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Determinants of livelihood diversification among rural households in Kwara State, Nigeria

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ABSTRACT

The study presented empirical findings on the factors determining livelihood diversification among rural households in Kwara State, Nigeria. The study used multistage random sampling techniques and data were collected using well-structured questionnaire administered on a total sample of 132 households for the analysis. Distributive statistics, Herfindahl index and Tobit regression model were used to analyse the data. Most of the respondents are males. About 68.9% were married with the average age of 41.15%. The study showed that 68.9% of the respondents were married. Respondents who engaged in livelihood diversification had different household sizes; the majority of the respondents (66.7%) had a household ranging from 1–5 with a mean household size of 5. The result further showed that 62.12% of the respondents moderately diversify their means of livelihood, while 34.85% did not diversify. Gender, marital status, poverty status, primary occupation and membership of association were significant factors that influenced livelihood diversification of the rural households in the study area. Therefore, there is need to sensitize rural households to diversify their income source in other to improve their livelihood.

INTRODUCTION

Diversification decisions seem to be driven to a large extent by desperation rather than new opportunities, in particular with regard to migration. The share of income from non-agricultural sources increases considerably and, in fact, drives income growth of the poorest, whose income from agriculture stagnates. While diversification seems to be beneficial to the poor from this static perspective, analysis may also give reasons to be concerned. High non-farm growth rates are achieved through allocating more labour to the local non-farm sector as well as migration and not by improved 'diversification productivity' (Ijaiya et al., 2011). Probably, this does not imply that diversification cannot provide a pathway out of poverty. Overall, there is still a positive correlation between income per capita and diversification – despite the dichotomy of diversification. Yet, there are signs that diversification is increasingly desperation-led, which is why this positive correlation tends to become weaker. Migration seems to be an important driver of local non-farm diversification, most likely through remittances and returning migrants. In addition, the expansion of education has certainly enabled or motivated more individuals to engage in local non-farm activities. These factors may indeed allow some household to escape poverty through diversification (Lay and Schuler, 2007).

The adopted strategies in diversification of income include non-farm income sources, most importantly those obtained from other than unskilled labour. These are associated with increased income and enormous income mobility especially upward earnings mobility. In contrast, those households that have neither access to non-farm

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activities nor sufficient productive non-labour assets to devote themselves entirely to on-farm agricultural production, typically must rely on a low return strategy of complete dependence on the agricultural sector and often find themselves caught in a dynamic stochastic poverty trap (Barrett et al., 2001).

Reardon et al. (2001) suggested that policies aimed at the rural sector which must be oriented towards providing incentives that stimulate households to participate in rural non-farm jobs, as well as the capacity of households to respond to such incentives. The challenge that was encountered was the share of income from non-farm enterprises which tends to be greater among higher-income rural households (International Food Policy Research Institute, IFPRI, 2003). Therefore, programs to develop existing non-farm rural enterprises will be probably directed to assist higher-income households more than the poor. Occupational diversification challenges conventional wisdoms about poverty reduction in rural areas of low income countries (Ellis, 2004).

The problem of diversification decisions seem to be driven to a large extent by desperation rather than new opportunities, in particular with regard to migration (Lay and Schuler, 2007). If trend of these problems continues, the farmers will have less money to carter for their household, and generally remaining in the ultimate vicious cycle of poverty (Olarinde and Kuponiyi, 2005). According to Ibrahim and Umar (2008), the diversification of income source of the farming household heads can help to reduce the risk associated with income from a single source especially a very risky enterprise such as agriculture.

Poor infrastructure will continue to be a disincentive to farmers diversifying in other activities due to high transaction costs coupled with other constraints such as poor assets base, lack of credit facilities, lack of awareness and training (Wanyama et al., 2010; Khatun and Roy, 2012). Babatunde and Quaim (2009) revealed that entry barriers for households disadvantaged to participate in higher-payment off-farm activities need to be overcome and the dire need to promote crop and livestock activities, which currently benefit the poor more than the rich.

Obayelu and Awoyemi (2010) showed that majority of the rural household heads are engaged in farming activities as the major source of income with attendant low income and this is expected to enhance increased access to credit in the rural areas where the majority of the poor reside. Adepoju and Obayelu (2013) showed that non-farm income plays a very important role in augmenting farm-income as almost three-quarters of the respondents adopted a combination of farm and nonfarm strategy. This is an indication that farming alone is not an adequate source of revenue for the rural households. Schwarze (2004) posited that poor households tend to have more income sources and a more evenly distribution of the income between these sources. This has less momentum as most rural households fairly diversified income sources (Babatunde and Quaim, 2009). According to Amare and Belaineh (2013), despite the high level of participation in non/off-farm activities, the contribution of non/off-farm income to total household income is small compared to farm income. Therefore, this study prompted the researchers to identify the determinants of livelihood diversification among rural households in Kwara State and specifically, to identify the pattern of livelihood diversification and determine the level of diversification.

Theoretical framework

Herfindahl index

Measuring the size of firms in relation to the industry and an indicator of the amount of competition those firms is termed Herfindahl index. It is known as the sum of the squares of the market shares of the firms within the industry. Most of the time, it is limited to the largest 50 firms, where the market shares are expressed as fraction. The resultant is equivalent to the average market share, weighted by market share; the result will ranged between 0 and 1, stepping up from large number of very small firms to a single monopolistic producers. A rise in the Herfindahl index always denotes increase of market power and a reduction in competition. Larger firms obtained more weight; this is the major benefit of the Herfindahl index in relationship to such measures as the concentration ratio. Squaring the market share of each firm participating in a market is the most commonly accepted measure of market concentration, and then adding up the resulting numbers. The HHI is expressed as:

$HHI = S_1^2 + S_2^2 + S_3^2 + ... + S_n^2 ...$

Where S_n is the market share of the ith firm. Formula:

$$H = \sum_{i=0}^{N} (S_i 2)$$

Where S_i is the market share of firm, *i* is the market and *N* is the number of firms. Thus, in a market with two firms having a 50% market share each, the Herfindahl index equals 0.502+0.502 = 1/2.

The Herfindahl Index (*H*) ranges from 1/*N* to 1, where *N* is the number of firms in the market. Equivalently, if percentages are used as whole numbers, as in 75 instead of 0.75, the index can range up to 1002, or

10,000.

An *H* below 0.01 (or 100) indicates a highly competitive index, and the value of *H* which fall below 0.15 (or 1,500) indicates an un-concentrated index. The value of *H* which lies between 0.15 and 0.25 (or 1,500 to 2,500) shows moderate concentration, while *H* above 0.25 (above 2,500) indicates high concentration.

There is also a normalised Herfindahl index. Whereas the Herfindahl index ranges from 1/*N* to 1, the normalized Herfindahl index ranges from 0 to 1. It is computed as:

For *N* > 1 and
H* = (H-1/N)/1-1/N for N>1 and
H* = 1 for *N* = 1

METHODOLOGY

Kwara State is located in the north central geographical. Farming is the predominant occupation of residents in Kwara State while some engaged in craft activities such as weaving, blacksmithing, bricklaying, carpentry, welding etc. Fishing is also prominent along the lower River Niger Basin. To facilitate extension delivery, the state is divided into four zones by the Agricultural Development Project (ADP) for administrative purposes. The ADP zones with headquarters located at Kaiama for zone A, Patigi for zone B, while the seat for zones C and D are respectively located at Shao and Igbaja. The study was carried out in Igbaja ADP (Zone D) that comprises of Ifelodun, Irepodun, Oyun, Isin, Oke- Ero, Offa and Ekiti Local Government Areas.

A multistage random sampling technique was used. The first stage involves selection of Igbaja ADP zone due to its agrarian nature. In the second stage, three out of seven LGA was randomly selected. The third stage involve the selection of twelve villages. Therefore, four villages were picked randomly from Irepodun LGA, five villages from Isin LGA and three villages from Offa LGA. Finally, 165 farming households were selected proportionate to the size of ADP household listing in the zone (31 households from Ajase-ipo, 37 from Eise/Ijan, 7 from Omu-Aran, 13 from Oko, 15 from Alla, 12 from Ijara, 9 from Iwo, 10 from Isanlu-Isin, 9 from Owu-Isin, 5 from Balogun, 5 from Igboidun and 12 from Shawo). Due to the inconsistency in the response of the respondents, 132 respondents were used for the study.

The study used descriptive statistics, Herfindahl index, and Tobit regression model for data analysis. The distribution and statistics used frequency distribution and percentage to analyze the socio-economic characteristics of the respondents in the study area. The livelihood activities engaged by the farmers were determined by ensuring that each member of the rural household supply information on the type of activities during the farming season and income generated. Descriptive techniques including computation of mean, standard error and income share were employed to describe the contribution of various livelihood activities of the farm households in the study area. The income diversification was determined by Herfindahl index, and index of livelihood diversification was used to analyse the determinants of income diversification using Tobit regression model. The income diversification index used in the study area was defined as the inverse of the Herfindahl index as adopted from Idowu et al. (2011) thus:

$$D = \left[\sum_{j=1}^{n} S_j^{\alpha}\right] 1(1-\alpha)$$

Where: D is the diversity index, S_j is the share of income from source j, Y_j is the total income from source j, $Y_j = \sum_{j=1}^{n} Y_j$, is total household income from all sources; j = 1,2,3,…n, α is the diversity parameter, such that α ≥ 0 and α ≠ 1, For α = 2, the index D becomes the inverse of the Herfindahl index which is commonly used as income diversification index. The income diversification index that was used in the study is defined as the inverse of the Herfindahl index as follows; $D = \frac{1}{\sum_{j=1}^{n} S_j^{\alpha}}$, Y_i = total income from source, Y = total household income from all source.

Herfindahl index measures the level of income diversification which is the degree of concentration (scatteredness) of households' income into various sources. Households with most diversified income had the largest value of D. Households with less diversified income had the smallest value of D. Least diversified household (those depending on a single income source) D takes on its minimum value of 1. The higher the number of income sources and or the more evenly distributed the income share, the higher the value of D.

Tobit regression model was however employed to ascertain the determinants of livelihood diversification among the respondents in the study area. The Tobit model (Greene, 2003) employed was, $Y = \beta L_i + \mu_i$ μi ~ N(0, σ^2). Where, Y is the livelihood diversification index obtained by dividing the number of livelihood sources employed by all the livelihood sources available in the study area. Thus, the value of the livelihood diversification index ranges between 0–1. Thus, the explanatory variables that was used in the regression analysis were measured as; X_1 = Age (years), X_2 = Sex (1 = male, 0 = female), X_3 = Years of schooling (years), X_4 = Farm income (naira), X_5 = Marital status (1 = married, 0 = otherwise), X_6 = Religion (1 = Christian, 0 = otherwise), X_7 = Household size (number of person per household), X_8 = Poverty status (Poor = 1, non-poor = 0), X_9 = Dependency ratio (number of non-working members/

Table 1. Distribution of respondents by socioeconomic characteristics.

Variables	Frequency	Percentage
Age		
≤ 30	23	17.4
31-40	28	21.2
41-50	41	31.1
51-60	25	18.9
Above 60	15	11.4
Mean age = 41.15		
Gender		
Male	95	71.9
Female	37	28.1
Marital status		
Single	15	11.4
Married	91	68.9
Divorced	10	7.6
Widow	16	12.1
Household size		
1-5	88	66.7
6-10	38	28.8
Above 10	6	3.5
Mean = 5		
Total	**132**	**100.0**

Source: Field Survey, 2015.

total house size), X_{10} = Primary occupation (1 = Farming, Non-farming = 0), X_{11} = Membership of association of the household head (1 = Yes, 2 = No), β = Regression parameters, ε_i = Error term.

RESULTS AND DISCUSSION

From Table 1, it can be implied that most of the respondents are still in their active age. This result is in line with the findings of Ayanda and Ogunsekan (2012) in their study on Farmers' perception of repayment of loans from Bank of Agriculture, Ogun State, Nigeria, where the mean age of the respondents was 39.36 years. Table 1 results are also in line with the findings of Ahmed (2012) in her work titled, 'Income diversification determinants among farming households in Konduga, Borno State, Nigeria', where 66.4% of their respondents are married. Most (66.7%) of the respondents had a household size of 1–5, 28.8% had between 6 and 10 members, 3.5% of the respondents had household size greater than 10. The mean of the household size of the respondents was 5, which indicated that rural households are moderate (Oyekale et al., 2006).

Table 2 reveals that majority of the respondents were involved in trading as their secondary occupation also most of the respondents engaged in more than one occupation to improve their standard of living. The result is in conformity with the findings of Ahmed (2012) in her study where about 42% of his respondents were into trading.

Pattern of livelihood diversification

Pattern of livelihood diversification shows the various income generating activities in the study area. Considering the results presented in Table 3, it can be implied that non-farming activities generate the highest income share in the study area. This findings contradicted the findings of Idowu et al. (2011) who reported that income share derived from labour oriented non-farm income diversification activities by the poor rural farm households was significantly higher ($p<0.05$) and different from what was obtainable among the non-poor farm households, while the non-poor rural farm households derived a significantly larger ($p<0.01$) share (24.86%) of income from non-labour investment than the average poor farm household (21.05%).

Level of livelihood diversification

Distribution of rural household heads by extent of livelihood diversification

From Table 4, it is observed that majority of the

Table 2. Distribution of respondents based on secondary occupation.

Secondary Occupation	Frequency	Percentage
Trading	63	47.7
Vulcanizing	4	3.03
Mechanic	5	3.78
No. Secondary occupation	7	5.3
Driving	11	8.33
Tailoring	7	5.3
Nursing	3	2.27
Furniture	5	3.78
Civil service	3	2.27
Photographer	3	2.27
Scaling	4	3.03
Bricklaying	4	3.03
Ministry	1	0.76
Welding	4	3.03
Labourer	1	0.76
More than one occupation	3	2.27
Painter	1	0.76
Shoemaking	1	0.76
Crafting	1	0.76
Tin can	1	0.16
Total	132	100.0

Source: Field Survey, 2015.

Table 3. Contribution of secondary income sources to rural households income.

Sec source	Frequency	Percentage	Mean income	Income share
Trading	63	47.7	217,961.90	2.56
Vulcanizing	4	3.03	1,490,400	17.54
Mechanic	5	3.78	261,360	3.80
No Sec occupation	7	5.3	-	-
Driving	11	8.33	384,845.45	4.53
Tailoring	7	5.3	174,171.43	2.05
Nursing	3	2.27	652,000	7.67
Furniture	5	3.78	232,000	2.73
Civil Service	3	2.27	247,200	2.91
Photographer	3	2.27	27,333.33	0.32
Scaling	4	3.03	1,437,000	16.91
Bricklaying	4	3.03	330,000	3.88
Clergy	1	0.76	168,000	1.98
Welding	4	3.03	435,600	5.13
Labourer	1	0.76	336,000	3.95
More than one occupation	3	2.27	928,000	10.93
Painter	1	0.76	1,008,000	11.86
Shoemaking	1	0.76	48,000	0.56
Crafting	1	0.76	48,000	0.56
Tincan	1	0.76	72,000	0.85
All Sources	132	100	8,497,872.11	100

Source: Field Survey, 2015.

Table 4. Distribution of rural households heads by extent of livelihood diversification.

Level of diversification	Frequency	Percentage
Not diversified (HI=1)	46	34.85
Moderately diversified (1.0<HI<2.0)	82	62.12
Highly diversified (HI>=2.0)	4	3.03
Total	132	100.0

Source: Field Survey, 2015

Table 5. Determinants of livelihood diversification among the respondents.

Variable	Coefficient	Standard error	T-ratio
Constant	0.8451	0.2503	3.376
Age (X_1)	-0.3802	0.3197	-1.189
Sex (X_2)	0.1621	0.7796	2.079**
Years of schooling (X_3)	-0.1726	0.6974	-0.248
Farm income (X_4)	0.2808	0.4473	0.628
Marital status (X_5)	0.2279	0.9452	2.412**
Religion(X_6)	0.1608	0.6901	0.233
Household size (X_7)	-0.1104	0.1099	-1.004
Poverty status (X_8)	0.1512	0.1714	2.039**
Dependency ratio (X_9)	-0.3782	0.3050	-1.240
Primary occupation (X_{10})	-0.7652	0.8074	-9.477*
Membership of association (X_{11})	-0.5339	0.1852	-2.883*

Source: Field Survey, 2015. *, Significant at 1%; **, significant at 5%.

respondents in the study area had at least two sources of income. This is in line with the findings of Okere and Shittu (2013) who reported that 51.4% of farm households in Odeda Local Government Area, Ogun State, Nigeria was moderately diversified.

Determinants of livelihood diversification among rural household in the study area

Table 5 reveals the determinants of livelihood diversification in the study area using Tobit regression model. Sex, marital status and poverty status of the respondent were positively significant. For sex (X_2), the result implies that increase in male headed households increases the chance of diversifying income. Likewise, an increase in married household head leads to increase in livelihood diversification. Also, a rise in poverty level of the respondents increases the chance of livelihood diversification. Primary Occupation was negatively significant at $p<0.01$. This indicates that an increase in the primary occupation of the respondents decreases their chance of livelihood diversification. Finally, increase in membership of organisation reduces the probability of the respondents' livelihood diversification. This is in line with Oluwatayo (2009) who stated that the major determinants of livelihood diversification were gender, household size, years of formal education, poverty status, income of the respondents and primary occupation.

CONCLUSION AND RECOMMENDATION

Conclusively, it was observed from the study that male were more involved in income diversification than female respondents in the study area. Majority of the respondents were married, educated and were between the ages of 41-50 years. Most households in the study area diversified their means of livelihood (that is, engaged in multiple income generated activities) to support their main income source. The determinants of livelihood diversification that were significant, had a positive coefficient were sex, farm income, marital status, religion, poverty status which implies that as these determinants increase, the higher the probability of livelihood diversification while primary occupation and membership of association were significant but had negative coefficient. Therefore, this study suggests that effort should be geared towards improving income diversification of the respondents as this will boost the livelihood of the rural dwellers.

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