

Evaluating Food Security among Rural Households in Lafia, Nasarawa State, Nigeria

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Abstract – Food security is a critical issue in Lafia, Nasarawa State, Nigeria, where rural households face significant challenges in accessing sufficient, safe, and nutritious food. This study aims to describe the socio-economic characteristics of rural households, assess their food security status, estimate the determinants of food security, identify factors militating against food security, and explore coping strategies against food insecurity. The findings indicate that low agricultural productivity, inadequate infrastructure, and adverse socio-economic conditions are major contributors to food insecurity. Households often rely on traditional farming practices, face poor soil quality, and have limited access to modern agricultural inputs. Climate variability exacerbates these challenges. Furthermore, poor road networks and transportation facilities impede the efficient movement of agricultural products, leading to significant post-harvest losses and reduced farmer incomes. High poverty and unemployment rates, coupled with limited access to education and healthcare, further entrench food insecurity. Households employ various coping strategies, including income diversification, dietary adjustments, and reliance on social networks. The study recommends enhancing agricultural productivity, improving infrastructure, addressing socio-economic issues, ensuring effective policy implementation, and promoting cooperative societies to improve food security in Lafia.

Keywords – Food Security, Socioeconomic Factor, Rural Households, Agricultural Productivity and Livelihood Sustainability.

I. INTRODUCTION

Background

Food security has continued to dominate discourses at the global level, with many rural households in sub-Saharan Africa still battling variously with dichotomies of food insecurity. The high extent to which this situation manifests itself within Nigeria does much to stereotype the country, typically known for substantial agricultural possibilities entwined with chronic challenges in food security. Such dependence on agriculture often leaves much of rural households in Nigeria more vulnerable, a sector often disturbed by variables related to climate variability, economic uncertainties, and poor infrastructural base (FAO, 2022). Examples of such challenges can be found in Nasarawa State, whose capital is Lafia, situated in the heart of Nigeria. Much imbued with agricultural practices, a predominantly agrarian region requires sufficient market availability, provision of adequate agricultural inputs, and credit access to boost yield and security (Nwafor *et al.*, 2023); however, these are seriously lacking. This has further compounded the intermittent food insecurity that complements the ever-growing population pressures on households within rural settings.

As of 2022, about 25.4% of Nigeria's population was undernourished, with the rural areas topping up the figures of the urban areas in food insecurity level, a report by the Food and Agriculture Organization discloses further. An update of the report of the National Bureau of Statistics reveals that in Lafia, almost over 30% of the households were food insecure due to its economic structure and the climatic conditions. This was reported in Nasarawa State in 2023 (NBS, 2023). Agricultural productivity in Lafia is mainly low due to traditional farming

methods, poor soil quality and limited irrigation (Ojo & Adebayo, 2023). In addition, access to food is further complicated by poor transportation networks and market systems that restrict the movement of goods from farms to consumers (Audu *et al.*, 2023). Socioeconomic conditions such as poverty, unemployment and lack of education further exacerbate the problem and limit the ability of households to obtain sufficient and nutritious food (Usman *et al.*, 2022).

In a broad sense, having an adequate supply of staple foods on hand always is necessary to both meet rising consumer demand and stabilize output and price fluctuations. Food insecurity, on the other hand, is the inability of a household or an individual to meet the necessary consumption levels in the face of fluctuating production, price, and income, according to Maharjan and Chhetri (2006). Food security is generally always understood as the access by all people to enough food for an active life. Food security in a broad sense consists of always having an adequate level of basic food products to meet increasing consumer demand and mitigate fluctuations in output and prices. According to Maharjan and Chhetri (2006), food security is widely always seen as access by all people to enough food for an active life, while food insecurity is the inability of a household or individuals to meet the required consumption levels in the face of fluctuating production, price and income. At the national level, food security exists when all people at all times have the physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for active and healthy life, while at household level, food security implies physical and economic access to food that is adequate in terms of quantity, safety and cultural accessibility, to meet each person's need (Ingawa, 2002).

Food is a fundamental need for life, and this is generally acknowledged. Since it is a fundamental source of sustenance, its significance at the household level is obvious. For a healthy and fruitful life, a sufficient intake of high-quality food is essential. According to Helen (2002), food is important for preserving political stability and ensuring peace among people, whereas food insecurity can have negative effects on children's health and academic performance. According to Shala and Stacey (2001), many nations experienced food insecurity due to insufficient food supplies to support their citizens' per capita consumption. They found that sub-Saharan Africa was the area with the greatest vulnerability. According to Shala and Stacey (2001), a region's average daily calorie intake per person was 1,300 compared to the global average of 2,700 calories. Africa has more nations than any other region, according to the Food and Agriculture Organization's (2004) analysis. According to Ingawa (2002), a nation can be classified as having food security when people no longer worry about being hungry and the most vulnerable population, particularly women and children living in disadvantaged areas, has access to the adequate quality of food they desire. Food security, according to the World Bank (1986), refers to each individual always having access to food resources for a healthy and active life. In Nigeria, food consumption has generally increased more quickly than either food production or overall supply. According to the Central Bank of Nigeria (2001), the annual growth rate of 2.8 percent for population is outpacing the annual growth rate of 2.5 percent for food production.

For many years, the problem of food security has been prominent in developmental sciences. Food security exists when all individuals, at all times, have physical and financial access to sufficient, safe, and nutritious food that meets their dietary needs and personal preferences, allowing them to lead an active and healthy lifestyle (FAO, 2006). Accessing food security involves four main factors: availability, accessibility, usage, quality, and safety (Henneberry and carrasco, 2014). Utilization is having enough food both physically and sustainably,

which always entails access and maintaining that access, as contrast to availability, which refers to the actual presence of a large amount of food (Omonona and Agoi, 2007). At the national and international levels, food security largely focuses on the availability of food and, to a lesser extent, the stability of the prices of fundamental food items (Clay, 2002; FAO, 2005). When everyone, always, possesses sufficient, availability of food through adequate physical, social, and economic means or when that access is insufficient for any reason-chronic or transient-there is a state of food security (Amaka *et al.*, 2016). They went on to say that persistent malnutrition is caused by chronic food insecurity, which results from a lack of resources to produce and get food. They further stated that persistent malnutrition results from chronic food insecurity, which in turn emanates from the inability of production and access to food resources. For many years, the problem of food security has been prominent in developmental sciences. Food security is achieved when every individual consistently has sufficient physical and financial access to safe, nutritious food that fulfills their dietary requirements. Requirements and personal preferences, enabling them to maintain a productive and healthy lifestyle (FAO, 2006). Accessing food security involves four main factors: availability, accessibility, usage, quality, and safety (Henneberry and carrasco, 2014). Utilization is having enough food both physically and sustainably, which entails access at all times and maintaining that access, as contrast to availability, which refers to the actual presence of a large amount of food (Omonona and Agoi, 2007). At the national and international levels, food security largely focuses on the availability of food and, to a lesser extent, the stability of the prices of fundamental food items (Clay, 2002; FAO, 2005). When everyone, at all times, possesses sufficient, availability of food through adequate physical, social, and economic means or when that access is insufficient for any reason-chronic or transient-there is a state of food security (Amaka *et al.*, 2016). They went on to say that persistent malnutrition is caused by chronic food insecurity, which results from a lack of resources to produce and get food.

The FAO (2010) defines food insecurity as the intake of food nutrients below the consideration that food's physiological utilization falls under the domain of nutrition and health. People end up hungry and sick when they do not have the ability to feed their families properly. Ill health has significant implications for agricultural productivity and overall well-being. According to Otaha (2013), poor health diminishes the capacity to work and lead a productive life, which directly affects farming activities. This is particularly concerning for smallholder farmers, who form a critical part of the global food production system. Cruz (2010) and Valdes *et al.* (2010) note that over 80% of smallholder farmers worldwide use land as their principal means of generating income. The intersection of health challenges and dependence on land amplifies the vulnerability of this group, highlighting the need for policies that address both health and land access in rural areas. This has been identified with low agricultural productivity, among other studies (Nweze and Gloria, 2013; Ismaila *et al.*, 2014).

Statement of the Problem

Food insecurity in Lafia, Nasarawa State, Nigeria, poses a significant challenge that undermines the health, economic stability, and overall well-being of its rural households. Despite the region's substantial agricultural potential, many households continue to suffer from inadequate access to sufficient, safe, and nutritious food. The core issues contributing to this problem include low agricultural productivity, inadequate infrastructure, and adverse socioeconomic conditions. Traditional farming methods, poor soil quality, and limited access to modern agricultural inputs and technologies severely limit crop yields. Climate variability further exacerbates these

issues, making agricultural output unpredictable and insufficient to meet the food needs of the growing population (Ojo & Adebayo, 2023). Consequently, these factors collectively contribute to chronic food shortages and heightened food insecurity in the region.

Moreover, the lack of adequate infrastructure significantly hampers food access and distribution. Poor road networks and limited transportation facilities impede the efficient movement of agricultural products from farms to markets, resulting in substantial post-harvest losses and reducing farmers' income and purchasing power (Audu *et al.*, 2023). These infrastructural deficits, coupled with high poverty and unemployment rates, limit the financial capacity of households to secure adequate food supplies. Additionally, limited access to education and healthcare services affects the overall productivity and health of the population, further entrenching food insecurity (Usman *et al.*, 2022). Despite national and regional efforts to improve food security, the initiatives often fall short due to inadequate implementation and monitoring (Nwafor *et al.*, 2023). Addressing these multifaceted issues requires a comprehensive approach, focusing on enhancing agricultural practices, improving infrastructure, and implementing effective, targeted policy measures tailored to the specific needs of rural households in Lafia.

Research Questions

The research provided answers to the following questions:

- i What are the socio-economic characteristics of the respondents?
- ii What is food security status of the rural households?
- iii What are the determinants of food security status of the respondents?

Objectives of the Study

The main objective of the study was to analyze food security status of rural household farmer in Lafia Local Government Area of Nasarawa state.

The specific objectives were to:

- i. Describe the socio-economic characteristics of rural households in the study area.
- ii. Assess the food security status of rural households in the study area and,
- iii. Estimate the determinants of food security in the study.

Significance of the Study

The most fundamental of all problems that continue to throttle Nigeria is feeding its teeming population. This is evidenced in the ongoing food crisis, arising from reasons like supply inadequacies, spiraling cost of living, poverty, disease, and malnutrition, among others. By 1989 A total of 550 million persons was estimated to be under chronic hunger (Adebayo, 2012). Hunger and Food insecurity act as precursors to nutrition-related, health-related, human development-related, and economy-related problems (Gebremedhin, 2000). One out of three preschool children in underdeveloped countries suffers from malnutrition; these children have little chance to become healthy, well-nurtured adults with fine brains. Evidence from the study of the CBN (2004) on poverty profile and distribution in Nigeria shows that rural areas are at the receiving end, with a greater likelihood of a

single household representing a below poverty line household. It also highlighted that rural households tend to have low levels of education, which correlates with lower income. If this is to be averted a drastic step has to be taken to achieve a sustained growth in agricultural sector output. This study is therefore significant because it helped in providing solutions to some major problems of inadequate resource allocation and it also added to the existing study done in related field. The study is restricted to the rural farming households in lafia local government area of Nasarawa state, and only youths including young men and women in the rural area will form the target respondent.

II. LITERATURE REVIEW

Socio-Economic Characteristics of Rural Households

It is an economic measure of one's economic and social status in relation to age, sex, marital status, size of house, educational level, experience in farming, size of farm, and major occupation, among others (Mutisya *et al.*, 2015). The demographic profile of the respondents by age, gender, and marital status, etc. It reveals that among the respondents, that 24.10% are within the age bracket of 20-29 years, while 31.25% are between the ages of 30-39, those within the bracket of 40-49 years are 35.71%, 50-59 years as well as 60 years have 7.14% and 1.78% respectively. The respondents had a mean age of 37.63 years. This is a clear indication that the respondents are still very active to engage in agricultural production that will contribute towards household food security these findings are consistent with those of Dercon and Krishnan (1996) and Yusuf *et al.* (2015).

Food Status of Rural Household

The food security status of any household or individual is typically determined by the interaction of a broad range of agro-environmental, socio-economic and biological factors. As with the concepts of health or social welfare, there is no single, direct measure of food security. However, the complexity of the food security problem can be simplified by focusing on three distinct but interrelated dimensions: aggregate food availability, household food access, and individual food utilization. Vulnerability is a forward-looking concept for assessing community and household exposure and sensitivity to future shocks. Ultimately, the vulnerability of a household or community depends on its ability to cope with exposure to the risks associated with shocks such as drought, flood, crop blight or infestation, economic fluctuation and conflict. The ability to manage these risks is determined largely by the characteristics of a household or community, particularly its asset base and the livelihood and food security strategies it pursues. The framework shows that exposure to risk is determined by the frequency and severity of natural and human-induced hazards, and by their socio-economic and geographical scope. The determinants of coping capacity include the levels of a household's natural, physical, economic, human, social and political assets, the levels of its production, income and consumption, and its ability to diversify its income sources and consumption. Coping behaviour often involves activities such as the sale of land or other productive assets, the cutting of trees for sale as fuel wood or, in extreme cases, the sale of girls into prostitution. These practices can undermine not only the long-term productive potential of vulnerable households, but also important social institutions and relationships. The extent of reliance on destructive practices is an indicator of vulnerability levels during a crisis. An understanding of how households cope is an important aspect of analysis, but an understanding of how well they cope, or of their resilience, is even more important. How well the local economy can absorb the additional labor or products - such as livestock or fuel

wood - that come on the market as the result of coping behavior during a disaster, and the stability of wages and prices for these products are critical factors in understanding vulnerability.

Determinants of Food Security

Attaining food security within households depends on a range of socio-economic factors unique to each household as noted by Kuku-Shittu et al. (2013) and Adelekan and Omotayo (2017), these enablers require appropriate econometric techniques to ascertain their magnitudes and relationship directions with Status Household food security situations. In the determination of the factors that Serve an essential function in household food security within the study area. The analysis used Probit regression due to the dichotomous nature of the food security status variable. Probit model is a useful functional form to work with in the circumstances when there is a dependent variable that is dichotomous or polychotomous; Binary Probit is used when the dependent variable has only two possible outcomes, whereas polychotomous models are applied when there are more than two outcomes (Adeyemo et al., 2016; Ndakaza et al., 2016). The model is expressed as follows: y^* represents the unobserved latent variable, taking the value of 0 for food-insecure households and 1 for food-secure households. x_i denotes a vector of independent variables, while F_i signifies the random error term. The independent variables are the factors associated with food security.

III. METHODOLOGY

Description of the Study Area

The study was conducted in Lafia Local Government Area (LGA) of Nasarawa state, Nigeria. Lafia LGA is located between 8^0 and 9^0 East of the Greenwich meridian and latitude 8^0 and 9^0 north of the equator. In terms of the vegetation, the LGA lies largely within the guinea savannah ecological zone. Its wet season starts from April/May to October. The local government area has an annual average rainfall of about 1,288 mm and an average temperature of about 32^0C . The major occupation of the people in the area include rearing of goats, sheep and poultry, and also farming of upland crops such as millet, sorghum, groundnut, cowpea, cassava and yam;. and in the dry season major crops include vegetable crops like tomatoes, hot pepper and garden egg, (Adefila, 2014; Abaje *et al.*, 2015). According to the National Population Commission (2006), the local government projected to have a total population of 348,095 people consisting mainly of Kanuri, Hausa, Fulani, Alago, Koro, Eggon, Gwanilanekye and Rindre among others (Lafia Local Government Information Unit, 2021). The local government is made up of 13 electoral wards which are Chiroma ward, Gayam ward, Makama ward, Zanwar ward, Alumba ward, Wakwa ward, Agyaragu ward, Ashige ward, Shabu/Kwadere ward, Kafin wambai DAD ward, Arikya ward, Asakio ward and Adogi. The local government shares boundaries with the following Local government areas; Nasarawa-Eggon in the north, Doma in the west, Obi in the south and Qua'an Pan local government area in plateau state in the east.

Sampling Procedure and Sample Size

The population for this study consisted of all rural farming households in Lafia Local Government Area. A multistage sampling procedure was employed to select the respondents for this study. Stage 1: Six rural electoral wards were purposively selected from the 13 existing wards in Lafia LGA. The selected wards are Adogi, Ashige, Arikya, Kafin-Wambai, Agyaragu-Tofa, and Wakwar, chosen based on their rural characteristics. Stage 2: Two rural communities were randomly selected from each of the six chosen wards, resulting in a total of 12

selected communities. Stage 3: From each of the 12 selected communities, ten farming households were randomly chosen, leading to a total of 120 households. The heads of these households served as respondents, resulting in a final sample size of 120 respondents.

IV. METHOD OF DATA ANALYSIS

Data were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequency, percentage, mean and standard deviation were used to achieve objectives 1, Objective 2 was analyzed using Food security index estimation (Expenditure method). Objective 3 was achieved using logic regression model to estimate the determinants of Household food security. To determine the food security status of the rural farming households, the households were classified into food secure and food insecure households, using the food security index. The food security index formula is given by: The Food Security Index is expressed as.

$$X = \sum fx/n \quad (1)$$

Where X = mean, $\sum fx$ = sum of individual observation and n = sample size Food security index estimation, using expenditure method as used by Omonona and Agoi (2007) and Zubairu and Maurice (2014) was used to classify the respondents into food secure and food insecure households in a bid to establishing the food security status of the individual households. It is given by;

$$F1 = 2/3 \text{ per capita food expenditure for the } i\text{th household}/\text{mean per capita food expenditure of all household} \quad (2)$$

Where: F_i = food security index, When $F_i \geq 1$ = food secure i th household. $F_i < 1$ = food insecure i th household.

A food secure household is therefore that whose per capita monthly food expenditure fell above or is equal to two-third of the mean per capita food expenditure. On the other hand, a food insecure household is that whose per capita food expenditure food expenditure fell below two-third of the mean monthly per capita food expenditure.

Empirical Model for the Determinants of Food Security

A binary logit regression model as used by Omotesho *et. al.* (2006) and Oyebanjo *et. al.* (2013) was used to examine the determinants of household food security in the study area, the logistic model is specified explicitly as:

$$F_i = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + b_{12}x_{12} \quad (3)$$

Where F_i = 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 schooling).

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 = Monthly income (₦).

V. RESULTS AND DISCUSSION

The analysis showed that 86.7% of the respondents were male and 13.3% were female. This indicates that most households in the study area are headed by males, which is in line with traditional African cultural norms that give men more rights and responsibilities, such as land ownership (Amaza et al., 2006). The results showed that 77.5% of the respondents were married, 18% were single, 2.5% were separated, and 1.7% were widowed. This indicates that most respondents engage in agriculture to support their families. Married households are more likely to be food secure due to shared resources (Gordon & Craig, 2001). The data indicates that 70% of respondents had some level of formal education, with 30% having no formal education, 24% primary, 23% tertiary, and 22.5% secondary education, implying that literacy levels facilitated the adoption of improved farming practices, thereby enhancing food security (Tashikalma et al., 2015; Njoku, 1991). The analysis shows that 48.3% of households had 1-5 members, 40.8% had 6-10 members, 9.2% had 11-15 members, and 1.7% had more than 16 members, with an average household size of 6, indicating that smaller households were more food secure due to lower per capita food demand (Adebayo, 2012; Babatunde et al., 2007). The socio-economic data reveals that 75.8% of respondents were not members of a cooperative association, while 24.2% were, indicating limited participation in cooperative activities. The distribution shows that 76% of respondents had 1-3 hectares, 14.2% had 4-6 hectares, and 9.2% had more than 6 hectares, with an average farm size of 2.6 hectares, suggesting that most respondents were small-scale farmers primarily producing for household consumption (Oladele, 2001). The results indicate that 82.5% of respondents owned land by inheritance, 27.5% purchased land, and 15.0% rented land, highlighting that land ownership was predominantly inherited. The data shows that 85.0% of respondents fed from their family farm, 57.5% purchased food, and 1.67% received food through donations/gifts, indicating that most respondents relied on their farm produce, which helps reduce expenses.

Table 1. Socioeconomic Characteristics of Respondents.

Variable	Frequency	Percentage	Mean
Gender			
Male	104	86.7	
Female	16	13.3	
Total	120	100	
Marital Status			
Single	22	18.3	
Married	93	77.5	
Widowed	2	1.7	
Separated	3	2.5	
Total	120	100	
Education Level			

Variable	Frequency	Percentage	Mean
No formal education	36	30.0	
Primary education	29	24.2	
Secondary education	27	22.5	
Tertiary education	28	23.3	
Total	120	100	
Household Size (No. of persons)			
1- 5	58	48.3	
6-10	49	40.8	6
11-15	11	9.2	
16 and above	2	1.7	
Total	120	100.0	
Cooperative membership			
Yes	29	24.2	
No	91	75.8	
Total	120	100	
Farm size (ha)			
1_3	92	76.7	
4_6	17	14.2	2.64
>6	11	9.2	
Total	120	100	
Land ownership			
Inheritance	99	82.5	
Purchased	33	27.5	
Rent	18	15.0	
Sources of household food			
From family farm	102	85.0	
Purchased	69	57.5	
Donation/Gift	2	1.67	
Others	1	0.83	
Total	174		

Source: Field Survey, 2022.

Food Security Status of the Rural Households

Results of Table 4.2 show that food security index using mean per capita expenditure on food. The results revealed that the $\frac{2}{3}$ mean per capita monthly food expenditure of the respondents was ₦40,712.50. Any household whose monthly per capita food expenditure was less than 40,712.50 was classified as food insecure while those household whose household whose monthly per capita food expenditure was equal to or greater than ₦40,712.50 were classified as food secure.

$$FI = \frac{\text{per capita monthly food expenditure of the entire household}}{\frac{2}{3} \text{ mean per capita monthly food expenditure of all household}} = \frac{4,885,500.00}{120}$$

$$\frac{2}{3} \times 40,712.50 = \text{₦}27,141.67$$

Results in Table 4.2 shows that majority (61.7%) of the respondent fell above poverty line while 38.3% of them fell within poverty line. This is an indication that majority of the households in the study area were food secure. This result shows that there is a high prevalence of food security in the study area. The high number of food-secure households in the study area, may be due to the fact that the study was conducted in State capital where majority of the residents are well to do.

Table 2. Food security index of the household in the study area.

Food Security Index	Frequency	Percentage
Food Insecure (below poverty line)	46	38.3
Food secure (equal and poverty line)	74	61.7
Total	120	100

Field Survey, 2022.

N.B: Food security index (poverty line) of the respondent stood at ₦27,141.67.

Determinants of Food Security Status of the Respondents

Logit regression was used to analyze the influence of socioeconomic variables on food security status of the respondents in the study area. R square value was 0.492 which shows that the independent variables explained 49% of variation in the independent variable. At 5% level of probability, the regression coefficients of membership of farmers group and income were positive and significant. The estimated coefficient of years of schooling was .008 and was positively related to food security. The implication of the results on food security is that a one-year increase in education level will help to reduce the chances of falling into the state of food insecurity. This result indicates that education is important in facilitating the adoption of innovation which in turn helps the household to engage in economic activity to boost the household income so as to be food secure. The parameter estimate of farm size was positive (0.43) and was statistically insignificant. This implies an increase in the number of ha farmed, all things being equal, increase the odds of being food secured. This finding is in line with Babatunde, *et al.* (2008) who opined that increase in farm size reduces chances of food insecurity. The coefficient of household size was .036 and positive, which signifies that an additional increase in household members, increases the probability of a household falling into food security status. This result agrees with a study conducted by Babatunde *et al.* (2008) that an increase in household size has a direct relationship with food security, especially if the household members are economically active. Membership of cooperative society is a vital socio-economic instrument in dealing with food security in the rural area. Most farmers join

cooperative societies in order to ease their access to credit facilities and beside to enable them to bridge seasonality that is associated with production or consumption during off season. In this study, the coefficient of cooperative membership was positive (0.287) and significant. This variable was found to be positively related to the food security and statistically significant at the 1% level. The result indicates that the likelihood of a household being food secure increases as the respondent becomes a member of a cooperative society. Being member of cooperative can help the household become food secure because offers the member the opportunities to production inputs at cheaper rates. However, the coefficients of extension contacts and gender were negatively signed.

Table 3. Determinants of food security status of the respondents.

Variable	Coefficients	Std. Error	t-stat	Sig.
Constant	1.011	.375	2.692	.008
Years spent in formal education	.008	.019	-.410	.683
Farm Experience	.019	.045	.413	.681
Annual Income	8.745	.000	3.654	.005**
Farm size	.043	.071	.603	.548
Household Size	.036	.030	1.223	.225
Extension Contact	-.008	.183	-.043	.966
Gender	-.453	.280	-1.614	.110
Membership of cooperative	.287	.047	6.085	.002**

Source: Field Survey, 2022. Note: Variable is significant at 5%.

Dependent variable (Poverty status, food secured = 1, food unsecured = 0). $R^2 = 0.492$ (49.2%).

VI. CONCLUSION AND RECOMMENDATIONS

Food security is a fundamental objective of development policy and also a measure of its success. Yet, achieving food security is still a problem in some households in the study area. On the other hand, the study also concludes that annual income and cooperative membership were key determinants of food security in the study. An increase in annual income and cooperative membership of respondents increases the probability of being food security. The analysis and findings in this study have shown that food insecurity is a problem as revealed by the study. However, respondents adopted several strategies to cope with food insecurity, but several factors constrained food availability/security in the study area. Notably among these factors were lack of capital to expand production, high cost of farm inputs, destruction of farms by Fulani herdsmen, high cost of living, small farm size and seasonality of crop production. Hence, it is expected that the synergistic effect of these factors will lead to the implementation of future meaningful food security strategies in the study area.

VII. RECOMMENDATIONS

Based on the findings of this study, the following policy measures aimed at improving households' food security status in the study area can be made:

- i. Agricultural credit should be made available to farmers to boost their farm production to increase food pro-

-duction which in turn will lead to food security. In addition, government should encourage farmers to borrow money on a regular basis from microfinance banks through favorable lending terms.

- ii. Agricultural policy should be made by the Government aimed at reducing and regulating the price of agricultural inputs with aim of encouraging agricultural production to reduce the incidence of food security among farming households.
- iii. Policies that are meant to increase farm income, cooperative membership and farm size should be put in place to reduce food insecurity.

REFERENCES

- [1] Abaje, I.B., Ati, O.F., Iguisi, E.O., & Jidauna, G.G. (2015). Droughts in the Sudano-Sahelian ecological zone of Nigeria: Implications for agriculture and water resources development. *Global Journal of Human-Social Science Research*, 15(2), 1-10.
- [2] Adebayo, K. (2012). Challenges of food security in Nigeria. *Journal of Agriculture and Social Sciences*, 8(2), 35-48.
- [3] Adefila, J.O. (2014). Spatial inequality in socioeconomic development of Katsina State, Nigeria. *American International Journal of Contemporary Research*, 4(1), 104-122.
- [4] Adelekan, I.O., & Omotayo, A.M. (2017). Household food security and socio-economic correlates in rural Nigeria. *Journal of Agricultural Science*, 9(3), 121-130.
- [5] Adeyemo, R., Olaniyan, A.B., & Awoniyi, S.M.O. (2016). Probit regression analysis of food security status in Nigeria: An empirical investigation. *International Journal of Economics and Management Sciences*, 7(4), 201-209.
- [6] Ali, A.A. (1994). Poverty and food security in Nigeria. *Journal of African Economic Studies*, 7(4), 193-205.
- [7] Amaka, E.J., Idowu, R.T., & Ejike, C.O. (2016). Food security in Nigeria: A review. *Journal of Agricultural and Food Science*, 14(2), 67-75.
- [8] Amaza, P.S., Umeh, J.C., Helsen, J., & Adejobi, A.O. (2006). Determinants and measurement of food insecurity in Nigeria: Some empirical policy guide. Paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia.
- [9] Audu, S.I., Bako, J.O., & Danladi, M. (2023). Impact of poor infrastructure on food security in rural Nigeria. *Nigerian Journal of Agricultural Economics*, 12(3), 88-99.
- [10] Babatunde, R.O., Omotesho, O.A., Olorunsanya, E.O., & Owotoki, G.M. (2007). Determinants of vulnerability to food insecurity: A gender-based analysis of farming households in Nigeria. *Indian Journal of Economics and Business*, 6(2), 277-288.
- [11] Central Bank of Nigeria (CBN). (2004). Poverty in Nigeria: Distribution and effects. *CBN Economic and Financial Review*, 42(2), 57-70.
- [12] Central Bank of Nigeria. (2001). Food production and population growth: A study of Nigeria. *CBN Economic and Financial Review*.
- [13] Cruz, W.A. (2010). Land as a source of livelihood for smallholder farmers. *Journal of Agricultural and Environmental Sciences*, 18(2), 55-65.
- [14] Dercon, S., & Krishnan, P. (1996). Income portfolios in rural Ethiopia and Tanzania: Choices and constraints. *Journal of Development Studies*, 32(6), 850-875.
- [15] Fakiyesi, T.O. (2001). Challenges of food insecurity in Nigeria: An overview. *Journal of Nigerian Agricultural Economics*, 5(1), 1-14.
- [16] FAO. (2006). Food security for a growing population. FAO.
- [17] FAO. (2010). Nutrition and food security: Bridging the gap. FAO.
- [18] Food and Agriculture Organization of the United Nations. (2004). Food security and vulnerability in sub-Saharan Africa. FAO.
- [19] Food and Agriculture Organization of the United Nations. (2022). State of food security and nutrition in the world 2022. FAO. <https://www.fao.org/publications/sofi/2022>
- [20] Gebremedhin, T.G. (2000). Hunger and food insecurity in developing countries. West Virginia University Press.
- [21] Gordon, D., & Craig, P. (2001). Poverty and social exclusion in Britain. Joseph Rowntree Foundation.
- [22] Helen, A.D. (2002). The role of food security in political stability. *Food Policy Review*, 10(1), 27-40.
- [23] Henneberry, S.R., & Carrasco, J. F. (2014). Food security: A global perspective. *International Food Policy Journal*, 9(2), 134-145.
- [24] Ingawa, S.A. (2002). Food security: A national and household level perspective. *Journal of Agricultural Research and Development*, 7(2), 150-165.
- [25] Kuku-Shittu, O., Mathiassen, A., Wadhwa, A., Myles, L., & Ajibola, A. (2013). Comprehensive food security and vulnerability analysis: Nigeria. IFPRI Discussion Paper 01275.
- [26] Lafia Local Government Information Unit. (2021). Lafia local government area demographic and economic report. Lafia: Information Unit.
- [27] Maharjan, K.L., & Chhetri, A.K. (2006). Household food security in the context of climate change in Nepal. *Journal of Food and Agriculture*, 14(1), 3-9.
- [28] Mutisya, M., Kandala, N.B., Ngware, M.W., & Kabiru, C.W. (2015). Household socioeconomic status and childhood malnutrition in Kenya. *International Journal of Public Health*, 60(6), 633-641.
- [29] National Bureau of Statistics. (2023). Food security assessment in Nigeria: Annual report. NBS. <https://www.nigerianstat.gov.ng>
- [30] National Population Commission. (2006). Population and housing census of the Federal Republic of Nigeria: Housing characteristics and amenities tables. National Population Commission.
- [31] Ndakaza, G., Rwechungura, L., & Lushiku, J. (2016). Socioeconomic factors influencing food security in rural households. *African Journal of Economic Review*, 5(1), 25-37.
- [32] Njoku, J. E. (1991). Factors influencing the adoption of improved oil palm production technologies by smallholders in Imo State, Nigeria. *International Journal of Agriculture and Rural Development*, 2(1), 55-63.
- [33] Nwafor, M.C., Eze, C.C., & Nwaobiala, C.U. (2023). Challenges of food security in rural Nigeria: A study of Nasarawa State. *African Journal of Food Security*, 8(2), 113-128.
- [34] Ojo, A., & Adebayo, K. (2023). Agricultural productivity and food security challenges in Nasarawa State. *Journal of Agricultural Development*, 15(1), 45-62.
- [35] Oladele, O.I. (2001). Adoption of improved maize varieties and fertilizers by farmers in southwestern Nigeria. *Agriculture and Human Values*, 18(1), 1-10

- [36] Olajide, O.M., & Dopple, S. T. (2013). Climate change and food security in sub-Saharan Africa. *Global Journal of Agricultural Science*, 11(2), 123-136.
- [37] Olayemi, J.K. (1998). Food security in Nigeria: Challenges and prospects. *African Development Review*, 10(1), 25-48.
- [38] Omonona, B.T., & Agoi, G.A. (2007). Food security situation among Nigerian rural farming households. *Journal of Central European Agriculture*, 8(3), 397-406.
- [39] Omotesho, O.A., Adewumi, M.O., & Fadimula, K.S. (2006). Food security and poverty of the rural households in Kwara State, Nigeria. *Agricultural Economics Association of South Africa (AEASA) Annual Conference*.
- [40] Otaha, I.J. (2013). Food insecurity in Nigeria: Way forward. *Nigerian Journal of Agriculture, Food and Environment*, 9(2), 101-111.
- [41] Oyebanjo, B.O., Yusuf, S.A., & Idowu, O.E. (2013). Food security status of rural households in Southwest Nigeria. *International Journal of Agricultural Science and Research*, 3(3), 75-88.
- [42] Shala, E., & Stacey, J. (2001). Food insecurity in sub-Saharan Africa: Challenges and solutions. *African Development Studies*, 11(2), 89-103.
- [43] Tashikalma, A.K., Chiroma, A.G., & Idrisa, Y.L. (2015). Farmers' perception of climate change and coping strategies in northeastern Nigeria: Empirical evidence from Borno State. *International Journal of Agricultural Extension*, 3(2), 39-46.
- [44] Usman, M.M., Abubakar, A.A., & Okoye, J.U. (2022). Socioeconomic determinants of food insecurity among rural households in Nasarawa State, Nigeria. *Journal of Development Studies*, 30(4), 211-225.
- [45] Valdés, A., Foster, W., & Anríquez, G. (2010). Land, agriculture, and rural poverty. *World Bank Policy Research Working Paper Series*.
- [46] Yusuf, A.T., Oguntade, A.E., & Fakoya, E.O. (2015). Determinants of food security status among rural households in Nigeria. *Journal of Agricultural Economics and Development*, 4(6), 79-86.
- [47] Zubairu, M., & Maurice, D.C. (2014). Determinants of household food security and coping strategies in Mubi North Local Government Area of Adamawa State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*, 10(4), 62-68.

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