

# Pattern of Income Diversification Strategies among Rural Farmers in Nnewi North Local Government Area of Anambra State

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## Abstract

The underlying report contains the result of a General Survey carried out between October and December, 2011 on “pattern of income diversification strategies among rural farmers in Nnewi North Local Government Area of Anambra State. The specific objectives include to; analyse the socio economic characteristics of the respondents in Nnewi North LGA of Anambra State, assess the pattern of income diversification in the study area, estimate the factors influencing income diversification in the study area and to make recommendations based on findings. A multi-stage random sampling technique was used to select 90 rural household in Nnewi North L.G.A. Data was collected using a pre-tested and well structure questionnaire and interview schedule. By descriptive, Herfindahe Index and Tobit Regression Model, data for this study were analyzed. The herfindahe index result indicates that the farmers gross income was N3,166,100.00 per annum. Income generate from livelihood activities contributes to 65.23% of the total income while the contribution of non- farm activities contributed substantially to the many household income in Nnewi North Local Government Area of Anambra State. The result got from Tobit regression shows that the model is well fit as confirmed by the pseudo  $R^2$  of 69%. The sample value of the log likelihood ratio of 45.20 is significant at 1% level of probability. Some constraints of income diversification include; high investment cost, low human capital, risk, credit constraint, lack or inadequate expertise.

**Keywords:** Income Diversification, rural farmers, Herfindahe index and Tobit regression model

## INTRODUCTION

Income diversification is the process of switching from low-income crop produce to higher value crops, livestock and non-farm activities. High value crops are regarded in terms of value per unit weight but preferable to define them as crops that yield high economic return per unit of labour of land such as cassava, Cocoa etc. (Escobal, 2001).

According to this definition, it focuses on diversification s a source of income growth and a potential means of poverty reduction. Household motives for diversification as well as the opportunities available to them differ significantly across settings and income group (Joshi *et al.*, 2005).

This suggests an important distinction between diversification undertaken to manage risk, cope with shock or escape from Agriculture in stagnation or in secular decline.

The accompanying increase in poverty levels has led residents of these economies to devise a number of strategies to cushion the negative effects of these changes. Meanwhile, there has been an increase recognition among researchers especially in the past one or two decades that Africans diversify their livelihood strategies, including On-Farm (crop, livestock, fisheries) and off-farm activities or market and non-market activities, to mitigate risks inherent in unpredictable agro climatic and politico economic circumstances (Ellis, 1998; 2000, Bryceson, 2002). The academic trend has been followed by policy shifts in that poverty reduction and sustainable development must be formulated by well recognizing how and why African farmers pursue diversified livelihoods. Diversification has been analyzed as a rational response by households to lack of opportunity 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 (Ellis and Freeman, 2005; Freeman and Ellis, 2005).

Consequently, the rural economy is not based only on Agriculture but rather on a diverse array of activities and enterprise (Reardon *et at.*, 2001). Much recent thinking on this subject is based on the concept of livelihood diversification as a survival strategy of rural household in developing countries (Ellis, 2000).

It is clear that rural household also engage in wide range of income-generating activities for livelihood. Broadly, this can be categorized into “farm activities” and “non-farm activities” (Eboh, 2000). Non-farm income is increasingly important in the livelihood of Nigeria rural household.

Non-farm employment include self or wage employment in manufacturing, craft, artisan work, commerce and service is an integral component of income generating activities among rural household (Eboh, 2000). In addition to providing a strategic employment option outside Agriculture, the non-farm sector stimulates inter-sectoral linkages; reduce rural-urban migration promote equitable distribution of income; broadens economic participation and enables the poor to smoothen inter-year and inter-season fluctuation of Agricultural labour demand and income (FMARD, 2001; Eboh 2000).

According to Oluwatayo (2009), it is widely agreed that a capacity to diversify is beneficial for households at or below the poverty line. Having alternatives for income generation can make the different between minimally viable livelihoods and destitution. However, diversification does not have an equalizing effect on rural incomes overall. Better-off families are typically able to diversify in more favorable labour markets than poor rural families. The tendency for rural households to engage in multiple occupations is often remarked with the aim of actualizing increased income generation.

Evidence had shown that Government had been involved in livelihood diversification of rural farm dwellers in Nnewi in Anambra State. "Keke Napep" had been issued on hire purchase thus creating employment to the unemployment, limiting criminal activities in the state and reducing poverty. Similarity the World Bank had also made meaningful effort in diversifying income of rural farmers by encouraging rice production in most areas such as Ebonyi in the East and Sokoto and Maiduguri in Northern Nigeria. These have helped in the income diversification of rural dwellers in those places.

All the efforts of the Federal Government and the World Bank notwithstanding, there is no remarkable reduction in the poverty situation or improvement of the livelihood of the rural dwellers. This therefore formed the centre piece of this paper.

**The implicit Specific Objectives of this paper are to;**

- i. analyze the socio-economic characteristics of the respondents in Nnewi North-Local Government Area of Anambra State;
- ii. assess the patterns of income diversification in the study area;
- iii. estimate the factors influencing income diversification among the rural farmers in the study area;
- iv. ascertain the barriers to income diversification in the study area;
- v. Make recommendations based on findings

**Methodology**

This study was conducted in Nnewi North Local Government Area of Anambra State. Nnewi North Local Government Area was created in 1996 from Old Nnewi Local Government Area (L.G.A). Nnewi North L.G.A comprises of four (4) autonomous quarters; Otolo, Umudim and Nnewichi and it shares common boundaries with Nnewi South L.G.A in the East, Ekwusigo L.G.A and South East Nnewi South.

Nnewi North Local Government Area has an estimated population of 391, 227 (NPC, 2006) and spans over 1,076 square miles (2789km<sup>2</sup>) in Anambra State. The main temperature varies from a minimum of about 20<sup>o</sup>c to maximum of about 36<sup>o</sup>c. it has an average humidity of 74.4% with dry and wet seasons as the two seasons of the year.

Nnewi North Local Government Area is located on the South-Eastern part of Nigeria within Latitude 6<sup>o</sup>21' and 6<sup>o</sup>65'N of the equator and longitude 6<sup>o</sup>45' and 7<sup>o</sup>25'E of the Greenwich meridian. The land has a good clay-loamy soil for Agriculture purpose.

Geographically, Nnewi North Local Government Area falls within the tropical rain forest region of Nigeria though it suffers from soil leaching and erosion which has reduced the soil terrain. It remains an area of rich Agriculture produce and epicenter of commerce.

The main occupation of the people of Nnewi North Local Government Area (L.G.A) is trading and farming, therefore they depend mainly on Agriculture and commerce for their daily livelihood. Most of the prime cash crops produced include; oil palm, raffia palm, groundnut, melon, cotton, cocoa, rubber, maize etc. food crops such as yam, cassava, cocoyam, bread fruit, three-leaf yam etc. Nnewi is home to many manufacturing industries in the cluster of automobile spare parts factories. They are also renowned for producing great statement and leaders of commerce.

A multi-stage random sampling technique was used to select 90 farmers from whom data and information were elicited. The first sate involved the random sampling of three (3) communities out of the four (4) autonomous communities of Nnewi North Local Government. The second stage of sampling involved the selection of three (3) villages from each autonomous communities making up a total of nine (9) villages. The third stage involved the random selection of ten (10) farmers from each of the three (3) villages giving a total of ninety (90) respondents for the study.

Objective (i) and (iv) were analyzed using descriptive statistics such as frequency distribution and

percentages.

The analysis of objective (ii) and (iii) was done using diversification index and Tobit model respectively.

Diversification Index: the pattern of diversification strategies that were adopted by farming households in the study area were analyzed using diversification index.

The diversification index was derived as the inverse of the Herfindahe index.

Following Kaija (2007) and Idowu *et al* (2011), the diversification index is given as:

Where D is the diversity index and SJ is the share of the total income derived from source J.

**Tobit Regression Model:** Tobit Model, was however employed to ascertain the determinants of diversification among household in the study area. The Tobit model (Greene, 2003) employed was of the

$$\text{Form: } Y^* = x b + e_i$$

Where  $e_i$  is normally distributed with zero mean and constant variance  $Y^*$  is the income diversification index obtained by dividing the number of livelihood source employed by all the livelihood source available in the study area.

The value of the diversification index ranges between zero and one. Thus, the explanatory variable used in the regression analysis were and measured as:

X <sub>1</sub>	=	Farm size(Ha)
X <sub>2</sub>	=	Household size(No)
X <sub>3</sub>	=	Age (years)
X <sub>4</sub>	=	Education (years)
X <sub>5</sub>	=	Distance to the nearest city (Km)
X <sub>6</sub>	=	Access to Credit (Dummy; Yes = 1; N o = 0)
X <sub>7</sub>	=	Sex (Male = 1; Female = 0)
X <sub>8</sub>	=	Marital Status (Married = 1; otherwise = 0)
b	=	Regression parameters or coefficient
e <sub>1</sub>	=	Error term.

## Results and Discussion

Some of the socio-economic characteristics of farmers are presented in table 1. The table showed shows that the mean age of the farmers were 51 years. This implies that majority of farmers young and energetic to be involved in farming. The mean of educational level is 11.37 years. With a mean of 11.37 years, it implies that the study area has farmers with a reasonable level literacy. Obasi (1991) opined that the level of education attained by a farmer not only increases his farm productivity but also enhances his ability to understand and evaluate new production technologies. The mean household size was 6. A household is in this case defined as all those people who feed from the same pot, (Ezeh, 2003). It has been observed that farmers who married many wives and probably had large household sizes provided enough labour for farming activities. Although Christianity restricts the number of wives in the household, many rural household sizes are relatively large. This situation has posed serious problems in recent times due to the present economic crisis and is responsible for the high rate of malnutrition, illiteracy and unemployment especially in the rural economy, (Obibuaku and Hursh, 1974; Umali and Schwatz, 1994).

The mean of household income is N 67,091.11. This implies that the farmers had high levels of income. This result is in agreement with Oputa, (2005) which said that income earners of less than 50, 000 per annum were medium to low income while those above these limit were medium to large income earners. The average hectarage cultivated by farmers was 1.69 ha. This indicates that most of the farmers in Anambra state are generally smallholder farmers and can be attributed to the constraints imposed by land fragmentation. According to Awoyemi (1999), farmers in Nigeria are predominantly smallholders with average farm size of between 1 and 2 hectares.

Table I: socio-Economic characteristic of the respondents in Anambra state, Nigeria

Socio economic variables	mean variable
Age	51
Education	11.37
House hold size	6
Household size income	N67,091.11
Farm size	1.69

Source: field survey data, 2011

Table 2 shows that majority of the farmers are married with a proportional representation of about 69%. Those that are single were only 13.33% while widows and widowers accounted for 8.89% each of the sampled population. This is understandable based on the fact that increasing family responsibility can propel women who

are the managers of homes to participate in income diversification strategies as a means of cushioning its effects

**Table 2: Distribution of Respondents According to Marital Status**

Marital Status	Frequency	Percentage (%)
Single	12	13.33
Married	62	68.89
Widow	8	8.89
Divorced		
Widower	8	8.89
<b>Total</b>	<b>90</b>	<b>100</b>

Source: field Survey (2011)

In assessing the patterns of income diversification among rural farmers in the area, the overall level of income diversification was measured by the inverse of Herfindelhe index and the result presented in Table 3.

**Table 3: Pattern of Income Diversification among Rural Farmers**

n=90				
Income Source	Participation	Income	Share in total income	t-value
Arable Cropping	9 (10.00)	192,000	0.061 (6.10)	5.092**
Livestock Prod	11 (12.22)	284,100	0.090 (8.97)	2.028**
Agro Processing	3 (3.33)	146,000	0.046 (4.61)	12.167*
Agricultural Mkting	36 (40.00)	356,000	0.428 (42.83)	4.511***
Forest/Resource Coll.	7 (7.78)	87,000	0.027 (2.75)	2.023
Non-Farm Activities	24 (26.67)	1,101,000	0.348 (34.77)	6.529***
<b>Total Farm Income</b>	<b>66 (73.33)</b>	<b>2,065,100</b>	<b>0.652 (65.23)</b>	
<b>T. Non-Farm Income</b>	<b>24 (26.67)</b>	<b>1,101,000</b>	<b>0.348 (34.77)</b>	
<b>Total Income</b>		<b>3,166,100</b>	<b>1.000 (100.00)</b>	

Source: Computed from Field Survey (2011)

The income level and its share of total derived from the various income diversification activities as show in Table 3 indicate that the farmer's gross income was 3,166,100.00 per annum. Income generated from farm livelihood activities contributes 65.23% to the total income while the contribution of Non-farm activities had about 35% share of total income. This result is not in consonance with Croppenstedt (2006) and Awoniyi and Salman (2011) who had a higher Non-farm income than farm income in a similar study conducted in South West Zone of Nigeria.

Agricultural marketing posted the largest proportion if income among the farm based activities and this is significantly ( $P = 0.001$ ) different from zero. A plausible explanation for this result is that majority of farmers participate in Agricultural marketing because it remains an important avenue for the sale of their produce.

Also, Non-farm activities recorded 26.67% participation and gulped 34.77% share of the total income. At 99% confidence level, the important of this diversification strategy is not in doubt. Other significant strategies include arable cropping which posted 10% farmer participation and 6.10% share of the total income. Its infinitesimal contribution to total income is a source of worry given the increasing rate of poverty in Nigeria. This result consolidates the findings of Idowu *et al.*, (2011) who had also a low percentage contribution of arable cropping in a similar study. Other strategies that recorded low participation are forest/natural resource collection and agro processing which imply that they do not command high incomes in the rural area. The non-significant posture of forest/natural resource collection explains the little or no attention paid to it by rural farmers and hence, its emergence as the least contributor to total income.

On the overall, total farm income recorded 73.33% farmer participation and thus emerged the majority. This is in tandem with Oboh and Ekpebu (2011) who observed that despite the systemic decline suffered by Agriculture, it has always played a pivotal role in the history of Nigeria Economic Development by providing food, employment, security, foreign exchange etc. Total Non-farm activities recorded 26.67% participation and contributed 34.77% to the total income. This result shows that non-farm activities contributed substantially to the rural household income in Anambra State and this is in agreement with the findings of Babatunde and Quaim (2008) and Idowu *et al.*, (2001) who obtained a related outcome in a similar research. In consonance with the finding, Awoniyi and Salman (2011) observed that the pattern of non-farm diversification is most likely a coping strategy for poverty among the predominantly poor rural folks.

In realizing the objective on the estimation of factors influencing income diversification among rural farmers, the Tobit model was employed and the result presented in Table 4.

The result of the diagnostic statistics show that the model is well fit as confirmed by the Pseudo  $R^2$  of 69%. The sample value of the log likelihood ratio of 45.20 is significant at 1% level of probability suggest that the regression analysis indicates that the factor which positively and significantly determines the likelihood of rural farmers to diversify their income is dependency ratio. The implication is such that increasing number of dependent in the family increase the rate of income diversity. This is understandable given the fact that increased

dependency ratio imposes more pressure on the income of the farmers. This relates positively with the opinion of Oluwatayo (2009) who averred that the accompanying increase in poverty levels has led.

**Table 4: Determinants of Income Diversification among Rural Farmers**

Variable	Coefficient (B)	Standard Error	t-value
Constant	1.481	1.634	0.91
Age (X <sub>1</sub> )	-0.082**	0.029	-2.84
Education ((X <sub>2</sub> )	0.006	0.073	0.08
Household size (X <sub>3</sub> )	-0.198*	0.100	-1.97
Sex (X <sub>4</sub> )	-0.077	0.206	-0.38
Marital Status (X <sub>5</sub> )	-0.573*	0.270	-2.13
Land holding (X <sub>6</sub> )	-0.022	0.169	-0.13
Access to credit (X <sub>7</sub> )	-0.135*	0.666	-1.70
Dependency ratio (X <sub>8</sub> )	0.776***	0.104	7.49
Distance (X <sub>9</sub> )	-0.591***	0.154	-3.83
No of Observation	90		
Pseudo R <sup>2</sup>	0.69		
LR Chi <sup>2</sup>	45.20***		

**Source: Computed from Field Survey (2011).**

\*\*\*, \*\* and \* denote statistical significant at 1%, 5% and 10% risk level respectively residents of developing countries to devise a number of strategies to cushion the negative effect of the changes.

The negatively signed coefficients with significance at varying probability levels in Table 4. are age, household size, marital status, access to credit and distance to the nearest city. By implication, young farmers with single marital status (such as widowed, divorced, single etc) and have no access to credit have the probability of diversifying their income. This is consistent with a priori.

Surprisingly, household size recorded a negative coefficient and significant at 10% level of probability. A plausible explanation is possible only if the households have children who are within productive age bracket. This runs counter with Babatunde and Quaim (2008) who had a positive coefficient for household size in a related income diversification study in Kwara State, Nigeria.

With a negative coefficient for distance to the nearest city, framers who live far away from the city tend to have a lower number source. The reason is obvious. In remote areas, there are no income possibilities outside self-employment within Agriculture (Schwarze and Zeller, 2005).

In the overall analysis, it could be deduced from the result that variables which intensify diversification have higher probability of worsening the living conditions of the rural farmers while those factors discouraging diversification enhances specialization and have higher likelihood of improving their living conditions. This perception is shared and demonstrated by prior studies such as Oluwatayo (2009); Schwarza and Zeller (2005) and Idowu *et al.*, (2011).

## 5 Identification of Barriers to Income Diversification

Barriers	Frequency	Percentage (%)
High Investment Cost	17	18.89
Low Human Capital	7	7.78
Risk	10	11.11
Credit Constraint	35	38.89
Lack Inadequate Expertise	21	23.33
<b>Total</b>	<b>90</b>	<b>100</b>

**Source: Field Survey (2011).**

As show in the Table 5, 18.89% of the barrier was accord from high investment cost, 7.78% from credit constraint, 23.33% lack or inadequate expertise. Here, it is observed that the major barrier to income diversification is credit constraint which takes the highest percentage. This is in line with Woldenhan and Oskam (2001) diversification and entry barrier. Evidence from the trigay region of Northern Ethiopia.

## Conclusion and Recommendation

Based on the findings of the study the factors which positively and significantly determine the likelihood of rural farmers to diversify their income is dependency ratio. This implication is such that increasing number of dependence in the family increase the rate of diversity. This is understandable given the fact that increased dependency ratio imposes more pressure on the income of the farmers. Also the study revealed that Non-farm activities contributed substantially to the rural household income in Anambra State.

It was therefore recommended that for the Government and public organization to successfully alleviate poverty and raise level of the rural dweller, Government should take measure to;

- Enhance the level of education of the rural people through sustainable formal and informal education system. This will enhance their receptivity to innovations that will increase their output and earnings. Farm production should be improved through use of improved technologies such as hybrid, disease resistant variety.
- Local Government should provide enabling environment by making available basic infrastructures design and develop policies and programme that will positively influence employment of rural inhabitants.
- Government should also provide the incentive for entrepreneurial development to the people in Nnewi North Local Government area as a first step in encouraging small-scale business that could become other source of income to the people.
- Couple with this is the need for the Government to expand and improve the existing credit market and information facilities that would allow for diverse income generating activities in the area.

The suggestion if fully implemented will not only enhance the income diversification but will encourage a rapid economic development in the Local Government of Anambra State in particular and country at large.

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