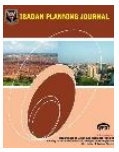
IPJ Ibadan Planning Journal
May 2025,
Vol.11, No. 1, 79-89

Ibadan Planning Journal
journal homepage: http://journals.ui.edu.ng/index.php/ipj/issue/view/7



The Influence of Socioeconomic Characteristics on Residents Practicing Sack Farming in Ibadan, Nigeria

[1]Adeyemi Atanda

Abstract

Global food security progress has declined, with one in nine people worldwide suffering from hunger. Increased agricultural productivity, particularly through innovative practices like Sack Farming Practices (SFPs), is crucial in addressing this challenge, especially in Nigeria. This study assesses the influence of socioeconomic characteristics on residents practicing sack farming (RPSF) in Ibadan. The cross-sectional survey design and mixed methods were adopted to select 1,288 respondents for the study. Three residential (high, medium, and low) areas were calibrated based on their densities, while RPSF were proportionally allotted to high (182), medium (708), and low (398) residential areas. Results revealed that majority of the respondents benefited from sack farming with an efficient use of space (High 6.4%, Medium 18.5% and Low 11.6%), increase in crop yields (High 3.7%, Medium 8.3% and Low 8.5%) and soil erosion reduction (High 0.0%, Medium 14.6% and Low 4.0%). Findings on age reveals that 31-40 respondents bracket shows the highest engagement (31.3%), with decreasing observation in younger and older groups, Chi-Square results (χ^2=41.791, p=0.003) confirm significant variation, with Phi value (0.180, p=0.003) denoting moderate association while gender status reveals that males (34.5%) indicate lower representation compared to females (65.5%). Inferentially, the Pearson Chi-Square results (χ^2=8.035, p=0.090) and Phi value (0.079, p=0.090) suggest no statistically significant gender-based difference in sack farming engagement levels. In conclusion, the study demonstrates that residents' socioeconomic characteristics play a crucial role in shaping their involvement in sack farming practices as a form of urban agriculture, which is a solution to address food insecurity in Ibadan.

Keywords
Urban agriculture, Sack farming practices, Residential densities, Socioeconomic characteristics, Food security

Article History
Received 21 Jan. 2025
Accepted April 2025
Published online May 31, 2025

Contact
Adeyemi Atanda
adeyemiatanda13@gmail.com
08059165759

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

1. Introduction

Rapid urbanisation has accelerated the growth of cities in many developing countries, including Nigeria (Farrell, 2018). In Africa, energy, water, and food insecurity pose significant challenges, with thousands in the informal settlements facing heightened vulnerabilities due to hunger, over-crowding, poverty, and inadequate infrastructure. Rapid urbanisation and population growth in Nigeria have led to a scarcity of arable land, as urban expansion encroaches on agricultural areas (Wahab *et al*. 2018), worsening the food supply crisis and driving up the cost of food. This development is occurring at an unprecedented rate, with the pressing problems of climate change, warming, pollution, poverty, overcrowding, urban sprawl, lack of open spaces, and rising food scarcity (Gbadamosi and Akanmu, 2023). This intersection of water, energy, and food insecurity in cities has profound social, economic, and environmental implications (Mubofu and Elia, 2017). According to studies, residential density is a measurement of how many homes or housing units are present within a specified area of land. Its calculation involves dividing the estimated number of housing units by the total land area. Yachori (2017) pointed out that different regions and municipalities may have specific rules or guidelines on residential density to manage growth in line with their community's objectives and vision. In the Ibadan region, residential densities vary from low-density, spacious homes with larger plots of land to medium-density and high-density homes with many housing units packed into a smaller area. The density of residential developments can greatly affect the character of the community and the quality of life for its residents (Appiah, 2012). Wahab *et al*. (2018), opined that Ibadan, with its dense population and limited arable land, presents a unique setting to investigate the potential and challenges of sack farming across residential densities by examining the experiences of residents practicing sack farming (RPSF), identifying best practices, and addressing constraints.

[1]*Department of Urban and Regional Planning, Faculty of Environmental Design and Management, University of Ibadan, Ibadan*

In Nigeria, the combination of land scarcity and security challenges has led to the increasing adoption of sack farming in urban centres (Kareem *et al.,* 2012). This method involves cultivating crops in soil-filled sacks, enabling people to grow food in small spaces such as backyards and rooftops (Kenneth *et al.,* 2014). By using sacks or similar containers filled with suitable growing media, individuals can produce a variety of crops in limited areas like balconies, courtyards, and rooftops (Grewal *et al.,* 2017).

Sack farming involves growing crops in soil-filled sacks, polythene bags, containers, or plastics (Gallaher et al., 2013). It is a form of mobile container gardening where crops are cultivated in sacks filled with soil or soilless growing media like peat moss, perlite, rock wool, composted bark, etc., which has emerged as a viable alternative for urban residents to engage in food production within their limited spaces (Gallaher et al., 2013). Crops like tomatoes, onions, cabbage, pepper, mushrooms, vegetables, and many more blossom with this method. It allows the flow of water to the roots and retains moisture more efficiently than traditional methods, meaning sack farmers can keep their plants hydrated with less water (Gallaher *et al.,* 2013). Farmers and non-farmers spend 50–75% of their total income on food, making sack gardening a strategic livelihood strategy (Gallaher *et al.,* 2015). Sack farming allows for better control of soil quality, water usage, and pest management, thereby increasing productivity and sustainability (Van Veenhuizen, 2006). Recently, it has gained momentum as a sustainable approach to addressing food insecurity and land scarcity in rapidly growing urban areas (Gallaher et al., 2013).

Most Nigerian cities, including Ibadan city, face similar challenges, where urbanisation and population growth are rapidly increasing, with increasing pressure on agricultural land. Sack farming presents an opportunity to address food scarcity and promote greener cities. The role of sack farming in providing fresh and nutritious food, especially in areas with limited access to traditional farmland, was emphasized by Adeoye *et al.* (2019). Additionally, environmental sustainability is promoted by reducing water consumption and minimising the use of chemical inputs (Amusa *et al.,* 2020), while enabling the farmers to maximise small open spaces by planting 20 to 40 plants in the sides and top of a 50kg soil-filled sack, with stones creating a central vent to distribute water to the plants (Gallaher, 2013). Akinmoladun, Olayanju, and Adedeji (2020) noted that urban farming methods like sack farming can empower local communities, especially women, because they offer opportunities for agricultural entrepreneurship and self-sufficiency. However, despite the benefits of urban farming techniques in the developed world, sack farming has shown success stories in various urban contexts; its implementation and impact in specific cities such as Ibadan remain underexplored. Knowledge and awareness of sack farming are uneven across different residential densities, and this gap in understanding hinders the widespread adoption (Zhang et al., 2016). While some city dwellers may have embraced sack farming, others remain unaware or lack the necessary resources to implement it effectively. There is an urgent need to understand the socioeconomic advantages of the practices of sack farming across residential densities in Ibadan. This understanding is essential for unlocking its potential as a sustainable urban entrepreneurship initiative and for promoting food security and economic resilience in the city. This study aims to examine the sack farming practices (SFPs) across different residential densities in Ibadan, Nigeria, with the view to understanding the effective sack farming practices in the region and focusing on unlocking its potential as an urban entrepreneurial opportunity. The challenges of food security, urbanisation, and sustainable land use in sub-Saharan Africa necessitate innovative strategies to enhance urban food production and optimise limited spaces (Aliyu & Amadu, 2017; Amusa, Adegbite, & Amusa, 2020). Socio-economic factors, such as income levels, educational attainment, and household size, play a critical role in the adoption and success of sack farming. For instance, low-income residents may turn to sack farming as a necessity to supplement food supplies, while affluent individuals may engage in it as an environmentally conscious activity. This study will explore these variations, offering insights into motivations and barriers across socio-economic groups.

2. Literature Review

The global food insecurity stems from a complex interplay of factors, including climate change, conflict, economic instability, and systemic inequalities (FAO, 2021). In other words, climate change exacerbates droughts, floods, and extreme weather, disrupting agricultural productivity, especially in vulnerable regions, while conflicts displace populations and disrupt supply chains, limiting access to food. Also, global economic instability, fuelled by inflation and trade barriers, reduces affordability, while systemic inequalities such as unequal land distribution and gender disparities in agriculture further marginalize communities (Napoli, 2011). Therefore, addressing food insecurity requires integrated approaches combining sustainable practices and equitable

policies, including embracing entrepreneurial opportunities provided by urban agriculture, especially sack farming in our cities, towns, and other large urban centres. In sub-Saharan Africa, agricultural information products have gradually increased from 2000 to 2018, where crops and livestock have witnessed the highest increase of growth in agricultural production (Jayne and Sanchez, 2021). Danso-Abbeam *et al.* (2018), in their view of disseminating agricultural information in improving the livelihood of farmers in rural communities, revealed that age and gender do not influence the effective dissemination of agricultural information. But according to Amegayibor (2021), Age, gender, educational level, income, geographical location, and ethnicity, among others, are some characteristics that make up the demographics of a population. This implies that demographics is the study of a population based on given characteristics of farmers, including age, gender, among others. Farmer group members' decision-making can be improved by access to re-packaged agricultural information, leading to a higher adoption rate of innovations, increased crop yield, and sustained livelihoods among farmers (Nahar & Ali, 2021). FAO (2020) asserts that access and application of relevant disseminated agricultural information raises the possibility that small-scale farmers in sub-Saharan Africa will apply agricultural extension methods, which can increase productivity, income, food security, wellbeing, and empowerment of farmers in rural communities.

Urban farming is increasingly recognised as a key component of sustainable development, addressing numerous dimensions of sustainability. It promotes self-reliance, strengthens community ties, supports local economies, and reduces the environmental impacts associated with traditional agriculture (Hsin, 1996). Drescher (1999) emphasised the need for the concept of urban farming to evolve continually, adapting to new challenges and opportunities to ensure its ongoing relevance and effectiveness in fostering sustainable urban development. This evolving understanding of urban agriculture is crucial for enhancing its role in achieving broader sustainability goals, addressing urban food security, and mitigating environmental concerns. Over recent years, various forms of urban agriculture have emerged as practical solutions to address food security and sustainability challenges in African cities and beyond. According to Olawepo *et al.* (2012), common examples of urban farming practices include home gardening, compound and backyard farming, subsistence farming on open lands, greenhouse farming, hydroponics, community gardens, and rooftop gardens. Among these, sack farming represents a novel and increasingly popular approach. Literature has revealed several benefits associated with sack farming, particularly in urban environments where space and resources are constrained. For instance, Adeoye *et al.* (2019) emphasise the role of sack farming in providing fresh and nutritious food to urban dwellers, especially in regions with limited access to traditional farmland. This practice not only supports food security but also aligns with broader environmental sustainability goals by reducing water consumption and minimizing the reliance on chemical inputs (Amusa *et al.,* 2020). Gallagher (2012) notes that sack farming offers advantages like better moisture retention and water flow compared to traditional methods, making it an ideal solution for urban dwellers with restricted space or low soil fertility. Its portability and low-cost, high productivity make it particularly suitable for those living in rented accommodations or areas with challenging land conditions.

In Nigeria, approximately 16% of urban residents engage in this practice. Such farming is often performed on undeveloped land and is driven by the need for additional food sources and income (Kareem and Raheem, 2012). However, the diverse forms of urban agriculture reflect a broader movement towards sustainable and resilient urban food systems. By integrating these practices into urban planning and policy, cities can better address food security, environmental sustainability, and economic challenges. In the context of sack farming in the Ibadan region, the governance of urban space and economic activities plays a crucial role in the success of sustainability initiatives. Understanding the political, economic, and social dynamics surrounding urban agriculture is essential for effectively implementing sack farming across different residential densities in Ibadan.

3. Materials and Methods

3.1 Study Area

Ibadan city is the study area and its topography ranges from 150 meters in the valley areas to 275 meters above sea level on the prominent north-south ridge. Natural drainage is provided by four main rivers: Ona, Ogbere, Ogunpa, and Kudeti (Filani et al., 1994). Additionally, Lake Eleyele is located in the northwestern part of the city, with the Osun River and Asejire Lake bounding it to the east (Filani et al., 1994). The residential densities of Ibadan have been influenced by colonial, post-colonial, and contemporary factors. The figure below shows the geographical area of Ibadan and the zones used during the experiment.

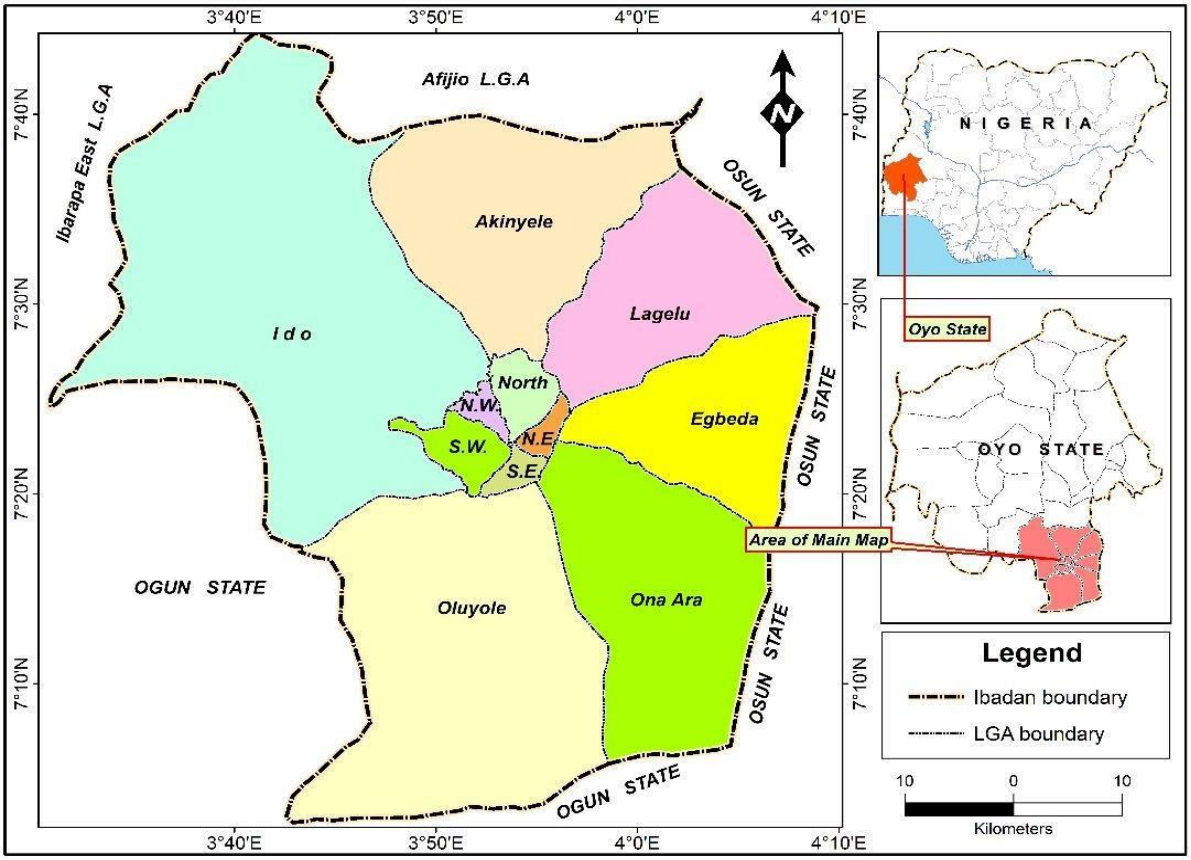


Figure 3.1: Location of Ibadan Metropolitan Area in the Context of Nigeria and Oyo State
Source: Department of Geography, University of Ibadan (2024)

Different Residential Zones in Ibadan

The residential zones of Ibadan have evolved, influenced by colonial, post-colonial, and contemporary factors. In the pre-colonial era, Ibadan was a walled city with traditional neighbourhoods like Beere, Oja-Oba. The British colonials introduced a grid-based planning, creating areas like Bodija and Jericho, while Ibadan expanded rapidly in the post-colonial era, with new residential densities emerging like high, medium, and low residential densities. In Ibadan, residential densities are categorised based on several factors. These factors include population per hectare, house forms and types, land use patterns, neighbourhood characteristics, and housing quality and condition.

Population of Study

The study population encompasses all residents practicing sack farming (RPSF) across the eleven Local Government Areas (LGAs) in Ibadan-North, Ibadan South-East, Akinyele, Ibadan South-West, Egbeda, Ido, Ibadan North-East, Lagelu, Oluyole, Ibadan North-West, and Ona Ara. Information about these practitioners was sourced from the Oyo State Ministry of Agriculture and the Farmers Development Unions (FADU) operating in the region.

3.2 Methodology

Von Thunen's Urban Land Use and Ebenezer Howard's Garden City of Tomorrow theories were used as a framework, while the cross-sectional survey design and mixed methods were adopted for this study. This combines quantitative and qualitative analyses of data obtained through questionnaire administration, Focus Group discussions, and structured interviews. The cross-sectional design is advantageous for this study as it provides a view of data at a specific moment in time. This method involves collecting data from the residents practicing sack farming (RPSF) at a single point in time without repeated measures, allowing for comparisons across different residential densities. The eleven Local Government Areas (LGAs) in Ibadan land were enumerated. One hundred and five localities, predominantly for SFPs, were purposively selected. One thousand, two hundred and eighty-eight residents practicing sack farming (RPSF) were randomly selected out of 20,276 RPSF captured in the LGAs. Three residential (high, medium, and low) areas were calibrated based on their density, while RPSF were proportionally allotted to High (182), Medium (708), and Low (398) residential areas. The data collected for this research were analysed using both descriptive and inferential statistics. The results of

these analyses were presented through tables to facilitate a clear and comprehensive understanding of the findings. Statistical software tools were essential for these analyses; SPSS Version 20 (Statistical Package for Social Sciences) and Microsoft Excel (Version 2013) were primarily used. SPSS was crucial for coding and analysing the characteristics of each variable from the questionnaire data.

4. Results and Discussion

This sub-section focuses on the presentation of results and discussion of the socio-economic and demographic characteristics of residents practicing sack farming and knowledge, awareness, and practices, as well as entrepreneurship potential. Descriptive analysis uses frequency tables, while Chi-Square and Phi, Cramer's V variations in practice/engagement, awareness, and knowledge across densities.

4.1 Socio-economic Characteristics of Residents Practicing Sack Farming (RPSF)

This study's objective focuses on the assessment of socio-economic characteristics of RPSF across residential densities (high, medium, and low) in Ibadan, Oyo State. The socio-economic characteristics examined, including gender, marital status, age, occupation, residency length, household status and household size, are presented in Table 1. Sack farming activities according to high, medium and low densities respectively are total of 69 (5.4%) females and 113 (8.8%) males, a total of 241 (18.7%) females and 467 (36.3%) males, and a total of 135 (10.5%) female and 256 (20.4%) males. Based on this outcome, it could be broadly deduced that sack farming activities are not the exclusive preserve of certain genders; hence, there is a relative degree of gender inclusiveness in sack farming activities in Ibadan across the residential densities. However, the male gender is dominant in sack farming activities across residential densities; a broad total of 445 (34.5%) RPSF were female, while 843 (65.5%) were male (Table 1). This aligns with the study that a gender gap exists in agriculture across the range of resources, and women do not have the resources to implement adaptation solutions in farming, even when they are aware of its impact (Huyer et al., 2015; Assan et al., 2018; Hariharan et al., 2020).

The age distribution of the sampled residents practising sack farming (RPSF) indicates that a majority belong to the economically active age group. In broad terms, a total of 221 (17.2%) sampled RPSF respondents are in the age cohort of 18-30 years, 403 (31.3%) are within the age category of 31-40 years, and 236 (18.3%) are in the age group of 41-50 years. Additionally, as presented in Table 1, a total of 188 (14.6%) respondents are in the group of 51-60 years; respondents who are 61-70 years are 85 (6.6%), while a total of 22 (1.7%) are 71 years and older. The outcome of the age cohort of sampled respondents across the residential densities in Ibadan shows that the working-age populations are higher than the dependent segment, which agrees with Gallaher et al. (2015) studies, stating that sack farming is a major interest to the young adults and middle-aged respondents.

Table 1: Socioeconomic Characteristics of RPSF

	High		Medium		Low		Total	
Variable	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Gender								
Male	113	8.8	467	36.3	256	20.4	843	65.5
Female	69	5.4	241	18.7	135	10.5	445	34.5
Total	182	14.1	708	55.0	398	30.9	1288	100
Age Group								
18-30 years	32	2.5	131	10.2	58	4.5	221	17.2
31-40 years	26	2.0	259	20.1	118	9.2	403	31.3
41-50 years	54	4.2	108	8.4	74	5.7	236	18.3
51-60 years	22	1.7	106	8.2	60	4.7	188	14.6
61-70 years	25	1.9	35	2.7	15	1.9	85	6.6
Above 70	23	1.8	69	5.4	63	4.9	22	1.7
Total	182	14.1	708	55.0	398	30.9	1288	100
Marital Status								
Single	31	2.4	123	9.5	69	5.4	223	17.3
Married	111	8.7	438	34.0	247	19.2	796	61.8
Divorced	28	2.2	102	7.9	56	4.4	186	14.5
Separated	12	0.9	46	3.6	25	1.9	83	6.4
Total	182	14.1	708	55.0	398	30.9	1288	100
Occupational Status								
Artisan	66	5.1	329	25.5	215	16.7	610	47.7
Civil Service	36	2.8	95	7.4	43	3.3	174	13.5
Private Establishment	49	3.8	211	16.4	79	6.1	339	26.3
Full-time Farmer	27	2.1	53	4.1	31	2.4	111	8.6
Unemployed	4	0.3	20	1.6	30	2.3	54	4.2
Total	182	14.1	708	55.0	398	30.9	1288	100
Average Monthly Income								
Below N30,000	0	0.0	14	1.1	3	0.2	17	1.3
N30,001-N60,000	57	4.4	290	22.5	160	12.4	507	39.4
N60,001 – N90,000	11	0.9	162	12.6	97	7.5	270	21.0
N90,001 – N120,000	78	6.1	201	15.6	117	9.1	396	30.7
N120,001 – N150,000	6	0.5	7	0.5	0	0.0	13	1.0
N150,001 – N180,000	30	2.3	32	2.5	19	1.5	81	6.3
Above N180,000	0	0.0	2	0.2	2	0.2	4	0.3
Total	182	14.1	708	55.0	398	30.9	1288	100
Length of Residence								
Less 3 years	14	1.1	56	4.3	31	2.4	101	7.8
3 – 5 years	12	0.9	45	3.5	25	1.9	82	6.4
6 -8 years	25	2.0	98	7.6	55	4.3	178	13.8
Above 9 years	131	10.2	509	39.5	287	2.3	927	72.0
Total	182	14.1	708	55.0	398	30.9	1288	100
Household (HH) Status								
HH Head	132	10.2	490	38.0	253	19.6	875	67.9
HH Member	50	3.9	218	16.9	145	11.3	413	32.1
Total	182	14.1	708	55.0	398	30.9	1288	100
Household Size								
1-3 persons	6	0.5	44	3.4	35	2.7	85	6.6
4-6 persons	120	9.3	394	30.6	189	14.7	703	54.5
7-9 persons	56	4.3	145	11.3	145	11.3	409	31.8
Above persons	10	0.0	29	2.3	29	2.3	91	7.1
Total	182	14.1	708	55.0	398	30.9	1288	100

Source: Author's Field Survey (2023)

As presented also in Table 1, the marital status of sampled RPSF across different residential densities in Ibadan shows that a total of 223 (17.3%) are single, 796 (61.8%) are married, 186 (14.4%) are divorced, and 83 (6.4%) are separated. This indicates the diverse marital background of RPSF in Ibadan and further indicates the marital inclusivity of the urban agricultural practice of sack farming.

On the occupational status, the study identified the occupations of the sampled respondents. Responses analysed from different residential densities, high, medium, and low across Ibadan, revealed that a total of 610 (47.7%) sampled respondents are artisans, 174 (13.5%) are civil servants, 339 (26.3%) are employed in the private establishments engaged in different sectors of the economy, 111 (8.6%) are full-time farmers, and a total of 54 (4.2%) are unemployed, as presented also in Table 1. Further breakdown of respondents across residential densities of high, medium, and low shows that artisans are 66 (5.1%), 329 (25.5%), and 215 (16.7%); civil servants are 36 (2.8%), 95 (7.4%), and 43 (3.3%); private workers are 49 (3.8%), 211 (16.4%), and 79 (6.1%).

Full-time farmers are 27 (2.1%), 53 (4.1%), and 31 (2.4%), while unemployed respondents are 4 (0.3%), 20 (1.6%), and 30 (2.3%) across residential densities of high, medium, and low, respectively. It could be deduced from the occupational structure of sampled respondents that there is a low level of the unemployed, who are engaged in sack farming across the residential densities in Ibadan. Furthermore, farming activities account for 8.6% of this employment opportunity. It is expected that sack farming could provide more employment opportunities through better urban development planning and robust public policy interventions in areas such as agricultural extension services, land use planning, and management. The study's claim regarding the economic advantages of sack farming is consistent with the Food and Agriculture Organisation's (2007) viewpoint, which suggests that urban agriculture can substantially enhance the well-being of adults and children in low-income areas.

The personal income of sampled RPSF across the residential densities in Ibadan varied. A total of 0 (0.0%) in high-density, 14 (1.1%) in medium-density, and 3 (0.2%) in low-density areas earn an income of less than N30,000 per month in Ibadan. A monthly income of 30,001-60,000 is earned by a total of 57 (4.4%) in the high-density, 290 (22.5%) in medium-density, and 160 (12.4%) in low-density areas in Ibadan. Furthermore, a total of 11 (0.9%), 162 (12.6%), and 97 (7.5%) earn N60, 001-90,000 across high, medium, and low densities in Ibadan, respectively, and a total of 78 (6.1%) in high-density, 201 (15.6%) in medium-density, and 117 (9.1%) in low-density areas of total sampled sack farmers earn 90,001-120,000 in Ibadan.

In addition, 6 (0.5%) in high-density, 7 (0.5%) in medium-density, and 0 (0.0%) in low-density of the total sampled respondents engaged in sack farming earned an income of 120,001-150,000 in Ibadan, respectively. A total of 30 (2.3%) in high-density, 32 (2.5%) in medium-density, and 19 (1.5%) in low-density areas of sampled RPSF in Ibadan earn 150,001-180,000, while a total of 0 (.0%) in high-density, 2 (0.2%) in medium-density, and 2 (0.2%) in low-density areas of total sampled RPSF earn above 180,000. Based on the income category of the RPSF sampled for this study, it could be inferred that most of the RPSF are low- and middle-income earners, and sack farming activities are meant to provide an alternative source of income. It is widely accepted that how long an individual resides in a location increases the level of understanding of the neighbourhood dynamics. In this regard, the length of residency of samples across the three residential densities was examined. A broad highlight shows that a total of 101 (7.8%) have lived in Ibadan for a period of fewer than 3 years, 82 (6.4%) have lived in the area across the residential densities of high, medium, and low for 3-5 years.

The dataset from this study indicates that sampled respondents who have lived in the areas for 6-8 years are 178 (13.8%), while 927 (72.0%) have resided in high, medium, and low residential densities for periods above 9 years (Table 4.1). It could be approximately inferred that sampled respondents would understand the dynamics and knowledge of prevailing issues of physical development and sack farming issues. This expected understanding by the respondents would further increase the quality of information provided for the study.

The household status of sampled RPSF for the study shows that a total of 132 (10.2%), 490 (38.0%), and 253 (19.6%) are heads in the residential densities of high, medium, and low, respectively. Also, 50 (3.9%) in high-density, 218 (16.9%) in medium-density, and 145 (11.3%) in low-density are household members. Furthermore, in broad terms, a total of 875 (67.9%) respondents for the study are household heads, while a total of 413 (32.1%) are household members (Table 4.1). It could be deduced from the data outcome of the study that sack farming activities are engaged in by different members of the households across residential density areas of Ibadan.

In the high-density areas in Ibadan, the household size of 1-3 persons is 6 (0.5%), 4-6 persons are 120 (9.3%), 7-9 persons are 56 (4.3%), and 10 persons or above is 0 (0.0%). For medium

residential density, the total number of 1-3 persons is 44 (3.4%), 4-6 persons are 394 (30.6%), 7-9 persons is 145 (11.3%) and 10 persons above household size is 29 (2.3%) and for low residential density areas in Ibadan, household size of 1-3 persons are 35 (2.7%), 4-6 persons are 189 (14.7%), 7-9 persons 145 (11.3%) and 10 persons above is 29 (2.3%) as presented in Table 4.1. In broad terms, there is a total of 85 (6.6%) 1-3 person households, 703 (54.6) 4-6 person households, 409 (31.8%) 7-9 person households, and 91 (7.1%) 10 person households. This indicates that there is a dominance of 4-6 person and 7-9 person household sizes across residential density areas in Ibadan. This outcome also revealed variation in household size structure across residential densities in Ibadan. This could also be due to residential area differentiation in terms of population in Ibadan, and this is also expected to impact the level of farm produce demand for consumption to feed households of different sizes.

4.2 Socio-Economic Differences in Sack Farming Population across Residential Densities in Ibadan

The analysis in Table 2 examines how socio-economic characteristics influence sack farming engagement levels. Frequencies and percentages of respondents at varying levels (Very Low to Very High) are cross-tabulated, with Pearson Chi-Square and Phi Cramer's V used to infer relationships. Findings on gender status revealed that among males (34.5%), the engagement levels indicate lower representation compared to females (65.5%). Engagement peaks at "High" for both genders, constituting 14.2% for males and 25.5% for females. Inferentially, the Pearson Chi-Square results (χ^2=8.035, p=0.090) and Phi value (0.079, p=0.090) suggest no statistically significant gender-based difference in sack farming engagement levels. This result implies gender inclusiveness in sack farming, reflecting its accessibility across demographics. On marital status, findings revealed that the married respondents dominate sack farming engagement, accounting for 61.8%. Singles and divorced individuals represent 17.3% and 14.4%, respectively, with the lowest engagement levels observed among separated respondents (6.4%). A significant Chi-Square statistic (χ^2=75.939, p<0.001) and moderate Phi value (0.243, p<0.001) highlight marital status as a critical determinant. This finding indicates the higher stakes that married individuals place on sustainable food sources due to household responsibilities.

Findings on age groups revealed that the respondents within the 31-40 age bracket show the highest engagement (31.3%), with decreasing participation observed in younger and older age groups. Engagement at "High" and "Very High" levels is notable within middle-aged demographics. The Chi-Square results (χ^2=41.791, p=0.003) confirm significant variation, with Phi value (0.180, p=0.003) denoting moderate association. This emphasised the importance of targeting productive-age individuals in sack farming advocacy. On the occupation status, findings revealed that the artisans (47.4%) dominate participation, followed by private-sector workers (26.3%) and civil servants (13.5%).

Farmers and unemployed groups exhibit minimal engagement. Chi-Square values (χ^2=33.294, p=0.007) and Phi value (0.161, p=0.007) confirm significant occupational influence on sack farming engagement. More so, the artisans' predominance in the study area may reflect their flexible schedules and resourcefulness. Findings on residency period revealed that respondents who have been residing for over nine years (72%) exhibit the highest sack farming engagement, possibly due to stronger community integration and environmental adaptation, while short-term residents (less than three years) account for only 7.8%. The Chi-Square (χ^2=37.529, p<0.001) and Phi value (0.171, p<0.001) showed and validated the residency period's significance on their engagement in sack farming. In other words, the long-term residents may be better positioned to optimize local resources.

Table 2: Influence of Socio-economic Attributes of Respondents on Sack Farming Level of Engagement

SEC		Sack Farming Level of Engagement						Pearson Chi-Square			Phi. Cramer's V			
		VL	L	M	H	VH	Total	Value	Df	Sig.	Phi value	Sig.	Cramer's V value	Sig.
Gender														
Male	F	16	52	154	183	40	445	8.035[c]	4	.090	.079	.090	.079	.090
	%	1.2	4.0	12.0	14.2	3.1	34.5							
Female	F	38	76	344	329	56	843							
	%	3.0	5.9	26.7	25.5	4.3	65.5							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Marital Status								75.939[c]	12	.000	.243	.000	.140	.000
Single	F	3	13	128	67	12	223							
	%	0.2	1.0	9.9	5.2	0.9	17.3							
Married	F	35	81	292	323	65	796							

SEC		Sack Farming Level of Engagement						Pearson Chi-Square			Phi. Cramer's V			
		VL	L	M	H	VH	Total	Value	Df	Sig.	Phi value	Sig.	Cramer's V value	Sig.
	%	2.7	6.3	22.7	25.1	5.0	61.8							
Divorced	F	15	23	56	88	4	186							
	%	1.2	1.8	4.3	6.8	0.3	14.4							
Separated	F	1	11	22	34	15	83							
	%	0.1	0.9	1.7	2.6	1.2	6.4							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Age								41.791[a]	20	.003	.180	.003	.090	.003
18-30	F	6	18	83	96	18	221							
	%	0.5	1.4	6.4	7.5	1.4	17.2							
31-40	F	19	46	152	158	28	403							
	%	1.5	3.6	11.8	12.3	2.2	31.3							
41-50	F	7	25	105	79	20	236							
	%	0.5	1.9	8.2	6.1	1.6	18.3							
51-60	F	5	14	79	78	12	188							
	%	0.4	1.1	6.1	6.1	0.9	14.6							
61-70	F	8	6	36	23	12	85							
	%	0.6	0.5	2.8	1.8	0.9	6.6							
71 above	F	9	19	43	78	6	155							
	%	0.7	1.5	3.3	6.1	0.5	12.0							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Occupation								33.294[a]	16	.007	.161	.007	.080	.007
Artisan	F	29	57	229	234	61	610							
	%	2.3	4.4	17.8	18.2	4.7	47.4							
Civil Servant	F	11	14	71	67	11	174							
	%	0.9	1.1	5.5	5.2	0.9	13.5							
Private Sector Worker	F	5	42	136	133	23	339							
	%	0.4	3.3	10.6	10.3	1.8	26.3							
Farmer	F	5	11	40	55	0	111							
	%	0.4	0.9	3.1	4.3	0.0	8.6							
Unemployed	F	4	4	22	23	1	54							
	%	0.3	0.3	1.7	1.8	0.1	4.2							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Residency Period in Ibadan								37.529[a]	12	.000	.171	.000	.099	.000
Less than 3 years	F	5	8	25	57	6	101							
	%	0.4	0.6	1.9	4.4	0.5	7.8							
3-5 years	F	4	1	43	33	1	82							
	%	0.3	0.1	3.3	2.6	0.1	6.4							
6-8 years	F	4	15	75	63	21	178							
	%	0.3	1.2	5.8	4.9	1.6	13.8							
9 years above	F	41	104	355	359	68	927							
	%	3.2	8.1	27.6	27.9	5.3	72.0							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Household Status								3.673[a]	4	.452	.053	.452	.053	.452
Household Head	F	41	89	336	350	59	875							
	%	3.2	6.9	26.1	27.2	4.6	67.9							
Household Member	F	13	39	162	162	37	413							
	%	1.0	3.0	12.6	12.6	2.9	32.1							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							
Household Size								37.594[a]	12	.000	.171	.000	.099	.000
1-3 persons	F	8	4	21	45	7	85							
	%	0.6	0.3	1.6	3.5	0.5	6.6							
4-6 persons	F	31	70	257	283	62	703							
	%	2.4	5.4	20.0	22.0	4.8	54.6							
7-9 persons	F	12	42	191	140	24	409							
	%	0.9	3.3	14.8	10.9	1.9	31.8							
10 persons above	F	3	12	29	44	3	91							
	%	0.2	0.9	2.3	3.4	0.2	7.1							
Total	F	54	128	498	512	96	1288							
	%	4.2	9.9	38.7	39.8	7.5	100.0							

Findings on the household status revealed that the heads of households (67.9%) engage more actively than members (32.1%). The Pearson Chi-Square and Phi Cramer's V values demonstrate no significant influence on sack farming engagement. Contrarily, findings on the household size revealed that the larger households (4-6 persons) dominate more engagement levels (54.6%), while small-sized households (1-3 persons) are less involved (6.6%). The Pearson Chi-Square and Phi Cramer's V values demonstrate strong statistical significance ($p<0.001$), affirming the household structure's impact. By implication, the larger households may utilise sack farming for food security, thus justifying the reasons for their engagements than the other categories. These findings have profound implications for urban agricultural policies, as the policy interventions must address barriers specific to demographics, such as constraints among short-term residents. Promoting sack farming in underserved groups could enhance food security and align with physical planning for sustainable land use

In summary, the socio-economic characteristics of the respondents highlighted diverse factors influencing engagement in sack farming. The findings indicated that males represented a larger proportion of sack farming practitioners than females, suggesting that although sack farming is a male-dominated practice, female participation remains significant. Age distribution revealed that most practitioners were in the economically active age group, predominantly individuals in their prime working years. Regarding occupation, a significant number of respondents were artisans, followed by those working in the private sector and civil servants, indicating that sack farming is more common among those in the informal sector and those with flexible employment arrangements. In terms of marital status, the majority of respondents were married, underscoring the importance of sack farming in ensuring household food security.

From an inferential perspective, the analysis revealed significant relationships between marital status and participation in sack farming, with married individuals being more likely to engage in the practice. The analysis also showed a significant association between residency period and sack farming participation, suggesting that individuals who have lived in Ibadan for longer periods are more likely to practise sack farming. However, gender differences did not significantly affect engagement in sack farming, pointing to the inclusiveness of the practice across genders. These findings suggest that sack farming is primarily engaged in by married individuals, larger households, and those in the working age group.

5. Conclusion and Recommendation

This study tends to provide a comprehensive understanding of sack farming practices across varying residential densities in Ibadan, Nigeria, revealing significant insight into its role in enhancing urban food security and contributing to sustainable urban agriculture. The findings illustrate that sack farming is a growing practice, particularly in medium- and low-density residential areas, where space availability and socio-economic factors, such as marital status, age, and occupation, foster its implementation. The study highlights that married individuals, particularly those within the economically active age group and in larger households, are more likely to engage in sack farming. This aligns with the broader socio-economic conditions, suggesting that the practice offers an effective means of food production and supplementary income for urban households.

Based on the socioeconomic characteristics associated with sack farming, several recommendations can be made to enhance its sustainability and effectiveness in Ibadan and beyond. Policymakers should integrate sack farming into urban agricultural policies to support and scale its adoption, ensuring that it contributes meaningfully to food security, employment, and sustainable livelihoods. Government agencies, research institutions, and relevant stakeholders should work collaboratively to establish frameworks that promote sack farming as a viable solution for urban food production.

Given that sack farming reduces production costs, government intervention in providing essential materials such as sacks, soil, compost, and organic fertilizers at subsidized rates or no cost would significantly benefit low-income urban farmers. Additionally, financial support in the form of microloans, grants, or cooperative funding should be made available to encourage widespread participation, particularly among economically disadvantaged households. To maximize productivity, urban dwellers must be educated on optimal crop selection, as certain vertical-growing crops, such as tomatoes, peppers, and leafy greens, perform better in sack farming systems compared to creeping crops like melons and pumpkins. Agricultural extension officers and experts should facilitate training programs to improve farmers' technical knowledge and efficiency in sack farming.

Awareness campaigns are essential to increase public engagement and acceptance of sack farming. Government and non-governmental organizations (NGOs) should lead sensitization efforts to educate urban residents on the benefits of sack farming, breaking cultural biases and overcoming land scarcity constraints, particularly in high-density

areas. Additionally, essential farming resources such as water tanks, compost, seeds, and fertilizers should be made accessible to urban farmers. Training in modern agricultural techniques, such as drip irrigation and vertical farming, should be provided to optimize resource use and improve productivity, making sack farming viable even in congested urban environments.

Ensuring social inclusivity in sack farming practices is crucial. Policies should be implemented to eliminate biases based on gender, age, and socioeconomic status, promoting equitable participation in sack farming. Special attention should be given to empowering women, who constitute the majority of sack farmers, by providing targeted support and training programs to enhance their productivity and economic independence. Further research should also be conducted to improve sack farming technologies, enhance productivity, and reduce costs. Collaboration with agricultural research institutions should be encouraged to develop and disseminate innovative urban farming methods that cater to the unique needs of different residential densities.

Finally, an effective monitoring and evaluation framework should be established to assess the impact of sack farming initiatives on urban food security, household income, and overall community well-being. Regular assessments and policy adjustments will ensure that sack farming remains a sustainable and effective solution for urban agriculture.

References

Adeoye, G. O., Ogundiran, M. B., and Olufolaji, O. A. (2019). Assessment of Sack Gardening: A Panacea for Urban Food Security and Climate Change Adaptation Strategy in Ibadan Metropolis, Nigeria. *International Journal of Agricultural Extension and Rural Development, 2*(6), 92-101.

Amusa, T. O., Adegbite, A. A., and Amusa, S. A. (2020). Urban Agriculture as a Sustainable Livelihood Strategy: A Study of Sack Farming in Ibadan, Nigeria. *Journal of Agricultural Extension and Rural Development Studies, 7*(2), 111- 121.

Aiken, M. T. (2013). The Promise of sack farming: promoting urban agriculture to address food insecurity in West Africa, The project on international peace and security, Virginia, 2013, pp. 1-30

Akinmoladun, F. O., Olayanju, A. O., & Adedeji, A. O. (2020). Urban agriculture as a tool for promoting food security in Nigeria. *Journal of Agriculture and Sustainability*, 12(2), 20-32.

Aliyu A.A. and Amadu L. (2017). Urbanisation, Cities, and Health: The Challenges to Nigeria – A Review. *Ann. Afr. Med., 16*(4): 149–158.

Amegayibor, G.K. (2021). The effect of demographic factors on employees' performance: A case of an owner manager manufacturing firm. *Annals of Human Resource Management Research (AHRMR)*, 1(2) 127–143. ISSN 2774-8561.

Amusa, T. O., Adegbite, A. A., and Amusa, S. A. (2020). Urban Agriculture as a Sustainable Livelihood Strategy: A Study of Sack Farming in Ibadan, Nigeria. *Journal of Agricultural Extension and Rural Development Studies, 7*(2), 111- 121.

Appiah, W. K. (2012). The management of urban land in Ghana: the case of Accra and Kumasi metropolitan areas. Kwame Nkrumah University of Science and Technology, Ghana.

Assan, E., Suvedi, M., Schmitt Olabisi, L., and Allen, A. (2018). Coping with and adapting to climate change: a gender perspective from smallholder farming in Ghana. *Environments* 5, 86. doi:10.3390/environments5080086

Danso-Abbeam, G., Ehiakpor, D.S. & Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture & Food Security*,7(74).

Department of Geography, University of Ibadan (2024).

Drescher, A. (1999). The integration of urban agriculture into urban planning: an analysis of the current studies and constraints. Land Use Planning.22: 555 -574.

FAO, (2020). The state of food and agriculture 2020: Overcoming water challenges in agriculture. Food and Agricultural Organisation of the United Nations (FAO); Rome, Italy. https://doi.org/10.4060/cb1447en.

Farrell, K. (2018). An Inquiry into the Nature and Causes of Nigeria's Rapid Urban Transition. *Urban Forum* 29, 277–298. Available at https://doi.org/10.1007/s12132-018-9335-6

Filani, M. O., Akintola, F. O. and Ikporukpo, C.O. (1994). *Ibadan Region*, (Ed.) Rex Charles Publication, Ibadan. pp 99-110.

Gbadamosi, K. T. & Akanmu, A. A. (2023). Food security and population growth in Nigeria: The urban agriculture perspective. In Olorunfemi Oriola, E. O. and Raheem, U. A. (edS). Nigeria perspective to population dynamics and sustainable development. *A festschrift in honour of Professor Olorunfemi Jacob Funsho.* Pp 30-45, Department of Geography, University of Ilorin, Nigeria.

Gallaher, C. M., Mwaniki, D., Njenga, M., Karanja, N. k., and WinkerPrins, A.M.G.A. (2013). Real or perceived: the environmental health Risks of urban Sack Gardening in Kibera Slums of Nairobi, Kenya. EcoHealth (2013) 9-20.

Gallaher, C. M., WinklerPrins, A. M. G. A., Njenga, M., & Karanja, N.K. (2015). Creating space: Sack gardening as a livelihood strategy in the Kibera slums of Nairobi, Kenya. Journal of Agriculture, Food Systems and Community Development. Advance online publication. http://dx.doi.org/10.5304/jafscd.2015.052.006.

Grewal, S. S., Grewal, P. S., and Maheshwari, B. L. (2017). Urban Agriculture: Policy, Law, Strategy, and Implementation. CRC Press.

Hariharan, V. K., Mittal, S., Rai, M., Agarwal, T., Kalvaniya, K. C., Stirling, C. M., et al. (2020). Does climate-smart village approach influence gender equality in farming households? A case of two contrasting ecologies in India. Clim. Change 158, 77–90. doi: 10.1007/s10584-018-2321-0

Huyer, S., Twyman, J., Koningstein, M., Ashby, J., and Vermeulen, S. J. (2015). Supporting Women Farmers in a Changing Climate: Five Policy Lessons. Copenhagen: CGIAR Climate Change, Agriculture and Food Security Programme. Available online at: https://cgspace.cgiar.org/rest/bitstreams/60479/retrieve

Jayne, T.S. & Sanchez, P.A. (2021). Agricultural productivity must improve in sub–Saharan Africa. *Science*, 372(6546), 1045–1047.

Kareem R.O. and Raheem K.A. (2012). A review of urban agriculture as a tool for building food security in

Nigeria: challenges and policy options. *Journal of Sustainable Development in Africa, 14(*3), 1-10.

Kenneth, P, Samuel, T.A and Joseph, N.A. (2014). Sack Farming: Innovation for land scarcity Farmers in Kenya and Ghana. *International Journal of Innovative Research and Studies, 3* (5), 30-44. ISSN 2319-9725.

Mubofu, C. & Elia, E. (2017)**.** Disseminating agricultural research information: A case study of farmers in Mlolo, Lupalama and Wenda villages in Iringa district, Tanzania. *University of Dar es Salaam Library Journal*, **12**(2), 80–97. ISSN: 0856-1818.

Napoli, M. (2011). Towards a Food Insecurity Multidimensional Index (FIMI).

Nahar, S. & Ali, M.Z. (2021). Socio-demographic characteristics and major problems faced by the farmers in adopting BRRI dhan29 in the coastal areas of Bangladesh. *International Journal of Agricultural Extension and Rural Development Studies*, **8**(4), 36–52.

Olawepo, R. A. (2012). Food Security and Challenges of Urban Agriculture in the Third World Countries, Food Production - Approaches, Challenges and Tasks, Available from: http://www.intechopen.com/books/food-production-approaches-challenges-and-tasks/food-security-and-challenges-of-urbanagriculture-in-the-third-world-countries.

Van Veehuizen, R. (2006). Cities farming for the future. Urban agriculture for sustainable cities, RUAF foundation, IDRC and IIRR, Leusden. The Netherlands 2006.

Wahab B., Popoola Ayo and Magidimisha L. (2018). Access to urban Agricultural land in Ibadan. Journal of the Malaysian Institute of Planners Vol 16, page 161-175.

Yachori, B. (2017). Urban planning capacity development's response to emerging issues of urbanisation in the WA and Lawra townships of Upper West Region. University for Development Studies.

Zhang, Y., Wang, L. & Duan, Y. (2016). Agricultural information dissemination using ICTs: A review and analysis of information dissemination models in China. *Information Processing in Agriculture*, 3(1), 17–29.