



Poverty and rural livelihood diversification among farming households in southwest Nigeria

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Abstract

The tendency for rural households to engage in multiple occupations is often remarked, but few attempts have been made to link this behaviour in a systematic way to rural poverty. This study attempted to contribute to knowledge by empirically relating poverty status to livelihood diversification in southwest Nigeria. This study utilized data obtained from a cross-sectional survey of 213 farming households in Yewa North and Odeda Local Government Areas of Ogun State. The survey was conducted in 2007. The data were analyzed using poverty depth analysis (FGT class) and Tobit regression model. The study revealed that the incidence of poverty revealed that the proportion of the farming households whose per capita expenditures fell below the poverty line was 47 percent. The depth of poverty depicted that severity of poverty in the study area was 8 percent. Aside farming, eleven livelihood activities (hunting, fishing, trading, hired labour services on other farms, processing of farm produce, artisanship, non-timber forest exploration, community service, civil service, private sector employment and other paid employment) were engaged in by the farming households. Furthermore, income generated from livelihood activities was negatively related to the probability of a household being poor suggesting that engagement in livelihood activities reduces the risk of poverty among the farming household in the study area. The results also showed that sex of the household head, household size, dependency ratio, land area owned by the household, income generated from livelihood activities and hunting as a means of livelihood significantly determined the poverty status of farming household in the study area. Policies aimed at increasing the income generation ability of the household should be strongly considered. Finally, the favoured livelihood activities (hunting, trading and artisanship) should be thoroughly examined to enable policy makers know the right point of intervention.

Key words: Poverty, Tobit regression, farming households, livelihood diversification, Nigeria.

Introduction

Literature is replete with empirical evidence of a link between agricultural systems, food security and poverty¹. Poverty is a phenomenon and a state which has generated a lot of interests in recent times and various views have been raised about the conceptualization of poverty²⁻⁵. Poverty depicts poor nutrition, inadequate shelter and low health standards. Furthermore, poverty is a situation whereby one cannot generate sufficient income required for the sustenance of life^{6,7}. Livelihood diversification, however, is the process by which households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living⁸. Diversification contributes positively to livelihood sustainability because it reduces vulnerability to stress and shocks⁹⁻¹¹. Livelihood strategies composed of a range of activities; both the access to assets and the use to which they can be put are mediated by social factors (social relations, institutions, organisations) and by exogenous trends (e.g. economic trends) and shocks (drought, disease, floods, pests)¹¹.

The attention given to food poverty of households is based on the fact that food poverty is the most important of all the different

dimensions of poverty facing the poor¹²⁻¹⁴. Besides this, food is a basic essential for survival. The tendency for rural households to engage in multiple occupations is often remarked, but few attempts have been made to link this behaviour in a systematic way to rural poverty reduction¹¹. Therefore, this study attempts to contribute to knowledge by empirically relating poverty status to livelihood diversification in Ogun State agriculture with particular reference to farming families. The broad objective of this study was to empirically relate poverty to livelihood diversification among the rural farming households in Ogun State. The specific objectives of the study include determining the incidence, depth and severity of poverty among the rural farming households in the study area, identifying the livelihood activities engaged in by the farming household and examining the socio-economic factors that influence poverty among the rural farming households in the study area.

Materials and Methods

The study area, sources, types and sampling technique: The study was conducted in Yewa North and Odeda Local Government

Areas (LGAs) of Ogun State. Ogun State is located in the South west, rainforest zone of Nigeria. It lies within latitude 6°55'-7°N and longitude 3°46'-4°15'E and has a human population of about 2,338,570 as at 1991 census. The state occupies a total area of 16,409.26 square km. The average annual rainfall in the state ranges between 1250 and 1800 mm, with a bimodal rainfall distribution, which peaks in June and October, while the dry season stretches from mid November to mid March. Temperature ranges from 27 to 32°C and average relative humidity from 80 to 90%. The climatic conditions favour the production of arable crops and tree crops. The occupation in the study areas is predominantly farming; production of food and cash crops includes maize, cassava, vegetables, yam and cocoa among others.

The data for the study were obtained from a cross-sectional survey of farming households in the two LGAs in Ogun State. The survey instrument was well-structured questionnaires. The cross-sectional survey was conducted using a multistage sampling technique to select 24 respondents each from 10 villages in the two Local Government Areas to give a total of 240 respondents. However, questionnaires from 213 respondents were used for the analysis. Twenty seven questionnaires were rejected for inconsistency in information provided. Data were collected on the households' socio-economic characteristics, food and non-food expenditures, livelihood activities and income among others.

Methods of data analysis:

Measures of poverty: The traditional approach of a poverty index is based on headcount of poor individuals below the specified cut-off point, that is, the proportion of the population whose standard of living is less than the poverty line to the number of individuals or households¹⁵. However, the headcount index does not indicate the depth of poverty, that is, how poor the individuals/households are, hence, the evolution of the poverty gap index. Poverty gap index is the ratio of the average extra consumption that would be required to bring all poor people or households up to the poverty line. The poverty gap is interpreted as measuring the depth of poverty. The squared poverty gap index takes into account not only the consumption shortfall of the poor from the poverty line, but also inequality among the poor. This measure decreases if, for example income is transferred from a poor individual to a poorer individual. The squared poverty gap index is often interpreted as measuring the severity of poverty¹⁶.

The FGT class of poverty measures has some desirable properties (such as additive decomposability), and they include some widely used poverty measures (such as the head-count and the poverty gap measures). The FGT poverty measures are defined as:

$$p_\alpha = \int_0^z \left[\frac{z-x}{z} \right]^\alpha f(x) dx \quad \alpha \geq 0 \quad (1)$$

where x is the household consumption expenditure, $f(x)$ is its density (roughly the proportion of the population consuming x), z denotes the poverty line, and α is a non-negative parameter. Higher values of the parameter indicate greater sensitivity of the poverty measure to inequality among the poor. In what follows, concern will be on the estimation of poverty measures, P , for $\alpha = 0, 1$, and 2 , which respectively define the head-count index, the poverty gap index, and the squared poverty gap index.

Hereafter, these measures are denoted H , PG , and SPG . Headcount index (H) and poverty gap index (PG) as given by Datt¹⁹ are thus presented below:

$$H = \frac{q}{n} = 1 - \frac{z}{\mu} \quad (2)$$

$$PG = H - \left(\frac{\mu}{z} \right) L(H) \quad (3)$$

where q = number of poor households, n = total number of households, z = poverty line, mean consumption, L = slope of the Lorenz curve $\left(\frac{z}{\mu} \right)$.

The squared poverty gap index for the Foster-Greer-Thorbecke measure of P_2 is given by Ravallion²⁰ as:

$$P_2 = \frac{PG^2}{H} + \frac{(H - PG^2)}{H} CV_p^2 \quad (4)$$

where PG = poverty gap index, H = headcount index, CV_p^2 = squared coefficient of variation of income among the poor household. The poverty line was determined by calculating two-third of the mean per capita food expenditure of the households in the study sample. This was used to categorize the households into poor or non-poor.

Tobit model specification: Several studies have assessed the determinants of poverty using different approaches, especially the Probit and Logit functions and also qualitative approaches^{14,17}. These approaches classified household into poor and non-poor without taking into consideration the extent of poverty. In this study, the relationship between poverty and various socio-economic variables were examined using the Tobit regression model. This model has the advantage of yielding results that can be interpreted for information on the intensity of food poverty in addition to that on classification of household into poor and non-poor. The model is stated thus:

$$\begin{aligned} V_i^* &= \beta X_i + e_i \\ V_i &= 0 \text{ if } V_i^* \leq 0 \\ V_i &= V_i^* \text{ if } V_i^* > 0 \\ i &= 1, 2, \dots, n \end{aligned} \quad (5)$$

where V_i^* = limited dependent variable, it is the depth of household poverty defined as:

$$(Z - Y_i)/Z \quad (6)$$

Z = food poverty line, Y_i = mean per capita household food expenditure ₦ per month, X_i = vector of explanatory variables, β = vector of unknown parameters, e_i = independently distributed error term, X_1 = age of the respondents (years), X_2 = dummy variable for the sex of the respondents (male = 1, female = 0), X_3 = educational status of the respondents (years of formal education), X_4 = size of the household (number of individuals), X_5 = dependency ratio (number of dependants as a ratio of total number of individuals in the household), X_6 = land area owned by the household (ha), X_7 = income generated from various likelihood activities (₦ per month), X_8 = hunting (1 if respondents is a hunter,

0 otherwise), X_9 = Trading (1 if respondents is a trader, 0 otherwise), X_{10} = Artisanship (1 if respondents is an artisan, 0 otherwise), X_{11} = Number of livelihood activities engaged in by the household head.

Results and Discussion

Socio-demographic features of the sampled rural household head: Table 1 revealed that the average sampled head of household was a male, about 47 years of age, had about five years of formal education. He had about seven people in the household with at least three dependants. An average household head cultivated less than one hectare of land but had access to about seven hectares of land. Finally, an average household head could not be said to be poor, he engaged in at least two other livelihood activities and earned about ₦ 11,365 per month for other livelihood activities aside farming.

hunting, fishing, trading, hired labour services on other farms, processing of farm produce and artisanship/craftwork. Others are non-timber forest exploration, community service, civil service, private sector employment and other paid employment. The table revealed that hunting, trading and artisanship/craftwork were the favoured livelihood activities in the study areas. Trading generated the highest mean income. This was closely followed by other paid employments such as digging. Hunting attracted many farmers despite the low income generated from the activity. One possible explanation for this is that little capital (cost of locally made guns and gunpowder) is required for hunting, therefore income received from the animals is considered as profit.

Tobit model estimates of poverty of farming households: Tobit regression model was used to examine the correlates of poverty status. The results as presented in Table 4 revealed that the sigma is significant at the 1% level. This implies that the model had a

Table 1. Descriptive statistics on socio-demographic features of households (n = 213).

Socio-demographic characteristics	Minimum	Maximum	Mean	Std. deviation
Age of respondents in years	20.00	85.00	47.55	12.61
Sex (1 = male, 0 = female)	0.00	1.00	0.76	0.43
Level of formal education in years	0.00	20.00	5.01	4.34
Household size	1.00	25.00	6.56	2.99
Number of dependants	0.00	14.00	3.16	2.02
Land area of the respondents (ha)	0.00	81.00	7.20	11.74
Farmland of respondents (ha)	0.00	1.00	0.85	0.35
Poverty level (1= non-poor, 0 = poor)	0.0	1.0	0.74	0.44
Number of livelihood activities	1.00	5.00	2.36	0.88
Income generated from all activities (₦)	5040.00	81500.00	11365.00	15611.45

Source: Field survey, 2007.

Poverty analysis: The values for the poverty measures, headcount index (H), poverty gap index (PG) and Foster-Greer-Thorbecke P_2 are presented in Table 2. The headcount index (incidence of poverty) computed for the study area was 0.47 implying that the proportion of the farming households whose per capita expenditures fell below the poverty line was 47 percent. The poverty gap index (depth of poverty) computed had a value of 0.0047, while the squared poverty gap index had a value 0.084, which depicts that severity of poverty in the study area was 8 percent. The squared poverty gap index takes into account not only the distance separating the poor from the poverty line, but also the inequality among the poor. The poverty line for the study sample was ₦ 416.38 (The official exchange rate of the naira for 2007 is 1\$ = ₦120).

Table 3 presents the distribution and other diagnostic statistics of the income generated per week from the likelihood activities engaged in by the farming households. Aside farming, eleven livelihood activities were considered in this study. They are

good fit. The results of the Tobit model showed that sex of the farming household heads was statistically significant at 10% and positively related to the likelihood of poverty. This implies that female-headed households are likely to be poorer than male-headed households. This could be attributed to the low income generating potentials of women. Gender is an integral and inseparable part of rural livelihoods. Men and women have different assets, access to resources, and opportunities. Women rarely own land, may have lower education due to discriminatory access as children, and their access to productive resources as well as decision-making tend to occur through the mediation of men. Women typically confront a narrower range of labour markets than men and lower wage rates ¹¹. The size of the farming households increases the probability of a household being poor. This implies that poverty is increased by higher household size. Dependency ratio of the farming households is statistically significant at 10% and positively related to the likelihood of poverty. The reason for the positive correlation between dependency ratio and risk of poverty is very clear. High dependency ratio decreases earning potential in relation to needs and therefore increases the risk of poverty ¹⁸.

The area of land owned by the respondents is statistically significant and negatively related to the probability of a household being poor. In the study area, land is a basic income earning assets and serves as collateral in credit transactions. Income generated from livelihood activities was found to be significant at 1% level and showed negative relationship with risk of being poor. Hunting was also found to be significant but at 5% level. This implies that

Table 2. Poverty measures for farming households in Ogun State (n = 213).

Poverty measure	Value
Head count	0.47
Poverty gap	0.0047
Squared poverty gap	0.084
Poverty line per week	₦416.38
Poverty line per month	₦1665.52
Poverty line per year	₦19986.24

Source: Author's calculation, 2007 (1\$ = ₦120).

Table 3. Frequency distribution and diagnostic statistics of the income generated per week from the likelihood activities (n=213).

Livelihood activities	Frequency	%	Minimum	Maximum	Mean (₦)	Std. deviation
Hunting	42	28.00	600.00	10000.00	2164.29	1803.50
Fishing	10	6.67	300.00	5000.00	1260.00	1421.42
Trading	52	34.67	200.00	50000.00	7368.27	12119.83
Labour of other farms	8	5.33	250.00	1800.00	931.25	573.80
Processing of farm produce	8	5.33	100.00	3000.00	1612.50	814.93
Artisanship/craftwork	37	24.67	200.00	50000.00	4956.76	10180.52
Non-timber forest exploration	12	8.00	200.00	12000.00	3100.00	4032.82
Community service	4	2.67	500.00	2000.00	1375.00	750.00
Civil service	13	8.67	1800.00	25000.00	5423.08	6711.33
Private sector employment	3	2.00	1500.00	4000.00	2005.00	1992.50
Other paid employment	24	16.00	1000.00	8000.00	4097.92	1649.28

Source: Author's calculation, 2007 (1\$=₦120).

Table 4. Tobit model estimates of the determinants of poverty levels among farming households in Ogun State.

Variable	Coefficient	t-value
Constant	-0.175	-1.939**
Age	0.0012	-0.594
Sex	0.117	1.664***
Education	-0.0063	-0.767
Household size	0.044	4.313*
Dependency ratio	0.239	1.773***
Land area owned by household head	-0.007	-1.973**
Income generated from likelihood activities	-0.0002	-4.773*
Hunting	-0.173	-2.225**
Trading	0.008	0.122
Artisanship	-0.069	-1.007
Livelihood activities engaged in by household head	-0.022	-0.666
Log likelihood ratio	-50.64	
Sigma	0.290*	
N	213	

Source: Regression results of Tobit model, 2007.

*Significant at 1% level, **Significant at 5% level, ***Significant at 10% level.

hunting in the study area reduces the likelihood of a household being poor. Surprisingly, the number of livelihood activities engaged in by the household heads was not significant.

Conclusions

This research work empirically related poverty status to livelihood diversification. This was done using Tobit regression model. The study revealed that income generated from livelihood activities was negatively related to the probability of a household being poor. Suggesting that engagement in livelihood activities reduces the risk of poverty among the farming households in the study area. The results of the Tobit model showed that the sex of the household head, household size, dependency ratio, land area owned by the household, income generated from livelihood activities and hunting as a means of livelihood significantly determined the poverty status of farming households in the study area. Policies aimed at increasing the income generation ability of the household should be strongly considered. The favoured livelihood activities should be thoroughly examined to enable policy makers know the right point of intervention. The livelihood enhancement interventions could be achieved through the existing measures put in place by the government to reduce poverty including the National Poverty Eradication Programme (NAPEP) and Nigeria Agricultural Credit and Rural Development Bank (NACRDB).

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