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Determinants of food security status among farming households in Oriire local government area, Ogbomoso Oyo state

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Abstract - Food insecurity remains a major development challenge in Nigeria, particularly among rural farming households. This study analysed the determinants of food security status and assessed the extent of food insecurity among farming households in Oriire Local Government Area, Oyo State. Primary data were collected from 150 farming households through a multistage sampling technique and analysed using descriptive statistics, the Foster–Greer–Thorbecke (FGT) technique, and a Logit regression model. Results showed that the average age of household heads was 41 years. Most of the respondents were male (61%), married (54%), with a mean household size of five persons. About 41% had tertiary education, farming experience averaged nine years, and the mean farm size was 1.06 hectares. Average monthly income was ₦80,320, while mean monthly food expenditure was ₦64,873, representing a large share of household income. The FGT analysis revealed that 51.7% of households were food insecure, with a depth of 22.7% and severity of 12.5%. The Logit regression identified years of schooling, household size, income, and farming experience as significant determinants of household food security. Specifically, education, income, and farming experience improved food security, while larger household sizes reduced it. The study concludes that food insecurity in Oriire LGA is both widespread and severe, even among food-producing households. It recommends policies that expand access to education and extension services, promote income diversification, strengthen social protection measures, encourage family planning, and support farmers with improved technologies and training to enhance productivity and resilience.
Keywords: Food security, determinants, farming households, Oriire LGA, Nigeria

INTRODUCTION

One of the most pressing challenges globally is how to ensure sufficient food supply for more than seven billion people (Ayinde *et al*., 2020). Food security is a multifaceted and dynamic concept comprising various dimensions, including availability, affordability, accessibility, consumption, utilisation, and stability (Roosevelt *et al.,* 2023). Malnutrition and inadequate diets can result in poor health, reduced productivity, and adverse social outcomes which further reinforce the importance of food security. At the household level, adequate intake of safe and nutritious food is fundamental for a healthy and productive life, while at the national level, food security underpins political stability and economic development (Ogunniyi *et al.,* 2020; Omotayo, 2020).

The Food and Agriculture Organization (FAO) (2023) defines food security as a situation in which all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Despite this recognition, hunger and malnutrition remain widespread. The FAO's State of Food Security and Nutrition in the World Report (2023) estimates that around 735 million people globally faced hunger in 2022, while more than two billion experienced moderate to severe food insecurity. In Nigeria, the burden is particularly severe.

The World Food Programme (WFP, 2025) reports that about 30.6 million Nigerians are currently facing acute food insecurity. This is supported by the National Bureau of Statistics (NBS) (2023), which found that 62.4% of Nigerian households are unable to afford sufficient and nutritious food. Projections by the Famine Early Warning Systems Network (FEWS NET) (2024) indicate that food insecurity will likely worsen between 2024 and 2025, driven by rising food inflation, conflict, and climate-related shocks. These alarming figures highlight the paradox of a country with vast agricultural potential still struggling to guarantee adequate food access for its population. The 2024 Global Hunger Index (GHI) places Nigeria 110th out of 127 countries, signaling a "serious" hunger level (GHI, 2024). Moreover, rapid population growth projected to reach 400 million people by 2050 further aggravates the challenge of ensuring adequate food supply (Otekunrin *et al*., 2019; Amzat and Aminu, 2020).

The availability of food depends on factors determined by the demand side, while the supply side determines factors contributing to the access to food. As a result, factors that trigger variations in both the demand and the supply of food would additionally influence the availability and access to food, respectively. This eventually results in food insecurity (Bashir and Schilizzi, 2013). Food insecurity at the household level is related to several factors, including poverty, low income, level of

education, household size, employment status, age, the type of household head (gender) and food price (Ihab *et al.,* 2015). Understanding the characteristics and determinants of household food insecurity is crucial to developing policies that address the challenges associated with household hunger and food insecurity (Ihab *et al.*, 2015).

Although rural households are directly engaged in food production, farming households often spend a significant share of their limited income on food purchases, leaving them vulnerable to rising prices and production shortfalls. Household-level factors such as income, education, household size, farm size, and farming experience have been shown to influence food security outcomes in Nigeria (Onasanya and Obayelu, 2016; Wudil *et al.*, 2023; Oduntan, 2024). Several recent studies have examined food security among Nigerian farming households, but their findings highlight strong contextual differences. For instance, household size, education, and credit access shaped outcomes among vegetable women producers in North-West Nigeria (Maharazu *et al*., 2024), while education reduced food insecurity, but household size worsened it among cassava farmers in Oyo State (Babarinde *et al.,* 2024). Similarly, credit access, marital status, education, farm size and farming experience were key drivers of food security for rice farmers in Ebonyi (Fasakin *et al*., 2024), gender, age and occupational patterns influenced food security in Kogi (Shaibu *et al*., 2023), and farm size and gender were key for plantain-producing households in Edo (Ozor *et al*., 2023).

While these studies provide valuable insights, they are often crop-specific, commodity-focused, or occupation-based, and therefore do not capture the broader farming population at the household level within local government areas. Yet, local-level analyses are crucial because interventions and policies in Nigeria are frequently implemented through local government structures. Moreover, most existing studies rely on pre-2024 data, limiting their ability to account for recent shocks such as persistent food inflation, climate variability, and heightened rural insecurity, all of which have intensified food insecurity. This study therefore contributes to filling this gap by providing updated, household-level evidence on the determinants of food security status among farming households in Oriire Local Government Area of Oyo State. By employing the Foster–Greer–Thorbecke index alongside regression analysis, it offers a more comprehensive assessment of both the incidence and drivers of food insecurity in a typical rural farming community. This study focuses on three objectives:

1. Describe the socioeconomic characteristics of farming households in the study area.
2. Determine the food security status of farming households in the study area
3. Examine the determinants of food security status among farming households in the study area.

METHODOLOGY

This study was conducted in Oriire Local Government Area (LGA) of Oyo State, Nigeria. The headquarters of the LGA are in the town of Ikoyi and the LGA is made up of several towns and villages such as Afekulu, Ikoyi ile, Igboroko, Mosumoje, Onimangoro, Oolo, Olokomeji, Gbemiro, and Alokomanro. Oriire is predominantly agrarian, with most households engaged in crop production and livestock rearing for subsistence and income (Manpower, 2023). The area lies within the derived savannah agro-ecological zone, characterized by a bimodal rainfall pattern and fertile soils that support the cultivation of crops such as yam, maize, cassava, and legumes (Manpower, 2023). The population consists largely of smallholder farmers, and agriculture remains the main source of livelihood, making the area suitable for investigating the link between food expenditure and household food security.

A multistage sampling procedure was adopted for selecting respondents. In the first stage, six communities were purposively selected from Oriire Local Government Area based on preliminary reports from agricultural extension officers indicating high densities of farming households. The communities selected were Abaja, Ajegunle, Alapamowo, Maya, Elebe, and Ikoyi-Ile. In the second stage, within each of these six communities, 25 farming households were randomly selected, resulting in a total sample size of 150 households. This approach ensures even representation and allows comparative community-level insights. The unit of analysis is the household head, because resource allocation, food purchasing, and consumption decisions are largely influenced by the head of the household in these rural settings.

Primary data were collected through a structured questionnaire administered to household heads. Information gathered covered respondents' socioeconomic characteristics (age, sex, marital status, education, household size, farm size, farming experience, and income), food and non-food expenditure patterns, and food security indicators. The food security measures included meal frequency, dietary diversity, food and non-food expenditure shares, and coping strategies during food shortages. The instrument was adapted from the Household Food Insecurity Access Scale (HFIAS) and related survey modules to ensure reliability and comparability.

Data were analysed using both descriptive and inferential methods. Descriptive statistics,

including means, percentages, and frequency distributions, were used to summarize household characteristics and expenditure patterns. To examine food security status, the Foster–Greer–Thorbecke (FGT) technique was employed. This technique decomposes food insecurity into incidence, depth, and severity. According to Foster, Greer, and Thorbecke, (1984), FGT technique is expressed as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^\alpha$$

$$\alpha = 0, 1, 2$$

where:

- Pα = food insecurity measure,
- N = total number of households,
- q = number of food-insecure households,
- z = food security line,
- y_i = food expenditure (or per capita food expenditure) of the i[th] household,
- α = 0, 1, 2 represent incidence, depth, and severity of food insecurity respectively.

To examine the determinants of food security, logit regression model was used, which was expressed as:

$$\ln\left(\frac{P_i}{1-P_i}\right) = Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \mu_i$$

where:

- P_i = probability that the i[th] household is food secured,
- Y_i = Household food security status (1 = food secure; 0 = food insecure)
- $X_1 \ldots X_n$ = socioeconomic characteristics (age, sex, marital status, household size, years of schooling, farm size, farming experience, and income),
- β_0 = constant term,
- β_n = estimated parameters,
- μ_i = error term.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 presents the socioeconomic characteristics of the respondents. The results show that the average age of household heads was 41 years, with nearly 53% of respondents below the age of 40. This indicates that the farming population in the study is relatively young and economically active. Similar findings by Wudil *et al.,* (2023) in Kano State reported a mean age of 40 years among farmers, reinforcing the idea that agriculture in Nigeria is largely sustained by young to middle-aged adults. The gender distribution reveals that 61% of respondents were male, while 39% were female. This male dominance in farming aligns with studies showing that men typically control land, inputs, and decision-making in Nigerian rural communities (Ogunniyi *et al.,* 2020).

The result also shows that a majority (54%) of the respondents were married, which may positively influence household labor supply and resource pooling. Household size averaged 5 members, with most households (62.7%) having between 4 and 6 members. Larger households generally face higher food requirements, potentially leading to increased food expenditure and greater vulnerability to food insecurity. This observation supports the findings of Amao *et al.,* (2023), who noted that larger households in Nigeria tend to allocate a greater share of income to food.

In terms of education, 41% of the respondents had tertiary education, while 25% had no formal education. Education is an important determinant of agricultural productivity, income diversification, and nutrition awareness. The relatively high share of tertiary-educated respondents is encouraging, as it suggests potential for better decision-making in resource allocation. Farm characteristics show that respondents cultivated an average of 1.06 hectares, confirming the dominance of smallholder farming. About 58% operated on ≤1 hectare, a constraint that limits economies of scale and income generation. Farming experience averaged 9 years, with 40% of farmers having less than 5 years' experience. Limited experience, coupled with small farm sizes, could reduce household resilience to shocks.

From the findings, the average monthly income was ₦80,320, while mean monthly food expenditure stood at ₦64,873, representing roughly 81% of income. This suggests that many households in the study area are highly food-expenditure dependent and therefore at greater risk of food insecurity.

Food security status of farming households

Table 2 shows the food security status of farming households using the Foster–Greer–Thorbecke (FGT) index. The results reveal that 51.7% of households were food insecure, meaning more than half of the farming households in Oriire LGA were unable to meet the minimum food security threshold. The incidence rate of 51.7% in Oriire LGA is comparable to findings by Osabohien *et al.,* (2020), who reported that over 50% of Nigerian households face food insecurity, and by Otekunrin *et al.,* (2019), who noted worsening vulnerability among rural households due to rising population pressure. The depth of food insecurity (22.7%) indicates the average shortfall in food consumption among the food-insecure households relative to the food security line. This suggests that, on average, food-insecure households would need at least 22.7% of the food security line to escape food insecurity.

Table 1: Distribution of respondents by socioeconomic characteristics

Characteristics	Frequency (n =150)	Percentage	Mean
Sex			
Male	91	60.67	
Female	59	39.33	
Age (Years)			41
≤ 30	36	24.00	
31 – 40	43	28.67	
41 – 50	30	20.00	
51 – 60	26	17.33	
Above 60	15	10.00	
Marital Status			
Single	33	22.00	
Married	81	54.00	
Widowed	16	10.67	
Divorced	20	13.33	
Household Size			5
≤ 3	22	14.67	
4 – 6	94	62.67	
Above 6	34	22.66	
Educational Status			
No Formal Education	38	25.33	
Primary Education	21	14.00	
Secondary Education	29	19.33	
Tertiary Education	62	41.33	
Farm Size (hectare)			1.06
≤ 1	87	58.00	
1.1 – 2	44	29.33	
Above 2	19	12.67	
Farming Experience (Years)			9
≤ 5	60	40.00	
6 – 10	42	28.00	
11 – 15	22	14.67	
16 – 20	14	9.33	
Above 20	12	8.00	
Monthly Income (N)			80,320
≤ 50,000	54	36.00	
51,000 – 100,000	47	31.33	
101,000 – 150,000	29	19.33	
Above 150,000	20	13.33	
Food Expenditure (N)			64,873.33
≤ 25,000	14	9.33	
26,000 – 50,000	54	36.00	
51,000 – 75,000	24	16.00	
76,000 – 100,000	34	22.67	
Above 100,000	24	16.00	

Source: Field Survey, 2025

The severity index (12.5%) reflects the inequality among food-insecure households, showing that the burden of food insecurity is disproportionately heavier among the poorest households. This further highlights the structural vulnerability of farming households in Oriire. These values suggest that food insecurity in the area is not only widespread but also intense, with many households facing severe deficits that push them deeper into deprivation. This aligns with Engel's law, as confirmed earlier in the regression analysis, where large household sizes significantly increased food expenditure but did not guarantee food security.

Table 2. Food security status of farming households in Oriire LGA (FGT Index)

Food Security Measure	Value
Incidence of food insecurity (Headcount ratio, P_0)	0.517 (51.7%)
Depth of food insecurity (Poverty gap, P_1)	0.227 (22.7%)
Severity of food insecurity (Poverty severity, P_2)	0.125 (12.5%)

Source: Field Survey (2025)

Determinants of Household Food Security Status

Table 3 presents the logit regression analysis of the determinants of household food security status among farming households in the study area. The model incorporates key socioeconomic variables such as age, sex, marital status, years of schooling, household size, farming experience, farm size and household income to examine their influence on monthly food expenditure. The model was statistically significant at the 1% level (Prob > Chi² = 0.000), with a Pseudo R^2 of 0.396, indicating that the selected socioeconomic variables jointly explain about 39.6% of the variation in food security status among farming households.

Years of schooling had a positive and significant effect ($p < 0.05$), suggesting that education improves the likelihood of being food secure, likely through better knowledge of nutrition, farm management, and income diversification. Household size exerted a negative and significant influence ($p < 0.05$), implying that larger households are more vulnerable to food insecurity due to higher consumption requirements relative to available resources. Household income was also positive and significant ($p < 0.05$), confirming that higher earnings improve household purchasing power and food access. Farming experience was positively associated with food security at the 10% level, indicating that more experienced farmers are better able to cope with production and market risks. Other variables, such as age, sex, marital status, and farm size, did not significantly influence food security status, although their coefficients showed expected signs. For instance, farm size was positively related, suggesting potential benefits of larger holdings, while sex had a negative sign, hinting at possible gender-related disadvantages in achieving food security.

Overall, the results emphasize the importance of education, household size, income, and farming experience as critical drivers of food security in Oriire LGA. These findings align with previous studies in Nigeria that highlight the role of human capital and resource endowments in shaping food security outcomes (Babarinde *et al.*, 2024; Fasakin *et al.*, 2024; Maharazu *et al.*, 2024).

Table 3: Determinants of household food security status in the study area

Variable	Coefficients	Std. Err	z-value	P > {t}
Age	1.70356	0.42453	1.56	0.575
Sex	-0.43598	0.24154	-1.64	0.101
Marital status	0.42832	0.14422	1.60	0.109
School years	1.89717**	0.58160	2.23	0.026
Household size	-2.23752**	1.29877	-2.36	0.022
Farm experience	0.36338*	0.12132	1.84	0.065
Farm size	2.98776	1.75801	1.41	0.156
Household income	0.47654**	0.15587	2.05	0.045
Constant	2.46570	1.23272	1.81	0.078
Pseudo R^2 = 0.3956				
Prob > Chi^2 = 0.0000				

Source: Field Survey, 2025

CONCLUSION AND RECOMMENDATIONS

This study assessed the determinants of food security status among farming households in Oriire LGA, Oyo State. Results showed that more than half (51.7%) of households were food insecure, with considerable depth (22.7%) and severity (12.5%), despite spending over 80% of their income on food. Education, income, household size, and farming experience emerged as the most important determinants of food security. Based on these findings, the study concludes that addressing food insecurity requires both household-level and policy-level interventions.

Given the study's findings, the study recommends that

1. At the household level, improving access to education and extension services will enhance nutrition awareness and farm decision-making.
2. Income diversification through non-farm enterprises and agro-processing should be promoted to strengthen household purchasing power.

3. Family planning programs can help reduce pressure from large household sizes; and support for farmers through training, improved inputs, and climate-smart technologies will boost productivity.
4. Government and development partners should design localized food security programs at the LGA level, integrate food security objectives into rural development planning, expand social protection measures such as conditional cash transfers and food subsidy schemes, and strengthen rural credit access.

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