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THE IMPACT OF FOOD SECURITY AND POVERTY STATUS ON RURAL HOUSEHOLD FARMERS IN IKWO, EBONYI STATE, NIGERIA

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ABSTRACT

Issues relating to food availability, accessibility/affordability, and food utilization remain of utmost importance to various stakeholders including policymakers and academics. As food security becomes a concern, poverty deepens systematically, and the meager income earned could not cover basic needs. The objective of this work was to analyze the food security and poverty status of the household farmers in Ikwo., Ebonyi State, Nigeria. For this study, a multistage sampling technique was used to select seventy-five farming households using a structured questionnaire. Data were analyzed using descriptive and inferential statistics. The study used, Radimer/ Cornell's questionnaire to measure the food insecurity of households; the Foster-Greer-Thorbecke model was used to measure the poverty status and Logit regression for determinants of food security. The food insecurity measure showed that 74.7% of the households were food secure. This showed that the monthly expenditures of 75% of the households were above the food security index. The poverty measure of the households shows that 21.3% points of the households express the incidence of poverty while 6.63% points and 2.81% points were found to have depth and severity of incidence of poverty, respectively. One out of the nine variables used as predictors of food security was statistically significant at $p<0.05$ level of probability. The Logit regression model indicated that income significantly influenced food security scenarios with respect to some of the indicators such as gender of household head, age of household head, farm size, farming experience, household size and education. The households' coping strategies were reduction in meal size by 85.3%, purchasing simple foods (78.7%), and extra income-generating activities (76.0%). The study concluded that most of the households were food secure and 21.3% fell below the poverty line. The Government should provide credible sources to enable farming households increase production and earn more income.

Key words: Poverty, Food Security, Households, Sustainability, Income, Farmers, Resources, Production

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INTRODUCTION

Food security is a situation in which all people, always have physical, and economic access to safe, nutritious and sufficient food that meets their dietary needs and food preferences for a healthy and active life, [1]. The absence of any of these conditions at the household, regional and national levels cause food insecurity. There are five major elements in assessing food security namely, availability, accessibility, utilization, quality and safety [2]. Availability connotes the physical presence of a large quantity of food, utilization means sufficiency in both quantities of food and sustainability, and accessibility always implies access and not losing such access [3a, 3b]. Food insecurity can be considered severe when food intakes are continuously insufficient to meet the daily dietary energy requirements of the individual, leading to a very severe stage of food insecurity called 'hunger.' It is accepted that food is a necessity of life. At the household level, the importance of food is obvious as it is a basic means of sustenance. Food security has proved a useful tool for maintaining political stability and ensuring peace among people [4].

A country can be said to be enjoying food security when people's fear of not having what to eat is removed and the most vulnerable group specifically women and children in marginal areas have access to an adequate quality of the food they want. Demand for food in Nigeria has speedily grown faster than food production or total supply. The Central Bank of Nigeria reported that the rate of increase in food production of 2.5% per annum does not keep pace with the annual population growth rate of 2.8% per annum [5].

Food access, one of the key dimensions of food security, is the function of income and purchasing power of households [2]. Food access is the ability of individuals, households, and nations to obtain the food that is needed to maintain nutrition balance. This encompasses physical access, economic access, and sustainability access.

Sub- Saharan Africa is the most vulnerable region to food insecurity [6]. The average amount of food available per person per day in the region was 1,300 calories, compared to the worldwide average of 2,700 calories [6].

Past and recent findings show that there is a connection between poverty levels in rural Nigeria and the level of food security, as well as its transition.

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Poverty is more easily recognized than defined [7], therefore, a universally accepted definition of the term poverty remains elusive. Poverty is, however, regarded as the inability to meet basic human necessities such as food, shelter, clothing and medication [8]. Poverty could be relative or absolute. Relative poverty varies with the income or economic growth, while absolute poverty refers to subsistence poverty based on the assessment of minimum subsistence requirements involving a judgement of basic human needs and measured in terms of resources required to maintain health and physical efficiency [7].

Statistically, as of 2019, most people on the planet live in poverty: about 85% live on less than $30 a day, two-thirds survive on less than $10 per day, and 10% live on less than $1.90 per day (extreme poverty) [9]. Recent poverty surveys from the World Bank and the National Bureau of statistics have shown that over 70% of the Nigerian population is living on less than one dollar per day and that over 40% are living below the national poverty line of ₦137,430 (US $381.75) per year [10]. The surveys also showed that poverty is especially higher in rural areas where most of the population are resident and derive their livelihoods from agriculture [10].

As poverty deepens systematically, and the meager income of the people does not cover their basic dietary and food needs, interest in farming and other economic activities is on the increase and is now being propagated by many persons as a food security strategy for vulnerable rural families. These farms, however, have limited success in providing food security and increasing incomes. The income of rural households remains low, despite their active involvement in farming activities. Consequently, for these rural farmers to improve their wellbeing and meet the food requirements of the rural populace, their poverty situation must be curbed [11].

Nigeria as a country is immensely blessed with natural and human resources in abundance and if properly harnessed can feed her people and still be able to export the surplus to other countries. Yet, Nigeria is experiencing a persistent food crisis in terms of both quality and quantity. Cases of undernutrition and malnutrition are growing by the day. Most of the introduced relief programs only helped to alienate the peasant farmers who are the major producers of food in Nigeria [11].

It is against this background that this research analyzed the food security and poverty status among household farmers in Ikwo local government area of Ebonyi state, Nigeria.

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Conceptual Framework

Food security comprises food availability, access and utilization, stability, nutrition and food safety. Availability refers to the physical existence of food, be it from own production, purchase from markets or transfer. Food access is a function of the physical, and social environments. It determines how households can effectively utilize their available resources to meet their food needs. Drastic changes in these conditions, such as social conflict or periods of drought, may severely impede production potential or the ability to obtain income, and, therefore, threaten the food access of affected households. These shocks besides compromising households' access to food, also often lead to the loss of productive assets like livestock; the shocks also have serious implications for the households' future productive potential and consequently, their long-term food security. This idea entails that when these conditions become worse, households may become food insecure, and their calorie intake may fall below 2100 kcal/day per person in adult equivalent, according to the U.S Department of Agriculture [12].

Food security is a dynamic phenomenon. The impact of food security varies based on its duration, severity, and local environmental and socio-economic conditions. It may be chronic or transitory. Households respond in diverse ways to reverse the situation in both cases. These measures, taken by households, are commonly known as coping strategies. Consequently, the food security status of the households can be improved, Figure 1.

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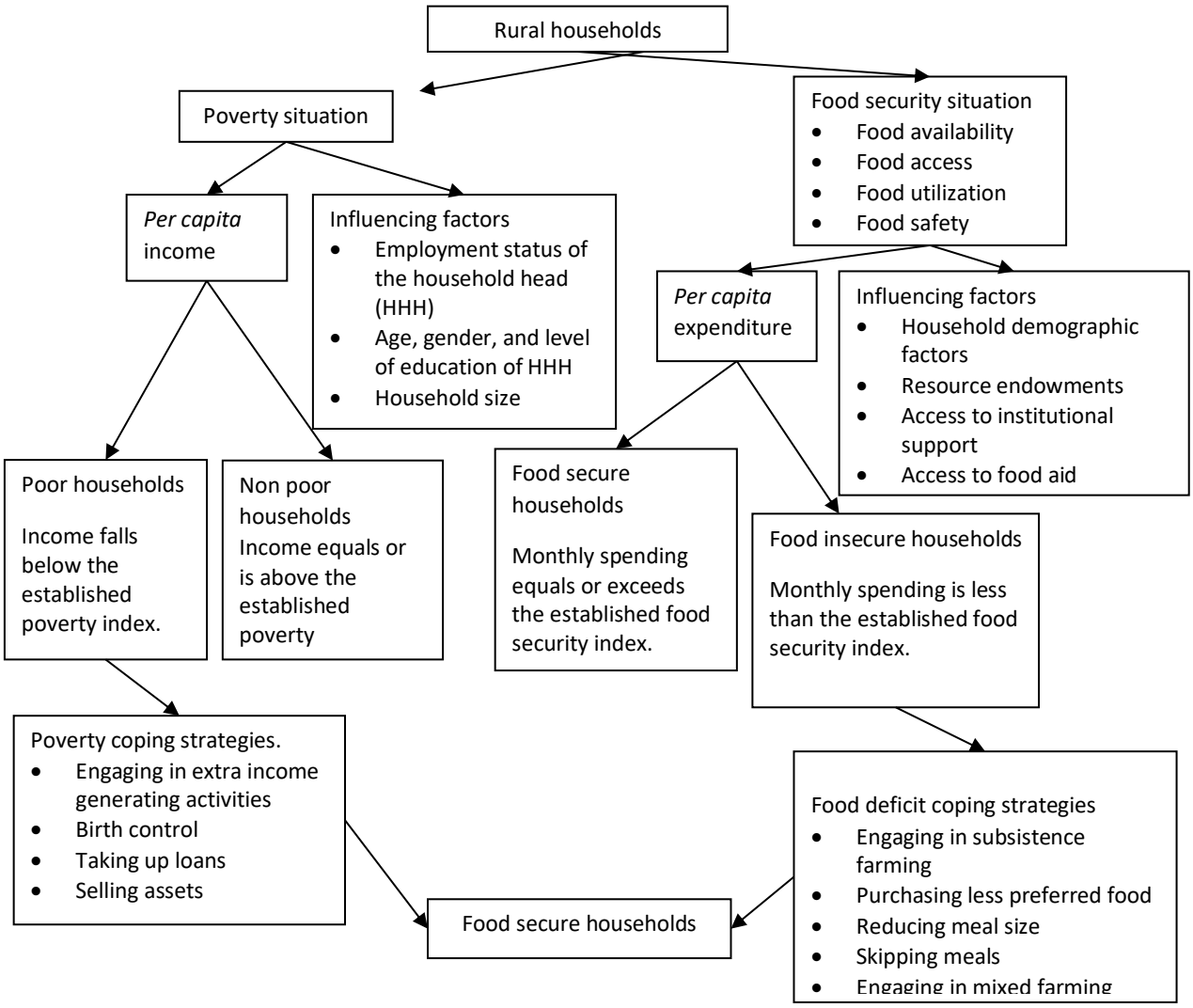

Figure 1: Conceptual framework (created by authors)

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MATERIALS AND METHODS

The study area

This study was conducted in the Ikwo Local Government Area of Ebonyi state, Nigeria. It is the largest local government area in Ebonyi state with headquarters at Onu-Ebonyi Echara. Ikwo is comprised of five communities: Unweka, Alike, Mgbabu, Echara and Okpitumo. Ikwo local government area has a land mass of about 500km and is located within longitude 800, 820°E, and latitude 600,620°N, with a projected population of 284,400 persons as of 2016 [13].

The people of Ikwo are mostly farmers and cultivate mainly rice, yams and cassava. The Ikwo farmers are regarded as the largest producers of *Abakaliki* rice and top producers of palm wine.

Also, Ikwo is endowed with abundant natural resources that are still untapped. These include limestone at Agubia, EcharaUkwu in Eka Awoke, Lead, Zinc and Salt in Ameri and Ohankwu. The incidence of hunger and malnutrition is evident in the people of the area.

Sampling procedure and data

The study adopted purposive and multi-stage sampling techniques. The population of this study comprised the rural farming households of Ikwo Local Government Area (LGA). The choice of the LGA was due to the presumed incidence of poverty among farming households. In the first stage of sampling, out of the five (5) autonomous communities that made up the Ikwo L.G.A, three autonomous communities were purposively selected based on the predominance of poverty incidence in the area. In the second stage of the sampling, from the three communities selected, a random sampling technique was used to select twenty-five (25) respondents. A total of seventy-five respondents constituted the sample for the study.

The researchers developed a questionnaire for data collection. The researchers guided the filling of the questionnaire to ensure total compliance from the respondents. A pilot survey was conducted using twenty households to determine the effectiveness of the questionnaire in terms of reliability. This action was repeated after one month. The test-retest reliability of the questionnaire yielded a correlation coefficient of 0.80 and was significant at 1% and 5% levels. This showed the overall reliability and suitability of the questionnaire for actual data collection.

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Data analysis and model specification

The objective of the study was realized using Descriptive Statistics, Radimer Cornell's tools for assessing food security, the Foster-Greer-Thorbecke model and the Logit regression model. Radimer Cornell's nine- item tool was used to analyze the questionnaire. Radimer /Cornell's tool has been used by researchers in caregiver evaluation studies and to measure culturally different contexts of urban households. The food security status and food security index were measured by the per-capita food expenditure of households (both cash and farm produce consumption) examined in their naira value per household. The households were classified as food secure or food insecure using the food security index as used by Omonona *et al.* [3a]. It is given as:

$$\text{fi} = \frac{\textit{per capita}\ \text{food expenditure of ith household}}{\frac{2}{3}\,\text{mean}\ \textit{per capita}\ \text{food expenditure of all households}} \quad \text{.....equation (i)}$$

Where Fi= food security index
When Fi≥ 1 = food secure ith household
Fi ≤ 1 = food insecure ith household

The estimation of the poverty line and poverty status were conducted using the Foster- Greer, (7) and Thorbecke (7) (FGT) weighted poverty index. FGT has been used by researchers to establish, multidimensional poverty index (MPI) and multidimensional poverty measurement (MPM). Foster- Greer and Thorbecke measures the respondents' poverty incidence, gap and severity, each of the indices puts different weights on the degree to which a household or individual falls below the food security line.

$$P_a = \frac{1}{N}\sum_{i=1}^{Q}\left(\frac{Z-Yi}{Z}\right) \text{.....equation (ii)}$$

Where:
α = the parameter that measures the prevalence, gap and severity of poverty respectively with number 0, 1 and 2 representing the poverty incidence, gap, and severity, respectively.
N = total number of households
Q = number of poor households
Z = poverty line or threshold: it is the 2/3 of the Monthly Average Household Expenditure (MAHE)
Yi = individual Monthly Average Household Expenditure (MAHE)

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The determinants of Food Security were arrived at using a binary logit regression model as used by Oyebanjo *et al.* [13]. Logistic model is specified as:

$$Fi = b0 + b1x1 + b2x2 + b3x3 + b4x4 + b5x5 + b6x6 + b7x7 + b8x8 + b9x9 + \ldots\ldots\ldots\ldots\ldots\ldots \text{ equation (iii)}$$

Where:
Fi = Food security status (Dummy where 1, if household head is food secure; and 0, if household head is food insecure)
X_1 = Age of household head (years)
X_2 = Level of education of household head (measured by years spent in school)
X_3 = Farm size (hectares)
X_4 = Farming experience (years)
X_5 = Household size (measured by number of persons in a household)
X_6 = Credit access (dummy, where 1 = credit access and 0 = otherwise)
X_7 = Gender (Male =1, Female = 2)
X_8 = Primary occupation (dummy, where 1 = farming access and 0 = otherwise)
X_9 = Monthly income (₦)

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Investigation into the gender of the household heads as shown in Table 1 revealed that the majority (73.3%) of the households were headed by males, while the remaining 26.7% of the households were headed by women. This result relates to cultural and religious inclinations that confer household headship on males and most importantly the responsibility of sustaining the household. The results further showed that most of the farmers combined crop and livestock farming (53.3%), as opposed to engaging in only crop, livestock, or fish farming. The implication of this is that the farmers have other sources of income, which is a way of diversifying trade as a means of alleviating poverty.

The farmers owned (64.0%) of farmland and (50.7%) engaged in trading as an additional income generating activity. The farmers (41.3%) had between 17 and 25 years of farming experience. This implies that the household heads were quite experienced farmers.

A greater percentage (44.0%) of the households had a population of 6 to 8 members. This implies that the farmers had large households, which could supply farm labour [14].

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The result also shows that (85.3%) of the households had between 2 and 4 earning hands and (97.3%) of the household heads had no access to credit. Access to earning hand would have helped to provide enough income for the household but lack of access to credit hindered the increase of production and long run guarantee of food security.

The age distribution of the heads of the farming households showed that (44.0%) of the household heads were within the ages of 45-54 years. This indicates that most of the household heads were in their Middle Ages, which is still an active and productive stage of life that allows them to engage in diverse income generating activities and reduce poverty severity among the households. The household heads acquired education up to senior secondary (41.3%), (26.7%) of them only up to primary school level, and (17.3%) of them held diploma certificates. This implies that the education status of the household heads was low. Educational level has shown to be a factor which can affect the food security and poverty status of the respondents, this agrees with the findings of Adebanjo *et al.* [15]. Education of households plays a role in sustainable development goals and is a promising future of households.

Food security assessment based on Radimer Cornell's tool for assessing food security

The result in Table 2 shows that 32.0% of the respondents sometimes worried that their food might run out before they had enough money to buy more, 33.3% worried that they might not be able to afford to buy adequate food and 44.0% wished they could buy more food if they had more money. About 37.3% of the family ate the same type of food for several days (37.3%) due to lack of money, (44.0%). The overall response from the Radimer Cornell's tool for assessing food security hinges on the ability to buy. This indicates that most of the households have food that is available to them, but not very accessible because of their lack of purchasing power. The food security status of the households was measured by the per-capita food expenditure of households (both cash and farm produce consumption) examined in their naira value per household. This means that the categorization of households into either food secure or food insecure is a function of the money spent on food, monthly and household size.

As shown in the pie chart (Figure 2), 74.7% of the households fell above the food security line, which means these households were food secure and 25.3% of the households were food insecure. This means that the monthly expenditure of 75.0 % of the households fell above the food security index (that is, greater than 1),

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which is a function of the per-capita expenditure of each household, divided by $\frac{2}{3}$ of the mean *per capita* expenditure of all the households. This result agreed with the findings of Olaolu *et al.* [16] where the majority (64.1%) of the Tiv farming households were food secure while only a few were not.

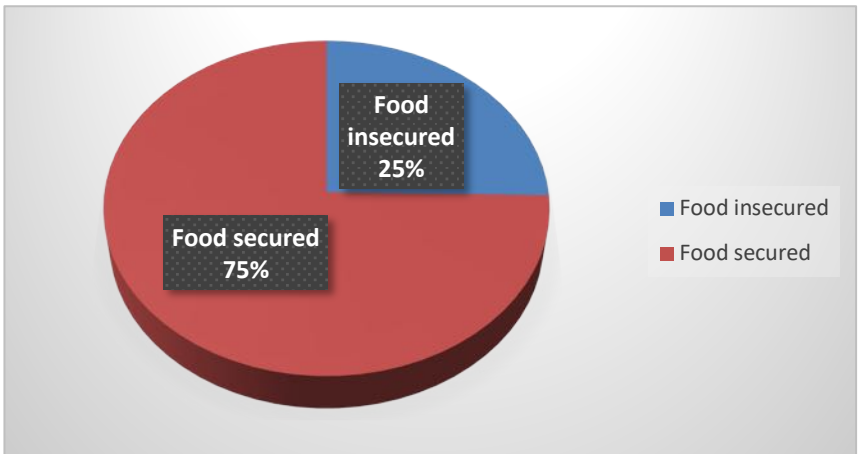

Figure 2: Percentage proportion of the Food Security Status of the respondents

Poverty status of the households

From the results, 98.7% of the farming households owned the land they farmed on. About 31% of the respondents owned farms that measured up to three hectares in size, 22.7% had farms as large as four hectares, and 10.7% had farms as large as five- or six-hectares as shown in Table 3.

The poverty line (monthly household income) was calculated to be ₦33,600 ($72.4USD) (Table 4). The mean farm income was calculated to be ₦37,053.33, ($79.86 USD) and a mean off farm income of ₦28,726.67 ($61.91 USD).

In this study, a ₦1,120.00 poverty line was established which equals about $2 per day. This is in line with the World Bank, International Poverty line as of 2021, which was set at $1.90. The poverty line/poverty threshold is the minimum level of income necessary to achieve an adequate standard of living in each country. The respondent's poverty line was set at ₦33,600, (72.41 USD) per month Table 4.

The FGT model was used to analyze the poverty status of the respondents. Data obtained from this analysis revealed the poverty incidence to be 0.2133 (21.3%), the poverty depth to be 0.0663 (6.63%), and the poverty severity to be 0.0281 (2.81%) (Table 5). The incidence indicates that 21.3% of the population was below the poverty line and was, therefore, poor. The 6.63% poverty depth shows the

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amount needed for the proportion of the respondent poor to be taken out of poverty. This poverty gap index estimates the depth of poverty by considering how far the poor are from the poverty line on average. A poverty severity of 2.81% shows that the poorest households were 2.81% worse off compared to poor households, on average. This indicates that the poorest households must mobilize financial resources of 2.81% more of the poverty line per poor household than is required for the average poor to be out of poverty in the study area.

Determinants of food security

As shown in Table 6, out of the nine variables identified as predictors or determinants of food security in rural Nigeria, only one was statistically significant at a 0.05% level of significance. The findings revealed that the total income of the respondents is a significant determinant of their level of food security with a p-value of 0.019. This implies that household food security increases with an increase in income and vice versa. Income has remained a critical factor that influences food accessibility, and as noted by Battersby [17], income makes a significant difference in reducing food insecurity. Also, income influences household monthly food expenditures. This finding agreed with those of Djangmah [18], Mungai [19], and Mutinda [20].

Based on the results of the regression analysis, the income of the respondents is a significant determinant of their food security status.

Coping strategies

According to the results shown in Table 7, 85.3% of the respondents resorted to reducing meal size, 78.7% purchased simple foods, and (76.0%) engaged in extra income-generating activities. These findings agree with the reports of a study carried out by Babatunde [21]. In this study, households that engaged in different enterprises earned additional money apart from their farm income. The findings show that 61.3% of the households had adults skip meals once a day in a bid to cope with their poverty and food insecurity levels, and 41.3% reduced expenditures on education, 33.3% reduced expenditures on health, and borrowed from friends and relatives. Twenty eight percent of the respondents purchased food on credit, and the least adopted strategies were selling assets and sending household members to eat/live elsewhere (both with a proportion of 1.3%).

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

Many of the households were food secure. There was an indication that 21.3% of the households were below the poverty line. The farmers did not earn sufficient on-

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farm and off-farm income. The farmers had a good number of years of farming experience, but due to factors such as low level of education, and the small size of their farm holdings, they did not have access to inputs and resources, and the know-how that would allow them to produce enough to obtain reasonable income and sustain themselves and their dependents. The government and other concerned institutions should provide adequate credit to the farmers to enable them to increase their production, thereby increase yield and subsequently income. Provision of better management and planning should be done to enable the farmers to link with markets and subsequently compete favorably with others.

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Table 1: Socio-economic Characteristics of Respondents

Variables	Frequency	Percentage	Mean (S.D)
Gender			
Male	55	73.3	
Female	20	26.7	
Type of farming activity			
Crop farming	35	46.7	
Crop and livestock farming	40	53.3	
Farm size			3.48(2.120)
1-3	48	64.0	
4-6	18	24.0	
7-9	8	10.7	
10 and above	1	1.3	
Additional occupation of the household head			
None	3	4.0	
Business	12	16.0	
Civil servant	12	16.0	
Marketing	2	2.7	
Palm wine tapping	1	1.3	
Teaching	3	4.0	
Trading	38	50.7	
Transporter	4	5.3	
Years of farming experience			22.74(7.388)
8-16	17	22.7	
17-25	31	41.3	
26-34	22	29.3	
35 and above	4	5.3	
No response	1	1.3	
Total number of household members			6.65(2.674)
3-5	30	40.0	
6-8	33	44.0	
9-11	6	8.0	
12-14	4	5.3	
15 and above	2	2.7	
Total earning hands			
2-4	64	85.3	
5-7	8	10.7	
No response	3	4.0	
Do you have access to credit?			
No	73	97.3	
Yes	1	1.3	
No response	1	1.3	
If yes list sources			
Non	74	98.7	
Farmer's co-operatives	1	1.3	
Age of the respondent			44.83(8.849)
25-34	9	12.0	
35-44	23	30.7	
45-54	34	45.3	
55-64	7	9.3	
65 and above	2	2.7	
Education level of household head			
No formal education	3	4.0	
Primary	20	26.7	
Junior secondary	5	6.7	
Senior secondary	31	41.3	
University	3	4.0	
Others(diploma)	13	17.3	

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Table 2: The Food Security Status of the Respondents

Variables	Frequency	Percentage
Do you worry that your family may run out of food before you have money to buy more		
No	16	21.3
Yes	15	20.0
Rarely	14	18.7
Sometimes	24	32.0
Often	6	8.0
Do you worry that you may not be able to afford to buy adequate food?		
No	16	21.3
Yes	14	18.7
Rarely	18	24.0
Sometimes	25	33.3
Often	2	2.7
Do you wish you could buy more food if you had more money?		
No	35	46.7
Yes	4	5.3
Rarely	33	44.0
Sometimes	3	4.0
Often		
Has your family ever run out of food because you do not have money to buy food?		
No	4	5.3
Yes	28	37.3
Rarely	15	20.0
Sometimes	26	34.7
Often	2	2.7
Has your family ever eaten the same type of food for several days because you do not have enough money to buy different food?		
No	1	1.3
Yes	33	44.0
Rarely	10	13.3
Sometimes	30	40.0
Often	1	1.3
Have you ever eaten less than you want because you do not have enough money to buy food?		
No	2	2.7
Yes	31	41.3
Rarely	13	17.3
Sometimes	26	34.7
Often	3	4.0
Have you had to skip meals because there was not enough money for food?		
No	17	22.7
Yes	13	17.3
Rarely	15	20.0
Sometimes	25	33.3
Often	5	6.7
Have your children not had enough to eat because you do not have enough money to buy food?		
No	4	5.3
Yes	24	32.0
Rarely	12	16.0
Sometimes	32	42.7
Often	3	4.0
Do you have enough money to buy healthy and nutritious (balanced) food for your children?		
No	27	36.0
Yes	2	2.7
Rarely	10	13.3
Sometimes	34	45.3
Often	1	1.3
No response	1	1.3

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Table 3: Tenancy status

Variables	Frequency	Percentage
Owner		
Yes	74	98.7
No	0	0
No response	1	1.3
Owned (hectare)		
2	5	6.7
3	23	30.7
4	17	22.7
5	8	10.7
6	8	10.7
7	4	5.3
8	4	5.3
9	3	4.0
10	1	1.3
11	1	1.3
No response	1	1.3

Table 4: Distribution according to household income

Statements	N	Minimum	Maximum	Mean	Std. Deviation
Average monthly farm income of the household head	75	8000	150000	37053.33	24523.510
Average monthly non-farming income of the household head	75	3000	75000	28726.67	17168.146
Total income	75	13000	190000	65780.00	35178.525
Z- Poverty line	75	33600	33600	33600.00	000

Table 5: Poverty measurement results

Indicators	Incidence	Depth	Severity
Sum	16	4.973214286	2.109472435
FGT	0.213333333	0.066309524	0.028126299
FGT (%)	21.33333333	6.630952381	2.812629913

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Table 6: Determinants of household food security

Socioeconomic characteristics	B	S.E.	Wald	Df	P-value
Gender of Household head	1.953	1.310	2.223	1	0.136
Age of the household head	0.053	0.136	0.152	1	0.697
Farm size in hectares	0.483	0.734	0.434	1	0.510
Years of farming experience	0.001	0.142	0.000	1	0.996
Household size	-1.730	1.323	1.710	1	0.191
Total earning hands	2.307	1.317	3.067	1	0.080
Number of years spent acquiring formal education	-0.115	0.226	0.261	1	0.610
Access to credit	3.831	40192.970	0.000	1	1.000
Total Income	0.000	0.000	5.508	1	0.019*
Constant	-10.869	6.206	3.067	1	0.080

Table 7: Coping strategies of the respondents

Variable	Frequency	Percentage
Borrowing from friends, neighbors, relatives, etc.	25	33.3
Engaging in extra income generating strategies	57	76.0
Stick to simple food or purchase less preferred food	59	78.7
Reduce expenditures on health	25	33.3
Reduce expenditures on education	25	41.3
Reduce meal size	64	85.3
Adults skip meals once a day	46	61.3
Selling assets	1	1.3
Purchase food on credit	21	28.0
Borrow food	5	6.7
Send household members to eat/live elsewhere	1	1.3

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