

## Analysis of Income Diversification Strategies among Farm Households in Oyo State

Oyewole, S. O.\* Adepoju, S. O. Akintola, A. L.

Forestry Research Institute of Nigeria, Federal Ministry of Environment, Forest Hill, Jericho, Ibadan, Nigeria

\*Corresponding e-mail: shola4delord@yahoo.com

### Abstract

Diversification of income sources is considered as a desirable option to augment income among small scale farmers. This study evaluates the income diversification among farm households in Oyo State of Nigeria. A multi-stage sampling technique was used to select 280 rural households. The data collected were analysed using diversity index and Tobit regression analysis. The results showed that all the respondents participated in arable farming and this accounts for 28.29 percent of the total income. 57.85 percent participated in tree crop income and this accounts for 11.95 percent of the total income, 60.36 percent of the households engaged in non-farm income and it accounts for 19.93 percent of the total income. The results of Tobit regression showed that education, household size, access to credit and extension contact were the factors increasing income diversification among the rural households in the study area. The study revealed that agriculture remains the major source of income among the respondents. Therefore, the study recommends improvement of agricultural activities through the distribution of agricultural inputs such as improved seeds, fertilizers and better extension services delivery in order to boost agricultural production.

**Keywords:** Income diversification, Diversity index, Rural Household, Tobit regression,

### Introduction

Income diversification has significant influence on small-holder farmers. It could enhance the viability of small farm agriculture, particularly in the context of the on-going process of globalization. It is contended that viability of small farms can be improved through diversification of agriculture into higher-value crops and those whose consumer demand is high (Joshi *et al.*, 2006). In addition, the interaction of off-farm, crop and livestock income-generating activities are perceived to augment total incomes levels. Farmers adopt different farm enterprises to achieve better incomes and improved standards of living.

Diversification has been analysed as a rational response by households to lack of opportunities for specialization, and was initially considered not the most desirable option. However, recent studies indicate that rather than promoting specialization within existing portfolios, upgrading them to augmenting income could be more realistic and relevant for poverty reduction and food security (Ellis and Freeman, 2005). A lot of literatures on livelihood diversification across the developing world have pointed to the increasing role farm income diversification plays in reducing food insecurity.

Despite the growing importance of farm and off-farm activities, very little is known about the role they play in the income generation strategies of rural households in developing economies like Nigeria (Ibekwe *et al.*, 2010). The tendency for rural households to engage in multiple occupations is often noticeable, but it is pertinent to link income diversification in a systematic way to rural poverty reduction and food security policies. Also less emphasis has been given to household level choices and especially to the explanation of differences of strategies among households in terms of income-source diversification.

The goal of any poverty and food insecurity reduction strategy is to increase income and achieve improvements in other welfare indicators. Any policy whose aim is to increase income must first understand the composition and determinants of rural income so that target interventions can be applied appropriately. This study examines the income diversification strategies of the rural households in South Western Nigeria evident from Oyo State. Specifically, the study evaluates the pattern of income diversification and identifies the determinants of income diversification among the households in the study area.

### Methodology of the Study

#### The Study Area

The study was conducted in Oyo State. The State is an inland State in South-western Nigeria. It covers 27 107.93 square kilometers. The state lies between latitudes 7°N and 9°N of the equator and between longitudes 2.5°E and 5°E of the prime meridian. It is bounded in the south by Ogun State, in the north by Kwara State, in the west partly by Ogun State and partly by the Republic of Benin and in the east by Osun State. The state covers an area ranging from swamp forests to western uplands. In-between are rain forests and deciduous forest/savanna. The rainfall pattern is bimodal with the peaks in June, early July and September, while November to February is characterized by harmattan brought about by the effect of the northeasterly trade winds from the Sahara desert. The agricultural sector forms the base of the overall development thrust of the state, with farming as the main occupation of the people in the area.

### Sampling Procedure

A multi-stage sampling technique was used to select 280 respondents for this study. Oyo State is divided into four agricultural zones. In the first stage, three out of four agricultural zones were purposively selected. The zones that were selected were Ogbomoso, Oyo and Oke-Ogun zones. In the second stage, two blocks were randomly selected from each of the three agricultural zones. In the third stage, two cells were selected from each of the six blocks. Finally 10% of the households in each of the twelve cells were selected

### Data Collection

Primary data were used for this study. These were collected with the aid of structured questionnaire. Information were collected on: (a) households' socio-economic characteristics such as age, gender, educational level, farm size, farm income, non-farm income, extension contact, membership of association, household size, amount of credit received, number of income sources; (b) pattern and determinants of income diversification. Data were collected 2012 farming season.

### Analytical Techniques

The analytical techniques used for this study include diversity index and Tobit regression model

### Diversity Index

The Diversity index is expressed as;

$$Diversity\ index = \frac{1}{\sum_{i=1}^n \left( \frac{r_i}{\sum_{i=1}^n r_i} \right)^2} \quad \text{----- (1)}$$

Where:

$i = 1, 2, \dots, n$  income sources

$r_i$  = the receipts from  $i^{th}$  income sources

If there is lack of diversity, the index is unity. So the degree of diversification depends on the amount by which diversity index exceeds unity.

### Tobit Regression Model

Tobit regression model was used to identify the determinants of income diversification among the households in the study area.

The model is specified as:

$$Y_i = X_i b \text{ if } i^* = X_i b + u_i > T_i \quad \text{----- (2)}$$

Where:

$Y_i$  = Income diversification (1 if households did not diversify income and greater than 1 if households diversify income).

$X_1$  = Age of household head (years)

$X_2$  = Education (years of formal schooling)

$X_3$  = Household size (number)

$X_4$  = Farm size (hectares)

$X_5$  = Amount of credit received (Naira)

$X_6$  = Membership of cooperative (years)

$X_7$  = Extension contact (Number of contacts)

### Results and Discussion

#### Households' sources of income

The results in Table 1 show the distribution of farmers based on their different income sources. It was found that 22.18 percent derived their income from arable crop farming, 13.02 percent from tree crop farming and 11.09 percent from livestock production. Only 3.81 percent obtained income from non-agricultural wage employment. About 9 percent obtained their income from agricultural wage employment while 19 percent from non-farm self-employment. Non-agricultural wage employment includes formal and informal jobs in education, construction, commerce, health and administration. Self-employment includes handicrafts, shoe cobbling, barber's work, tailoring, bricklaying, carpentry as well as trading. Remittance income includes money sent by children and relatives living elsewhere. These results showed that agriculture remains the major source of rural income for the farmers. Babatunde and Qaim (2009) in their study on patterns of income diversification in rural Nigeria found arable crop production, which is mainly subsistence in nature, to be the most important single source of income providing about 45% of total income. They also found that more than half of their respondents derived income from livestock enterprises, though this accounted for less than 5% of total income.

#### Households' degree of income diversification

The results in Table 2 show the degree of income diversification among the farmers in the study area. Respondents with the most diversified income sources had the largest index and those with the least sources had the smallest index. Ten percent had a diversity index of 1. This implies that these farmers did not diversify their income sources. About 8 percent had diversity index between 1.1 and 1.5, 1.79 percent had between 3.1-3.5 and

about 2.86 percent had diversity index between 3.6 and 4.0. The mean income diversification index is 2.02. This implies that an average respondent in the study area had its members involved in almost in all the types of income-generating activities simultaneously. These activities were distributed between the two sectors, that is the farm and non-farm sectors due to long list of activities identified in the area. On average, a respondent was involved in at least one farming activity and one non-farm activity. The result obtained is consistent with Idowu *et al.*'s (2011) who reported an average income diversification index of 2.83.

#### **Determinants of Income Diversification among the respondents in the study area**

The factors that determine income diversification are presented in Table 3. The results showed that the coefficient obtained for education was positive and significant at 1 percent level of probability. This result implies that each additional year of schooling increases income diversification by 0.6294. Education enhances the potential of respondents and makes them access available opportunities with little or no stress. The positive coefficient of education agrees with results of studies earlier reported by Minot *et al.* (2006) that education gives individual's access to a number of different economic activities, either as a formal requirement for wage earning jobs or because it helps them in setting up and managing their own small businesses.

The coefficient obtained for household size was found to be positive and significant at 10 percent. This implies that increase in household size would increase income diversification. Increase in household size with limited farm size make the household to diversify their surplus labour supply to other income-generating activities.

Furthermore, amount of credit received was positive and significant at 5 percent level of probability. This means that amount of credit received would increase income diversification by 0.0004. This result is similar to that reported by Babatunde (2009). He noted that credit can reduce liquidity constraints and increase the capacity of households to start off-farm business. Ibrahim *et al.* (2009) also noted that access to credit without any means of increasing farm size will cause the households to invest in non-farm activities in order to increase the rate of return to capital investment.

The coefficient obtained for extension contact was positive and significant at 5 percent level. The implication of this is that increase in the number of extension contact would increase income diversification. Contact with extension can provide information to the respondents on better and modern techniques of farming as well as income-generating activities.

The coefficients obtained for age, farming experience and membership of cooperatives were not significantly related to income diversification. However, age was negative and this implies that an increase in age would decrease income diversification. This is because the older the farmers the less their willingness to take risks. (Philips and Stenthal, 1977; Fabyan, 1999).

#### **Conclusion and Recommendations**

Empirically, income diversification in the study area was high and the respondents adopt multiple income generating activities to meet household consumption. Only 10 percent of the farmers had income diversity index of 1, meaning the respondents adopted multiple income generating-activities. However, crop farming remained the dominant income source for the respondents. Socio-economic characteristics such as education, household size, credit and extension contacts were the main determinants of income diversification, meaning that adequate attention should be given to these variables. Agricultural activities should be promoted through the distribution of agricultural inputs such as improved seeds and fertilizers and better extension services delivery in order to boost agricultural production. Also, farmers should form themselves into groups and pull their resources together in order to increase their capital base. This is because access to credit was significantly and positively related to income diversification in the study area.

#### **References**

- Babatunde RO and Qaim M. (2009) Patterns of Income Diversification in Rural Nigeria: Determinants and Impacts. *Quarterly Journal International Agriculture*. 4: 305-320
- Ellis F. and Freeman A.H. (2005) Implications of Livelihood Strategies for Agricultural Research: A Kenya Case Study', in Ellis and Freeman (Eds.), *Rural Livelihoods and Poverty Reduction Policies*. London and New York: Routledge. pp 198-212.
- Ibekwe U.C., Eze, C. C., Onyemawa CS, Henri-Ukoha A, Korie OC and Nwaiwu IU (2010) Determinants of Farm and Off-farm Income among Farming Households in South East Nigeria. *Academia Arena*. 2(11):11-14
- Idowu AO, Aihonsu JOY, Olubanjo OO and Shittu AM (2011) Determinants of income diversification amongst rural farm households in southwest Nigeria, *Economics and Finance Review* 1(5): 31 – 43.
- Joshi PK, Joshi L, and Birthal PS (2006) Diversification and its Impact on smallholders: Evidence from a study on vegetable production. *Agric. Econ. Res. Rev.*, 19: 219-236.
- Minot N, Epprecht M, Anh TTT and Trung LQ (2006) Income diversification in the northern uplands of vietnam *research report* 145. International food policy research institute, Washington D.C

Philips LW and Brian S (1977) The role of marketing in economic development. *J. Marketing Res.* 24: 44-57

**Table 1: Distribution of the farmers according to their income sources**

Source of income	Number of farmers	Percentage of farmers	Average income(₦)	Income share in total income (%)
<b>Farm Income</b>				
Arable cropping	276	22.18	93531.82	28.93
Tree cropping	162	13.02	39509.32	12.22
Livestock sales	138	11.09	29913.67	9.25
<b>Non-farm income</b>				
Non-agricultural wage employment	34	3.81	48559.06	15.02
Agricultural wage employment	78	8.75	27913.67	8.64
Non-farm employment	168	18.86	65894.12	20.38
Remittance income	35	3.93	17914.25	5.54
<b>Total</b>	<b>891</b>	<b>100.00</b>	<b>323235.9</b>	<b>100.00</b>

\* Multiple responses were allowed, hence total frequency exceeded sample size

**Table 2: Distribution of the farmers by their degree of income diversification**

Diversity	Frequency	Percentage
1	28	10.00
1.1-1.5	22	7.85
1.6-2.0	98	35.00
2.1-2.5	73	26.07
2.6-3.0	46	16.43
3.1-3.5	5	1.79
3.6-4.0	8	2.86
Total	280	100.00
Mean	2.02	

**Table 3 Determinants of income diversification among the farmers in the study area**

Variable	Coefficient	Standard error	b/St.Er.
Age	-0.1955	0.4096	-0.477
Gender	1.9235	7.7391	0.249
Education	0.6294	0.1451	4.337***
Household size	3.4885	2.0127	1.733*
Farming experience	0.1414	0.5289	0.267
Credit	0.0004	0.0002	1.913**
Cooperative	0.2364	0.7736	0.306
Extension contact	5.5081	2.6326	2.092**
Sigma	27.512	3.6585	7.520***

\*\*\* = significant at 1 percent

\*\* = significant at 5 percent

\* = significant at 10 percent

NS = not significant

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

### CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

**Prospective authors of journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

### MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

### IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

