



# Urban Farming for Food Security and Sustainability in Nigerian Cities

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Received: 28.11.2025 | Accepted: 13.12.2025 | Published: 19.12.2025

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DOI: [10.5281/zenodo.17989253](https://doi.org/10.5281/zenodo.17989253)

## Abstract

## Original Research Articles

Urban agriculture (UA) is an alternative to ensure food security and lead to environmental sustainability in Nigeria's urbanising regions. Nevertheless, UA has been partially unexploited by weak policy attention and a lack of a proper infrastructural base.

This mixed-methods study incorporates a long literature review and a structured survey of 120 respondents in the main Nigerian urban areas. The survey assessed demographic factors, farming practices, the effects of UA on food security and the environment, and the challenges that prevent its practice.

The findings indicated that 58.3 per cent of the participants practice urban farming, primarily in container and backyard gardening. Approximately 62.5 per cent of them had increased access to fresh produce. Among the most mentioned environmental advantages are the decrease in waste (54.2%) and improved air quality. Nevertheless, limited space (50.0 per cent), expensive inputs (45.8 per cent), inadequate access to water (37.5 per cent), and low levels of institutional support were prominent limiting factors. Nonetheless, it showed that 83.3% of them were willing to make UA a part of urban planning, and 75.0% were in favour of UA in school programs.

UA has four demonstrable advantages of enhancing urban food systems and lowering environmental effects. To lend a wider effect, policymakers in Nigeria should resort to incorporating UA into urbanisation, land and resource accessibility, and institutionally and education-wise support.

**Keywords:** *Urban agriculture, Food security, Environmental sustainability, Urban planning, Nigeria.*

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## INTRODUCTION

### Background of the Study

Food insecurity remains a significant development challenge in many low- and middle-income countries, including Nigeria. The Food and Agriculture Organisation (FAO) defines food security as the existence of access, through physical and economic means, by individuals at all times, to quantity, safe, quality and nutritious food, which meets the dietary requirements of the individual and the population. Nonetheless, food insecurity, i.e. the absence of secure and sustainable access to enough

and affordable food, is still a reality for many millions of households, and the populations in cities and rural areas are becoming increasingly susceptible to it [2]. Urban agriculture (UA), which involves the production of crops, as well as the rearing of animals in cities and their environs, has been cited as one plausible approach to enhancing access to food, environmental sustainability, and economic resilience globally [3].

In most countries of the African continent, urban farming is becoming relevant because urbanisation is growing rapidly, which adds more burdens on food, residential lands, infrastructure, and the job market.



Agriculture was a rural activity in Nigeria. Nevertheless, as the demand for food and livelihoods in urban areas increases, city inhabitants are adopting urban farming as a strategy to satisfy the food demand shortfall and earn household income [4]. Urban agriculture in Nigeria has been little studied, little developed in policy, and institutionally functions weakly. Therefore, its entire potential to add to urban food security and environmental sustainability remains unknown [5].

### Objectives of the Study

This research comes at a time when urban agriculture has become a priority area of research, as it helps to study the extent of its contribution to the enhancement of food security and environmental conditions in Nigerian cities. In particular, it will be set to:

1. Evaluate the potential of urban agricultural activities in increasing food security.
2. Assess the positive environmental impacts of urban farming, such as carbon footprint reduction and tons of waste.
3. Find socio-economic and logistical issues with urban farming.
4. Advise effective strategic plans for incorporating urban agriculture in the planning of urban development.

### Specific Aims and Hypothesis

It is hypothesised in this study that urban agriculture is playing a very important role in food availability and environmental sustainability in the urban areas of Nigeria. It also proposes a hypothesis that, with its positives, city agriculture is confronted with institutional, financial and logistic difficulties that should be overcome by integrated urban planning and policies.

## METHODS

### Study Design

The given study was a mixed-methods one as it incorporated both quantitative data collected in the form of the survey and qualitative data derived with the help of the open-ended answers and the synthesis of the literature. The method served to develop a

detailed picture of the situation with urban agriculture in Nigeria and give empirical data as well as a conceptual explanation.

### Study Area and Population

The study was done on several urban centres in Nigeria, such as Lagos, Abuja, Port Harcourt, Ibadan and Abeokuta. The selection of these cities was based on the high population within these cities, high rates of urbanisation and cases of food insecurity experienced. The target population involved the adult residents (those aged 18 years and over) who were actively engaged in urban farming or had awareness of how urban agriculture is done in their communities.

### Sample Size and Sampling Technique

Purposive sampling was used in identifying a sample size of 120 respondents, which comprised people who participated in different types of urban agriculture to facilitate the adequate representation of the respondents. Inclusion criteria stated that the respondents must live in urban places of residence and engage in urban farming or have knowledge of urban farming and its effects.

### Data Collection Tools and Procedure

A designed questionnaire obtain the data, which was developed and checked through a pilot test involving 10 respondents. The data gathered in the questionnaire included demographic information, the kind of urban agriculture they carried out, the food security outcomes of all these, the environmental advantages of the practice and the problems encountered. The questionnaire was answered in person or via a secure Internet-based platform, depending on the location of the respondent and his or her accessibility.

### Study Variables

Household food security was the main dependent variable, and it was measured by perceived availability of fresh and healthful food. The major independent variables were forms of urban farming activities, environmental effects (e.g. waste and carbon footprint), socio-economic and logistical concerns (e.g. space, water, and cost). Other

covariates like gender, age, education and occupation were also studied.

### Statistical Analysis

The statistical analyses of quantitative data were performed with the help of IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY). Descriptive statistics were generated to describe characteristics of demographics and farming. The responses to the questions listed were described with frequencies and percentages. Cross-tabulations were done to find

patterns within the population. The research was based on the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) reporting requirements of cross-sectional studies [6].

### Ethical Approval

Informed consent has been obtained from all participants before participating. In carrying out the study, respondents were completely maintained in terms of confidentiality and anonymity.

## RESULTS

### Sociodemographic Characteristics

**Table 1: Demographic Distribution of Survey Respondents**

Demographic Category	Response Options	Frequency (n)	Percentage (%)
Gender	Male	60	50.0%
	Female	60	50.0%
Age Range	18-24	40	33.3%
	25-34	35	29.2%
	35-44	30	25.0%
	45+	15	12.5%
Educational Level	No formal education	10	8.3%
	Primary school	20	16.7%
	Secondary school	40	33.3%
	Tertiary education	50	41.7%

Occupation	Student	15	12.5%
	Farmer	40	33.3%
	Public Servant	30	25.0%
	Private Sector Worker	25	20.8%
	Other	10	8.3%

Among the 120 respondents, 50 per cent were male, and the other 50 per cent were female gender. Most of them were between the ages of 18-34 years and represented 62.5 per cent of the respondents. As far as educational level was concerned, 75 per cent of them had attained at least a secondary level of education, with 41.7 per cent having gone beyond

tertiary level qualifications. The subjects were involved in various occupations: 33.3 per cent of the population were farmers, 25.0 per cent were public servants, and 20.8 per cent were undertaking an occupation in the private sector, whereas 12.5 per cent were identified as students.

**Table 2: Frequency Distribution of Urban Farming Practices and Their Impact on Household Food Security**

Question	Response Options	Frequency (n)	Percentage (%)
<b>Do you practice urban farming?</b>	Yes	70	58.3%
	No	50	41.7%
<b>What type of farming do you practice? (multiple responses allowed)</b>	Backyard Gardening	45	37.5%
	Container Gardening	30	25.0%
	Vertical Farming	15	12.5%
	Animal Rearing	25	20.8%
<b>How often do you harvest food from your farm?</b>	Weekly	40	33.3%
	Monthly	20	16.7%

<b>Has urban farming improved your access to fresh food?</b>	Occasionally (seasonal/rare)	60	50.0%
	Strongly Agree	35	29.2%
	Agree	40	33.3%
	Neutral	25	20.8%
	Disagree	10	8.3%
	Strongly Disagree	10	8.3%

The total number of respondents who said that they practice urban agriculture was 58.3%. The most popular of them was backyard and container gardening, with 37.5 and 25.0 per cent of participants, respectively. Most urban farmers

(62.5%) reported that, because of their farming operations, they had better access to fresh food. In addition, 62.5 per cent of the total number of respondents assumed that street agriculture enhanced household food security.

**Table 3: Respondents' Perception of Environmental Benefits of Urban Farming**

<b>Question</b>	<b>Response Options</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
<b>Has urban farming helped reduce household waste (e.g., composting)?</b>	Yes	65	54.2%
	No	55	45.8%
<b>Do you believe urban farming reduces carbon emissions from food transport?</b>	Strongly Agree	40	33.3%
	Agree	35	29.2%
	Neutral	25	20.8%
	Disagree	10	8.3%
	Strongly Disagree	10	8.3%
<b>What environmental benefit have you observed? (multiple choices allowed)</b>	Reduced food waste	45	37.5%
	Reduced transport cost	30	25.0%

Increased green space	40	33.3%
Improved air quality	20	16.7%

The Partial List of environmental positive effects reported by the respondents encompassed the decrease in waste (54.2%), less transportation-induced carbon intensity (62.5%), and more green space (33.3%). Although these are the benefits, the urban farmers cited some challenges, namely, lack of space (50.0%), high input costs (45.8%), and restricted access to water (37.5%). Also, 62.5 per cent of the respondents mentioned that low income was the barrier to investing in urban farming and poor access to inputs like seeds and compost was reported by 50.0 per cent of the respondents.

Respondents reported receiving support offered by the governmental or non-governmental organisations in only 20.8 per cent. Most of the respondents (83.3%) indicated a responsibility to integrate urban agriculture into urban planning processes, and 75.0% opted to implement it into learning curricula. The chosen areas of support strategies were financial incentive (58.3%), provision of government land (54.2%) and technical training (45.8%).

**DISCUSSION**

This paper was an evaluation of how urban agriculture (UA) could be utilised in making cities food secure and environmentally sustainable within Nigeria. The results are in line with previous studies highlighting the multi-utility nature of UA, especially its capacity to support the food demands of a household, alleviate stresses to the environment, and build community resilience.

**Analysing Key Findings**

It was found that more than 50% of the respondents (58.3%) practice urban farming, which is mainly through backyards and container gardens. These habits were closely linked with the fact that people had easier access to fresh food, 62.5 per cent of subjects claimed. This concurs with a previous report by Olaleye et al. that revealed the improvement of

household food security of urban crop farmers in the state of Oyo, Nigeria [7]. Moreover, the identified environmental impacts, such as the decrease in household waste and transportation-associated carbon emissions, are consistent with the results provided by Orsini et al., who emphasised the role of urban agriculture in reducing the food systems' ecological impact [8].

Nevertheless, infrastructural, financial and institutional limitations hamper the adoption of urban agriculture despite its resources and benefits. Access to land and water, the high input costs, as well as the lack of technical support were identified as the most urgent challenges. The above limitations are in agreement with previous researchers who have found land tenure insecurity as well as poor government support to be a factor that prevents the growth of urban agriculture in sub-Saharan Africa [9].

**Limitations and Strengths**

The strength of the study is the mixed methods, mixing quantitative data with the contextual information within the literature. The systematising of the interview questionnaire, carrying out a pilot study, and consideration of the STROBE guidance enhanced the methodological strength. Nonetheless, due to purposive sampling, the findings cannot be generalised. Moreover, self-reported data can be connected with recall bias or social desirability bias.

**Recommendations for Future Research**

Longitudinal designs should be contemplated by future research that would examine the contributions of urban agriculture to the long-term results of food security and urban sustainability. Qualitative studies are also required to investigate which motivations and barriers are encountered by individuals, especially women and youth, of a particular demographic group.

## CONCLUSION AND TRANSLATION IMPLICATION

This research paper gives empirical documentation of findings that urban agriculture should be a practical resource that is used to improve food security as well as environmental sustainability in the Indian urban cities that are rapidly undergoing urbanisation. The findings show that urban agricultural practice, which is particularly backyard and container gardening activities, enhances access to fresh food, minimises waste, and decreases emissions induced by transportation. These results promote urban agriculture as a strategic means towards the attainment of major public health and sustainability goals.

What is more, the potential of urban agriculture is now limited by infrastructure and institutional capacities, such as the difficulty of access to land and water, the high input prices, and the lack of governmental promotion. The barriers need to be dealt with using all-inclusive policies and well-organised support mechanisms to ensure that urban agriculture can flourish.

In a translational view, these findings demand a more integrative urban planning that would consider food production in the city itself. Urban agriculture should be included in the framework of sustainability and food security by policymakers, urban planners and development agencies. Some of the interventions that may a great deal to the benefits of urban farming would include land-use zoning for fields, subsidised inputs, technical training, as well as school-based programs.

Nigeria can make a critical step towards the construction of resilient food systems, the enhancement of environmental health and achieving several Sustainable Development Goals, especially zero hunger (SDG 2), sustainable cities (SDG 11), and climate action (SDG 13), by integrating urban agriculture into the national development plans.

### *Author Contribution*

*M.R.O., F.R.O. and S.O.A. funded the research. M.R.O. designed the study, conducted the fieldwork, led the data analysis and assisted in drafting the manuscript. F.R.O. contributed to the literature review and helped interpret the findings. S.O.A.*

prepared the data tables. All authors reviewed and approved the final version of the manuscript.

### **Declarations**

#### **Funding**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

#### **Consent to Publish**

Consent to Publish declaration: not applicable.

#### **Data Availability**

All data generated or analysed during this study are included in this published article.

#### **Ethics and Consent to Participate**

Ethics and Consent to Participate declarations: not applicable.

#### **Competing Interests**

The authors declare that they have no competing interests.

### **References**

- [1] Practical G. An introduction to the basic concepts of food security. FAO: Rome, Italy. 2008.
- [2] National Research Council, Division on Earth, Life Studies, Institute for Laboratory Animal Research, Board on Life Sciences, Committee on Animal Models for Testing Interventions Against Aerosolised Bioterrorism Agents. Overcoming challenges to develop countermeasures against aerosolised bioterrorism agents: appropriate use of animal models.
- [3] Van Veenhuizen R, Danso G. Profitability and sustainability of urban and periurban agriculture. Food & Agriculture Org.; 2007.
- [4] Adeogun OA, Ogunbadejo HK, Ayinla OA, Oresegun A, Oguntade OR, Tanko A, Williams SB.

Urban aquaculture: producer perceptions and practices in Lagos State, Nigeria. *Middle-East Journal of Scientific Research*. 2007;2(1):21-7.

[5] Egbuna EN. Urban agriculture and food security in Abuja: an enquiry. Unpublished PhD. Dissertation Proposal. University of Agriculture, Abeokuta, Nigeria. 2001.

[6] Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *The Lancet*. 2007 Oct 20;370(9596):1453-7.

[7] Olaleye DT, Obayelu AE, Ogunmola OO. Urban Food Crop Farming and Farm Households' Food Security Status in Oyo State, Nigeria. *Applied Studies in Agribusiness and Commerce*. 2018 May 2;12(1-2):23-8.

[8] Orsini F, Kahane R, Nono-Womdim R, Gianquinto G. Urban agriculture in the developing world: a review. *Agronomy for sustainable development*. 2013 Oct;33(4):695-720.

[9] Dossa LH, Buerkert A, Schlecht E. Cross-location analysis of the impact of household socioeconomic status on participation in urban and peri-urban agriculture in West Africa. *Human Ecology*. 2011 Oct;39(5):569-81.