

SOCIO-ECONOMIC CHARACTERISTICS OF WETLAND RESIDENTS AND URBAN FOOD SECURITY IN AKURE, NIGERIA

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ABSTRACT

Urban wetlands are important ecological and livelihood-support systems in rapidly expanding cities, yet their functions are increasingly affected by urban growth and changing socio-economic conditions. This study assessed the socio-economic characteristics of residents in wetland communities in Akure, Ondo State, Nigeria, and examined their implications for urban food security and sustainable wetland use. A cross-sectional survey design was adopted, involving 716 respondents selected within a 30-metre buffer zone of wetland areas using GIS-based random sampling and ground-truthing. Data were analysed using descriptive statistics, including frequency distributions and percentages. The findings reveal that a substantial proportion of respondents (43.99%) are within the economically active age group of 31–45 years, while males constitute 53.35% of the sample. More than half of the respondents (53.21%) attained tertiary education, indicating relatively high human capital. Despite this, participation in farming activities is very low (4.3%), as most respondents are engaged in non-farm livelihoods such as trading, business, public service, and artisanal occupations. Income levels are generally low, with a large proportion of households earning below ₦60,000 monthly, while moderately large household sizes increase food consumption pressure and vulnerability to food insecurity. The study shows that urban wetlands in Akure remain underutilized for food production despite their ecological potential. The study recommends the integration of wetland agriculture into urban land-use planning, the promotion of capacity-building programmes on climate-resilient farming, the provision of livelihood support through microcredit and cooperative systems, and the strengthening of inclusive community-based wetland management strategies. These interventions could enhance food accessibility, affordability, and livelihood resilience in rapidly urbanising areas.

Keywords: Urban wetlands, Socio-economic characteristics, Urban food security, Urban agriculture, Akure, Nigeria



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1. | Introduction

Wetlands are among the most productive ecosystems globally because of their ecological, hydrological, and socio-economic functions. It provides essential ecosystem services such as flood regulation, groundwater recharge, biodiversity conservation, carbon sequestration, water

purification, and food production For the substance of human existence (Ramsar Convention Secretariat, 2021). Globally, wetlands support the livelihoods of over one billion people through agriculture, fishing, and other natural resource-based activities (FAO, 2023). Despite these benefits, wetlands are increasingly threatened by rapid urbanization, climate change,

pollution, and unsustainable land-use practices, particularly in developing countries where urban expansion is occurring rapidly (UNEP, 2022).

Nigeria possesses one of the largest wetland systems in Africa, covering approximately 13 million hectares or about 14% of the country's total land area (Federal Ministry of Environment, 2022). These wetlands include freshwater swamps, floodplains, mangroves, and inland valley systems distributed across different ecological zones. In southwestern Nigeria, wetlands play important roles in supporting urban agriculture, dry-season farming, flood mitigation, and local livelihoods (Adekola & Mitchell, 2011). However, rapid urban growth in cities such as Lagos, Ibadan, Abeokuta, and Akure has resulted in increased encroachment on wetland ecosystems through residential development, sand filling, road construction, and commercial expansion (Olawajun et al., 2021).

Urbanization has significant implications for food security in developing countries. Food security exists when individuals have physical, social, and economic access to sufficient, safe, and nutritious food at all times (FAO, 2023). In many urban centres, rising food prices, unemployment, and declining household income have reduced the ability of low-income households to access adequate food supplies (Engdaw & Kebede, 2019). Urban wetlands contribute to food security because they support urban agriculture through fertile soils and year-round water availability, thereby improving food accessibility and affordability among urban residents (McCartney et al., 2010). However, the continuous conversion of wetlands into built-up areas has reduced agricultural land availability and weakened the capacity of cities to support local food production (UN-Habitat, 2022).

Recent studies have shown that urban food insecurity is increasingly linked to declining urban agriculture and environmental degradation. According to FAO

(2023), many urban households in developing countries rely heavily on purchased food, making them highly vulnerable to inflation and disruptions in food supply systems. Similarly, UNEP (2022) emphasized that ecosystem degradation, including wetland loss, contributes to declining livelihood opportunities and increased vulnerability among low-income urban populations. In Nigeria, increasing urban expansion has significantly altered wetland ecosystems and reduced their capacity to support agricultural activities and local food systems (Adekola & Mitchell, 2011).

Socio-economic characteristics such as education, occupation, income, household size, and age significantly influence how urban residents interact with wetlands and participate in urban agriculture. Adeleke, (2018) opined that individuals with higher educational attainment and formal employment are less likely to engage in agricultural activities because agriculture is often perceived as a rural occupation associated with low economic returns. Conversely, low-income households are more likely to depend on subsistence agriculture as a strategy for improving food accessibility and reducing household food expenditure (Engdaw & Kebede, 2019). Household size also affects food demand and food security because larger households require more resources to maintain adequate nutrition levels (FAO, 2023).

Several empirical studies have examined wetland degradation, urbanization, and agricultural practices in Nigeria. Adekola and Mitchell (2011) investigated urban wetland encroachment and environmental management challenges in Nigerian cities, while Olawajun et al. (2021) examined the decline of urban agricultural activities within wetland environments. Similarly, Olayiwola and Adeleye (2022) observed that uncontrolled urban expansion in southwestern Nigeria has contributed to the reduction of wetlands and agricultural land. Many of these existing studies have however, concentrated mainly on physical wetland transformation, flooding, and

environmental degradation with limited attention to the socio-economic characteristics of residents living within wetland zones and the implications for urban food security. Furthermore, studies specifically focusing on Akure and other medium-sized cities in southwestern Nigeria remain limited. Existing studies in Akure have largely emphasized land-use change (Alabi, 2020; Omodehin et. al, 2021), flooding (Basorun, 2018; Owoye & Ibitoye, 2016), and environmental impacts (Olajuyigbe et. al., 2016) without adequately examining how household socio-economic conditions influence wetland utilization, urban agriculture, and food accessibility. This creates an important knowledge gap because socio-economic conditions determine the ability of households to engage in food production and adapt to increasing food insecurity challenges within rapidly urbanizing environments.

This study therefore examines the socio-economic characteristics of residents living within wetland zones in Akure, Nigeria, and analyzes their implications for urban food security and sustainable wetland management. The study contributes to existing knowledge by linking socio-economic dynamics with wetland utilization patterns and food security concerns in a rapidly urbanizing secondary city in southwestern Nigeria.

2. | Conceptual Framework and Literature Review

2.1 | Conceptual Framework

This study is based on the interaction between socio-economic characteristics, wetland utilization, urban agriculture, and food security within rapidly urbanizing environments. The framework for his study is hinged on the concept of sustainable Livelihood Approach (SLA) which explains how households utilize available resources and assets to sustain their livelihoods. Chambers and Conway (1992) submits that livelihood outcomes are

influenced by access to human, financial, natural, physical, and social capital. Wetlands constitute important natural assets that can support agriculture, fishing, and income generation. The theory suggests that socio-economic factors influence household livelihood strategies and resource utilization patterns. Low-income households may depend more on wetland agriculture for subsistence and income generation, while households with higher educational attainment and formal employment may shift toward non-agricultural occupations (Engdaw & Kebede, 2019). It involves the use of policies & structures for sustainable wetlands use to reduce shocks that can emerge as a result of misuse and encroachment to improve food security. The theory therefore provides a useful framework for understanding how socio-economic characteristics shape wetland utilization and food security outcomes among urban residents.

2.2 | Urban Food Security and Urban Agriculture

Urban food security refers to the ability of urban residents to obtain sufficient, nutritious, affordable, and safe food for healthy living (FAO, 2023). This means that food security encompasses food availability, accessibility, affordability, utilization, and stability over time. In many developing countries, rapid urbanization has intensified food insecurity due to unemployment, inflation, poverty, and dependence on purchased food (UN-Habitat, 2022). Urban agriculture has increasingly been recognized as an important strategy for improving food accessibility and affordability in cities. McCartney *et al.* (2010) opines that urban wetlands support agricultural activities because of their fertile soils and year-round water supply. Urban agriculture contributes to household nutrition, employment generation, poverty reduction, and livelihood diversification among low-income urban populations (FAO, 2023). Similarly, Mougeot (2015) argued that urban agriculture enhances household resilience by reducing dependence on external food

markets. In Nigeria, wetlands have historically supported vegetable cultivation, rice farming, and dry-season agriculture (Adekola & Mitchell, 2011). However, increasing urban expansion and changing occupational structures have reduced participation in urban agriculture, particularly among educated urban residents who increasingly depend on formal employment and purchased food (Adeleke, 2018). This decline in urban agriculture has implications for food affordability and accessibility because households become more exposed to fluctuations in food prices and supply chains.

2.3 | Sustainable Wetland Management

Sustainable wetland management refers to the conservation and utilization of wetlands in ways that maintain their ecological integrity while supporting human livelihoods and economic activities referred to as the wise use of wetlands. Wetlands provide multiple ecosystem services, including flood control, biodiversity conservation, carbon storage, nutrient recycling, and agricultural support (Ramsar Convention Secretariat, 2021). The degradation of wetlands therefore affects both environmental sustainability and human well-being. United Nations Environmental Program (UNEP, 2022) highlighted that ecosystem-based approaches such as wetland conservation are important for enhancing urban resilience and reducing environmental risks associated with climate change. Similarly, UN-Habitat (2022) stressed that sustainable urban development requires the protection of environmentally sensitive areas, including wetlands, to support resilient food systems and reduce disaster vulnerability.

Despite these recommendations, wetlands in many African cities continue to experience severe encroachment due to weak planning regulations, poor enforcement of environmental policies, and rapid urban population growth (Wood *et al.*, 2013). In Nigeria, urban wetlands are increasingly being

converted into residential and commercial land uses, thereby reducing their ecological functions and agricultural potential (Olawejaju *et al.*, 2021).

2.4 | Wetland Encroachment and Climate Resilience

Wetland encroachment involves the conversion of wetland ecosystems into built-up areas for residential, industrial, and infrastructural purposes. Rapid urbanization in developing countries has accelerated wetland loss and environmental degradation (UNEP, 2022). In southwestern Nigeria, wetland encroachment has contributed to increased flooding, biodiversity decline, and reduction in agricultural land availability (Olayiwola & Adeleye, 2022). Climate change further intensifies the vulnerability of urban wetlands through irregular rainfall, flooding, erosion, and rising temperatures. Wetlands serve as natural buffers that regulate water flow, store excess floodwater, and maintain ecological balance (Ramsar Convention Secretariat, 2021). Consequently, wetland degradation weakens urban resilience and exposes urban populations to environmental and food security risks.

UN-Habitat (2022) emphasized that resilient cities depend on integrated environmental planning approaches that combine ecosystem conservation with sustainable livelihood strategies. Therefore, protecting urban wetlands is increasingly regarded as an important strategy for promoting climate resilience, sustainable urbanization, and food security.

2.5 | Empirical Review and Knowledge Gap

Several empirical studies have examined the relationship between socio-economic conditions, urban agriculture, and food security. Engdaw and Kebede (2019) found that household income, occupation, and educational status significantly influenced participation in urban agriculture and

food security outcomes in Ethiopia. Similarly, Wood *et al.* (2013) observed that wetlands contribute significantly to livelihoods and food production in many African communities. In Nigeria, Adekola and Mitchell (2011) examined wetland encroachment and environmental management challenges in urban areas, while Olarewaju *et al.* (2021) investigated the decline of agricultural activities in urban wetland environments. Olayiwola and Adeleye (2022) further reported that rapid urban expansion in southwestern Nigeria has intensified wetland degradation and reduced agricultural land availability.

Although these studies provide important insights into wetland degradation and urbanization, limited attention has been given to the socio-economic characteristics of residents living within wetland areas and how these characteristics influence food accessibility and affordability especially in Akure. Existing studies in Akure have focused largely on flooding, land-use change, and environmental impacts with little emphasis on the relationship between household socio-economic conditions, declining wetland agriculture, and urban food security challenges.

This study therefore fills this gap by examining how socio-economic characteristics influence wetland utilization and food security among residents of wetland areas in Akure, Nigeria. Also, due to rapid urbanization, wetlands are being destroyed, and agricultural land is being lost. This has reduced their capacity to support food production, thus relying on external sources of food (Ramsar, 2021). Understanding the socio-economic characteristics of people living in wetlands is crucial in designing strategies for sustainable wetland management with regard to food security challenges in urban settings.

3. | Materials and Methods

3.1 | Study Area

The study was carried out in Akure, Ondo State, Nigeria which lies between latitude 7°15'N and 7°30'N and longitude 5°05'E and 5°20'E. Akure is the capital city and largest city in Ondo state and 19th largest in Nigeria (Worldometer, 2025), with a population that has risen from 109,253 in 1976 to 360,268 in 2006 National Population Commission (NPC 1976; NPC 2006) and currently estimated to

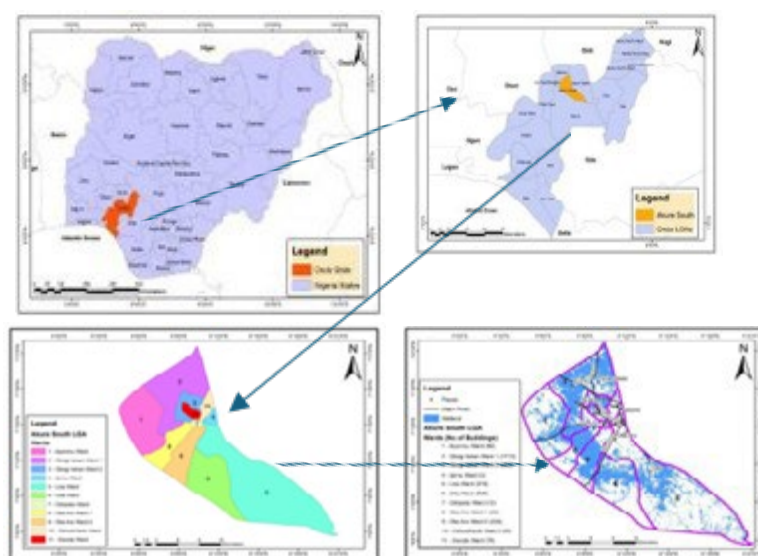


Figure 1 | Map showing the study area

Source | Author's field work, adapted from Google Earth, 2025

be 730,000 (Worldometer, 2025). Figure 1 shows the map of the study area comprising of the maps of Ondo state and Akure South Local Government as well as the ward map of Akure South Local Government and the existing wetlands in Akure South. The city experiences a tropical climate with wet and dry seasons, creating conditions for the development of wetlands in different parts of the city.

3.2 | Methodology

Primary data was collected using structured questionnaires, which were administered to 716 respondents who lived within the wetland areas. 30m buffer was created on both sides of wetlands in the study area using Geographic Information

System (GIS) as shown in Figure 2. The 30m buffer zone was deemed adequate in line with the generally recommended standard of buffer zone distance of 100ft (30.48m) for wetlands (Chase, Deming, and Latawiec, 1997; Macfarlane, et. al., 2014, Ondo State, 2025). The total number of buildings that fell within the buffer zone, as calculated using ArcGIS 10.5 data digitization was 3, 578 out of which 20% sample size was taken to give a total of 716 across the eleven (11) wards in Akure South. This percentage is adopted on the premise of previous similar studies in urban planning with which similar sample size obtained good results; among these studies are: Olamiju, Oyinloye & Daramola (2016); and Olunloyo (2014) who used 20% sample size in their studies; and Olusa, Olujimi & Okoko (2016) who used a similar sample size of 729 respondents.

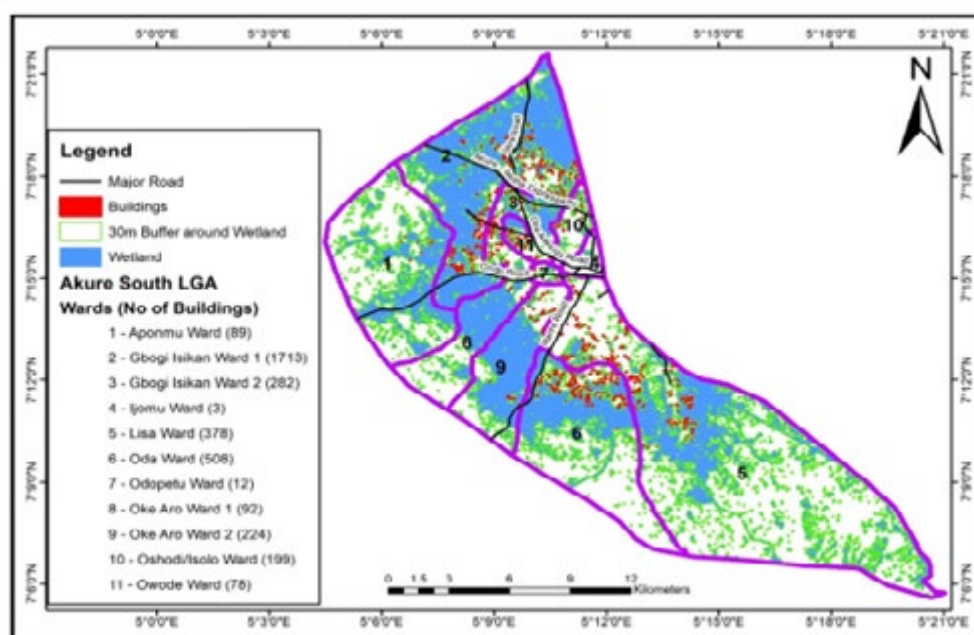


Figure 2 | Map showing number of buildings that fall within 30m buffer to wetlands in Akure South Local Government Source: Author's field work (2025)

The data gathered was analysed using the Statistical Package for Social Sciences (SPSS) version 25, and the results obtained presented using maps, charts, pictures, and tables. Univariate analysis such as frequencies and percentages were employed to analyze the data.

4. | Results and Discussion

4.1 | Results

4.1.1 | Gender

The study revealed in Table 1 that 53.35% of the total number of respondents were males while the remaining 46.65% were females. The results

showed that there were more males as household heads than females in the study area. The dominance of male-headed households reflects prevailing socio-cultural norms in Nigeria, where men are often regarded as household heads and primary decision-makers. This gender structure may influence access to and control over resources such as land and income, thereby shaping household livelihood strategies and food security outcomes.

Table 1 | Gender of Respondents

	Frequency	Percentage
Male	382	53.35
Female	334	46.65
Total	716	100.0

Source | Author’s field work, 2025

4.1.2 | Age

Table 2 shows that 43.99% which forms the majority of the respondents fall within the age of 31 and 45 years; 31.15% fell within age 46 to 60 years; 14.94% were between ages 18 and 30 years, while the remaining 9.92% were above 60 years old. This means that many of the household heads were within Nigeria’s economically active or working age population as stipulated by the National Bureau of Statistics (2012), hence can work to provide food for their families and have the strength to engage in wetland agriculture.

Table 2 | Age of Respondents

	Frequency	Percentage
18-30 years	107	14.94
31-45 years	315	43.99
46-60 years	223	31.15
Above 60 years	71	9.92
Total	716	100.0

Source | Author’s field work, 2025

The predominance of household heads within the economically active age group suggests the availability of a productive workforce that can

support wetland farming and related livelihood activities. This may contribute to increased food production, improved household income, and better access to food. The finding further indicates that the study area possesses the human resources needed to support sustainable wetland utilization and strengthen household food security.

4.1.3 | Educational Qualification

The study has revealed that 5.59% of the total number of respondents have no formal education, 6.70% obtained primary education, 34.50% obtained secondary education, while 53.21% attained tertiary education (Table 3). The results showed that more than half of the respondents had tertiary education, which means that a good number of them were educated and skilled; this should expose them to adopt diverse means of using the wetland resources to their advantage.

Table 3 | Educational Qualification of Respondents

	Frequency	Percentage
No formal education	40	5.59
Primary	48	6.70
Secondary	247	34.50
Tertiary	381	53.21
Total	716	100.0

Source | Author’s field work, 2025

The high level of educational attainment among respondents suggests the presence of a knowledgeable population capable of utilizing wetland resources more effectively. Education can facilitate access to information, improve decision-making, and encourage the adoption of improved agricultural and livelihood practices. This may enhance household food security through increased productivity and better management of available wetland resources (Abdulai & Huffman, 2014; Mignouna *et al.*, 2011).

4.1.4 | Religion

Figure 3 shows that 82% of the respondents practiced Christianity as their religion, 15% practiced Islam, 2% were traditionalists while 1% had no religion. This means that almost all the respondents practiced christianity as their religion. This finding is in line with that of Nolte, Jones, Taiyari and Occhiali (2016) who stated that approximately 65% of the population in Ondo state are Christians, and being the capital city of Ondo state, Akure reflects the state’s religious composition with a significant Christian majority. The high level of religious affiliation among respondents suggests the presence of strong social networks that can promote community support, cooperation, and information sharing. These social connections may enhance household resilience and contribute to food security, while religious institutions can also serve as effective platforms for community development and sustainable resource management initiatives (Candland, 2000; Alderman, 2002).

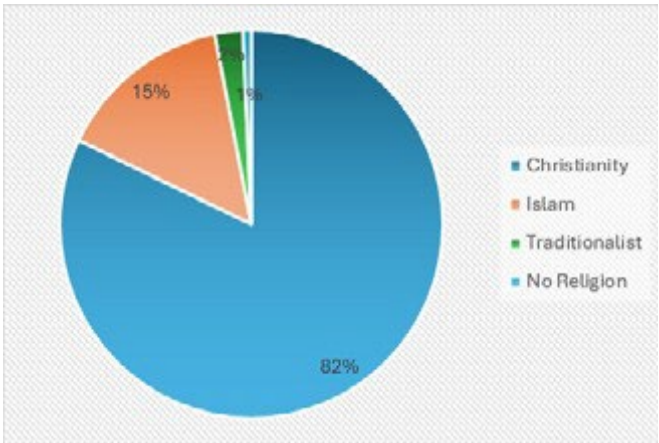


Figure 3 | Religion of Respondents
Source | Author’s field work, 2025

4.1.5 | Ethnicity

It was discovered from the study that 6.7% of the respondents were Hausas, 11.31% were Igbos, 75.42% were Yorubas while the remaining 6.57% fell in the category of “others” which comprised of residents from Delta, Kogi, Fulani and Edo (Table 4). The data revealed that most of the respondents

were Yorubas and this may be because Akure is one of the urban areas in Yoruba region.

Table 4 | Ethnicity of Respondents

	Frequency	Percentage
Hausa	48	6.70
Igbo	81	11.31
Yoruba	540	75.42
Others	47	6.57
Total	716	100.0

Source: Author’s field work, 2025

The dominance of Yoruba respondents reflects the cultural composition of Akure as a predominantly Yoruba urban area, which may strengthen social cohesion and ease of interaction among residents. This can facilitate cooperation in livelihood activities such as urban agriculture and wetland use. Nevertheless, the presence of minority ethnic groups introduces some diversity in practices and knowledge systems.

4.1.6 | Occupation

Figure 4 indicates that 17.5% of the respondents were public or civil servants, 3.1% were medical personnels, 22.2% were into business, 17.0% traders, 15.8%, artisans, 4.3% were farmers, 5.3% were unemployed, 6.7% were retired while 8.1% fell in the category of “others” comprising of teachers, clergy, and secretary. The results indicates that the larger proportion of the respondents were into business, public servants, traders, and Artisans. An implication that many are not involved in farming despite their proximity to wetlands. The occupational structure shows that most respondents are engaged in non-farm activities, indicating limited dependence on wetland agriculture despite its availability. This suggests that urban livelihood diversification may be reducing direct participation in farming, even in wetland areas with agricultural potential.

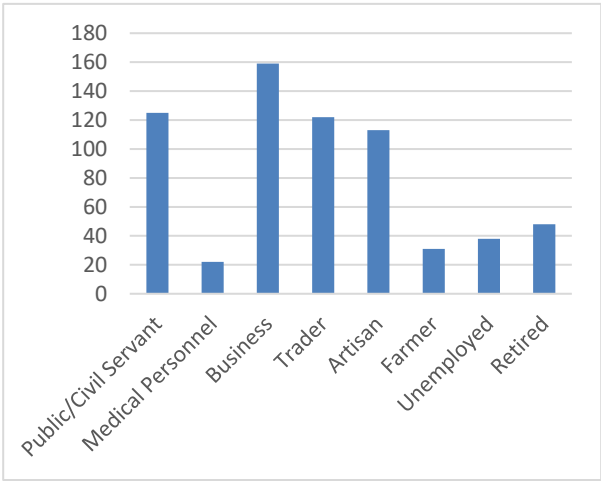


Figure 4 | Occupation of Respondents
Source | Author’s field work, 2025

4.1.7 | Income

The findings from the study revealed that 28.91% earned below ₦30,000, 26.96% earned ₦30,000 - #59,999; 22.90% earned #60,000 - #89,999; 12.29% earned #90,000 - #119,999; while the remaining 8.94% earned #120,000 and above (Table 5). This shows that more than 50% of the respondents earn below ₦30,000 and between ₦30,000 - #59,999. The implication of this is that most of the respondents either earned below the minimum wage mark or a little above it, which means that they may not be able to buy food especially with the recent increase in food prices. This is supported by Engdaw and Kebede (2019) who stated that low and irregular income are the main causes of urban dwellers food insecurity as it affects their access to and affordability of food.

Table 5 | Income of Respondents

	Frequency	Percentage
Below #30,000	207	28.91
#30,000 - #59,999	193	26.96
#60,000 - #89,999	164	22.90
#90,000 - #119,999	88	12.29
#120,000 and above	64	8.94
Total	716	100.0

Source | Author’s field work, 2025

4.1.8 | Household Size

In the study area, 21.37% of respondents had a household size of 1-3; 63.83% had 4-6; 11.87% had 7-9 while 2.93% had 10 and above as their household size (Table 6). It can be seen from this that the larger number of the respondents had a household size of 4-6, which implies that most of the households would require large quantities of food to feed their families satisfactorily. This suggests that household food security may depend on adequate income, livelihood diversification, and productive activities such as farming, as larger household sizes often place greater pressure on available food resources (Feleke *et al.*, 2005; Omotesho *et al.*, 2006).

Table 6 | Household Size of Respondents

	Frequency	Percentage
1-3	153	21.37
4-6	457	63.83
7-9	85	11.87
10 and above	21	2.93
Total	716	100.0

Source | Author’s field work, 2025

4.2 | Discussion

The socio-economic profile of respondents shows a population that is largely engaged in non-agricultural livelihoods despite their proximity to wetland environments. Economic activities such as trading, salaried employment, and artisanal work dominate, suggesting that wetland-based agriculture is not the primary livelihood option for most households. This pattern reflects a gradual shift away from primary production activities in urban settings, where households increasingly depend on income diversification to sustain their welfare (Ellis, 2000).

Although wetlands are traditionally recognised as productive ecosystems for urban food supply, their utilisation in the study area appears limited. This may be linked to the pressures of urban expansion, which intensify competition for land and reduce the availability of spaces suitable for cultivation. In addition, weak institutional integration of agriculture into urban planning reduces the attractiveness of farming within wetland zones, despite their ecological potential for food production (Mougeot, 2005; van Veenhuizen, 2006).

Income distribution among respondents further highlights a significant constraint to food access.

A large proportion of households fall within low-income categories, indicating limited capacity to consistently meet food needs through market purchases alone. Since urban households are highly dependent on purchased food, fluctuations in prices directly influence food security status, particularly among low-income groups (FAO, 2023; World Bank, 2022).

Household size structure also adds pressure to food demand. With many households consisting of four to six members, consumption needs are relatively high, which increases the burden on household income. Where income levels remain low, this situation can heighten vulnerability to food insecurity due to the mismatch between food demand and purchasing power (Feleke *et al.*, 2005).

Gender structure further reflects prevailing socio-cultural arrangements in which male-headed households dominate. Such patterns may influence how resources are accessed and controlled within households. However, evidence suggests that limiting women's access to productive assets can reduce overall household welfare and food security outcomes, making inclusive access to resources an important consideration for development interventions (Quisumbing & Pandolfelli, 2010).

The evidence suggests that although wetland environments in Akure offer potential for food production, their contribution to household food security remains constrained by livelihood transitions, economic limitations, and institutional gaps. Addressing these constraints would require policy attention toward urban agriculture integration, livelihood strengthening, and improved access to productive resources.

5. | Recommendation

Urban wetlands are facing increasing threats due to land reclamation, infrastructure development, and uncontrolled urbanization. Based on these findings, the following recommendations are proposed:

1. **Promotion of urban wetland agriculture:** Government and relevant planning authorities should integrate urban agriculture into land-use policies. Since many residents live near wetlands but are not engaged in farming, access to land, extension services, and basic farm inputs should be improved to encourage productive use of wetland resources.
2. **Capacity building and agricultural training:** with the relatively high level of education among respondents, targeted training programmes on modern and climate-resilient wetland farming practices should be introduced. This could enhance willingness to participate in agriculture and improve productivity among those already engaged.
3. **Livelihood and income support interventions:** Considering the low-income status of a significant proportion of households, there is a need for improved access to microcredit, cooperative schemes, and small-scale enterprise support. This would strengthen household purchasing power and reduce vulnerability to food insecurity.

4. Inclusive and community-based development strategies: Policies should encourage broader participation in wetland-based activities, with particular attention to gender inclusion. Improving women's access to productive resources, alongside leveraging existing social and religious networks, can strengthen community cooperation and support more resilient household food security outcomes.

6 | Conclusion

The study focused on the socio-economic characteristics of the wetland resident community in Akure, Nigeria. The findings revealed that most of the community residing in the wetland area are educated urban workers engaged in non-agricultural activities, indicating that they are not engaged in agricultural activities within the area. The study also revealed that most of the community have low income levels, while the household size of the community is moderately large, indicating that the community is vulnerable to food insecurity. The study, therefore, indicates the need for policies that can ensure the sustainable utilization of the wetlands for the benefit of the community while at the same time enhancing food security in the rapidly expanding urban area such as Akure.

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