KADUNA JOURNAL OF GEOGRAPHY
2026, VOL. 8, No. 1, 813-826
https://doi.org/10.47514/kjg.2026.08.01.076

Research Article

Population Growth and Food Security in a Semi-Urban Nigerian Community: Evidence from Ijebu-Ode, Ogun State, Nigeria

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ABSTRACT

Rapid population growth in Nigeria's semi-urban towns is often assumed to be outstripping local food production capacity, yet household-level evidence from smaller urban centres remains limited. This study assessed the relationship between population growth and food security among households in Ijebu-Ode, Ogun State, Nigeria. A cross-sectional survey design was adopted, and a structured questionnaire was administered to 110 respondents drawn from eleven wards using simple random sampling, following a sample size derived from Cochran's formula. Data were analyzed using descriptive statistics (frequencies and percentages) and chi-square tests of association at the 5% significance level. Most respondents (57.3% male; 31.8% aged 26-35 years; 44.5% with tertiary education) were economically active, with trading (25.5%) and farming (20.0%) as dominant occupations and moderate-to-large households (30.9% with five or more members) common. A large majority (70.0%) agreed or strongly agreed that population growth had driven up food prices, and more than half reported reducing meal size or switching to cheaper foods as coping strategies. High food cost (40.9%), lack of farmland (22.7%), and limited market supply (20.0%) were identified as the greatest challenges, while awareness of government food security interventions was low (47.3% "not aware at all"). The chi-square tests did not detect a statistically significant association between household-size growth and food availability ($x^2 = 0.767$, df = 1, p = 0.381) or between monthly income and perceived food affordability ($x^2 = 7.752$, df = 9, p = 0.578). Within the limits of a modest sample and perception-based measures, these results are consistent with perceived food insecurity in the study area being shaped more by market prices, land access and institutional support than by household size alone, although this interpretation warrants confirmation in larger, longitudinal studies. The study recommends targeted investment in local agricultural production, farmland protection, food price stabilization, improved storage infrastructure, and stronger, better-publicized government interventions to strengthen household food security under continuing population pressure.

ARTICLE HISTORY
Submitted 10 September 2026
Accepted 30 October 2026
Published 27 November 2026

GUEST EDITOR
A. M. Ahmed

KEYWORDS
Population growth; food security; food availability; household coping strategies; Ijebu-Ode; Nigeria

1 Introduction

Food security remains one of the most pressing development challenges confronting Nigeria in the face of rapid population growth and urban expansion (Tavershima et al., 2022). The United Nations defines food security as a condition 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. In Nigeria, rising population figures have placed considerable pressure on agricultural systems, infrastructure and environmental resources, widening the gap between food demand and supply (Owoo, 2021). This pressure is evident in towns such as Ijebu-Ode, Ogun State, a historically agrarian, semi-urban town that has experienced significant demographic change driven by migration, urbanization and natural population increase (Akinsulu, 2023; Sanusi, 2025). Several interrelated pressures are eroding the town's food system.

Residential, commercial and industrial development is encroaching on agricultural land, transforming land-use patterns and reducing the land available for farming (Ojo et al., 2024). As more land is converted, local food production potential diminishes, and dependence on external food sources deepens, exposing residents to price shocks and supply disruptions, while population growth simultaneously raises demand (Okpalanwabude, 2025; Owoo, 2021). Water insecurity compounds the problem for smallholders, as competition for water intensifies among domestic, industrial, and agricultural users, particularly where farming is rain-fed and exposed to erratic rainfall linked to climate change (Sanusi, 2025). Population growth also deepens inequality in access to land, capital and inputs (Balogun et al., 2018), and urbanization weakens the communal networks through which smallholders traditionally pooled resources, shared knowledge and accessed markets. Further constraints include an ageing farming population with limited youth involvement (Oke et al., 2021) and weak participation in community-based organizations (Kehinde & Alabi, 2025). Although sustainable land-management practices such as crop rotation, composting, agroforestry, and efficient irrigation improve yields and soil fertility (Ojo et al., 2024),

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most farmers in Ijebu-Ode lack the knowledge, capital, or institutional support to adopt them, leaving continuous mono-cropping, fertilizer overuse, and deforestation as the norm.

Despite the seriousness of these pressures, empirical evidence linking demographic change to household-level food security in smaller, semi-urban Nigerian centres such as Ijebu-Ode remains limited. Most existing Nigerian studies focus on specific farming sub-sectors (e.g., cassava, cocoyam, rice, and catfish) or on national-level secondary data, rather than on households' everyday food-security experience in a rapidly urbanizing town. Understanding this relationship locally is essential for formulating context-specific policies that ensure food availability, affordability, and stability for a growing population. This study addresses that gap by assessing how population growth is associated with food availability, affordability, coping behaviour, and perceptions of government intervention among households in Ijebu-Ode.

The aim of the study is to assess the relationship between population growth and food security in Ijebu-Ode. The specific objectives are to: (i) examine the socio-economic characteristics of residents; (ii) analyze how population growth is affecting food availability; (iii) analyze how families are coping with food shortages or rising prices caused by population growth; (iv) examine the main challenges residents face in obtaining enough food as the population increases; and (v) examine the steps being taken by government or the community to improve food security.

1.1 Conceptual Review

Population growth is understood here as the continual increase in the number of people in an area, driven by high fertility, declining mortality, and migration. It is a key driver of food demand, since more people raise household consumption needs and create imbalances between food supply and nutritional requirements (Idachaba, 2004; Okpalanwabude, 2025; Owoo, 2021). Larger families devote a bigger share of income to food, but this does not guarantee dietary adequacy where production and income remain constrained (Akinsulu, 2023; Adesina, 2022). On the supply side, population growth increases pressure on land, water, and labour, and has been linked to land fragmentation and soil degradation that erode yields and long-run self-sufficiency (Okpalanwabude, 2025; Sanusi, 2025).

Socio-economic characteristics such as income, education, credit access, and social capital moderate household impacts: better-resourced households absorb demographic pressure more readily, while poorer ones are more vulnerable (Babatunde et al., 2007; Balogun et al., 2018; Kehinde & Alabi, 2025). Sustainable land-management practices and household resilience buffer these effects, while weak policy and institutional support intensify them (Ojo et al., 2024; Tavershima et al., 2022). Population growth is therefore positioned as a demand-side driver of food insecurity whose household impact depends on production capacity, socio-economic status, resource management, resilience, and institutional response.

1.2 Theoretical Framework

This study draws on five complementary theories: Malthusian Theory, Demographic Transition Theory, Central Place Theory, Von Thünen's Model of Agricultural Land Use, and Location Theory. Malthusian Theory (Malthus, 1798, as discussed in Olayemi, 2020) holds that population grows geometrically while food production grows arithmetically, producing a long-run imbalance. Nigeria's population, exceeding 220 million and projected to surpass 400 million by 2050 (World Bank, 2020), together with outdated farming practices, climate variability, and limited technology access (Olomola, 2022), illustrates this dynamic and justifies treating demographic pressure as a primary explanatory variable. Demographic Transition Theory (Notestein, 1945) explains population change as a sequence of stages tied to falling mortality and, eventually, fertility.

Nigeria lies between the second and third stages, with high fertility (about 5.3 children per woman; UNFPA, 2021) and declining mortality producing growth that has outpaced agricultural output (World Bank, 2020; IMF, 2023). Central Place Theory (Christaller, 1933/1966) describes settlements as hierarchical hubs for goods and services. Secondary towns such as Ijebu-Ode act as lower-order centres for staples, so as urban demand grows, they depend more on distant hubs and become more exposed to price shocks (Okpala, 2024; Zimmer et al., 2022).

Von Thünen's Model (1826) explains how production is organized around market centres by transport cost and perishability. As farmland near cities is converted to residential and commercial use, production moves farther away, raising transport costs and post-harvest losses (Adebayo, 2021; Bello, 2020), which mirrors respondents' reported concerns about farmland access. Location Theory (Weber, 1909/2020) similarly explains how producers and distributors minimize transport costs while maximizing market access; urban expansion displaces agricultural land, raises costs, and reduces food accessibility for urban and peri-urban households (Aliyu, 2019; Okafor, 2021). Together, these theories offer a demographic, spatial, and institutional lens for interpreting how population growth in Ijebu-Ode translates into the food-security outcomes examined.

1.3 Empirical Review

1.3.1 Global and regional evidence

In high-income countries, population-linked food insecurity is more a problem of access than of aggregate shortage. Immigration and urbanization concentrate demand in cities and complicate supply chains (Fox-Kämper et al., 2023), and insecurity persists among low-income and minority households even where national supply is adequate (Odoms-Young, 2023; USDA ERS, 2025). Logistics, social protection, and urban food planning buffer these pressures (FAO, 2020), showing that infrastructure and governance, not population size alone, shape outcomes. In developing regions, particularly sub-Saharan Africa and South Asia, population growth outpacing productivity has been linked to stagnating per-capita food supply (Miladinov, 2023; Wudil et al., 2022). Large families and high dependency ratios reduce per-capita resources (Wudil et al., 2022), urbanization converts peri-urban farmland and strains supply chains, and shocks such as COVID-19 and grain-market disruptions magnify exposure (Amare et al., 2024).

1.3.2 Evidence from Nigeria

National-level studies provide direct support for a population–food linkage. Idachaba (2004) identified rapid population growth as a structural constraint on Nigeria's food security, and Okunolà et al. (2018) found a long-run relationship between population growth and food production, consistent with Malthusian expectations. More recent work reports that urban population growth significantly reduced national food production between 1980 and 2020 (Okpalanwabude, 2025) and that population had outstripped agricultural output (Tavershima et al., 2022). Household- and farm-level studies are more mixed and point to socio-economic and locational factors. Earlier work in Kwara State linked household characteristics, including household size, to farming households' food-security status (Babatunde et al., 2007). Owoo (2021) found that larger households had worse food-security and nutrition outcomes, including in urban Nigeria. Akinsulu (2023) found that credit, cooperative membership, education, extension contact, and non-farm income improved food security among Ogun State cocoyam farmers, while larger family size worsened it, yet 97.9% remained food insecure.

Adesina (2022) identified education, household size, information access, and location as the main determinants among fish-farming households. Social capital raised cassava productivity in Ogun State (Balogun et al., 2018), while age, education, and cooperative membership drove catfish output in Oyo State (Oke et al., 2021). Smallholder rice farmers in Ogun State showed low resilience to water insecurity (Sanusi, 2025), and sustainable land-management adoption improved dietary diversity (Ojo et al., 2024). Participation in community-based organizations was linked to lower rural poverty in Osun State (Kehinde & Alabi, 2025). Two gaps motivate the present study. First, most Nigerian studies rely on national time-series data or focus on specific farming sub-sectors, leaving little household-level evidence for semi-urban settlements such as Ijebu-Ode. Second, national analyses tend to find population growth significantly associated with declining food production, whereas household-level studies more often find that credit access, education, social capital, and cooperative participation explain food security more directly than household size or population growth alone.

2 Materials and Methods

2.1 Study Area

The study was conducted in Ijebu-Ode, a local government area in Ogun State, south-western Nigeria, located approximately 100 km east of Lagos at latitudes 6.75 to 6.85°N and longitudes 3.85 to 3.98°E (Figure 1). Founded in the 13th century, Ijebu-Ode became a major centre of trade in the 16th century and, following British colonial rule from 1892, was incorporated into present-day Ogun State at Nigeria's independence in 1960. The town has a tropical monsoon climate, with average temperatures of 21–33°C, a wet season from April to October (peaking in August) and a dry season from November to March marked by the Harmattan. Annual rainfall averages 1,500–2,000 mm, supporting cultivation of cocoa, oil palm and cassava on predominantly sandy soils with moderate drainage. The local economy combines long-established trade with agriculture, small-scale manufacturing and services, and the town hosts several tertiary institutions, including Tai Solarin Federal University of Education. Key markets, such as the Ijebu-Ode Central Market, facilitate trade in foodstuffs, textiles, and artisanal goods. The annual Ojude Oba festival draws tourists, adding to the local economy. Its proximity to Lagos and robust educational institutions further reinforces its significance.

Transportation infrastructure is well-developed, with the Lagos-Ibadan Expressway ensuring connectivity to Lagos and other regions. The town's intra-city movement relies heavily on motorcycles and tricycles (Keke Napep), while its bus terminal serves as a regional transit hub. Despite its strategic location, challenges like traffic congestion and limited public transport remain, prompting efforts to improve road networks and urban mobility. The study covered eleven wards: Ijasi/Idepo, Porogun I, Porogun II, Ijade/Imepe I, Ijade/Imepe II, Odo-Egbo/Oliworo, Isiwo, Itamapako, Isoku/Ososa, Odo-Esa, and Itantebo.

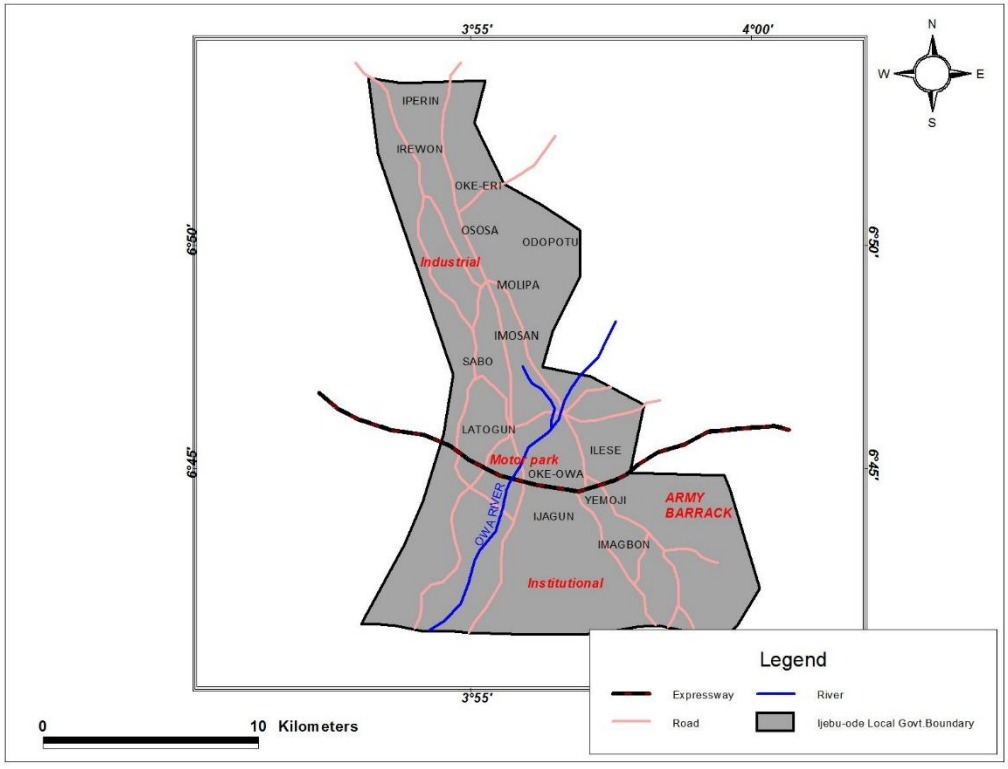

Figure 1: Ijebu-Ode
Source: Ijebu-Ode Town Planning Office, Ijebu-Ode, Ogun State, Nigeria, 2018.

2.2 Research Design and Data Sources

The study adopted a cross-sectional survey design combining quantitative and qualitative approaches. Primary data were collected through a structured questionnaire administered to household respondents, while secondary data were obtained from journal articles, institutional reports, and online sources to support the literature review and contextual analysis.

2.3 Population, Sample Size and Sampling Technique

The study population comprised residents of the eleven wards of Ijebu-Ode Local Government Area. Given the 2025 projected population of 409,000, the minimum sample size was determined using Cochran's formula for large populations:

$$n_0 = Z^2pq / e^2$$

where Z is the standard normal value at the 95% confidence level (1.96), p is the estimated proportion of the population with the attribute of interest (0.5, which gives the maximum variability), q = 1 − p (0.5), and e is the margin of error (0.05). This yielded $n_0 = (1.96^2 \times 0.5 \times 0.5) / 0.05^2 \approx 384$. Applying the finite population correction, $n = n_0 / [1 + (n_0 - 1)/N]$, gave the same value (≈ 384), since the population is very large. Owing to time and resource constraints, 110 respondents (about 28.6% of the calculated sample) were surveyed. A stratified random sampling technique was adopted, with the eleven wards serving as strata.

An equal number of respondents (10) were selected from each ward using simple random sampling, and all 110 questionnaires were administered and fully retrieved, giving a 100% response rate. At 95% confidence, a sample of 110 corresponds to a margin of error of approximately ±9.3% rather than the ±5% targeted. The findings were therefore interpreted as indicative rather than strictly generalizable to the entire local government area.

2.4 Data Collection Instrument

Data were collected using a structured questionnaire divided into six sections: (A) socio-economic characteristics of respondents; (B) population growth and food availability; (C) household views on population growth and food shortage; (D) household coping strategies; (E) main challenges of food shortage; and (F) government and community interventions in food security. Section C comprised five statements measured on a four-point Likert scale (Strongly Agree, Agree, Disagree, and Strongly Disagree). The questionnaire was not pilot-tested before the main survey. To assess the reliability of the Section C items, Cronbach's alpha was computed after data collection using the 110 completed questionnaires, yielding α = 0.72, which indicates acceptable internal consistency (threshold ≥ 0.70. The absence of a prior pilot test is acknowledged as a limitation, as item wording and administration time were

not checked before fieldwork.

The study was conducted in line with the ethical guidelines of the department, and approval was obtained from the supervisor before data collection. Participation was voluntary, and informed consent was obtained from each respondent after the purpose of the study was explained. No personal identifiers were recorded, respondents' anonymity and confidentiality were assured, and the data were used solely for academic purposes.

2.5 Method of Data Analysis

Data obtained from the questionnaire survey were analyzed using descriptive statistics (frequency counts and percentages) to summarize socio-economic characteristics and perception variables, presented in tables and charts. Inferential analysis was conducted using the chi-square (χ^2) test of association to examine the relationship between (i) increase in household size (a proxy for population growth) and food availability, and (ii) monthly household income and perceived food affordability. Both hypotheses were tested at the 5% (0.05) level of significance, with the decision rule that the null hypothesis is rejected when the computed p-value is less than 0.05, and retained otherwise.

3 Results

3.1 Socio-Economic Characteristics of Respondents in Ijebu-Ode

Table 1 shows that male respondents (57.3%) outnumbered female respondents (42.7%). Most respondents were aged 26–35 years (31.8%), followed by 36–45 years (19.1%), reflecting a predominantly economically active sample. Educational attainment was relatively high: 44.5% held tertiary education and 32.7% secondary education, with only 5.5% having no formal education. Married respondents constituted the largest group (51.8%). Trading (25.5%) and farming (20.0%) were the dominant occupations, and 48.2% of respondents earned between ₦50,001 and ₦100,000 monthly. Household sizes were moderate to large, with 57.3% of households having 3–4 members and a further 30.9% having five or more, indicating considerable pressure on household food demand.

Table 1: Socio-Economic Characteristics of Respondents in Ijebu-Ode

Variable	Category	Frequency	Percent (%)
Sex	Male	63	57.3
	Female	47	42.7
Age (years)	18–25	20	18.2
	26–35	35	31.8
	36–45	21	19.1
	46–55	16	14.5
	56 and above	18	16.4
Educational level	No formal education	6	05.5
	Primary education	19	17.3
	Secondary education	36	32.7
	Tertiary education	49	44.5
Marital status	Single	44	40.0
	Married	57	51.8
	Divorced	4	03.6
	Widowed	5	04.5
Occupation	Farming	22	20.0
	Trading	28	25.5
	Civil service	17	15.5
	Private sector	17	15.5
	Unemployed	11	10.0
	Other	15	13.6
Average monthly income	Below ₦20,000	14	12.7
	₦20,001–₦50,000	28	25.5
	₦50,001–₦100,000	53	48.2
	Above ₦100,000	15	13.6
Household size	1–2	13	11.8
	3–4	63	57.3
	5 and above	34	30.9
Total		110	100.0

3.2 Population Growth and Food Availability in Ijebu-Ode

As shown in Table 2, 45.5% of respondents reported an increase in household size over the past ten years, while 53.6% reported no change. A large majority (70.0% combining "strongly agree" and "agree") attributed rising food prices to population growth, against 18.2% who disagreed or strongly disagreed. Perceptions of current market food availability were split, with 53.6% seeing no decline relative to five years ago and 44.5% perceiving reduced availability. Regarding farmland access, 38.2% believed population growth had reduced their access to land for cultivation, 37.3% disagreed, and 24.5% were unsure. On coping, a slight majority (52.7%) reported reducing meal sizes, while 47.3% shifted to cheaper foods

Table 2: Population Growth and Food Availability in Ijebu-Ode

Variable	Category	Frequency	Percent (%)
Household size increased in last 10 years	Yes	50	45.5
	No	59	53.6
	No response/Invalid	1	0.9
Food prices increased due to population growth	Strongly Agree	45	40.9
	Agree	32	29.1
	Neutral	13	11.8
	Disagree	13	11.8
	Strongly Disagree	7	06.4
Food less available in markets than 5 years ago	Yes	49	44.5
	No	59	53.6
	No response/Invalid	2	01.8
Population growth reduced access to farmland	Yes	42	38.2
	No	41	37.3
	Not sure	27	24.5
Household coping response	Reduced meal size	58	52.7
	Shifted to cheaper food	52	47.3

3.3 Household Views on Population Growth and Food Shortage in Ijebu-Ode

Table 3 shows that 75.5% of respondents (SA + A) agreed that population growth had increased pressure on food availability in their community. Views on affordability were more divided: only 46.4% agreed that increasing population made food harder to afford, while 53.6% disagreed, suggesting affordability difficulties are not attributed to population growth alone by most households. A majority (56.4%) agreed that large family size contributes to food shortage, and 56.3% agreed that shortages had affected the quality and quantity of household meals. Notably, 80.0% of respondents (SA + A) expressed concern about future food availability given continuing population growth, indicating a strong forward-looking anxiety that is not fully mirrored in current affordability perceptions.

Table 3: Household Views on Population Growth and Food Shortage in Ijebu-Ode (Likert Scale, %)

Statement	SA (%)	A (%)	D (%)	SD (%)
Population growth in my community has increased pressure on food availability.	39.1	36.4	21.8	02.7
My household finds it more difficult to afford food due to increasing population.	6.4	40.0	50.0	03.6
Large family size contributes to food shortage in my household.	10.9	45.5	30.0	13.6
Food shortages have affected the quality and quantity of meals my family consumes.	13.6	42.7	32.7	10.9
My family is concerned about future food availability because of population growth.	24.5	55.5	16.4	03.6

3.4 Household Coping Strategies for Food Shortages in Ijebu-Ode

Table 4 shows that reducing the number of daily meals (37.3%) and reducing portion sizes (25.5%) were the most common short-term coping mechanisms. Local markets remained the dominant food source during shortages (67.3%), well ahead of buying directly from farmers (18.2%) or neighbouring towns (12.7%); government or

NGO food distribution reached only 0.9% of households, indicating negligible direct food-aid coverage. To afford food during price increases, over half of respondents (51.8%) engaged in additional work or trading, while 29.1% reported using no particular strategy. Reliance on extended family or neighbours for food assistance was inconsistent: 40.9% relied on this "sometimes", while 34.5% "never" did, suggesting social support networks are important but not universal. For long-term adaptation, home gardening or farming (35.5%) and bulk buying/storage (29.1%) were the leading strategies, while 19.1% of households had adopted no specific long-term strategy at all.

Table 4: Household Coping Strategies for Food Shortage in Ijebu-Ode

Question	Option	Frequency	Percent (%)
How has your household adjusted meals during food shortage?	Reduced number of meals per day	41	37.3
	Reduced portion sizes	28	25.5
	Substituted with less preferred food	24	21.8
	No change	17	15.5
Where does your household mainly buy food during shortages?	Local markets in Ijebu-Ode	74	67.3
	Directly from farmers	20	18.2
	Government/NGO food distribution	1	0.9
What strategies afford food when prices rise?	Engage in additional work/trading	57	51.8
	None of the above	32	29.1
	Borrow money or food	11	10.0
	Sell household assets	6	05.5
	Rely on remittances from relatives	4	03.6
Reliance on extended family/neighbours for food assistance	Sometimes	45	40.9
	Never	38	34.5
	Neighbouring towns/villages	14	12.7
	Very often	14	12.7
	Rarely	12	10.9
Long-term strategy for recurring shortages	Home gardening/farming	39	35.5
	Bulk buying and food storage	32	29.1
	No specific strategy	21	19.1
	Reducing household size (sending members to relatives)	11	10.0
	Migration to areas with better opportunities	7	6.4

Note: Percentages within each question sub-total approximately to 100%, subject to rounding and non-response.

3.5 Main Challenges of Food Shortage and Population Growth in Ijebu-Ode

Table 5 indicates that rising food prices constitute at least a moderate challenge for 69.1% of households (moderate + grave), confirming affordability as a central concern. Food shortages in local markets are experienced "very often" or "sometimes" by 72.7% of respondents. On farmland, 77.3% reported some reduction in access due to population growth (slightly or greatly reduced), reinforcing the land-pressure narrative from Table 2. While 38.2% of households could always afford enough food, the remaining 61.8% experienced some degree of difficulty, ranging from occasional to frequent. The high cost of food (40.9%) was the single largest reported barrier to adequate food access, ahead of lack of farmland (22.7%), limited market supply (20.0%), and poor storage facilities (16.4%).

Table 5: Main Challenges of Food Shortage and Population Growth in Ijebu-Ode

Question	Option	Frequency	Percent (%)
How much of a challenge are rising food prices?	Moderate challenge	52	47.3
	Grave challenge	24	21.8
	Minor challenge	24	21.8
	Not a challenge	8	07.3
How often are food-item shortages experienced in local markets?	Sometimes	53	48.2
	Very often	27	24.5

	Rarely	24	21.8
	Never	6	05.5
Has population growth affected access to farmland for cultivation?	Slightly reduced access	52	47.3
	Greatly reduced access	33	30.0
	No change	25	22.7
Household's ability to afford enough food	Always able to afford	42	38.2
	Sometimes unable to afford	39	35.5
	Rarely able to afford	16	14.5
	Often unable to afford	13	11.8
Biggest challenge in getting enough food	High cost of food	45	40.9
	Lack of farmland for production	25	22.7
	Limited supply in markets	22	20.0
	Poor storage and preservation facilities	18	16.4

3.6 Government and Community Interventions in Food Security in Ijebu-Ode

Table 6 reveals low public awareness of food security interventions: 47.3% of respondents were entirely unaware of any government or community programme, and 31.8% had noticed none of the listed measures in their area. Among those who had noticed interventions, community food cooperatives (25.5%) and support for local farmers (23.6%) were the most cited; subsidized food distribution was almost absent (3.6%). Perceptions of effectiveness were mixed and skewed toward the negative: only 40.9% rated interventions as effective or very effective, while 31.8% rated them ineffective or very ineffective, and 27.3% remained neutral, largely reflecting the low awareness reported above. Community-level initiatives were similarly limited, with 37.3% of respondents unsure whether any existed and only 16.4% describing them as very active. When asked what should be prioritized, expanding local farming support (38.2%) was the clear leading preference, followed by improving storage facilities (19.1%) and regulating food prices (18.2%).

Table 6: Government and Community Interventions in Food Security in Ijebu-Ode

Question	Option	Frequency	Percent (%)
Awareness of government/community food security programmes	Not aware at all	52	47.3
	Aware to some extent	35	31.8
	Yes, very aware	23	20.9
Food security measures noticed in the area	None of the above	35	31.8
	Community food cooperatives	28	25.5
	Support for local farmers (fertilizer, seedlings)	26	23.6
	Market price regulation	17	15.5
	Subsidized food distribution	4	3.6
Perceived effectiveness of government intervention	Neutral	30	27.3
	Effective	27	24.5
	Very ineffective	19	17.3
	Very effective	18	16.4
	Ineffective	16	14.5
Community-organized local efforts to improve food access	Not sure	41	37.3
	No initiatives	26	23.6
	Yes, but limited initiatives	25	22.7
	Yes, very active initiatives	18	16.4
Action recommended to be prioritized	Expanding local farming support	42	38.2
	Improving storage and preservation facilities	21	19.1
	Regulating food prices	20	18.2
	Providing more government food aid	17	15.5
	Promoting food cooperatives/community farming	10	9.1

3.7 Test of Hypotheses

The chi-square value of 0.767 (df = 1, p = 0.381) exceeds the 0.05 significance threshold, so the null hypothesis is retained: there is no statistically significant association between an increase in household size and food availability in Ijebu-Ode. Although a numerically higher proportion of households reporting increased household size also reported reduced food availability (27.3% against 18.2%), this difference is not large enough, given the sample size, to be statistically distinguishable from chance.

H01: There is no significant relationship between population growth and food availability in Ijebu-Ode, Ogun State.

Table 7: Cross-Tabulation of Increase in Household Size and Food Availability in Ijebu-Ode

Increase in household size (10 yrs)	Food available: Yes	Food available: No	Total
Yes	20 (18.2%)	30 (27.3%)	50 (45.5%)
No	29 (26.4%)	31 (28.2%)	60 (54.5%)
Total	49 (44.5%)	61 (55.5%)	110 (100.0%)

Table 8:

χ^2 value	df	p-value	N	Decision
0.767	1	0.381	110	Not significant; H01 accepted

a

H02: Respondents' income does not determine their perception of food affordability in Ijebu-Ode, Ogun State:

The chi-square value of 7.752 (df = 9, p = 0.578) is also well above the 0.05 threshold; the null hypothesis is therefore retained. Respondents' monthly income level does not significantly determine their perception of food affordability in Ijebu-Ode – households across all income brackets showed broadly similar, and generally negative, agreement patterns regarding affordability difficulty, rather than affordability perception scaling systematically with income.

Table 9: Cross-Tabulation of Monthly Income and Difficulty of Food Affordability in Ijebu-Ode

Monthly income	Strongly agree	Agree	Disagree	Strongly disagree	Total
Below ₦20,000	0	8	6	0	14 (12.7%)
₦20,001–₦50,000	2	11	15	0	28 (25.5%)
₦50,001–₦100,000	3	18	29	3	53 (48.2%)
Above ₦100,000	2	7	5	1	15 (13.6%)
Total	7 (6.4%)	44 (40.0%)	55 (50.0%)	4 (3.6%)	110 (100.0%)

Table 10: Chi-Square Test – Monthly Income and Food Affordability Perception in Ijebu-Ode

χ^2 value	df	p-value	N	Decision
7.752	9	0.578	110	Not significant; H02 accepted

4 Discussion

The socio-economic profile of respondents – predominantly economically active, moderately to highly educated, and engaged in trading and farming – suggests a population generally capable of making informed decisions about food consumption and expenditure, consistent with Arene and Anyaeji's (2010) finding that household education and income structure are key determinants of food-security status in Nigeria. The prevalence of mixed livelihood strategies, particularly trading alongside farming, also mirrors the diversification patterns that FAO (2022) associates with household efforts to manage food-accessibility risks amid inflation and changing economic conditions. Within this context, the finding that a large majority of respondents (70.0%) attributed rising food prices to population growth is consistent with the broader expectation that demographic pressure increases demand relative to supply, thereby contributing to price instability (World Bank, 2023). It is also consistent with national-level Nigerian evidence from Okunolà et al. (2018), Tavershima et al. (2022), and Okpalanwabude (2025), which found population growth to be significantly associated with declining or constrained food production.

However, respondents' perceptions of current market food availability were considerably more divided, with 53.6% perceiving no decline compared with 44.5% who perceived reduced availability. This apparent contrast reinforces Barrett's (2010) observation that food security comprises multiple dimensions, including availability, access, and utilization, which do not necessarily change simultaneously. Similarly, Ecker and Qaim (2011) argue that food can remain physically available in markets even when access becomes increasingly difficult for individual

households because of economic or other constraints. Thus, the continued presence of food in Ijebu-Ode markets does not necessarily imply that households have equal or adequate access to it. The issue of access to productive farmland provides further insight into the relationship between population growth, urban expansion, and food security in the study area. The farmland-access findings, with 77.3% of respondents reporting some reduction in access and 38.2% identifying lack of farmland as the biggest food-related challenge, support the theoretical expectation derived from Von Thünen's model and Location Theory that urban expansion progressively displaces agricultural land and increases the spatial distance between production and consumption (Adebayo, 2021; Aliyu, 2019).

This finding is consistent with FAO's (2022) observation that rapid urbanisation in Africa is making land increasingly inaccessible for local food production and with AfDB's (2021) position that competition between agricultural and residential land uses is an important driver of food insecurity in rapidly growing urban centres. The implication is that as urban development expands in Ijebu-Ode, agricultural land may increasingly be converted to residential and other urban uses, potentially reducing the capacity of households to produce food locally and increasing their dependence on markets.

This interpretation is further supported by the concentration of food purchases in local markets, reported by 67.3% of respondents, alongside the near-absence of government or NGO food distribution, reported by only 0.9%. This pattern illustrates the Central Place Theory expectation that, in the absence of strong institutional intervention, households remain heavily dependent on existing market hubs for access to essential goods, even as those hubs experience increasing demographic and economic pressure (Christaller, 1933/1966; Okpala, 2024). Despite these descriptive findings, the statistical analysis presents a more nuanced picture of the relationship between population characteristics and food security. The most notable result is the absence of a statistically significant association between household-size growth and food availability ($\chi^2 = 0.767$, $p = 0.381$), as well as between income and perceived affordability ($\chi^2 = 7.752$, $p = 0.578$).

At first glance, these results may appear to contradict the descriptive evidence and the Malthusian and demographic-transition theoretical framing, which suggest that population growth can place increasing pressure on food systems in Ijebu-Ode. However, the findings are consistent with the broader household-level food-security literature, which emphasises that food-security outcomes are influenced by a combination of factors rather than by household size or income in isolation. Barrett (2010) and Ecker and Qaim (2011), for instance, argue that food-security outcomes are shaped by market structure, food access, household behaviour, purchasing power, and institutional conditions. Similarly, several Nigerian farm-level studies (e.g., Adesina, 2022; Akinsulu, 2023; Balogun et al., 2018) indicate that education, access to credit, cooperative membership, and social capital may be more direct determinants of food-security outcomes than household size or income alone. The absence of statistically significant relationships in the present study should therefore be interpreted within this broader multidimensional context rather than as evidence that demographic pressure or income is unrelated to food security. Two further explanations may account for the non-significant statistical relationships observed in the study.

First, the household-size variable used in the analysis, which was based on a binary self-report of whether household size had increased over ten years, represents a relatively coarse measure of population pressure. It may therefore fail to capture the magnitude, rate, or spatial distribution of population change occurring across Ijebu-Ode, even though respondents may perceive and describe substantial community-wide demographic changes, as reflected in Tables 2, 3, and 5.

Second, the sample size of 110 respondents may have limited the statistical power required to detect relatively modest associations, particularly within the nine-cell income–affordability cross-tabulation. Consequently, the non-significant chi-square results should not be over-interpreted as evidence that population pressure is irrelevant to food security in Ijebu-Ode. Rather, they suggest that the effects of population growth may operate indirectly and diffusely through mechanisms such as food-price increases, farmland conversion, market pressure, and changes in household purchasing behaviour, rather than being sharply differentiated according to individual household size or income category.

The findings concerning government and community food-security interventions provide an additional institutional dimension to this interpretation. The relatively low level of awareness, with 47.3% of respondents indicating that they were "not aware at all" of such interventions, together with the mixed ratings of their effectiveness, points to a potential policy and institutional gap in the study area. This finding is consistent with the Policy and Institutional Interventions strand of the conceptual framework (Tavershima et al., 2022; Owoo, 2021) and with Kehinde and Alabi's (2025) finding that weak participation in community-based organizations can limit their potential contribution to poverty reduction and food-insecurity alleviation. The limited presence of government and NGO food-

distribution mechanisms, as indicated by the very small proportion of respondents reporting such support, further suggests that households largely depend on their own livelihoods and market-based access to food. Taken together, these findings indicate that improving food security in Ijebu-Ode requires a multidimensional approach that addresses not only population-related pressures but also the protection of agricultural land, improvement of food-market accessibility, livelihood diversification, and stronger institutional support. In particular, increasing the visibility, coverage, accessibility, and effectiveness of government and community-based interventions may provide an important avenue for strengthening household food security in the study area.

5 Conclusion

This study examined the relationship between population growth and food security among households in Ijebu-Ode, Ogun State, focusing on socio-economic characteristics, food availability and affordability, coping strategies, major challenges, and government and community interventions. Residents widely perceive population growth as contributing to rising food prices, reduced access to farmland, and greater household vulnerability to food insecurity. Households cope mainly through dietary adjustments such as smaller and fewer meals and through market-based strategies such as relying on local markets and taking on extra income-generating activities, while longer-term strategies such as home gardening and food storage are less common. High food prices, scarce farmland, market supply constraints, and inadequate storage were the principal challenges, and awareness and perceived effectiveness of interventions were low. Statistical tests found no significant association between household-size increase or monthly income and food availability and affordability, suggesting that the effects of population growth operate through broader community-level mechanisms, including rising prices, conversion of agricultural land, pressure on markets, limited local production and storage, and institutional responsiveness, rather than through household size or income alone. Addressing these challenges requires coordinated action among government agencies, communities, agricultural stakeholders, market actors, and development organizations to strengthen both the supply and accessibility of food.

The study recommends six measures. First, strengthen local production through subsidized inputs, irrigation, and modern equipment. Second, protect farmland through stronger land-use planning and development control, and encourage cooperative farming. Third, stabilize food prices through market monitoring, community food markets, and targeted assistance for vulnerable households. Fourth, invest in community and market-level storage, processing and preservation facilities. Fifth, improve the visibility, coverage and monitoring of food-security programmes, since nearly half of respondents were unaware of them, using ward-level outreach and community mobilization. Sixth, promote diversified livelihoods and social protection, including credit, skills training, and support for income-generating activities.

References

Adebayo, M. A. (2021). Urban expansion and agricultural displacement in Nigeria. Journal of African Urban Studies, 7(2), 144–160.

Adesina, S. (2022). Food insecurity and its correlates: Empirical evidence from fish farming households in Nigeria. Interdisciplinary Journal of Rural and Community Studies, 4(6), 60–70. https://doi.org/10.38140/ijrcs-2022.vol4.06

African Development Bank. (2021). African economic outlook 2021: From debt resolution to growth. AfDB.

Akinsulu, A. (2023). Determinants of food security status among cocoyam farmers in Ogun State, South Western Nigeria. Moor Journal of Agriculture Research, 24, 93–100.

Aliyu, S. (2019). Revisiting Von Thünen: Agricultural land use in Nigeria. African Journal of Geography and Environment, 6(3), 55–71.

Amare, M., Abay, K., Tiberti, L., & Chamberlin, J. (2024). Spatial market integration during a pandemic: Evidence from food markets in Nigeria. Agricultural Economics, 55(1), 57–74. https://doi.org/10.1111/agec.12781.

Babatunde, R. O., Omotesho, O. A., & Sholotan, O. S. (2007). Socio-economic characteristics and food security status of farming households in Kwara State, North-Central Nigeria. Pakistan journal of nutrition, 6(1), 49-58.

Balogun, O., Ogunsina, I., Ayo-Bello, T., & Afodu, O. (2018). Effect of social capital on productivity of cassava farmers in Ogun State, Nigeria. Journal of Agricultural Sciences, 63(1), 99–112. https://doi.org/10.2298/JAS1801099B

Barrett, C. (2010). Measuring food insecurity. Science, 327(5967), 825–828.

Bello, A. (2020). Land use and food security in Sub-Saharan Africa. Journal of Rural Development, 14(1), 22–39.

Christaller, W. (1966). Central places in southern Germany (C. W. Baskin, Trans.). Prentice-Hall. (Original work published 1933)

Ecker, O., & Qaim, M. (2011). Analyzing nutritional impacts of policies: An empirical study for Malawi. World Development, 39(3), 412–426.

Food and Agriculture Organization. (2020a). Food systems for an urbanizing world. FAO.

Food and Agriculture Organization. (2020b). Food systems profile—Nigeria. FAO. https://www.fao.org Food and Agriculture Organization. (2021). The state of food security and nutrition in the world 2021:

Transforming food systems for food security, improved nutrition and affordable healthy diets for all. FAO. https://doi.org/10.4060/cb4474en

Food and Agriculture Organization. (2022). The state of food security and nutrition in the world 2022. FAO.

Fox-Kämper, R., Caitlin, K., Jason, K., Kathrin, S., Rositsa, I., Nevin, C., Silvio, C., Lidia-Ponizy, B., & Victoria, S. (2023). The role of urban agriculture in the food-energy-water nexus: Evidence from Europe and the United States. Science of the Total Environment, 856, 159064. https://doi.org/10.1016/j.scitotenv.2022.159064

Idachaba, F. S. (2004, March 24). Food security in Nigeria: Challenges under democratic dispensation [Lecture]. 9th ARMTI Annual Lecture, Agricultural and Rural Management Training Institute, Ilorin, Nigeria.

International Monetary Fund. (2023). Food insecurity in Nigeria: Food supply matters (IMF Country Report No. 23/43). IMF.

Kehinde, A., & Alabi, D. (2025). Determinants of participation in community-based organizations and its impact on poverty eradication among rural households in Osun State. Global Social Welfare, 13, 157–173. https://doi.org/10.1007/s40609-025-00390-w

Malthus, T. R. (1798). An Essay on the Principle of Population, as it affects the future Improvement of Society, with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers. London: J. Johnson.

Miladinov, G. (2023). Impacts of population growth and economic development on undernourishment in low-income countries. Frontiers in Human Dynamics, 5, Article 1121662. https://doi.org/10.3389/fhumd.2023.1121662

Notestein, F. W. (1945). Population: The long view. In T. W. Schultz (Ed.), Food for the world (pp. 36–57). University of Chicago Press.

Odoms-Young, A. (2023). Food insecurity, neighborhood food environment, and diet quality in the United States: Recent evidence and policy implications. Nutrients, 15(3), 567. https://doi.org/10.3390/nu15030567

Ojo, T., Adesiyan, O., Ige, A., Emenike, C., Kassem, H., Elhindi, K., Kitole, F., & Sesabo, J. (2024). The role of sustainable land management practices in alleviating household food insecurity in Nigeria. Frontiers in Sustainable Food Systems, 8, 1414243.

Okafor, C. (2021). Population growth, food systems, and spatial theory in Nigeria. African Development Review, 33(1), 101–117.

Oke, F., Kiyesi, C., & Akerele, D. (2021). Socioeconomic correlates of catfish production status in Ido Local Government Area of Oyo State, Nigeria. FUNAAB Research Bulletin, 54(5), 184–191.

Okpala, E. (2024). The impact of market infrastructure on food insecurity in Nigeria. Research Journal of Food Science and Quality Control, 10(1), 1–19.

Okpalanwabude, I. (2025). The impact of population growth on food production in Nigeria: An empirical analysis. Nwafor Orizu College of Education Journal, 2(2), 64–76.

Okunolà, A., Nathaniel, S., & Bekun, F. (2018). Revisiting population growth and food production nexus in Nigeria: An ARDL approach. Asian Research Journal of Arts & Social Sciences, 5(4), 1–13.

Olayemi, F. (2020). Rethinking the Malthusian crisis in Nigeria's food system. Journal of Development Studies, 14(2), 75–89.

Olomola, A. (2022). Agricultural value chains and food security in Nigeria. African Journal of Food Policy, 8(1), 21–38.

Owoo, N. (2021). Demographic considerations and food security in Nigeria. Journal of Social and Economic Development, 23, 128–167. https://doi.org/10.1007/s40847-020-00116-y

Sanusi, M. (2025). Smallholder rice farmers' resilience to water insecurity in Ogun State, Nigeria. Regional Environmental Change, 25(1), 30. https://doi.org/10.1007/s10113-025-02364-2

Tavershima, T., Kotur, L., & Tseaa, E. (2022). Food security and population growth in Nigeria. Direct Research Journal of Agriculture and Food Science, 10(8), 176–183.

UNFPA. (2021). State of world population 2021: My body is my own. UNFPA. UNICEF. (2025). feeding profit: How food environments are failing children. UNICEF.

United States Department of Agriculture Economic Research Service. (2025). Food security in the U.S.—key statistics and graphics. USDA. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/

von Thünen, J. H. (1826). Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie. Hamburg: Friedrich Perthes

Weber, A. (2020). Theory of the location of industries (Translated ed.). Routledge. (Original work published 1929)

World Bank. (2020). Nigeria demographic dividend policy note. World Bank.

Wudil, A. H., Usman, M., Rosak-Szyrocka, J., Pilř, L., & Boye, M. (2022). Reversing years for global food security: A review. Frontiers in Public Health, 10, 841023. https://doi.org/10.3389/fpubh.2022.841023

Zimmer, A., Zack, G., Julia, D., Nupur, J., Alla, C., & Tom, E. (2022). Food systems and rural–urban linkages in African secondary cities. Urban Transformations, 4(6), 1–18.