, Number 2, June, 2024

ISSN (Print): 2651-6144; ISSN (Online): 2651-6365 Website:http://www.jasd.daee.atbu.edu.ng Table 4: Factors influencing livelihood diversification among the farming households

Variables	<u>Coefficient</u>	Std. Error	T-value	P> t	
Sex	0.029	0.015	1.86	0.063*	
Age (years)	-0.001	0.001	-1.67	0.095*	
Age square	0.002	0.001	1.94	0.053**	
Marital status	0.025	0.014	1.75	0.080*	
Primary Education	-0.001	0.007	-0.12	0.908	
Secondary	0.003	0.007	0.37	0.710	
Tertiary	0.027	0.014	1.93	0.053*	
Household size	-0.002	0.001	-2.21	0.027**	
Cooperative	0.004	0.010	0.45	0.655	
Farm size (ha)	0.001	0.002	0.49	0.621	
Income (N)	2.58e-09	1.06e-09	2.44	0.015**	
Northeast	-0.027	0.009	-2.95	0.003***	
Northwest	0.009	0.001	0.95	0.345	
Southeast	-0.013	0.010	1.28	0.201	
South-south	-0.034	0.010	-3.48	0.001***	
Southwest	-0.024	0.013	-1.71	0.087*	
Constant	0.637	0.031	20.32	0.000	
Number of observations $= 4,8$	381				
LR chi2(15) = 75.74					
Prob > chi2 = 0.0000					
Log likelihood = 1306.26					
Pseudo $= -0.0299$					

Source: Author's computation from GHS Data (2018/2019) **Legend:** *, **, *** means significance level at 10%, 5% and 1%, respectively.

CONCLUSION AND RECOMMENDATIONS

The study examined the factors that influence livelihood diversification of farming households in Nigeria. The study's findings demonstrated that the farming households participated in a variety of non-farming livelihood activities, which assisted in increasing their family's income. The adoption of supplementary livelihood strategies or income portfolios has a favourable effect on farming households' income, indicating the significance of livelihood diversification in enhancing overall household welfare. Additionally, this study has demonstrated that a variety of factors, including sex, age, marital status, education level, family size, income, and geographical location, influence households' decisions to engage in non-farm activities. Thus, in line with the result that majority of the farming households engage in non-farm livelihood activities, this study recommended that agricultural activities be improved through the introduction of new technologies, irrigation and credit facilities, which will cause subsistence farming to become more commercialized one and, as a result, raise the households' income. Thereby, encouraging the farmers to engage more into agricultural activities other than non-farm activities.

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