

EFFECT OF OFF-FARM INCOME ON HOUSEHOLD FOOD SECURITY OF SMALL SCALE FARMING IN OYO STATE, NIGERIA

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Abstract

The effect of off-farm income on food security status of small scale farming households was examined in Oyo state. Income is the most important single factor which has continued to sustain food security. Sources of income available to small scale farming households of are vocational activities apart from peasant farming. Multi-stage random sampling technique was used to collect data from 240 respondents in Oyo State. Food security index and probit regression were the analytical tools used. The mean per capita food expenditure was ₦5,486.6. The percentage of households that were food secure was 77.5% while the percentage of those that were 22.5% were not food secure. Off-farm income had a positive influence on food security in the study. Therefore, efforts should be in providing basic infrastructure in the area that would complement agriculture.

Key words: off-farm income, food security, small scale farmers, probit and Oyo State

INTRODUCTION

In developing countries like Nigeria a major policy to be tackled is the issue of reducing food insecurity [2]. Reports show that Nigeria is one of the countries technically unable to meet her food target goal ultimatum in 2015 with the country having recorded a rise in the number of undernourished from about 10 million in 2010 to 13 million in 2012 [8]. In a household food insecurity can take various forms with the urban poor, rural landless and smallholder farmers being the most vulnerable [12]. They often lack sufficient income and may not have enough food for required nutrition [7].

Off-farm activities are the activities associated with incomes that are not directly based on farming, forestry or fishery [4, 9]. In rural areas the major off activities are mining, food processing, woodwork, metal work and service [10].

The importance of off-farm income generating sources cannot be overemphasized because there is an emergent worry about the feasibility of smallholder agriculture, towards expansion of agriculture into export crops [11].

The collaboration of on-farm income-generating activities with off farm is reported to supplement incomes levels in total [3]. To attain enriched incomes and better livelihood farmers adopt different off-farm enterprises [14]. Initially diversification was not considered as the best option for because it is emphasized as a sensible response by households to lack of chances for specialty [6]. Yet, studies such as [5] recently show that upgrading existing portfolios to augment income can be more accurate and important for food security.

Although, the impact of off-farm income may be positive as they is more resources which may be diverted obtaining access to needed food requirement nut it may also be negative, as the opportunity cost for working outside the farm may be reduced food availability for household [13, 2].

A lot of studies have been carried out on poverty implication of off-farm income, little is known about household food security and nutrition especially in the area of study. This paper is therefore examining the effect of off-farm income on food security of small scale farmers in Oyo State, Nigeria.

MATERIALS AND METHODS

Source of data and method of data collection

Primary data were employed through the use of a semi-structured questionnaires and interview schedule. The data were collected from various households in the study area. The study area is Oyo State. It has a land area of 27,107.93 square kilometers and an estimated population of about 7,743,221. In this study a multi-stage sampling technique was used. Three agricultural zones in Oyo State were purposively selected in the first stage,. They are Ibarapa, Ogbomoso, and Oyo/Iseyin because these zones are purely agrarian communities. In the The second stage two local government areas from each of the three agricultural zones were randomly selected. These include Egbeda, Lagelu, Surulere, Oriire, Afijio and Atiba. In the third stage, from the six local government areas four villages were randomly selected, due to large number of farm households and farming activities in the areas. These are Awaye, Jagun, Erunmu, Osengere, Arulogun, Lalupon, Alagbede, Jagun, Owode, Ilogbo, Aganyan, Iresaadu, Ikoyi-ile, Elegu, Olugbeyo, Onikolobo, Awe, Ilori, Iware, Jobele, Agbonrangudu, Agba-akin, Ayetoro, and Akodudu. Finally ten farmers were selected from each village because the farmers were homogenous and this sample can represent the whole population. This accounts for the total of 240 respondents used for this study.

Analytical procedure

Food Security Index(FSI)

The core issues of affordability, availability, and quality are considered in the Global Food Security Index. Using the food security index the households will be classified into food insecure food secure categories hence establishing the food security status of various households. It is given in the following formula:

$$F_i = \frac{\text{per capita food expenditure for the } i\text{th household}}{\frac{2}{3} \text{ mean per capita food expenditure of all household}}$$

where:

F_i = Food Security Index

When $F_i \geq 1$ = Food secure i th household

When $F_i \leq 1$ = Food insecure i th household

Food poverty line construction

Per capita household food expenditure was used for determining the food poverty line because of its consistency and ability to be static over time [1]. Two-thirds (2/3) Mean Per Capita Households food Expenditure (MPCHFE) was used as a benchmark for poverty line which is a relative poverty approach. Using the 2/3 MPCHFE, households were classified into non-poor and poor groups. Households whose MPCHFE falls above the poverty line are regarded as being food non-poor or food secure while the reverse are food poor or food insecure.

$$PCE = TCE/HHS \dots \dots \dots (2)$$

$$MPCHFE = THHFE/TNOR \dots \dots \dots (3)$$

$$PL = 2/3 * MPCHFE \dots \dots \dots (4)$$

where:

MPCHFE = Mean Per Capita Households food Expenditure

TNOR = Total Number Of Respondent

PCHFE = Per capita household Food expenditure

THHFE = Total household’s food expenditure

TFCE = Total Food Consumption Expenditure

HS = Household Size

FPL = Food Poverty Line

To determine the effect of off-farm income on food security of small scale farmers probit regression model was used. The dependent variable is dichotomous, that is, Yes and No; Yes takes the value of 1 and 0 for No. It is expressed thus:

$$Pr(Y_i=1|X_i) = [1-\Phi(-\beta X_i)]$$

Thus, $\frac{\partial Pr(Y_i=1|X_i)}{\partial x_k} = \beta_k \phi(\beta X_i)$

The desired quantity $\frac{\partial Pr(Y_i=1|X_i)}{\partial x_k}$, is known as the “marginal effect” of x on the binary outcome y. To calculate it, we have to

multiply our estimate of β by the density of \mathcal{E} , which will vary with the level of x .
 We specify Probit model as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon_i$$

where:

Y_i = Farmers' Food Security status obtained from FSI (food insecure=0, food secure =1).

$X_1 - X_n$ include household variables, socio-economic/demographic characteristics

X_1 = Age (years)

X_2 = Marital status (single =0, married=1) o

X_3 = Household size

X_4 = Years of education

X_5 = Primary occupation (1= farming, 0=others)

X_6 = Years of farming experience

X_7 = Total farm size owned in hectares

X_8 = Total cultivated land size in hectares

X_9 = Mode of land acquisition (Do not on land =0, own land 1 =)

X_{10} = Being a member of farmers' association (No membership =0, member =1)

X_{11} = Being a member of cooperative society (No membership =0, member =1)

X_{12} = Access to credit

X_{13} = Farm enterprises engaged by farmers

X_{14} = Total on-farm income in Naira

X_{15} = Total off-farm income in Naira (which include every activity outside the farm)

X_{16} = Proximity to urban centre (km)

$\beta_1 - \beta_n$ = The coefficients for the respective variables

β_0 = Constant

ε_i = error term.

RESULTS AND DISCUSSIONS

Household Food security status of respondents

The MPCHFE was ₦5,486.6 with food poverty line of ₦3,657.73.

This implies that respondents that falls below ₦3,657.73 per month were food insecure and food secure.

In Table 2, factors that significantly influence food security are off-farm income, proximity to urban centre, farm size, age, household size, years of farm experience and on-farm income.

Table 1. Food security distribution for the respondents

Food security status	Frequency	Percentage
Food secure	186	77.5
Food insecure	54	22.5
Mean Per Capita Households food Expenditure (MPCHFE)	₦5,486.6	
2/3 (MPCHFE)	₦3,657.73	

Source: Data Analysis, 2018.

Table 2. Probit Regression Analysis Result

Variable	Coefficient	Standard Error	Z-value	P>z	Marginal Effect
Constant	4.49732	392.6913	0.01	0.991	
Age	-0.0675131**	0.0264413	-2.55	0.011	-0.79122
Marital status	-0.0014135	0.5316705	-0.00	0.998	-0.01657
Household size	-0.278041*	0.1456529	-1.91	0.056	-3.25849
Years in spent in school	-0.0045731	0.0252261	-0.18	0.856	-0.05359
Primary occupation	-0.1477107	0.4688742	-0.32	0.753	-1.73109
Years of farm experience	0.1305768***	0.0324319	4.03	0.000	1.53029
Farm size owned	-0.0121481	0.0754218	-0.16	0.872	-0.14237
Farm size cultivated	0.2770906***	0.1020192	-2.72	0.007	3.24736
Inherited land	-0.5333546	0.41832	-1.27	0.202	-6.25064
Purchased land	0.3839978	0.7865487	0.49	0.625	4.50025
Member of farmers association	-0.6402635	0.4486345	-1.43	0.154	-7.50355
Credit access	0.1768121	0.5677703	0.31	0.755	2.07214
Crop production	-2.899568	392.6903	-0.01	0.994	-33.98141
Crop and livestock production	-3.335359	392.6902	-0.01	0.993	-39.08866
On-farm income	0.0000436***	0.0000163	2.68	0.007	0.000511
Off-farm income	0.0000373***	0.0000122	3.07	0.002	0.000438
Member of cooperative	0.5398817	0.5338296	1.01	0.312	6.32713
Proximity to urban centre	0.0761453**	0.0378626	2.01	0.044	0.89238
No of observation = 240 Pseudo R-squared = 0.6090					
LR chi-square (18) = 155.87 Log likelihood = -50.026267					
Prob > chi-square = 0.0000					

Source: Data Analysis, 2018.

*** = significant at 1%

** = significant at 5%

* = significant at 10%

Age and household size is found to negatively and significantly affect food security at 5% and 10% respectively. This indicates that as the age of household head increases by one year the household food security status is likely to reduce by 0.7912. An addition of one more person to the household will reduce the probability of being food secure by 3.2585.

Years of farm experience is found to positively and considerably influence food security status at 1%. This implies that an addition of another year to the farmers' experience will cause a rise in the probability of being food secure by 1.5303.

The coefficient of farm size is positive and significant at 1%. An increase in farm area cultivated by farmers will increase the likelihood of food security by 3.2474.

On-farm and off-farm income is also found to significantly and positively influence food security at 1%. This indicates that a rise in the amount gotten from farm will increase farmers' likelihood of being food secure by 0.0005 and 0.0004 respectively.

Proximity to urban centre has a positive marginal effect on food security and is significant at 5%. This implies that the probability of being food secure is increased by 0.8924 with a km nearness to urban centre. Therefore, based on the findings of this study, there is a significant relationship between off-farm income of farmers and household food security.

CONCLUSIONS

In this study, only 22.5% were found to be food insecure while 77.5% were food secure. The food security status and off-farm income of households were positively correlated, meaning that food security status of households progresses as off-farm income rises.

Based on the results aforementioned, below are recommendations made:

-Policy makers should supplement agriculture with programs targeted at increasing the off-farm work existing to farming households, taking into consideration the resources and composition of individual households.

-Agricultural extension agents should incorporate the addition of various occupation earning activities into their programmes. This would improve farmers' ability to cope with any shock like food shortage.

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