

Rural livelihood diversification in Nigeria: Implications for labour supply and income generation

A. O. Iraoya*, A. C. Isinika*

**Sokoine University of Agriculture, Tanzania*



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Corresponding author:
iraoyaaustine@gmail.com

Abstract

This study assessed how rural households in Nigeria diversify their livelihoods, using data from the 2015/16 Nigeria General Household Survey. The degree of livelihood diversification was measured using the Simpsons Index of Diversity (SID), and the income shares obtained by the households from their livelihoods was estimated using the mean of income shares approach. Empirical findings of this study indicates that livelihood diversification is becoming the norm among rural households. Although there is a higher labour supply in the agricultural sector, but the households earn a lower mean income from agriculture, and a low share of farm income relative to off-farm income. This suggests that subsistence mode of farming prevails and rural households in Nigeria earn more income from off-farm than from farm livelihoods.

Keywords: livelihood diversification, labour engagement, Nigeria, share of income.

1. Introduction

A common view shared by a number of empirical literatures is that majority of the population in low and lower-middle income countries reside in rural areas, where the agricultural sector remains the single largest employer of labour (Ssozi *et al.*, 2019; Townsend *et al.* 2018; Yeboah and Jayne 2018)

Although Nigeria's rural economy is traditionally agrarian, only a minority of rural households derive income exclusively from farming. Djido and Shiferaw (2018) finds that 82% of rural households in Nigeria diversify their income sources and as much as 69% of the total rural household income in Nigeria is derived from non-farm income.

The Nigerian rural households may have enough reasons to diversify their income. Firstly, factors such as inconsistent government policies, poor processing techniques, poor storage facilities, bad road networks and natural disasters which negatively impact on farmers' productivity, drives income diversification in Nigeria (Msoo and Goodness, 2014). Secondly, Cooke and Jonathan (2016) argued that Nigerian farmers finds it very difficult to access quality agricultural inputs, such as seeds, pesticides, fertilizer and credit needed to scale up their farm operations. Thirdly, the Nigerian labour productivity per worker is about three times higher in the non-farm sector than the farm sector and the non-farm sector boast of higher average income than incomes from the farm sector (Djido and Shiferaw, 2018).

Moreover, given the prevalence of high risk associated with the rural Nigeria smallholder agriculture, the Nigeria rural households diversify their income sources to manage risks associated with agricultural production and imperfect market and as well ensure more rapid income growth. Exacerbating climatic conditions such as erratic rainfall, rising temperatures (Cooke and Jonathan, 2016), over grazing in the far north, desertification, incessant violent clashes between herdsmen and farmers and prevailing Boko Haram insurgency in the North-East (International Crisis Group, 2017) pushes poorer smallholder farmers to seek alternative incomes in the non-farm sector. Rural household income diversification in Nigeria could therefore have a potential correlation with agricultural intensification in the nation.

Livelihood diversification is defined as the "process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living" (Ellis, 1998). Income diversification is sometimes used interchangeable with livelihood diversification in literature. However, income diversification refers to the process by which rural households increase their economic activities by allocating their productive assets to different income generating enterprises (Alobo and Bignebat, 2017). The differences between livelihood diversification and income diversification is that; livelihood diversification includes non-monetary activities as well as income earning activities, hence it is a broader concept than income diversification (Harris-Coble, 2017). An in-depth review of the literature shows that, among variables (income, assets and activities) used to analyze livelihood diversification, income variable stands out. Unlike assets which cannot be valued accurately in the presence of incomplete market and activities which do not truly reflect profitability, income gives a visible outcome of livelihood diversification and a clear interpretation as a welfare outcome (Harris-Coble, 2017; Alobo and Bignebat, 2017).

A wealth of information is found in the current literature on rural household diversification but with increasing inquiry into the effects that livelihood diversification has on rural labour supply. The drivers of livelihood diversification decision have been clearly identified in empirical literature and could be categorized broadly into two: necessity versus choice (Ellis, 2000). While diversification that is driven by necessity results from desperation and may lead the household to end up in a more vulnerable livelihood system, diversification may also stem from the voluntary decision of a household to pursue a wider scope of livelihood options. In this case, a household chooses to diversify not for survival *per se* but also for accumulation (Gautam and Adersen, 2016). However, going by this classification, it might be difficult to clearly identify those who diversify their livelihood for reason of desperation from those who diversify their livelihood by choice.

Rural households could also diversify their livelihoods in many ways and these options could be classified into three: (i) agricultural intensification (using productivity enhancing inputs, mixed cropping, and rearing different kinds of livestock), (ii) non-farm diversification (skill acquisition, self-employment and waged labour) and (iii) migration (Losch *et al.*, 2012; Aloba and Bignebat, 2017) depending on the economic opportunities and constraints they face.

Invariably economic opportunities and constraints are geographically specific but only little attention has been given in the literature to the role of geography in determining rural household livelihood strategies and labour supply especially among Africans who have been termed “a late comer to the process of structural transformation” (Davis *et al.*, 2017). The current study is motivated by this information gap found in the literature. Empirical evidence from the current study will help to inform policy making and foster a balance between focusing on agriculture versus diversifying from agriculture as countries including Nigeria strive to use their scarce resources to meet the sustainable development goals (SDGs). This will avert the problem of “one size fits all policies”.

2. Methodology

2.1. Data

The data used in this study is the third wave of the Nigeria General Household Survey (NGHS) 2015/16. The data was obtained through the World Bank LSMS-ISA website (<http://www.worldbank.org/lsms-isa>). The NGHS is a product of partnership between the National Bureau of Statistics (NBS), the Federal Ministry of Agriculture and Rural Development (FMA&RD), the National Food Reserve Agency (NFRA), the Bill and Melinda Gates Foundation (BMGF), as well as with the World Bank (WB). A multi-stage stratified sampling procedure was used for the Nigeria General Household Panel Survey. This is based on a master sample referred to as the National Integrated Survey of Households (NISH). In the first stage, the National Bureau of Statistics (NBS) selected a master sample of enumeration

areas (EAs) in each Local Government Area (LGA). This LGA master sample comprises 30 EAs that were selected with equal probability within each LGA of the 36 states of Nigeria, and 40 EAs that were selected in each LGA of Abuja (the federal capital territory). Hence, a sum of 23 310 EAs were selected from the 769 LGAs in 36 states of Nigeria and 6 LGAs in Abuja.

In the second stage, 2 220 EAs and then 10 households in each of the 2,220 EAs were selected systematically with equal probability for the general household survey (GHS). In the third stage, a subsample of the GHS which comprises of 500 sample EAs and 5 000 sample households were randomly allocated for the panel survey with probability proportional to size (PPS). The third wave of the NGHS was carried out in two visits (post-planting visit in September – November 2015 and post-harvest visit in February-April 2016). The NGHS is representative of both urban and rural areas but only the rural sample was used for this study. Table 1 provides the final sample size in the Wave 3 of the NGHS.

Table 1: Sampling and Sample Size

	Post-Planting		Post-Harvest		Final Sample	
	Number of EAs	Number of households	Number of EAs	Number of Households	Number of EAs	Number of Households
Urban	159	1479	159	1469	159	1469
Rural	327	3131	327	3112	327	3112
Nationwide	486	4610	486	4581	486	4581

2.2. Methods of Data Analysis

The labour supply of the households was analysed using descriptive statistics. The Mean of Income Shares approach was used to estimate the income shares obtained by the households from different livelihoods while the Simpsons Index of Diversity (SID) was used to estimate the degree of livelihood diversification of the households.

2.2.1. The Mean of Income Shares

The mean of income shares approach is used to disaggregate the total household income into the share of each income source or livelihood in the total household income. The estimation procedures can be expressed as follows;

Let y_{kh} be the income from source k in household h . Then total household income Y_h is the sum of its components such that;

$$Y_h = \sum_{k=1}^k y_{kh} \dots \dots \dots (1)$$

The mean of the household income shares from source k (MS_k) is expressed as;

$$MS_k = \frac{1}{n} \sum_{h=1}^n \frac{y_{kh}}{Y_h} \dots \dots \dots (2)$$

While the Share of the k^{th} source in the mean income of the group of households is expressed as;

$$S_k = \frac{1}{\sum_{h=1}^n Y_h} \sum_{h=1}^n y_{kh} \dots \dots \dots (3)$$

The share of household income from livelihood diversification is used to reflect the importance of off-farm income in farm household's livelihood (Davis *et al.*, 2017; Alobo and Bignebat, 2017).

2.2.2. Simpsons Index of Diversity (SID)

The Simpsons Index of Diversity is generally expressed as;

$$SID = 1 - \sum_{i=1}^n \rho_i^2 \dots \dots \dots (4)$$

Where;

SID = Simpsons Index of Diversity,

n = number of livelihood activities,

ρ_i = proportion of income generated from livelihood i ,

The value of SID ranges from zero (0) to one (1) such that zero (0) denotes specialization, the closer the value is to one, the more diversified the household and SID value of one (1) implies extreme diversification (Ahmed *et al.*, 2018).

In accordance with the methods of Ahmed *et al.*, (2018) and Djido and Shiferaw, (2018), the empirical SID model used in this study is expressed as follows;

$$SID = 1 - \sum_{i=1}^6 \left[\left(\frac{ci}{thi} \right)^2 + \left(\frac{lvsti}{thi} \right)^2 + \left(\frac{wgi}{thi} \right)^2 + \left(\frac{sefei}{thi} \right)^2 + \left(\frac{remi}{thi} \right)^2 + \left(\frac{othi}{thi} \right)^2 \right] \dots \dots \dots (5)$$

Where;

ci = crops income,

Livsti = livestock income,

wgi = wage income,

sei = self-employment income,

remi = remittance income, and

othi = other income sources.

2.3. Results and Discussions

2.3.1. Socio-demographic Profile of the Households

Table 2 presents descriptive statistics of the socio-demographic variables of the rural households. Summary statistics of key variables such as household size shows that the rural household earned on average about ₦97969.32 from on-farm livelihoods while the households earned higher amount of about ₦149253.78 from off-farm livelihoods. The households have a mean of eight members, the household head has about five years of schooling and other household members have about 12 years of formal education. Empirical literature shows that education allows households to overcome barriers to diversification and provides incentives for expansion of livelihood options both within and outside agriculture (Amare and Shiferaw, 2017). It is also asserted that households with high level of education are more likely to diversify their livelihoods than those who are less educated (Alobo and Bignebat, 2017).

Moreover, the asset indicators of the rural households shows that on average the households have a mean of 33 tropical livestock unit and a farm size of about 1.14ha. The community indicators of the households shows that with a relatively long distance to urban center (23.17) and long distance to input market (66.53km), the rural households are exposed to high transaction cost.

Table 2: Selected Descriptive Statistics

Variable	Description	Mean	SD
<i>Income Source</i>			
On-farm livelihood	Total income from crops and livestock	97969.32	1173.12
Off-farm livelihood	All cash income earned from agricultural wage employment, non-agricultural wage employment, self-employment, remittances, and income from any other source, measured in Naira	149253.78	2543.24
Labour Supply	the amount of time the household head spends working either on-farm or off-farm	141.4	42.67

<i>Household characteristics</i>			
Household size	Actual number of household members	7.83	3.60
Gender HH head	Gender of household head (male = 1, female = 0)	0.83	0.38
Age HH head	Age of household head (years)	52.97	14.59
Educ. HH head	Education of household head (years)	5.5	1.19
Edu. Other	Mean years of schooling of household members (years)	12	2.39
<i>Wealth indicators</i>			
Livestock	Livestock (measured in tropical livestock unit, TLU)	33.70	11.93
Total asset	Value of total assets (Naira) per capita	78899.82	190095.74
Farm size	Land holdings (hectares)	1.14	3.33
<i>Community characteristics</i>			
Distance to market	Distance from household location to nearest major market (km)	23.1785	10.77
Distance to town	Distance from household location to nearest urban center (km)	66.5315	12.87

2.3.2. Labour Supply of Rural Households in Nigeria

The labour supply of rural households in Nigeria was measured by using the hours spent in agriculture and off-farm labour activities in the rural households as shown in figure 1. This is in concordance with previous empirical works such as Almeida and Bravo-Ureta (2019), Ahmed and Goodwin, (2016), as well as Mathenge and Tschirley, (2015). According to the results of the analysis, the rural households commit their labour to on-farm as well as off-farm livelihoods. However, a higher share of the labour hours are devoted to on-farm livelihoods. The findings did not concur with the ‘deagrarianization’ theory proposed by Bryceson (2002) and Rigg (2006) wherein they argue that rural livelihoods are becoming delinked from agriculture (Pritchard *et al.*, 2017).

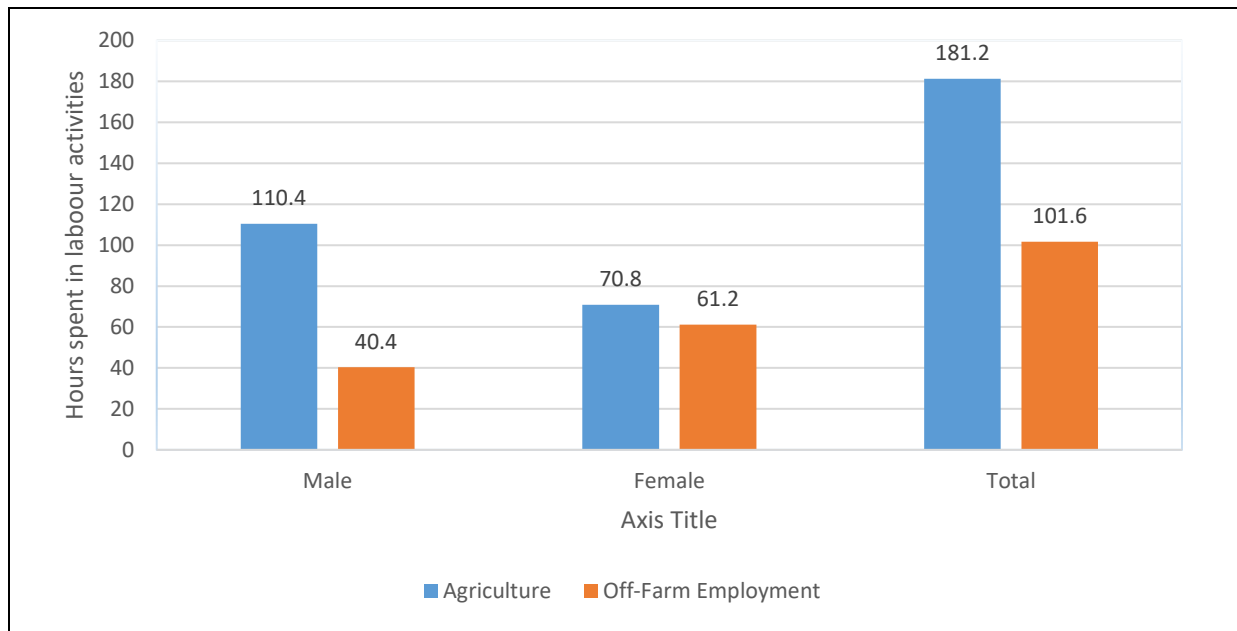


Figure 1: Hours spent in labour activities during the last one month (of interview)

2.3.3. Income Generation from Farm and Off-farm Activities

The labour supply of the household (herein defined as the amount of time spend working on-farm and off-farm) shows that the rural households spend a higher proportion of their time (53%) on agricultural livelihoods as against 47% committed to off-farm livelihoods.

The mean income from the off-farm sector as seen in Table 3 is considerably higher than the mean income from the agriculture sector. Moreover, results of the analysis shows that on average, the rural households earns about ₦97969.32 from farm income livelihoods while they earn a higher amount of ₦149253.78 from off-farm income livelihoods. Also, the share of farm income (40%) is lower than the share of off-farm income (60%) in the total household income. These results substantiate previous findings by Oseni and Winters (2009) and Djido and Shiferaw (2018) that rural households in Nigeria earn more income from off-farm than from farm livelihoods. This could be a reflection of a gradual impact of the ongoing structural transformation of African agriculture and rural income portfolio (Amare and Shiferaw, 2017).

Table 3: Income Generation from Farm and Off-farm Livelihoods

Livelihoods	Diversification Rate (%)	Labour Supply (%)	Mean Income	Share of Income
Agriculture (on-farm diversification)	0.62	0.53	97969.32	0.40
Off-farm	0.87	0.47	149253.78	0.60
Total income			247223.10	
SID (mean degree of diversification)	0.54			

Furthermore, a higher labour supply to agriculture (53%), a lower mean income from agriculture (₦97969.32) and a low share of farm income (47%) relative to off-farm income suggests that subsistence mode of farming prevails in the rural households. Moreover, it confirms the assertion that livelihood diversification does not imply abandoning agriculture (Verkaart *et al.*, 2018). Although there is a declining share of labour in agriculture (Yeboah and Jayne 2018), but rural labour force has not moved out of agriculture as rapidly as expected (Ahmed and Goodwin, 2016). This may be due to constraints in skills and expertise needed in formal employment.

The SID shows that mean degree of livelihood diversification of the rural households is 0.54. This is a relatively high degree because the closer the SID value is to one (1), the more diversified the household's livelihoods. This suggests that most of the households diversified their livelihoods into several options and earned higher amount of income from multiple livelihoods. Similar to these findings of Ahmed *et al.*, (2018) who found high level of livelihoods diversification in rural Bangladesh as well as the findings of Verkaart *et al.*, (2018) with evidence from Kenya.

3. Conclusion

Based on empirical findings, the study concludes that agriculture remains a key labour employing sector in the economic portfolio of rural households in Nigeria, but the households earn a lower mean income from agriculture, and a low share of farm income relative to off-farm income. This suggests that subsistence mode of farming prevails and rural households in Nigeria earn more income from off-farm than from farm livelihoods. From a policy perspective, it can be inferred from the findings of the study that agricultural livelihoods and off-farm livelihoods of rural Nigeria are complementary. Hence, inclusive policies aimed at promoting both sectors should be pursued by policy makers and all stakeholders concerned.

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