



FOOD SECURITY AND POVERTY DYNAMICS AMONG URBAN HOUSEHOLDS IN SOKOTO METROPOLIS, NIGERIA

FATIMA MUSA AHMAD¹ AND PROF. C. N. SHAILONG²

¹Federal College of Education, Gidan Madi, Sokoto State

²Department of Home Science and Management, Shabu Lafia Campus, Nasarawa State University, Keffi

*Corresponding author: ahmadfatimamusa158@gmail.com

ABSTRACT

The study investigated the relationship between household food security and poverty dynamics among households in Sokoto Metropolis, Nigeria. A correlational survey design was adopted, involving 400 respondents selected through stratified random sampling. Data were collected using a structured questionnaire (HFSPQ) with a reliability coefficient of 0.82 and analyzed using descriptive statistics, Pearson correlation, and multiple regression at 0.05 significance level. Findings showed that household food security was at a moderate level across availability ($M = 3.45$), access ($M = 3.30$), utilization ($M = 3.40$), and stability ($M = 3.29$), with an overall mean of 3.36. A significant negative relationship was found between poverty dynamics and household food security ($r = -0.214$, $p < 0.05$). Regression results revealed that income ($\beta = 0.312$), employment status ($\beta = 0.280$), household size ($\beta = -0.265$), and education ($\beta = 0.198$) significantly predicted household food security, explaining 21% of the variation ($R^2 = 0.21$). The study concluded that socio-economic factors significantly influence household food security in the study area and recommends poverty reduction, job creation, education improvement, and targeted welfare interventions.

ARTICLE INFO

Article History

Received: 11.05.2026

Received in revised form: 15.06.2026

Accepted: 18.06.2026

Published online: 22.06.2026

KEYWORDS

Food security, poverty dynamics, urban household, Sokoto metropolis, Nigeria

INTRODUCTION

Food security has become one of the most pressing development concerns of the twenty-first century, affecting both developed and developing economies. It has drawn extensive attention from governments, international development agencies, researchers, and policy experts due to its strong link with human well-being, economic performance, and sustainable development. Despite notable improvements in global food production systems and distribution networks, a considerable proportion of households still lack consistent access to adequate, safe, and nutritious food necessary for healthy living (FAO, 2021). This challenge is more severe in developing countries, where structural issues such as poverty,



unemployment, rapid population growth, and macroeconomic instability continue to undermine household welfare and food accessibility (FAO et al., 2023).

The problem of food insecurity has become even more pronounced in urban environments, largely driven by accelerated urbanization across developing regions. Urban growth has generated economic opportunities, expanded markets, and improved social interactions; however, it has also intensified several socio-economic pressures, including high living costs, unemployment, housing deficits, and widening income inequality. Unlike rural populations that may rely partly on subsistence agriculture, urban households depend almost entirely on market systems for food acquisition. As a result, their ability to achieve food security is strongly determined by income levels and purchasing power (World Bank, 2024). In Nigeria, food insecurity remains a significant development challenge despite the relative availability of food in urban markets. The national economic landscape has been characterized by persistent inflation, declining real incomes, high unemployment rates, currency instability, and increasing poverty levels, all of which negatively affect household welfare (National Bureau of Statistics [NBS], 2023). These conditions have heightened the vulnerability of urban households, where food is primarily accessed through market purchases. Consequently, many families struggle to maintain adequate dietary intake, resulting in varying degrees of food insecurity.

Sokoto Metropolis, the administrative and commercial center of Sokoto State, has experienced rapid population growth and continuous urban expansion over time. This growth has placed increasing pressure on available infrastructure, economic opportunities, and household resources. While urbanization has supported commercial development and economic activities, it has also deepened socio-economic inequalities among residents. A significant proportion of households in the metropolis continue to face challenges such as low income, unemployment or underemployment, large household sizes, and limited access to education. These conditions have direct implications for household welfare and strongly influence the ability of families to secure sufficient and nutritious food.

Food security is defined as a condition in which all individuals, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs for an active and healthy life (FAO, 2021). This concept is commonly explained through four key dimensions: availability, accessibility, utilization, and stability. Food availability refers to the presence of adequate food supplies, while accessibility focuses on the ability of households to obtain food through economic or physical means. Utilization relates to the proper biological use of food for nutrition, and stability emphasizes consistent access to food over time. In urban settings, economic access remains the most critical dimension, as food may be available in markets but unaffordable to low-income households.

Household food security is closely connected to poverty dynamics, which is increasingly understood as a multidimensional condition extending beyond income deprivation to broader socio-economic



limitations that affect quality of life. In this study, poverty dynamics are examined through four key indicators: income level, employment status, household size, and educational attainment. These factors represent essential determinants of household welfare and play a major role in shaping food access and consumption patterns. Income level is a primary determinant of household purchasing power and directly influences the ability to acquire adequate food. Households with higher income are generally more capable of meeting their nutritional needs, whereas low-income households often experience food shortages or reduced dietary quality. Employment status also plays a crucial role, as stable employment provides regular income and enhances resilience against food price fluctuations and economic shocks. Similarly, household size affects food security outcomes, as larger households often experience higher dependency ratios and greater pressure on available resources. Educational attainment contributes indirectly by improving employment prospects, income potential, nutritional knowledge, and household decision-making capacity (Alkire & Foster, 2011; World Bank, 2023).

The interaction of these socio-economic factors creates complex patterns of vulnerability. Households characterized by low income, unstable or informal employment, large family sizes, and limited education are more likely to experience food insecurity. In coping with such challenges, many households adopt survival strategies such as reducing meal frequency, consuming less preferred or less nutritious foods, borrowing food, or skipping meals. While these strategies may provide short-term relief, they often have long-term negative consequences for health, nutrition, and overall well-being. Although several studies have examined food security and poverty in Nigeria, much of the existing literature has focused on rural areas or has relied mainly on income-based measures of poverty. There is still limited empirical evidence on how multiple dimensions of poverty jointly influence household food security in urban environments, particularly in Sokoto Metropolis. Given the increasing urban population and rising socio-economic pressures in the area, there is a clear need for a more comprehensive empirical investigation.

Therefore, this study examines the relationship between household food security and poverty dynamics among households in Sokoto Metropolis, Nigeria. Specifically, it analyzes how income level, employment status, household size, and educational attainment influence household food security. The findings are expected to enrich existing literature and provide evidence-based insights for policymakers, development practitioners, and stakeholders engaged in poverty reduction and food security enhancement in urban Nigeria.

STATEMENT OF PROBLEM

Food security continues to pose a significant challenge for many urban households in Nigeria, even in contexts where food commodities are physically available in local markets. In Sokoto Metropolis, food



items are readily found through various market systems; however, a considerable number of households still struggle to access sufficient, safe, and nutritious food. This situation indicates that food insecurity is not primarily a problem of availability, but rather a reflection of underlying socio-economic conditions that shape households' ability to acquire and utilize food effectively.

A substantial proportion of households in Sokoto Metropolis are affected by persistent economic difficulties, including low and unstable income, unemployment or underemployment, large household sizes, and limited educational attainment. These factors collectively weaken household purchasing power and significantly restrict access to adequate food supplies. As a result, many households are unable to sustain balanced and nutritious diets and are often forced to adopt coping strategies such as reducing meal frequency, skipping meals, purchasing less nutritious but cheaper food options, or relying on informal social support networks to meet their basic food needs. The continuation of these challenges raises questions about the effectiveness of existing interventions designed to improve household welfare and food security. Although various poverty reduction and food security programmes have been implemented across different levels of government and development agencies, many of these initiatives tend to focus on isolated dimensions of poverty rather than addressing its broader and interconnected nature. Consequently, limited attention has been given to understanding how income level, employment status, household size, and educational attainment collectively influence household food security outcomes in urban settings.

In addition, existing empirical research in Nigeria has largely focused on rural communities or has examined poverty using single indicators, particularly income. Such narrow approaches may not fully capture the complex and interrelated dimensions of poverty that shape food security outcomes among urban households. Furthermore, there remains a scarcity of empirical studies specifically focused on Sokoto Metropolis, despite its rapid urban growth, increasing population density, and rising socio-economic pressures. This lack of comprehensive, location-specific evidence on the relationship between household food security and poverty dynamics presents a significant knowledge gap. Without a clear understanding of how income level, employment status, household size, and educational attainment jointly influence food security in Sokoto Metropolis, policy responses and intervention strategies may remain ineffective or poorly targeted.

It is against this backdrop that this study is undertaken to examine the relationship between household food security and poverty dynamics among households in Sokoto Metropolis, Nigeria. The study aims to provide empirical evidence on the extent to which income level, employment status, household size, and educational attainment are associated with household food security, thereby contributing to the development of more informed and effective poverty reduction and food security policies.



OBJECTIVES OF THE STUDY

The study is guided by the following specific objectives:

1. To determine the level of food security among households in Sokoto Metropolis;
2. To examine the relationship between poverty conditions and household food security;
3. To assess the combined influence of income, employment status, household size, and level of education on household food security.

RESEARCH QUESTIONS

The study is guided by the following research questions:

1. What is the current level of household food security in Sokoto Metropolis?
2. What type of relationship exists between poverty-related factors and household food security?
3. To what extent do socio-economic factors jointly influence household food security?

HYPOTHESES

The following null hypotheses were formulated and tested in the study:

H01: There is no statistically significant relationship between poverty conditions and household food security.

H02: Socio-economic variables do not jointly and significantly predict household food security.

THEORETICAL FRAMEWORK

This study is grounded in the Sustainable Livelihoods Framework, which explains that the well-being of households depends on their access to different forms of capital, including financial, human, social, physical, and natural resources. Among these, financial and human capital are especially important in urban environments, where income level and educational attainment strongly influence access to food and other basic necessities.

Within this framework, poverty is viewed as a limitation in access to these essential resources. When households lack adequate financial resources or human capital, their ability to secure sufficient and nutritious food becomes constrained. As a result, such households are more likely to experience food insecurity. The framework therefore provides a useful explanation of how poverty-related conditions contribute to variations in household food security outcomes.



METHODOLOGY

The study adopted a correlational survey research design. This design was chosen because it enables the examination of the relationship between two or more variables without manipulating or controlling them. In this study, the design was considered appropriate for investigating the relationship between household food security and poverty conditions among residents of Sokoto Metropolis.

The population of the study comprised all households within Sokoto Metropolis, Sokoto State, Nigeria. The area was selected because it reflects common socio-economic challenges associated with food access and poverty. From this population, a sample of 400 respondents was selected to participate in the study. The sample size was considered adequate based on Cochran's (1977) sample size determination formula for large populations at a 95% confidence level and a 5% margin of error. Under these conditions, a sample of approximately 384 respondents is generally regarded as sufficient. To improve the precision of the study and make provision for possible non-response or incomplete questionnaires, the sample size was increased to 400 respondents. A stratified random sampling technique was employed to select the respondents. First, the population was divided into different strata based on relevant characteristics within the metropolis. Thereafter, respondents were selected proportionately from each stratum. Within each stratum, simple random sampling was used to ensure that every household had an equal chance of being selected. This procedure enhanced the fairness of the selection process and improved the representativeness of the sample.

Data were collected using a researcher-developed structured questionnaire titled the Household Food Security and Poverty Questionnaire (HFSPQ). The instrument comprised 32 items and was organized into three sections. Section A contained 6 items designed to obtain respondents' demographic information, including age, gender, educational attainment, employment status, household size, and monthly household income. Section B consisted of 16 items measuring household food security across four dimensions: food availability (4 items), food access (4 items), food utilization (4 items), and food stability (4 items). Section C comprised 10 items measuring poverty-related conditions, including household income level, employment status, household size, educational attainment, and other indicators of household well-being. All items in Sections B and C were rated on a five-point Likert scale of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1) to facilitate quantitative measurement and statistical analysis.

The Household Food Security and Poverty Questionnaire (HFSPQ) was subjected to face and content validation by three experts in research methodology and the social sciences. The experts assessed the instrument for clarity, relevance, adequacy of coverage, and appropriateness of the items in relation to the study objectives and variables. Their observations and recommendations were incorporated into the final version of the questionnaire, thereby enhancing its content validity. To establish the reliability of the instrument, a pilot study was conducted among respondents with characteristics similar to those of the target population but who were not included in the main study. The responses obtained from the pilot study were analyzed using Cronbach's Alpha, which produced a reliability coefficient of 0.82. Since this value exceeded the recommended minimum reliability threshold of 0.70, the instrument was considered reliable and suitable for data collection.



Following data collection, the completed questionnaires were sorted, coded, and analyzed using SPSS version 25. Both descriptive and inferential statistical techniques were employed in the analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the respondents' demographic characteristics and describe the study variables. Pearson Product-Moment Correlation was employed to determine the relationship between household food security and poverty variables, while multiple regression analysis was used to examine the extent to which the dimensions of household food security predict poverty outcomes. All hypotheses were tested at the 0.05 level of significance.

Ethical principles were strictly observed throughout the conduct of the study. Participants were adequately informed about the purpose and objectives of the research, and informed consent was obtained from each respondent before participation. Participation was entirely voluntary, and respondents were free to withdraw from the study at any stage without any consequences. The anonymity and confidentiality of all participants were assured, and the information obtained was used solely for academic research purposes.

RESULTS

Table 1: Socio-Demographic Characteristics of Respondents (n = 400)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	180	45.0
	Female	220	55.0
Total		400	100.0
Educational Level	No Formal Education	60	15.0
	Primary Education	80	20.0
	Secondary Education	140	35.0
	Tertiary Education	120	30.0
Total		400	100.0
Marital Status	Single	140	35.0
	Married	220	55.0
	Others	40	10.0
Total		400	100.0
Household Size	1–3 Persons	120	30.0
	4–6 Persons	200	50.0
	7 Persons and Above	80	20.0
Total		400	100.0
Employment Status	Employed	160	40.0
	Unemployed	120	30.0
	Self-employed	120	30.0
Total		400	100.0

Source: Field Survey, 2026.



Table 1 presents the demographic characteristics of the respondents. The findings show that 220 respondents (55.0%) were female, while 180 respondents (45.0%) were male, indicating a slightly higher participation of females in the study. Regarding educational attainment, the largest proportion of respondents, 140 (35.0%), had secondary education, followed by 120 (30.0%) with tertiary education. Respondents with primary education accounted for 80 (20.0%), while 60 (15.0%) had no formal education. This distribution suggests that most respondents possessed at least a basic level of formal education, which may have enhanced their understanding of the questionnaire.

The results further reveal that 220 respondents (55.0%) were married, 140 (35.0%) were single, and 40 (10.0%) belonged to other marital categories. In terms of household size, 200 respondents (50.0%) had households comprising 4–6 persons, 120 (30.0%) had 1–3 persons, while 80 (20.0%) had seven or more persons. Concerning employment status, 160 respondents (40.0%) were employed, whereas 120 (30.0%) were unemployed and another 120 (30.0%) were self-employed. Overall, the findings indicate that the study participants were predominantly married, moderately educated, lived mainly in medium-sized households, and represented diverse employment categories, providing a broad socio-economic profile for examining the relationship between household food security and poverty..

Table 2: Level of Household Food Security among Respondents

Dimension of Food Security	Mean Score	Standard Deviation (SD)	Interpretation
Availability	3.45	0.81	Moderate
Access	3.30	0.78	Moderate
Utilization	3.40	0.74	Moderate
Stability	3.29	0.80	Moderate
Overall Mean	3.36	—	Moderate

Source: Computed from Field Survey Data, 2026.

Table 2 presents the level of household food security among respondents across four key dimensions: availability, access, utilization, and stability. The results show that the mean score for food availability is 3.45 (SD = 0.81), indicating a moderate level of food availability among households. Food access recorded a mean score of 3.30 (SD = 0.78), while food utilization had a mean score of 3.40 (SD = 0.74). Food stability showed a mean score of 3.29 (SD = 0.80). All the dimensions fall within the moderate range, suggesting that households experience a fair but not optimal level of food security across all components.



The overall mean score for household food security is 3.36, which also falls within the moderate category. This indicates that, on average, respondents experience a moderate level of food security in the study area. Although none of the dimensions reflect low food security, the results suggest that households are not fully food secure, as their conditions remain below a high or optimal level. This implies that improvements are still needed across all dimensions of food security to achieve stronger and more stable household food security outcomes.

Table 3: Pearson Correlation Analysis Showing the Relationship between Poverty Dynamics and Household Food Security

Variable Pair	Pearson Correlation Coefficient (r)	p-value	Decision
Poverty Dynamics and Household Food Security	-0.214	0.000	Significant
Decision Rule: Reject the null hypothesis if $p < 0.05$			

Source: SPSS Version 25 Output, 2026.

The results in the table 3 show that there is a negative relationship between poverty dynamics and household food security, with a Pearson correlation coefficient (r) of -0.214. This indicates a weak inverse relationship, meaning that as poverty dynamics increase, household food security tends to decrease slightly, and vice versa. The strength of the relationship is relatively low, but it still reflects a meaningful association between the two variables under study.

The p-value of 0.000 shows that the relationship is statistically significant at the 0.05 level. Based on the decision rule, since $p < 0.05$, the null hypothesis is rejected. This implies that there is a statistically significant relationship between poverty dynamics and household food security among respondents in the study area. Therefore, changes in poverty conditions are significantly associated with variations in household food security.

Table 4: Multiple Regression Analysis on Predictors of Household Food Security

Predictor Variable	Standardized Coefficient (β)	t-value	p-value	Decision
Income	0.312	4.21	0.000	Significant
Employment Status	0.280	3.89	0.001	Significant
Household Size	-0.265	3.77	0.001	Significant
Educational Level	0.198	2.95	0.003	Significant

Table 4 presents the results of the multiple regression analysis on the predictors of household food security. The findings show that income has a positive and significant influence on household food security with a standardized coefficient (β) of 0.312, t-value of 4.21, and p-value of 0.000, indicating a significant contribution. Employment status also shows a positive and significant effect with $\beta = 0.280$, $t = 3.89$, and $p = 0.001$, suggesting that improved employment conditions enhance household food security.

The results further reveal that household size has a negative and significant relationship with household food security, with $\beta = -0.265$, $t = 3.77$, and $p = 0.001$, indicating that larger household size tends to reduce food security levels. In addition, educational level shows a positive and significant influence with $\beta = 0.198$, $t = 2.95$, and $p = 0.003$, implying that higher education contributes to improved household food security. Overall, all the predictor variables are statistically significant at the 0.05 level, indicating that income, employment status, household size, and educational level are important determinants of household food security in the study area.

Model Summary

Statistic	Value
Multiple Correlation Coefficient (R)	0.46
Coefficient of Determination (R^2)	0.21
F-value	18.34
Significance Level (p-value)	< 0.05

Source: SPSS Version 25 Output, 2026.

Model Summary: $R = 0.46$, $R^2 = 0.21$, $F = 18.34$, $p < 0.05$



The model summary provides an overview of the adequacy of the multiple regression model used to explain household food security. The multiple correlation coefficient (R) of 0.46 indicates a moderate level of association between the independent variables (income, employment status, household size, and education) and household food security. This suggests that the combined predictors have a reasonable relationship with the dependent variable.

The coefficient of determination (R^2) value of 0.21 shows that approximately 21% of the variation in household food security is explained by the variables included in the model. This implies that the remaining 79% of the variation is likely due to other influencing factors not captured in this study. In addition, the F-statistic value of 18.34 demonstrates that the regression model is statistically significant and performs better in predicting household food security compared to a model without explanatory variables. The associated significance level ($p < 0.05$) confirms that the overall model is statistically meaningful. Based on this result, the null hypothesis stating that the predictor variables do not jointly influence household food security is rejected. This confirms that the selected socio-economic factors significantly contribute to explaining household food security differences among respondents.

DISCUSSION

The finding that household food security is generally moderate across availability, access, utilization, and stability reflects patterns commonly reported in developing urban contexts. Similar evidence from the Food and Agriculture Organization of the United Nations (2021) shows that many households in low- and middle-income countries experience partial food security, where food may be available but access and stability remain inconsistent. This supports the current result that food security is not absent but exists at a moderate and fragile level. Likewise, Jones et al. (2013) argue that food security outcomes are often uneven across dimensions, with access and stability typically lagging behind availability, which is consistent with the present findings.

The significant negative relationship between poverty and household food security aligns strongly with empirical evidence from open-access studies. Smith et al. (2017) found in a global analysis that poverty and income volatility are key predictors of food insecurity, especially in urbanizing regions. Similarly, Headey and Martin (2016) report that increases in poverty rates consistently lead to declines in dietary quality and food access. In the Nigerian context, Olagunju et al. (2019) also confirmed that poverty status significantly reduces household food security among urban households, supporting the present study's conclusion that worsening poverty dynamics reduce food security outcomes.

The regression results further show that income, employment status, household size, and education significantly predict household food security, which is consistent with multiple open-access findings.



For instance, Ali et al. (2020) report that household income is one of the strongest determinants of food access and consumption stability in sub-Saharan Africa. Employment status similarly improves food security by stabilizing purchasing power, as confirmed by Maxwell and Smith (2019), who emphasize livelihood security as a core pathway to food security outcomes. Education also plays a positive role, as Ecker and Qaim (2011) explain that higher education improves nutrition awareness and income opportunities, strengthening household resilience.

However, the negative effect of household size is also widely supported in empirical literature. Gebre (2012) found that larger household sizes increase dependency ratios, thereby reducing per capita food availability in Ethiopian households. This is consistent with the present study, where larger households reduce food security levels due to resource pressure. Overall, while the findings are largely consistent with global and African evidence, slight contextual differences reflect variations in income structure, urbanization level, and household composition.

CONCLUSION

The study concluded that household food security in Sokoto Metropolis is generally at a moderate level, indicating that while most households are able to meet basic food needs, they still experience varying degrees of vulnerability. The findings further reveal that food security conditions are significantly shaped by underlying socio-economic and poverty-related factors. In particular, income level, employment status, household size, and educational attainment emerged as key determinants influencing the food security status of households in the study area. Collectively, these variables explain important aspects of household welfare and highlight the role of economic and demographic conditions in shaping access to adequate and stable food. The results therefore underscore that improving household socio-economic conditions is essential for strengthening food security in the study area.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. Government (Federal, State, and Local) should strengthen food security and poverty reduction policies through job creation, social protection programmes, and economic empowerment initiatives to improve household welfare.
2. Ministry of Agriculture and Agricultural Agencies should enhance food production by supporting farmers with inputs, irrigation systems, extension services, and improved farming techniques to increase food availability and stability.
3. Ministry of Labour and Employment Agencies should expand employment opportunities



through skill acquisition programmes, youth empowerment schemes, and support for small and medium-scale enterprises to improve household income levels.

4. Ministry of Education and Adult Literacy Programmes should improve access to education and strengthen literacy programmes, as education contributes significantly to improved income opportunities and household food security.
5. Non-Governmental Organizations and Development Partners should support poverty alleviation initiatives, nutrition programmes, and targeted interventions for vulnerable households to complement government efforts.
6. Community Leaders and Religious Institutions should promote awareness on responsible family planning practices and encourage households to participate in development programmes aimed at improving livelihoods.
7. Households should adopt improved livelihood strategies, engage in skill development opportunities, and manage available resources effectively to enhance food security outcomes.

REFERENCES

- Abdullahi, A., & Aliyu, S. (2021). Urban poverty and food security in Nigeria. *Journal of Development Studies*, 18(2), 25–45.
- Ali, H., Ahmad, M., & Iqbal, M. A. (2020). Determinants of food security in Sub-Saharan Africa: Evidence from household surveys. *PLOS ONE*, 15(8), e0237319. <https://doi.org/10.1371/journal.pone.0237319>
- Ecker, O., & Qaim, M. (2011). Analyzing nutritional impacts of policies: An empirical study for Malawi. *World Development*, 39(3), 412–425. <https://doi.org/10.1016/j.worlddev.2010.08.002>
- FAO. (2021). The state of food security and nutrition in the world 2021. <https://www.fao.org/publications/sofi>
- Food and Agriculture Organization & UNICEF. (2022). Nutrition-sensitive food systems in Nigeria. FAO & UNICEF.
- Food and Agriculture Organization. (2020). The state of food security and nutrition in the world 2020. FAO.
- Food and Agriculture Organization. (2021). The state of food security and nutrition in the world 2021. FAO.
- Gebre, G. G. (2012). Determinants of food security among rural households in Ethiopia. *African Journal of Agricultural Research*, 7(15), 2456–2465. <https://doi.org/10.5897/AJAR11.212>



- Headey, D., & Martin, W. (2016). The impact of food prices on poverty and food security. *World Bank Research Observer*, 31(1), 71–98. <https://doi.org/10.1093/wbro/lkv023>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610.
- Maxwell, D., & Smith, M. (2019). Household food security: Concepts and definitions. *World Food Programme Working Paper*. <https://www.wfp.org/>
- National Bureau of Statistics. (2023). Consumer price index report. NBS.
- Olayemi, A. O., Yusuf, S. A., & Adekunle, O. A. (2020). Socioeconomic determinants of household food security. *African Journal of Economic Review*, 8(1), 45–60.
- Smith, L. C., Haddad, L., & Herforth, A. (2017). How is food security changing? Evidence from global data. *Global Food Security*, 12, 1–10. <https://doi.org/10.1016/j.gfs.2017.01.002>
- World Bank. (2023). Nigeria poverty and equity brief. World Bank.