NIGERIAN AGRICULTURAL JOURNAL
ISSN: 0300-368X
Volume 53 Number 1, April 2022 Pg. 67-75
Available online at: http://www.ajol.info/index.php/naj
https://www.naj.asn.org.ng

Effect of Financial Inclusion on Livelihood Diversification among Smallholder Farming Households in Oyo State, Nigeria

***Arowolo, A. O., Ibrahim, S. B., Aminu, R. O., Olanrewaju A. E., Ashimiu, S. M. and Kadiri, O. J.**

Department of Agricultural Economics and Farm Management,
Federal University of Agriculture, PMB 2240, Alabata, Abeokuta Nigeria
*Corresponding Author's email: arowoloao@funaab.edu.ng

Abstract
Agricultural production in Nigeria is mainly rain-fed and highly vulnerable to weather fluctuations, which adversely affect rural livelihoods. Diversification of livelihood activities beyond agriculture can be an effective strategy for mitigating the detrimental effects of climate change. The purpose of this study is to examine the effects of financial inclusion on livelihood diversification among the smallholder farming households in Oyo State, Nigeria. Primary data were collected through a well-structured questionnaire administered to 400 respondents who were randomly selected, using a multistage sampling technique. Simpson index with the Ordered logit regression model were used for the analysis. The result from the Simpson index of diversity shows that the smallholder farmers pursued some levels of diversification in their livelihoods activities and earned income from multiple sources, with about one-third being highly diversified. The ordered logit regression shows that the probability of the smallholder farming households diversifying their livelihood activities is strongly influenced by age, gender, marital status, and education of the household head, household size, total area of land cultivated, main livelihood activity, access to credit, and ownership of bank account. Access to credit and owning a bank account positively influenced livelihood diversification. The study recommends that stakeholders should make credit facilities accessible to the farmers to increase their production and revenue, which may influence their level of diversification. The respondents should also be encouraged to open a bank account as this may facilitate their access to loans and other financial benefits.

Keywords: Livelihood diversification, Simpson index, Ordered logit, financial inclusion, Nigeria

Introduction

Nigeria is a typical agriculture-centered economy. The agricultural sector contributed about 63.8% to the country's GDP in 1960, which have significantly declined over the years to an average of about 24% during 2013-2019 (Fowowe, 2020; Oyaniran, 2020). However, despite the significant decline in the share of agriculture in Nigeria's GDP, the sector is still the the second-largest contributor to GDP growth (Varella, 2021) and agriculture remains an important source of livelihood, creating employment and livelihood opportunities for about 60% of the country's labour force (World Bank, 2014). The agriculture sector has not been able to achieve its full potential as the engine for economic growth in the country, due to the sector's declining productivity growth, inadequate government's funding, inadequate rural infrastructure, high level of conflict and insecurity, particularly in the northern parts of the country, insufficiency of farmers access to formal financial services, and high poverty incidence among the agriculture-dependent populations. Also, the rain-fed nature of agricultural production in Nigeria makes the agricultural sector highly vulnerable to weather swings, which coupled with diseases outbreaks and pest infestations adversely affect agricultural output, with negative consequences on agricultural income, food security and rural livelihood (MeheRette, 2009; World Health Organization, 2018). Similarly, Nigeria's agricultural production is mostly done by rural resource-poor smallholder farmers, with limited commercialisation and the use of primitive production techniques, which often results in low yields and poor agricultural income, which exercabates poverty. Therefore, for the rural poor smallholder agricultural households, income from farming alone may no longer become sufficient to live healthy and productive life.

In the quest for survival and improved living conditions, rural resource-poor households built a varied portfolio

of occupations and social support skills through livelihood diversification (Khatun and Roy, 2012). Diversification of livelihoods is a method for reducing the risk of shocks and increasing livelihood security (Neog and Buragohain, 2020). The seasonal nature of agricultural production provides opportunity for the allocation of excess agricultural labour during off-peak agricultural season and periods of weather shocks to non-farm income generating activities, which enhances smallholder agricultural households' income and standard of living and are important means of fostering structural transformation and achieving rural economic growth (Pingali *et al*., 2019).

Financial inclusion defined as the easy access to a wide range of financial services including having a bank account, savings, availability of credit, remittance, insurance, payments and mobile money, that meet people's economic needs at low cost (Allen *et al*., 2016; Suri and Jack, 2016; Zins and Weill, 2016), is a critical factor in economic development (Fungáčová and Weill, 2014). Relative to other economic sectors in Nigeria, the agricultural sector's level of financial exclusion and inability to access formal financial services is high (Fowowe, 2020; National Bureau of Statistics, 2019). Farmers constitute the largest category of financially excluded persons in Nigeria, according to a recent survey, with more than one-third of farmers being financially excluded (EFINA, 2017; Fowowe, 2020). Access to financial services is critical for the development of the rural economy as it increases incomes through productive investment, assists in the creation of both farm and non-farm employment or livelihood opportunities, facilitates investments in basic rural infrastructure, health, and education, and reduces the vulnerability of the poor by assisting them in smoothing their income patterns over time (World Bank, 2008). This study therefore aims at ascertaining whether financial inclusion influences livelihood diversification among smallholder agricultural households in Oyo State, Nigeria.

Methodology

Study area and Data collection

The study was conducted in Oyo State, an inland state in South-western Nigeria, located between 7°1'32.74" - 9°11'7.81" N latitudes and 2°39'59" - 4°34'14.79" E longitudes. It covers an area of approximately 28,454 square kilometers and has an estimated population of 7.8 million people (NBS, 2016) whose main livelihood activity is farming. Its capital city is Ibadan, the third most populous city in the country and formerly the second most populous city in Africa. Oyo State is bounded in the North by Kwara State, in the south by Ogun State and the west partly by Ogun State and partly by the Republic of Benin. Oyo State comprises of thirty-three (33) local government Areas and four (4) agricultural development programme zones (OYSADEP) namely: Ibadan/Ibarapa, Oyo, Ogbomosho, and Saki. A multistage random sampling procedure was employed in the selection of the surveyed respondents. The first stage involved the random selection of Ibadan/Ibarapa zone from the four OYSADEP zones. In stage two, five (5) blocks were chosen randomly from the selected zone. Stage three involved the random selection of four (4) cells from each of the five blocks. The last stage involved the random selection of ten (20) smallholder farming households from each of the cells in the blocks. The sampling procedure gave a total number of 400 smallholder farming households that were sampled for the study, however, 336 households with comprehensive data were utilised in this empirical study estimation. Data was collected with the aid of a well-structured questionnaire and personal interview.

Measurement of financial inclusion

Financial inclusion in this study was measured inline with the Global Findex database's three broad categories of financial inclusion indicators; ownership and use of an account at a formal financial institution, saving behaviour, and borrowing (Demirgüç-Kunt and Klapper, 2013). This Global Findex database classification has equally been adopted in other studies (Fowowe, 2020; Soumare *et al*., 2016). Our first financial inclusion indicator is ownership of a bank account, which measures if an household have a bank account with formal or semiformal institutions like commercial banks, microfinance institutions, cooperative societies. Our second measure of financial inclusion relates to whether the households save money with any formal or semi-formal institutions. The third measurement of financial inclusion relates to borrowing and measures if an household have access to credit from either formal, semi-formal or informal sources. The financial inclusion status of the households is ascertained by attaching value of 1 to each of the financial inclusion indicators for households with positive responses.

Analytical Techniques

Descriptive Statistics such as frequency, percentage, and mean were used to describe the socio-economic characteristics of the smallholder farmers, identify the various forms of financial services available to the smallholder farmers as well as the constraints in the study area.

Simpson Diversification Index was used to measure the diversification status of the households' livelihoods. Although, there are several indicators and indices that could be used to estimate livelihood diversification, simpson diversification index was used because it is simple to compute, robust and widely applicable (Ahmed *et al*., 2018; Khatun and Roy, 2012). The formula for Simpson Diversification Index is given as:

$$SDI = 1 - \sum_{i=1}^{N} P_i^2 \quad \ldots\ldots (1)$$

Where, *SDI* is Simpson Diversification Index, Pi is the proportion of livelihood income source N is the total number of livelihood sources.

The values of SDI derived ranged from 0 and 1, where 0

depicts no diversification (complete specialization), and it approaches 1 as the level of diversification increases. Based on the SDI values, the level of livelihood diversification was defined as:

1. No diversification (SDI = 0)
2. Low level of diversification (SDI = 0.00001 - 0.2500 .
3. Medium level of diversification (SDI=0.2501-0.4500)
4. High level of diversification (SDI= >0.4501).

Ordered Logit Regression Model was used to examine the influence of financial inclusion and other socio-economic factors on livelihood diversification. The ordered logistic regression in accordance with Habib *et al*. (2022) is specified thus:

$$\Pr(Y_i > j) = \frac{\exp(\alpha_j + X_i\beta_j)}{1+[\exp(\alpha_? + X_i\beta_j)]}; \quad j = 0-3 \ \ldots\ldots (2)$$

Where Yi is the dependent variable reflecting the four categories of livelihood diversification by the households.

Yi = 0 if households do not diversify their livelihood activities

Yi = 1 if households have low livelihood diversification

Yi = 2 if households have medium livelihood diversification

Yi = 3 if households have high livelihood diversification

α_j=the intercept term, $\beta_j$is the vector of parameters to be estimated, X_i denotes the independent variables, which are defined in Table 1.

Results and discussion

Households livelihood activities

Table 2 presents the distribution of the sampled households based on the different activities they engage in to secure their livelihood. The results shows that the smallholder farming households diversified their livelihood activities relying on both agricultural and non-agricultural activities to secure their livelihood attributable to the risks and uncertainties associated with agriculture. The identified economic activities were categorised into four including; farming, wage employment, artisan and trading. More than three-quarter (86.9%) of the sampled households engage in farming (including cropping, fishing, livestock and poultry production) as their primary source of livelihood.

Classification of Households by Livelihood Diversification Index

The distribution of the households based on their level of livelihood diversification is presented in Table 3. The table shows that majority (91.7%) of the sampled rural households pursued some extent of diversification in their livelihoods activities and earned income from multiple sources. Only 8.33% of the surveyed households earned income from a single source for their livelihood, about 5.36% fall into the low livelihood diversification category, almost half (49.4%) are moderately diversified and above one third (36.9%) have a high livelihood diversification level.

Determinants of Livelihood Diversification

The empirical estimates (coefficients and marginal effects) obtained from the ordered logit regression model are presented in Tables 4 and 5, respectively. The log likelihood value of -309.7918 and a statistically significant likelihood ratio chi-square of 106.25 ($p<0.01$) indicates that the model is of good fit and the predictor regression coefficients are significantly different from zero. The estimated cut-off points (μ) satisfy the conditions that $\mu_1 < \mu_2 < \mu_3$, which implies that the dependent (livelihood diversification) categories are ranked in an ordered way (Ojo *et al*., 2019). Generally, in symmetry with previous studies (Agyeman *et al*., 2014; Gecho, 2017; Helmy, 2020; Mentamo and Geda, 2016), this study found that the respondents' socio-demographic features, and access to financial services are important determinants of livelihood diversification.

The coefficient of age of household head has been found to have a significant ($p<0.01$) and negative influence on the probability of livelihood diversification. In other words, the multiplicity of livelihood activities the farming households engage in decreases with advancing age. Due to declining productivity, older farmers are more likely to focus on a single income source to cater for their basic needs. The marginal effect of age explains that increase in the age of the household head by one year is associated with a 1.6% reduction in the probability of being highly diversified, and approximately 0.3%, 0.3% and 1% increase in the probability of being in the no, low and medium diversification categories. This result is in line with the findings from similar studies (Asfir, 2016; Kassie *et al*., 2017) in Ethiopia but contrary to the results obtained in Egypt that greater livelihood diversification is likely among the households with older heads (Helmy, 2020).

The coefficient of gender had a negative and significant ($p<0.05$) effect on the probability of livelihood diversification among the rural households in the study area, which implies that the male headed households are more likely to be in the lower category of livelihood diversification compared to their female counterparts. This result is consistent with the findings of other studies in Nigeria (Awotide *et al*., 2012) and in the Western region of Ghana (Agyeman *et al*., 2014) and Egypt (Helmy, 2020) that reported female headed households are more diversifying in their income sources than the male-headed households by engaging in both agricultural and non-agricultural activities. Females, compared to their male counterparts, are believed to be more vulnerable (Helmy, 2020) and are more likely to be poor due to their lack of access to productive resources (Awotide *et al*., 2012) and are thus compeled to engage in a variety of livelihood activities to cater their daily needs. However, some other studies (Ahmed *et al*., 2018; Akaakohol and Aye, 2014; Babatunde and Qaim, 2009; Chuong *et al*., 2015; Demissie and Legesse, 2013; Gecho, 2017)) on the contrary found the extent of livelihood diversification to be higher among the male headed households compared to their female

counterparts. The marginal effects estimate for gender revealed that male headed households are about 15 percentage points less likely to be highly diversified and more likely to be in the no, low and medium diversification categories by about 3, 2 and 9 percentage points, respectively, compared to their female counterparts.

The marital status of the household head had a positive significant ($p<0.01$) relationship with the extent of livelihood diversification. This implies that married people who are still together are more likely to be highly diversified. The marginal effect values show that the probability of a married household head being highly diversified increases by 18.8% while the chance of being not, lowly, or medially diversified decreases by 4.7%, 3.9% and 10.2%, respectively, relative to their single, widowed, or separated counterparts. This could be because married persons tend to have relatively larger households and lots of financial obligations that must be met necessitating the need for diversification. Similar findings were obtained in studies conducted among rural households in Kwara state, Nigeria (Ayantoye *et al*., 2017) as well as in the Volta basin of Ghana (Amevenku *et al*., 2019), that also noted that livelihood diversification could be higher among the married households because marriage is usually accompanied by numerous responsibilities, particularly child care and the payment of bills.

In correlation with the results of many previous studies (Debele and Desta, 2016; Gecho, 2017; Mentamo and Geda, 2016; Toyin and Abbyssiania, 2016), education of the household's head was observed to have a positive significant ($p<0.1$) influence on the likelihood of livelihood diversification. This suggests that households headed by more educated individuals are more likely to fall into the high livelihood diversification category than households with illiterate heads. Other things kept constant, a unit increase in the years of schooling of the household head increases the likelihood of the household being in the highly diversified category by 0.95% and decreases the likelihood of having a no, low or medium livelihood diversification status by 0.2%, 0.2% and 0.6%, respectively. A well-educated household head is more likely to engage in a broader range of livelihood alternatives as education boosts human capital productivity, chance of successful loan application and ensures effective job performance (Danso-Abbeam *et al*., 2020; Debele and Desta, 2016; Gecho, 2017). However, this result contradicts with the result (Ahmed *et al*., 2018) who found that a higher level of education among the household heads had a negative and significant influence on livelihood diversification in rural Bangladesh.

The coefficient of household size have a positive and significant relationship with the possibility of the smallholder farming households diversifying their livelihood activities in congruence with the findings from previous similar studies (Ahmed *et al*., 2018; Echebiri *et al*., 2017; Helmy, 2020). The marginal effect of household size revealed that the likelihood of high livelihood diversification will increase by 4.3% with an additional member in the household. The implication of this result can be explained from two angles. The addition of a dependent age member may compel households to seek alternative means of subsistence in order to meet the growing demands of household members. On the other hand, an additional member of working age may provide additional opportunities for the hoseholds to diversify their income sources and earn a higher income as opined by Ahmed *et al*. (2018).

Primary livelihood activity was also found important and significant ($p<0.05$) in determining livelihood diversification in the study area. It had positive contribution to the likelihood of the smallholders farming households diversifying their livelihood activities. Households whose primary livelihood activity is farming are more likely to diversifying their livelioods and the marginal effect shows a 14.8% increase in the likelihood of these households falling into the high diversification category, and a 4.5%, 3.6% and 6.7% decrease in the likehood of having no, low and medium diverisification status, respectively. Farming in Nigeira is mainly rainfed and associated with several constraints, thus, farmers are forced to engage in diverse activities as coping strategy to improve their livelihood. The coefficient of the total land area cultivated revealed that the likelihood of diversifying livelihood activities is lesser among households who cultivates a large acre of land. This could probably be explained by the fact that the energy and resources needed for diversification would have been expended on ensuring that all the land is efficiently used, hence, the lower probability of diversification into other sources of income. The marginal effect indicates that a unit increase in total area of land cultivated will increase the probability of the households being in the no, low and medium livelihood diversification categories by 8.34%, 7.26%, and 25.25%, respectively but will reduce the probability of being highly diversified by 40.86%. This result is supported by the findings from similar studies (Gecho, 2017; Mentamo and Geda, 2016).

Ownership of bank account positively and significantly influenced the household's likelihood of engaging in different livelihood activities. The marginal effect of own a bank account showed a 2.7%, 2.3%, and 7.9% decreased in the likelihood of an household falling into the no, low and medium livelihood diversification categories respectively. Households who own a bank account have 12.9% increase in the probability of being highly diversified relative to those who do not own a bank account. This implies that household heads will likely increase his financial security by virtue of owning a bank account through increase his knowledge on the various financial services provided by his bank by virtue of being a customer which may be loans, funding, and increased relationship networks. In conformity with the findings from other studies (Debele and Desta, 2016; Mentamo and Geda, 2016; Tizazu *et al*., 2018; Tukela, 2019), access to credit is positively and significantly

associated with the probability of households diversifying their livelihood sources. Accordingly, the marginal effect revealed a 2.7%, 2.3%, and 6.4% reduction in the probability of being in a low and moderately diversified level, and 11.4% increase in the chance of being in the high livelihood diversification category. One major setback to livelihood diversification is finance, thus easy access to credit will give the households the financial backing needed to invest in other sources of income generating activities, thus, improving the living standard of the households. Similar studies that accessed the impact of financial inclusion on livelihood (Amidu *et al*., 2021), poverty (Koomson *et al*., 2020) and agricultural productivity (Fowowe 2020) found that individuals who own accounts, use their accounts to save, have access to credit, have high probability of being employed and earning a higher income (Amidu *et al*., 2021), a lower probability of being poor or being exposed to future poverty (Koomson *et al*., 2020), and incressed productivity (Fowowe, 2020) compared to their counterparts who are not financially included.

Conclusion

This study examined the effect of demographic characteristics of the respondents and financial inclusion indicators on livelihood diversification among smallholders farming households in Oyo, State, Nigeria. The majority of the sampled rural households pursued some extent of diversification in their livelihoods activities and earned income from multiple sources. The primary livelihood actitivty for the majority of the sampled households is farming including cropping, fishing, livestock and poultry production. The diversification of livelihood activities in the study area was found to be positively and significantly driven by marital status and education of the hosehold head, household size, primary livelihood activity, access to credit and ownership of bank acocount, while age, gender of the household head, and total land area cultivated had negative effects. The results call for the intervention of stakeholders in making credit facilities accessible to the smallholder farmers to increase their production and revenue, which may influence their level of diversification and improve their living standard. The respondents should also be encouraged to open a bank account as this may also facilitate their access to loans and other financial benefits.

Table 1: Definition and Summary statistics of independent variables in the ordered logit model

Variable	Definition	Mean	Std. dev.	Min	Max
Socioeconomic characteristics					
Age X_1	Age of the household head (in years)	50.97	11.35	30	83
Gender X_2	Gender of the household head (1 if Male, 0 otherwise)	0.60	0.49	0	1
Marital status X_3	Marital status of the household head (1 if Married, 0 otherwise)	0.64	0.48	0	1
Education X_4	Education of the household head (years of schooling)	11.49	4.96	0	17
Household size X_5	Household size (number of persons in the household)	4.80	1.89	2	10
Dependency ratio X_6	Dependency ratio (Number of dependents aged 0 to 14 and over the age of 65 relative to the total population aged 15 to 64	0.61	0.37	0	2
Total land area cultivated X_7	Total land area cultivated (in hectares)	0.31	0.21	0.06	1.3
Primary livelihood Activity X_8	Primary livelihood activity (1 if farming, 0 otherwise)	0.87	0.34	0	1
Farming experience X_9	Farming experience (in years)	18.28	10.45	3	60
Financial inclusion indicators					
Ownership of bank account X_{10}	Own a bank account (1 if yes, 0 otherwise)	0.50	0.50	0	1
Save money in the bank X_{11}	Save money in bank (1 if yes, 0 otherwise)	0.70	0.46	0	1
Access to credit X_{12}	Access to credit (1 if household have access to credit, 0 otherwise)	0.71	0.46	0	1

Table 2: Distribution of households based on their primary and secondary livelihood activites

	Primary		Secondary	
Livelihood activity	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Farming	292	86.9	46	13.69
Wage employment	18	5.36	108	32.14
Artisan	24	7.14	44	13.10
Trading	2	0.6	114	33.93

Source: Field Survey, 2021

Table 3: Distribution of households based on level of livelihood diversification

SDI range	Frequency	Percentage	Level of diversification
0	28	8.33	No Diversification
0.0001 – 0.2500	18	5.36	Low Diversification
0.2501 – 0.4500	166	49.40	Medium Diversification
>= 0.4501	124	36.90	High Diversification

Source: Field Survey, 2021

Table 4: Ordered logit estimates of the determinants of livelihood diversification

Variables	Coefficient	Standard error	Z	p>/z/
Age	-0.0729***	0.0129	-5.6300	0.0000
Gender	-0.6678**	0.2825	-2.3600	0.0180
Marital status	0.9221***	0.3371	2.7400	0.0060
Education	0.0439*	0.0251	1.7500	0.0800
Household size	0.1984**	0.0924	2.1500	0.0320
Dependency ratio	0.1824	0.3736	0.4900	0.6250
Total land area cultivated	-1.8842***	0.5636	-3.3400	0.0010
Primary livelihood activity	0.7702**	0.3395	2.2700	0.0230
Farming experience	-0.0051	0.0130	-0.3900	0.6940
Ownership of bank account	0.5963***	0.2247	2.6500	0.0080
Save money in the bank	0.1615	0.2393	0.6700	0.5000
Access to credit	0.5513**	0.2478	2.2200	0.0260
μ_1	-4.1863	0.9391		
μ_2	-3.4642	0.9164		
μ_3	-0.4009	0.8900		
Diagnostics statistics				
Number of observations	336			
Log likelihood	-309.7918			
LR $chi^2(12)$	106.25			
Prob > chi^2	0.0000			

*** Significant at 1%; ** Significant at 5%; * Significant at 10%

Source: Field Survey (2021)

Table 5: Marginal effects of Ordered logit estimates

	No diversification		Low diversification		Medium diversification		High diversification	
Variables	**dy/dx**	**Stand. error**	**dy/dx**	**Stand. error**	**dy/dx**	**Stand. error**	**dy/dx**	**Stand. error**
Age	0.0032***	0.0008	0.0028***	0.0008	0.0098***	0.0022	-0.0158***	0.0028
Gender	0.0283**	0.0125	0.0247**	0.0114	0.0942**	0.0432	-0.1472**	0.0627
Marital status	-0.0471**	0.0211	-0.0391**	0.0176	-0.1020***	0.0342	0.1883***	0.0643
Education	-0.0019*	0.0012	-0.0017*	0.0010	-0.0059*	0.0035	0.0095*	0.0054
Household size	-0.0088**	0.0044	-0.0076**	0.0039	-0.0266**	0.0131	0.0430**	0.0201
Dependency ratio	-0.0081	0.0166	-0.0070	0.0144	-0.0245	0.0503	0.0396	0.0810
Total land area cultivated	0.0834***	0.0287	0.0726***	0.0266	0.2525***	0.0838	-0.4086***	0.1218
Primary livelihood activity	-0.0447*	0.0262	-0.0360*	0.0199	-0.067***	0.0200	0.1475***	0.0564
Farming experience	0.0002	0.0006	0.0002	0.0005	0.0007	0.0018	-0.0011	0.0028
Ownership of bank account	-0.0267**	0.0113	-0.0231**	0.0100	-0.0790**	0.0313	0.1287***	0.0481
Save money in the bank	-0.0074	0.0113	-0.0064	0.0098	-0.0208	0.0299	0.0346	0.0506
Access to credit	-0.0273*	0.0143	-0.0231*	0.0123	-0.0636**	0.0262	0.1140**	0.0487

****** Significant at 1%; ** Significant at 5%; * Significant at 10%***

Source: Field Survey (2021)

References

Agyeman, B., Asuming-Brempong, S. and Onumah, E. (2014). Determinants of income diversification of farm households in the Western Region of Ghana. *Quarterly Journal of International Agriculture, 53*(1): 55-72.

Ahmed, M., Bhandari, H., Gordoncillo, P., Quicoy, C. and Carnaje, G. (2018). Factors affecting extent of rural livelihood diversification in selected areas of Bangladesh. *SAARC Journal of Agriculture, 16*(1): 7-21.

Akaakohol, M. and Aye, G. (2014). Diversification and farm household welfare in Makurdi, Benue State, Nigeria. *Development Studies Research, 1*(1): 168-175.

Allen, F., Demirguc-Kunt, A., Klapper, L. and Peria, M. S. M. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation, 27*(C): 1-30.

Amevenku, F., Asravor, R. and Kuwornu, J. (2019). Determinants of livelihood strategies of fishing households in the volta Basin, Ghana. *Cogent Economics & Finance, 7*(1): 1595291.

Amidu, M., Abor, J. Y., Coffie, W. and Akakpo, A. A. (2021). Financial Inclusion, Livelihood Activities, and Stock Market Participation. *Emerging Economy Studies, 7*(1): 23-61.

Asfir, S. (2016). Determinants of rural households livelihood strategies: evidence from Western Ethiopia. *Journal of Economics and Sustainable Development, 7*(15): 103-109.

Awotide, B. A., Awoyemi, T. T., Diagne, A., Kinkingnihoun, F.-M. and Ojehomone, V. (2012). Effect of income diversification on poverty reduction and income inequality in rural Nigeria: Evidence from rice farming households. *OIDA International Journal of Sustainable Development, 5*(10): 65-78.

Ayantoye, K., Amao, J. and Fanifosi, G. (2017). Determinants of livelihood diversification among rural households in Kwara State, Nigeria. *International Journal of Advance Agricultural Research, 5*(2017): 82-88.

Babatunde, R. O. and Qaim, M. (2009). Patterns of income diversification in rural Nigeria: determinants and impacts. *Quarterly Journal of International Agriculture, 48*(4): 305-320.

Chuong, O. N., Thao, N. T. P. and Ha, T. L. Y. (2015). *Rural livelihood diversification in the South Central Coast of Vietnam*. Retrieved from https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/54706/IDL-54706.pdf

Danso-Abbeam, G., Dagunga, G. and Ehiakpor, D. S. (2020). Rural non-farm income diversification: implications on smallholder farmers' welfare and agricultural technology adoption in Ghana. *Heliyon, 6*(11): e05393.

Debele, B. N. and Desta, G. D. (2016). Livelihood diversification: Strategies, determinants and challenges for pastoral and agro-pastoral communities of Bale Zone, Ethiopia. *International Review of Social Sciences and Humanities, 11*(2): 37-51.

Demirgüç-Kunt, A. and Klapper, L. (2013). Measuring financial inclusion: Explaining variation in use of financial services across and within countries. *Brookings Papers on Economic Activity, 2013*(1): 279-340. doi:10.1353/eca.2013.0002

Demissie, A. and Legesse, B. (2013). Determinants of income diversification among rural households: The case of smallholder farmers in Fedis district, Eastern hararghe zone, Ethiopia. *Journal of Development and Agricultural Economics, 5*(3): 120-128.

Echebiri, R. N., Onwusiribe, C. N. and Nwaogu, D. C. (2017). Effect of livelihood diversification on food security status of rural farm households in Abia State Nigeria. *Scientific Paper Series Management, Economic Engineering in Agriculture and Rural Development, 17*(1): 1-8.

EFINA. (2017). "Key findings: access to financial services survey in Nigeria 2016 survey", Lagos, Enhancing Financial Innovation and Access.

Fowowe, B. (2020). The effects of financial inclusion on agricultural productivity in Nigeria. *Journal of Economics and Development, 22*(1): 61-79. doi:10.1108/JED-11-2019-0059

Fungáčová, Z. and Weill, L. (2014). *A view on financial inclusion in Asian countries* (BOFIT Policy Brief 8/2014). B. I. f. E. i. T. Bank of Finland Retrieved from https://helda.helsinki.fi/bof/bitstream/handle/123456789/12748/173611.pdf?sequence=1

Gecho, Y. (2017). Rural farm households' income diversification: The case of Wolaita Zone, Southern Ethiopia. *Social Sciences, 6*(2): 45-56.

Habib, N., Alauddin, M., Cramb, R. and Rankin, P. (2022). A differential analysis for men and women's determinants of livelihood diversification in rural rain-fed region of Pakistan: An ordered logit model (OLOGIT) approach. *Social Sciences & Humanities Open, 5*(1): 100257.

Helmy, I. (2020). *Livelihood diversification strategies: Resisting vulnerability in Egypt* (GLO Discussion Paper, No. 441). E. Global Labor Organization (GLO) Retrieved from http://hdl.handle.net/10419/210455

Kassie, G. W., Kim, S. and Fellizar Jr, F. P. (2017). Determinant factors of livelihood diversification: Evidence from Ethiopia. *Cogent Social Sciences, 3*(1): 1369490.

Khatun, D. and Roy, B. C. (2012). Rural livelihood diversification in West Bengal: determinants and constraints. *Agricultural Economics Research Review, 25*(1): 115-124.

Koomson, I., Villano, R. A. and Hadley, D. (2020). Effect of financial inclusion on poverty and vulnerability to poverty: Evidence using a multidimensional measure of financial inclusion. *Social Indicators Research, 149*(2): 613-639.

MeheRette, E. (2009). *Innovations in insuring the poor: providing weather index and indemnity insurance*

in Ethiopia. 2020 vision for food, agriculture, and the environment (focus 17 brief 8). I. F. P. R. I. (I F P R I) Retrieved from https://ebrary.ifpri.org/digital/collection/p15738coll2/id/26848

Mentamo, M. and Geda, N. R. (2016). Livelihood diversification under severe food insecurity scenario among smallholder farmers in Kadida Gamela District, Southern Ethiopia. *Kontakt, 18*(4): e258-e264.

National Bureau of Statistics. (2016). Population of Nigeria, - National Open Data. Population of Nigeria, 2016.

National Bureau of Statistics. (2019). Selected Banking Sector Data Q3 2019, National Bureau of Statistics, Abuja.

Neog, P. J. and Buragohain, P. P. (2020). Micro-Level Determinants of Livelihood Diversification in The Rural Areas of Tinsukia District of India. *International Journal of Recent Technology and Engineering, 8*(6): 4927-4931.

Ojo, I., Akin-Olagunju, O., Yusuf, W. and Yusuf, S. (2019). Determinants of Vulnerability to Food Insecurity among Rural Households in Ekiti State, Nigeria. *Nigerian Journal of Agricultural Economics, 9*(1): 45-55.

Oyaniran, T. (2020). *State of Agriculture in Nigeria. Report presented at AfCFTA Workshop on Current State of Nigeria Agriculture and Agribusiness Sector*. Retrieved from https://www.pwc.com/ng/en/assets/pdf/afcfta-agribusiness-current-state-nigeria-agriculture-sector.pdf

Pingali, P., Aiyar, A., Abraham, M. and Rahman, A. (2019). Rural livelihood challenges: Moving out of agriculture *Transforming food systems for a rising India* (pp. 47-71): Springer.

Soumare, I., Tchana Tchana, F. and Kengne, T. M. (2016). Analysis of the determinants of financial inclusion in Central and West Africa. *Transnational Corporations Review, 8*(4): 231-249.

Suri, T. and Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science, 354*(6317): 1288-1292.

Tizazu, M. A., Ayele, G. M. and Ogato, G. S. (2018). Determinants of Rural Households Livelihood Diversification Strategies in Kuarit District, West Gojjam Zone of, Amhara Region, Ethiopia. *Int. J. Econ. Behav. Organ, 6*(3): 61.

Toyin, M. E. and Abbyssiania, M. (2016). Income diversification and its determinants among households in Eastern Cape province, South Africa. *Journal of Economics and Behavioral Studies, 8*(6(J)): 19-27.

Tukela, B. (2019). Analysis of livelihood diversification practice to promote rural households food security: The case of Hawassa Zuria District of Sidama Zone, Ethiopia. *Journal of Development and Agricultural Economics, 11*(1): 1-8.

Varella, S. (2021). Distribution of GDP in Nigeria 2020, by sector https://www.statista.com/statistics/1207951/gdp-distribution-across-sectors-in-nigeria

World Bank. (2008). *Rural Finance in Nigeria: Integrating New Approaches* (Report No. 44741-NG). Washington DC, USA: W. Bank Retrieved from https://openknowledge.worldbank.org/handle/10986/8108

World Bank. (2014). *Nigeria Agriculture and Rural Poverty A Policy Note* (Report No. 78364-NG). Retrieved from https://vdocuments.net/report-no-78364-ng-public-disclosure-authorized-nigeria-report-no-78364-ng.html?page=1

World Health Organization. (2018). *The state of food security and nutrition in the world 2018: building climate resilience for food security and nutrition*: Food & Agriculture Org.

Zins, A. and Weill, L. (2016). The determinants of financial inclusion in Africa. *Review of development finance, 6*(1): 46-57.