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SUSTAINABLE URBAN FARMING AS A LIVELIHOOD STRATEGY: A CASE STUDY OF MAKURDI, BENUE STATE, NIGERIA

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SUSTAINABLE URBAN FARMING AS A LIVELIHOOD STRATEGY: A CASE STUDY OF MAKURDI, BENUE STATE, NIGERIA

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Abstract

Sustainable urban farming (SUF) is a key strategy for achieving several of the Sustainable Development Goals (SDGs), particularly in reducing unemployment, alleviating food insecurity, and fostering a more sustainable urban environment. However, town planners and policymakers must approach urban agriculture (UA) with a comprehensive understanding of its role within the urban system, especially with regard to resource management and waste utilization. This paper examines the livelihood impact of urban farming in Makurdi, Benue State, Nigeria. The study employed a survey research design, utilizing accidental sampling to collect data from 251 urban farmers across 22 urban farms. Descriptive statistics, including frequency tables and charts, were used to analyze the data. Additionally, a 5-point Likert scale was employed to assess the contribution of UA to livelihoods in the area. Findings revealed that UA significantly contributed to the livelihood of urban farmers, particularly through employment opportunities, with the highest positive index value of 0.51. However, the impact on GDP and revenue was insignificant, with a negative index value of -1.24. The study also found that 69.7% of respondents utilized waste materials in their farming practices, with 25.9% using industrial waste as feed for livestock. The study draws on three key theoretical frameworks: Urbanization Theory, which highlights the shift of rural agricultural practices into urban contexts; the Sustainable Livelihoods Framework, which underscores the importance of diverse assets in urban farming; and Social Capital Theory, which emphasizes the role of community networks in enhancing the sustainability of urban farming. The paper concludes that integrating urban agriculture into urban planning, supported by appropriate policies and strategies, is essential for promoting food security, employment, and sustainability in Makurdi and similar urban centers.

Keywords: *Livelihood, sustainability, urban agriculture, urbanization*

JEL Classification: I32, O18, Q12, Q15, Q53

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Introduction

Urbanization, as a global phenomenon, has escalated at an unprecedented rate in the last century, dramatically reshaping societies and their infrastructures. Today, over 56% of the world's population lives in urban areas, and this proportion is expected to reach 68% by 2050 (United Nations, 2022). The rapid transition from rural to urban living has brought both opportunities and challenges, particularly in developing regions where urban growth has been the most pronounced. The unprecedented concentration of people in cities has resulted in an overwhelming demand for resources, including housing, sanitation, water, and energy, which urban infrastructures struggle to meet. This pressure has exacerbated environmental issues such as air and water pollution, increased waste generation, and the depletion of natural resources, creating serious challenges for urban sustainability. While urbanization has spurred economic growth, it has also contributed to the degradation of the natural environment, leading to the loss of biodiversity, and creating inequities that undermine the quality of life for many urban residents (Reinhard & Yasin, 2011). Therefore, the ongoing process of urbanization calls for more sustainable planning solutions to ensure that both the environmental and socio-economic challenges are addressed, particularly in rapidly growing cities in developing countries.

The implications of rapid urbanization are especially pronounced in Africa, the world's fastest urbanizing continent. According to the United Nations (2022), Africa's urban population grows at an annual rate of 4.3%, a pace that far exceeds that of other continents. Projections suggest that by 2050, over 60% of Africa's population will live in urban areas, with much of this growth taking place in informal settlements (Satterthwaite, 2016). The rapid urbanization process in Africa has often occurred without the necessary planning and infrastructure development, leading to a range of challenges, including inadequate housing, insufficient basic services, high unemployment rates, and food insecurity. Cities like Lagos, Nairobi, and Accra, which have experienced exponential population growth, are grappling with the pressures of expanding urban populations without corresponding improvements in urban infrastructure (Maxwell et al., 2000). This disconnect between urban growth and infrastructure development has resulted in the proliferation of slums and informal settlements, where millions of urban dwellers are left

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without access to basic amenities such as clean water, sanitation, and reliable energy. Additionally, as more land is converted into urban areas, agricultural production, which once provided sustenance for rural populations, is being displaced, further intensifying food insecurity in many African cities.

The environmental consequences of urbanization in Africa are significant. As cities expand into rural areas, fertile land used for agriculture is increasingly being replaced by urban structures, roads, and industrial complexes, leading to a loss of arable land and reduced agricultural productivity (Satterthwaite, 2016). Furthermore, urbanization in Africa has led to widespread deforestation, the contamination of water sources, and the pollution of air and soil, which have long-term adverse effects on the health and well-being of urban populations (Maxwell et al., 2000). The encroachment of urban areas into previously undeveloped spaces has exacerbated these environmental problems, as cities often lack the infrastructure and capacity to deal with the increased environmental burden. In this context, urban agriculture has emerged as a crucial strategy to mitigate the negative effects of urbanization by addressing food insecurity, promoting local food production, and creating employment opportunities for marginalized urban populations. Urban agriculture, as defined by Mougeot (2001), involves the cultivation of food and non-food crops in or near urban areas, often utilizing available urban spaces such as vacant lots, rooftops, and backyards. It has become a critical component of urban food systems in cities across Africa, providing a means of producing fresh, locally grown food, creating livelihoods, and improving environmental sustainability.

In cities like Dar es Salaam in Tanzania and Accra in Ghana, urban agriculture has been instrumental in providing food security for urban dwellers. In Accra, for example, urban agriculture has become a major contributor to the city's food supply, with up to 60% of the food consumed by urban residents grown within the city (Jacobi et al., 2000). Urban farming in African cities typically involves small-scale farming practices, such as backyard gardening, poultry farming, and vegetable production. These practices not only provide food for local consumption but also create informal employment opportunities, particularly for women and youth who are often excluded from formal employment sectors (Maxwell et al., 2000). Urban agriculture in Africa has been shown to help alleviate poverty by generating income for low-

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income urban households and providing them with access to affordable, nutritious food. In addition to its economic and social benefits, urban agriculture can also mitigate some of the environmental challenges posed by urbanization by reducing the carbon footprint associated with long-distance food transportation and promoting the reuse of organic waste through composting and organic farming practices (Mougeot, 2001).

In Nigeria, the pace of urbanization has been equally rapid. With an annual urban population growth rate of 5.5%, Nigeria is one of the fastest urbanizing countries in Africa (Reinhard & Yasin, 2011). By 2050, it is expected that Nigeria will have one of the largest urban populations globally, which presents both opportunities and challenges for the country's urban areas. Cities like Lagos, Abuja, and Port Harcourt have seen massive population growth, leading to increased demand for housing, infrastructure, and services. However, this rapid urbanization has been largely unplanned, with most urban growth occurring in informal settlements where infrastructure and services are inadequate (Agbola & Adegoke, 2011). In Nigeria, urbanization has been associated with several challenges, including the deterioration of environmental quality, inadequate waste management, and significant gaps in access to basic services like clean water and sanitation. As in other parts of Africa, Nigeria's cities are struggling to keep up with the demand for housing, healthcare, education, and employment, leading to high rates of urban poverty and food insecurity (Satterthwaite, 2016).

The emergence of urban agriculture in Nigeria has been a direct response to these challenges. As urban populations continue to grow, urban agriculture has become a critical means of addressing food insecurity and unemployment. In cities like Lagos, urban farming on vacant plots, rooftops, and roadsides has become increasingly common. Informal urban farming provides residents with access to fresh produce, which helps reduce their dependence on food imports and ensures a more resilient food system. Urban agriculture in Nigeria is not limited to crop production but also includes livestock farming, fish farming, and poultry. It has become a source of income for many low-income households, particularly in urban areas where formal employment opportunities are scarce (Jacobi et al., 2000). However, urban agriculture in Nigeria faces several challenges, including inadequate government support, limited access to land, and weak policy frameworks that fail to formally recognize and regulate the sector

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(Mougeot, 2001). Despite these challenges, urban agriculture continues to grow in significance, contributing to food security and offering an important livelihood strategy for millions of Nigerians.

In Benue State, which has experienced rapid urbanization in recent decades, urban agriculture holds significant potential to address the food insecurity issues that have emerged as a result of population growth. The state's capital, Makurdi, has seen an increase in population, leading to greater demand for food and other essential services. In response to these challenges, many households in Makurdi and other urban centers in Benue have turned to urban farming, including backyard gardening, small-scale poultry farming, and vegetable cultivation. These activities provide urban residents with access to fresh food and help supplement their incomes, particularly for those in the informal economy. Urban agriculture in Benue, like in other Nigerian cities, plays a critical role in reducing food insecurity by providing locally grown food close to where it is needed, thus reducing the reliance on long supply chains and external food sources. However, urban farming in Benue, as in many other regions, faces challenges such as insecure land tenure, lack of policy support, and insufficient infrastructure for large-scale agricultural production (Mougeot, 2001).

As urbanization continues to accelerate in Nigeria and Benue State, urban agriculture will play an increasingly important role in addressing the challenges of food security, unemployment, and environmental sustainability. By promoting local food production, creating informal employment, and reducing the environmental impacts of urbanization, urban agriculture offers a practical and cost-effective solution to many of the challenges posed by rapid urban growth. However, for urban agriculture to reach its full potential, policymakers must address the barriers that hinder its development, including improving land access, providing financial support, and creating policies that formally recognize the role of urban agriculture in the urban economy. If these challenges are addressed, urban agriculture could play a central role in shaping the future of urban living, particularly in regions like Benue State, where urban growth has outpaced infrastructure development.

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2.1 CONCEPTUAL REVIEW

2.1.1 Urbanization

Urbanization refers to the increasing population concentration in urban areas, leading to the growth of cities and towns. This process is often associated with the migration of people from rural areas to urban centers in search of better economic opportunities, housing, and social services (Reinhard & Yasin, 2011).

Urbanization is the transformation of an area from a rural to an urban environment, which encompasses changes in land use, infrastructure, and socio-economic conditions. It typically results in increased population density, urban sprawl, and a growing demand for urban services and resources (Agbola & Adegoke, 2011).

2.1.2 Urban Agriculture (UA)

Urban agriculture (UA) refers to the practice of cultivating, processing, and distributing food and non-food products within or on the outskirts of cities. It involves the use of available land and resources in urban environments, contributing to food security, income generation, and environmental sustainability (Mougeot, 2001).

Urban agriculture is a form of agriculture that takes place in urban settings, including the cultivation of crops, livestock rearing, and horticulture. It integrates urban waste management and land utilization strategies to address local food insecurity and provide livelihoods, especially in low-income areas (Smit et al., 1996).

2.1.2.1 Type of Urban Agriculture

Type of urban agriculture refers to the various forms of farming practiced within urban areas, including crop farming, livestock farming, and mixed farming. These practices vary based on the available resources, land use, and the socio-economic conditions of the urban environment (Smit et al., 1996).

The type of urban agriculture refers to the specific agricultural activities carried out within urban settings. These activities can be categorized into crop farming (growing vegetables,

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fruits, etc.), livestock farming (raising animals for food and other products), and mixed farming, which combines both crops and livestock for diversified production (Mougeot, 2001).

2.1.2.2 Employment Creation through Urban Agriculture

Employment creation through urban agriculture involves the generation of income and jobs within urban areas by practicing agricultural activities. This can include direct employment in farming activities as well as indirect employment in related sectors such as agro-processing, transport, and retail (Hovorka et al., 2009).

Urban agriculture contributes to employment by providing job opportunities in farming as well as in agro-based industries. This helps alleviate urban unemployment by offering income-generating activities for both skilled and unskilled workers in cities (Ayaga et al., 2005).

2.1.2.3 Waste Utilization in Urban Agriculture

Waste utilization in urban agriculture refers to the practice of using industrial, domestic, and agricultural waste as inputs in farming activities, such as composting waste for fertilizer or using organic waste as feed for livestock. This contributes to environmental sustainability by recycling waste and reducing pollution (World Bank, 2012).

Waste utilization in urban agriculture involves transforming discarded materials, such as food waste, industrial by-products, and agricultural residues, into useful resources for agricultural production. These resources are often used for fertilizing crops or feeding animals, contributing to both waste reduction and agricultural productivity (Bakker et al., 2000).

2.1.2.4 Commercialization of Urban Agriculture

Commercialization of urban agriculture refers to the transformation of urban farming from subsistence to profit-oriented activities. It includes the production of crops and livestock for sale in local markets, which provides urban farmers with a source of income while contributing to urban food security (Veenhuizen, 2000).

The commercialization of urban agriculture is the process of turning urban farming practices into profitable enterprises, where agricultural products are sold for profit. This involves scaling up agricultural activities and integrating them into the broader urban economy, fostering

business growth in sectors such as food processing, transportation, and marketing (Maxwell & Zziwa, 1992).

2.1.3 Livelihood Strategies

Livelihood strategies refer to the activities and resources that individuals, households, or communities employ to secure their well-being. These strategies often include a combination of income-generating activities, such as farming, business, or wage labor, designed to meet basic needs and improve living standards (Ellis, 2000).

Livelihood strategies are the diverse ways people utilize available resources to make a living, particularly in situations of vulnerability. These strategies are context-dependent and include activities such as subsistence farming, remittances, informal trade, or urban agriculture to support household income and security (Chambers & Conway, 1992).

2.1.4 Socio-Economic Characteristics of Urban Farmers

Socio-economic characteristics of urban farmers refer to the demographic and economic factors that influence the participation and success of individuals in urban agriculture. These include gender, age, educational background, income levels, and employment status, which collectively shape the livelihoods and productivity of urban farmers (Jongwe, 2014).

Socio-economic characteristics encompass the social and economic attributes of urban farmers, such as their gender, age group, educational qualifications, household income, and employment status. These factors influence farmers' ability to engage in agriculture and their access to resources such as land, capital, and labor (Reinhard & Yasin, 2011).

2.2 THEORETICAL FRAMEWORK

Urbanization Theory (Reinhard & Yasin, 2011) posits that the rapid growth of urban areas, particularly in developing countries, forces the adaptation of traditional agricultural practices into urban contexts to meet the increasing demand for food. The theory applies to the study of Makurdi, where the urbanization process is influencing the migration of rural farming practices into urban areas as residents seek to address food insecurity and unemployment. The

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assumption underlying this theory is that urban growth leads to an increased need for localized food production systems, which urban farming fulfills.

Sustainable Livelihoods Framework (SLF), developed by Chambers & Conway (1992), provides a comprehensive view of how individuals and communities leverage various assets (social, human, financial, physical, and natural) to secure their livelihoods. In the context of Makurdi, urban farmers are seen as utilizing a combination of these assets—such as land, education, and community networks—to sustain themselves and their families through urban farming. The theory assumes that urban farming is not just a means of food production but an integrated livelihood strategy that can reduce poverty and improve socio-economic conditions.

Social Capital Theory (Putnam, 2000) emphasizes the role of community networks, trust, and cooperative relationships in achieving collective goals. In the case of Makurdi, urban farmers often form collaborative networks to share resources, labor, and knowledge, which enhances the productivity and sustainability of urban farming. The assumption behind this theory is that strong social ties and community engagement are vital to the success of urban farming ventures, especially in informal sectors where access to formal resources is limited.

Together, these theories offer a nuanced understanding of sustainable urban farming as a livelihood strategy in Makurdi. Urbanization drives the need for localized agricultural practices, which are embedded within the broader socio-economic system of the city. The Sustainable Livelihoods Framework highlights the diverse assets that urban farmers use to maintain their livelihoods, while Social Capital Theory underscores the importance of community collaboration in ensuring the sustainability and success of urban farming initiatives. By combining these theoretical perspectives, the study can better assess how urban farming in Makurdi contributes to poverty alleviation, food security, and economic resilience in a rapidly urbanizing environment.

The reliance on these theories in this study is essential because they provide a structured approach to understanding the interplay between urbanization, livelihood strategies, and social networks. The application of these frameworks allows for a more comprehensive analysis of the socio-economic impact of urban farming in Makurdi and contributes to the broader

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discourse on sustainable urban development in Nigeria and similar urbanizing regions in Sub-Saharan Africa.

2.3 EMPIRICAL REVIEW

In a study by Ogunjimi et al. (2022), titled "Assessment of Urban Agriculture Practices and their Impact on Livelihoods in Lagos Metropolis," the researchers aimed to investigate the types and scale of urban agriculture in Lagos, as well as its socio-economic contributions to urban livelihoods. The study was conducted across various districts in Lagos, covering both high-density residential areas and peri-urban zones. Data were gathered through a mixed-methods approach, including surveys and in-depth interviews with 450 urban farmers. The study revealed that 53% of urban farmers were classified as low-income earners, with 49% of them earning below the national minimum wage of N30,000. The study also found that urban agriculture significantly contributed to poverty alleviation and food security, providing employment for over 1,000 people across the city. Furthermore, social capital and community engagement emerged as key factors in ensuring the sustainability of urban farming practices. The study recommended that urban agriculture be formalized in government policies, providing subsidies for urban farmers and integrating urban farming into city planning.

Babatunde and Adebayo (2020) conducted a study on "Urban Agriculture and Food Security in the City of Ibadan, Nigeria," with the aim of understanding the role of urban agriculture in enhancing food security among the urban poor. The scope of the study included low-income neighborhoods in Ibadan, and the methodology involved household surveys and focus group discussions. The researchers utilized a stratified random sampling technique to select 400 households engaged in urban farming. Their findings showed that urban agriculture accounted for 22% of the total food consumed by the urban poor in Ibadan. The study concluded that urban farming improved food availability and reduced dependency on external food supply, thereby enhancing urban food security. The study emphasized the importance of government support in the form of land access, technical assistance, and funding to strengthen urban agriculture practices.

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In "The Role of Urban Agriculture in Mitigating Climate Change in Abuja," Musa et al. (2019) examined the intersection of urban agriculture and environmental sustainability, particularly in relation to climate change mitigation in Abuja, Nigeria. The study utilized a qualitative approach, with interviews conducted among 250 urban farmers across different sectors of the city. Findings showed that 75% of urban farmers used waste recycling methods, such as composting and converting organic waste into fertilizers, contributing to reduced waste in the environment. Additionally, the study highlighted that urban agriculture helped in lowering greenhouse gas emissions by reducing the need for long-distance food transportation. The study concluded that urban agriculture has the potential to play a pivotal role in mitigating climate change in urban settings. The study recommended increased investment in urban farming techniques that focus on sustainable environmental practices.

In "Exploring the Socio-Economic Impacts of Urban Agriculture on the Livelihoods of Rural-Urban Migrants in Port Harcourt" (Akinyemi & Eze, 2021), the researchers sought to explore how urban agriculture serves as a livelihood strategy for rural-urban migrants in Port Harcourt. Using a mixed-methods approach, including both qualitative and quantitative data from 500 participants, the study revealed that 68% of migrants had engaged in urban farming activities, with a significant contribution to their household income. The findings also showed that urban agriculture provided an important social safety net for migrant populations, offering both food and economic security. The study concluded that urban agriculture serves as a vital strategy for rural-urban migrants, improving their quality of life and fostering community cohesion. The study recommended policy interventions that ensure easier access to urban farming land and capital for migrants.

In "Urban Agriculture and its Contribution to Sustainable Development in Kano", Aliyu & Tukur (2020) analyzed the sustainability of urban agriculture in Kano, with an emphasis on its environmental and socio-economic contributions. The study involved surveying 350 urban farmers, and data were analyzed using both descriptive statistics and thematic analysis. The findings revealed that urban agriculture contributed to local food security by providing up to 30% of the total food consumed in the city. It also played a crucial role in creating employment for young people, with 40% of urban farmers employing laborers on a part-time basis.

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The study concluded that urban agriculture had the potential to significantly contribute to sustainable urban development, with recommendations for strengthening policy frameworks that promote green agriculture and waste recycling practices.

3.1 METHODOLOGY

This study adopted a survey design to gather pertinent data from urban farmers in Makurdi, Benue State. Both primary and secondary data were utilized in the research. Primary data were collected directly from urban farmers using a structured questionnaire, while secondary data were obtained from relevant institutions, including the Benue State Agricultural Development Program (BSADP), the Benue State Fishery Association, Poultry Association of Nigeria, and the Piggery Association of Nigeria. A well-structured questionnaire was developed to gather information on the livelihood impacts of urban farming in the study area. A total of 22 urban farms were randomly selected from an identified list of 50 urban farms in Makurdi. From these selected farms, 251 urban farmers were sampled, representing approximately 50% of the total number of urban farmers in the chosen farms. The survey was conducted during peak farming hours, from 7:30 am to 12:00 noon and 3:00 pm to 6:30 pm, ensuring that most urban farmers were available for participation during these periods. A simple random sampling method, without replacement, was employed to select the urban farms, while an accidental sampling technique was used to select the individual urban farmers. Data analysis was performed using descriptive statistics, including tables and charts to present the responses based on their frequencies. Additionally, a Likert scale was applied to assess the contributions of urban agriculture to livelihoods in Makurdi, particularly in terms of income generation, food security, and social cohesion.

The Study Area

Makurdi is the capital city of Benue State, located in the central region of Nigeria. The city is positioned between latitude 07° 43’ 45” N and 07° 55’ 12” N, and longitude 08° 32’ 24” E and 08° 39’ 12” E. Makurdi is situated along the Benue River and serves as a key gateway to the northern and southern parts of Nigeria. The town covers an approximate land area of 56.2 square kilometers and lies about 1,150 meters above sea level.

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Makurdi is characterized by a tropical climate, with distinct wet and dry seasons. The city is situated in a derived savannah zone, with the influence of agricultural activities such as crop farming, animal husbandry, and mixed farming. The climate and soil conditions in Makurdi support various crops, including yam, cassava, maize, rice, and vegetables, making it suitable for urban farming practices.

As of the most recent population estimates, Makurdi's population is around 500,000 people, with rapid urbanization in recent years due to the city's administrative, economic, and commercial importance. The surrounding terrain features lowland areas, and the Benue River provides ample water resources, which are essential for both subsistence and commercial farming activities in the region.

Makurdi's population is growing at a steady rate, and with increasing rural-to-urban migration, there is a rising demand for sustainable livelihood strategies, particularly urban farming, to address food security, income generation, and poverty alleviation. The study area includes both urban and peri-urban farms, which play a significant role in meeting the food needs of the population while also providing employment opportunities for residents.

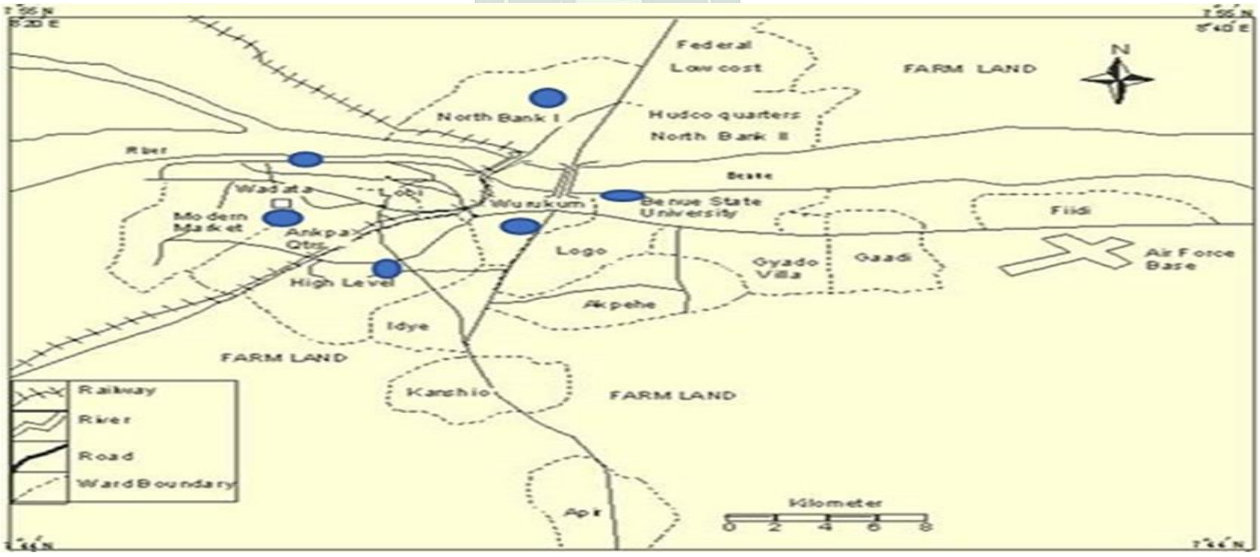

Figure 1: Spatial Distribution Map of the 45 identified urban farms in Makurdi, Benue State.

Source: Authors' design, 2025.

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4.1 DATA ANALYSIS AND DISCUSSIONS

Results and Discussion

Socio-Economic Characteristics

The study revealed that 61.2% of the sampled urban farmers in Makurdi were male, while 38.8% were female farmers (Table 1). Over 75% of the urban farmers were within the active and independent age group of 21-60 years, indicating a predominance of working-age individuals involved in urban farming. This gender distribution aligns with findings from earlier studies such as Jongwe (2014), who noted that males often dominate urban agriculture due to the labor-intensive nature of farming and the challenges associated with land access in urban areas.

Gender Distribution	Frequency	Percentage
Male	150	59.8
Female	101	40.2
Total	**251**	**100**
Age Distribution		
Below 20yrs	18	7.2
21 – 40yrs	128	51.0
41-60yrs	71	28.3
Above 61yrs	24	13.5
Total	**251**	**100**
Level of Education		
No formal education	15	6.0
Primary school	25	13.9
Secondary school	38	15.1
NCE/ND	70	27.9
B.Tech/HND	86	34.3
Postgraduate	7	2.8
Total	**251**	**100**
Household Income		
Below ₦30000	50	19.9
₦31000-₦60000	108	43.0
₦61000-₦90000	72	28.7
Above ₦910000	21	8.4
Total	**251**	**100**

Source: Authors' fieldwork, 2025

NB: USD1 = 1450 Naira; July, 2025

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In terms of educational background, it was observed that 60% of the respondents had obtained tertiary education. This suggests that urban farming in Makurdi attracts individuals with higher education, possibly due to the high level of unemployment and inflation, which have pushed many urban dwellers to seek alternative livelihoods. Furthermore, 82.5% of the respondents were employed in other sectors apart from farming, highlighting the role of urban agriculture as a supplementary income-generating activity for urbanites.

Income distribution revealed that 22.1% of the urban farmers earn below ₦30,000 monthly, while 35.3% earn between ₦31,000 and ₦60,000. A further 28.1% earn between ₦61,000 and ₦90,000, and 14.5% of the respondents earn above ₦91,000 per month. These findings reflect the varied economic returns from urban farming in Makurdi, indicating that while many farmers earn modest incomes, a significant number are able to earn above the average monthly income level in Nigeria (at USD1 = ₦1450).

Type of Urban Agriculture

The study revealed that 55.2% of the urban farmers in Makurdi engage in livestock farming, while 32.7% are involved in crop farming, and 12.1% practice mixed farming (Table 2). This indicates that livestock farming remains the dominant practice among urban farmers in Makurdi, likely due to factors such as the lesser land space required for livestock, the higher economic returns from livestock products, and the relatively lower water and soil fertility requirements compared to crop farming. The prevalence of livestock farming suggests that urban agriculture in Makurdi aligns with the findings of previous studies, which highlighted livestock as a more feasible and profitable option for urban farmers in constrained environments (Blanke & Burdick, 2005).

Table 2: Type of Urban Agriculture

Type of Farming	Frequency	Percentage
Crop farming	77	30.7
Livestock farming	145	57.8
Mixed farming	29	11.6

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Total	**251**

Source: Authors' fieldwork, 2025.

The predominance of livestock farming also correlates with the region's economic structure, as farmers often opt for practices that require less space and can offer quicker returns. Moreover, the challenges of crop farming, such as water availability, soil quality, and labor intensity, likely influence the choice of livestock farming as the more viable urban agricultural activity in Makurdi.

Scale of Practice

Findings revealed that 68.1% of urban farmers practice urban agriculture for commercial purposes, 21.1% practice subsistence type of UA, and the remaining 10.8% practice recreational type of UA, as shown in Figure 2. The implication is that most urban farmers see UA as a means of income.

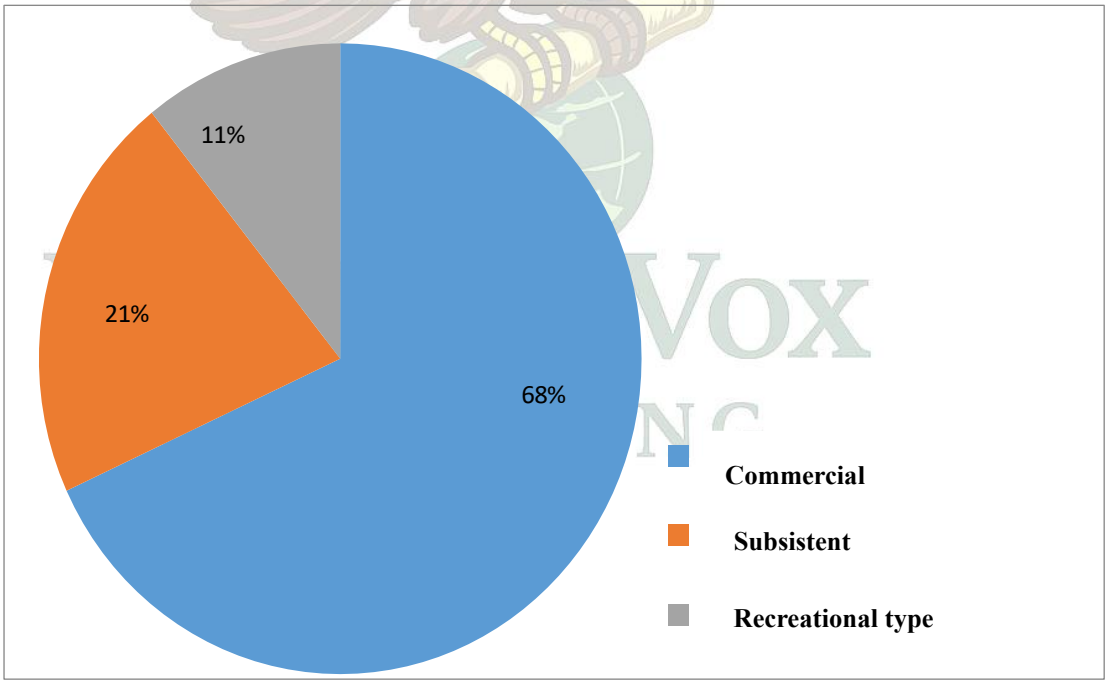

Figure 2: Scale of Production Source: Authors' fieldwork, 2025.

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Role of Urban Agriculture Regarding Employment Opportunity

Findings from this study revealed that 30.2% of the urban farmers in Makurdi engage workers in urban farming activities, while the remaining 69.8% of the respondents do not employ farm workers. Among those that employ workers, 28.5%, 5.3%, and 3.1% stated that they had hired less than five people, between 6-10 people, and between 11-15 people, respectively, for various farming activities (Table 3). The remaining 1.1% employed between 16-20 workers. These findings align with the significant role of urban agriculture in providing job opportunities for local residents in Makurdi.

Table 3: Role of UA Regarding Employment Opportunity

No of engaged workers	Frequency	Percentage
Less than 5	66	26.3
6-10	10	4.0
11-15	3	1.2
16-20	6	2.4
None	166	66.1
Total	251	100

Source: Authors' fieldwork, 2025.

The Nigerian National Bureau of Statistics (2024) reports that nearly 40% of the Nigerian population lives below the poverty line. Given the high unemployment rates and the poverty levels, urban agriculture in Makurdi provides a critical employment outlet. This is consistent with Ayaga et al. (2005), who noted that urban farming activities create low-skilled but relatively well-paid jobs for local workers, thus alleviating some of the economic burdens faced by the urban poor. Furthermore, the study revealed that 70.5% of the sampled urban farmers engage in urban agriculture primarily to supplement household income (Figure 4).

Moreover, 63.2% of the urban farmers practicing commercial urban agriculture reported earning above the Nigerian minimum wage of ₦30,000, indicating the economic viability of urban farming as a livelihood strategy. In addition, 36.8% of the respondents used urban agriculture as an income supplement to help their households cope with the rising cost of living.

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The findings suggest that urban agriculture plays a crucial role in combating unemployment and poverty in Makurdi, particularly for low-income households.

Reason for Engaging in Urban Agriculture

Urban agriculture has become a vital strategy for addressing poverty and food insecurity in sub-Saharan Africa. The Millennium Development Goal (MDG) and Sustainable Development Goals (SDGs) 1 and 2 highlight the necessity of eradicating poverty and hunger. In line with this, many urban residents in Makurdi have turned to farming as a solution to their socio-economic challenges.

Table 4: Reason for Engaging in Urban Agriculture

Reason	Frequency	Percentage
Food insecurity and malnutrition	70	27.9
Unemployment	78	31.1
leisure	19	7.6
Supplementary income	84	33.5
Total	251	100

Source: Authors' fieldwork, 2025.

As shown in Table 4, 38.4% of the respondents engaged in urban farming to complement their income, while 32.5% practiced it due to unemployment, 24.7% because of food insecurity and malnutrition, and 4.4% for leisure. The findings suggest that the majority of urban farmers in Makurdi view farming as a means to overcome economic challenges, rather than as a hobby or leisure activity.

This trend is consistent with the findings of Hovorka et al. (2009), who recognized urban agriculture as a crucial safety net for low-income households seeking to supplement declining incomes. Furthermore, the study supports Smith's (2002) assertion that urban agriculture contributes significantly to household income, with urban farmers in Makurdi reporting that farming helps them meet basic needs such as food and healthcare.

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Source of Waste Use in Urban Agriculture

Further investigation revealed that 72.4% of the urban farmers in Makurdi utilize waste materials in their farming practices. The remaining 27.6% do not use waste materials. Among those using waste, 28.3% relied on industrial waste, 22.5% used mixed waste, 17.6% utilized agricultural waste, and 4.2% depended on domestic/restaurant waste (Table 5). Additionally, 7.3% of farmers used abattoir waste, and 19.1% used multiple sources of waste for feed and manure.

Table 5: Source of Waste Use in Urban Agriculture

Source of Waste	Frequency	Percentage
Industrial	65	25.9
Domestic and restaurants waste	9	3.6
Agricultural	34	13.5
Abattoir	11	2.8
All of the above	60	23.9
No usage of waster	76	30.1
Total	251	100

Source: Authors' fieldwork, 2025.

The role of urban agriculture in providing employment and income generation in Makurdi is critical, as it offers much-needed job opportunities for the urban poor. Urban agriculture also plays a significant role in mitigating food insecurity and poverty, contributing substantially to the livelihoods of urban dwellers. Through the use of waste materials, urban agriculture in Makurdi helps create a more sustainable and environmentally friendly urban space. The study confirms that urban agriculture is a viable livelihood strategy that helps reduce unemployment, alleviate poverty, and promote food security in Makurdi.

Contribution of Urban Agriculture (UA) to Livelihood in the Study Area

Table 6 presents the five-point Likert scale results on the contribution of urban agriculture to livelihoods in Makurdi, Benue State. The data reveals that urban agriculture has made

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significant contributions in various domains, particularly in providing employment and improving food security. The highest positive index value of 0.51 is attributed to the "provision of employment," followed closely by food security with an index value of 0.48. These findings underscore the vital role of urban farming in addressing pressing socio-economic issues in Makurdi.

Table 6: Contribution of Urban Agriculture (UA) to Livelihood in the Study Area

VARIABLES OF EVIDENCE RANKING	5	4	3	2	1	EW	N	EWV/N	$\bar{X}$ D	D2
Provision of Employment	147	57	47	0	0	1104	251	4.40	0.51	0.26
Source of Income	120	86	39	6	0	1073	251	4.27	0.38	0.14
Improve access to land	48	66	46	91	0	824	251	3.28	0.61	0.37
Food insecurity reduction in poverty	143	66	35	7	0	1098	251	4.37	0.48	0.23
Increase in GDP and revenue	95	61	77	18	0	986	251	3.93	0.04	0.0016
Increase social cohesion	29	21	35	166	0	666	251	2.65	1.24	1.537
Increase in food affordability	45	40	96	70	0	813	251	3.24	0.65	0.423
Promote urban sustainability	71	48	73	59	0	884	251	3.52	3.89	0.37
Increase in community resilience	147	41	53	10	0	1078	251	4.29	0.40	0.16
Creation of profitable business	141	45	46	8	0	1067	251	4.25	0.36	0.1296
Decrease in crime	119	54	58	20	0	1025	251	4.08	0.19	0.0361

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Total	46.64

The contribution of urban agriculture to income generation (index value of 0.14) follows food security, with poverty reduction showing a positive index of 0.04. However, the contribution of urban agriculture to poverty alleviation remains less significant, highlighting the challenges faced by urban farmers in fully overcoming poverty through farming alone.

Further contributions of urban agriculture include the promotion of urban sustainability (index value of 0.47), creation of profitable businesses (index value of 0.40), increase in community resilience (index value of 0.38), and food affordability (index value of 0.37). The least significant contributions were observed in decreasing the crime rate (index value of 0.19) and reducing poverty (index value of 0.04). These results reflect the broad socio-economic benefits of urban farming, particularly in terms of employment, food security, and business creation.

The analysis also highlights the significant role of urban agriculture in providing both direct and indirect employment opportunities. Urban farmers, middlemen (such as those engaged in livestock trade), farm workers, and suppliers are all beneficiaries of urban farming activities. This underscores the potential of urban agriculture in fostering not only food security but also job creation within the urban economy.

Urban agriculture in Makurdi has significantly contributed to the livelihoods of urban dwellers, especially in areas such as employment, food security, and the creation of profitable businesses. Despite its substantial contributions, urban agriculture has had a relatively lower impact on poverty reduction and crime rate reduction. Nevertheless, the findings support the view that urban farming is an effective livelihood strategy, providing opportunities for income generation, enhancing community resilience, and promoting sustainable urban growth.

Discussion of Findings

The findings of this study on Sustainable Urban Farming as a Livelihood Strategy: A Case Study of Makurdi, Benue State, Nigeria highlight the central role of urban agriculture (UA) in addressing socio-economic challenges in the rapidly urbanizing city of Makurdi. The analysis

confirms the relevance of three key theories: Urbanization Theory, Sustainable Livelihoods Framework (SLF), and Social Capital Theory, in understanding the contributions of UA to the livelihoods of urban farmers.

First, the Urbanization Theory posits that rapid urban growth leads to a rising demand for local food production, which is supported by the migration of traditional farming practices into urban areas. In Makurdi, the increasing urban population and the migration of rural farming practices into the city align with this theory, where urban farming emerges as a response to food insecurity and high unemployment. Our findings support this, showing that urban farmers in Makurdi predominantly engage in livestock farming (57.8%), which is less dependent on fertile soil compared to crop farming and requires less space. This shift in farming practices reflects the adaptation of rural methods to the urban context, where space constraints and the need for efficient food production are significant factors.

The Sustainable Livelihoods Framework (SLF) emphasizes the use of various assets—such as human, financial, and social capital—in securing livelihoods. In Makurdi, urban farmers draw on diverse resources, such as land, education, community networks, and waste materials, to sustain their farming activities. For example, 69.7% of the urban farmers recycle waste products, such as cassava peels, poultry dung, and food by-products, for animal feed and crop fertilizers. This not only reduces environmental waste but also provides an avenue for farmers to lower production costs and increase food security. The significant percentage (68%) of farmers practicing UA for commercial purposes further highlights that urban farming in Makurdi is not just a survival strategy but an integrated livelihood approach that provides income, food security, and environmental sustainability. The assumption underlying SLF—that farmers use a combination of social, financial, and natural assets to support their livelihoods—holds true in this case.

Additionally, Social Capital Theory underscores the importance of community networks, trust, and cooperation. In Makurdi, urban farmers often collaborate in groups to share resources, labor, and knowledge, fostering social cohesion and enhancing the productivity of urban agriculture. The study found that 33.9% of urban farmers employed workers, with a substantial portion providing employment to more than five people, suggesting that community

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engagement and cooperative efforts are essential for the success of UA in the area. The collaborative nature of urban farming in Makurdi aligns with Putnam's (2000) assertion that strong community ties enhance the sustainability of informal sectors like urban agriculture.

Empirical studies from other Nigerian cities, such as Ogunjimi et al. (2022) in Lagos and Babatunde & Adebayo (2020) in Ibadan, have shown similar patterns. These studies reported that urban farming contributes significantly to food security, poverty alleviation, and employment creation, much like the findings from Makurdi. The role of urban agriculture in providing a livelihood strategy in cities with growing populations is consistently supported by the empirical evidence, and Makurdi's case further substantiates this.

In conclusion, urban agriculture in Makurdi contributes significantly to employment, food security, and economic resilience. The findings align with the theoretical frameworks, illustrating how urban farming provides a multifaceted livelihood strategy that integrates the principles of urbanization, sustainable livelihoods, and social capital. However, while urban agriculture contributes positively to food security and income, its impact on poverty reduction and crime reduction remains limited, suggesting that more targeted interventions may be needed to enhance its socio-economic contributions.

Conclusion

Urban agriculture (UA) has emerged as a key informal sector contributing significantly to the social, economic, and ecological development of urban areas. In Makurdi, as in many cities worldwide, urban food production has become an increasingly lucrative venture, offering both income-generating opportunities and a sustainable solution to the challenges of food insecurity and unemployment. While relatively few paid jobs exist directly within the field of urban agriculture, its indirect contributions—such as creating employment opportunities in related sectors like food processing, transportation, and retail—highlight its potential as a viable livelihood strategy for urban dwellers. As such, UA should be carefully considered by policymakers and urban planners as a significant element of the urban economy.

Urban agriculture also plays an integral role in advancing the Sustainable Development Goals (SDGs), particularly in the areas of food security (SDG 2), sustainable cities (SDG 11), and

climate action (SDG 13). Through its environmental benefits, such as waste recycling and reduction of carbon emissions, UA contributes to the creation of greener, more resilient urban environments. However, for urban agriculture to reach its full potential, it is important for planners and decision-makers to view it as an essential component of the urban system, with proper regulation and integration into urban development policies. This approach will ensure that urban agriculture remains sustainable and beneficial, rather than becoming an unregulated practice that may compete with other urban development needs.

Thus, urban agriculture should be embraced as a livelihood option within urban areas, with the appropriate strategies developed to ensure its sustainability. It is crucial for policymakers, urban planners, and all stakeholders to support the development of sustainable urban farming practices, recognizing its multifaceted contributions to the city's socio-economic well-being.

Recommendations

Based on the findings of this study, several urban planning measures are recommended to ensure the sustainable practice of urban agriculture in Makurdi:

1. Land Allocation for Irrigation Farming: The State government should reserve land around the Water Corporation area for irrigation farming. The allocation of these spaces can serve as dedicated agricultural zones for urban farmers. A model like Asa Dam in Ilorin, which supports irrigation farming, can be adapted to Makurdi to enhance local food production.

2. Integration of Urban Agriculture in Residential Planning: Town planners should design residential layouts that incorporate individual and community gardens. This approach, as seen in cities like Vancouver (Canada), Kampala (Uganda), and Dar es Salaam (Tanzania), promotes food security and community well-being by integrating gardening into public housing and slum rehabilitation programs.

3. Increasing Residential Plot Sizes: The Nigerian Institute of Town Planners (NITP) and the Town Planners Registration Council (TOPREC) should urgently review and increase residential plot sizes to accommodate backyard farming. Larger plots would provide urban

farmers with more space for food production and enhance the aesthetic value of the city through horticulture and green spaces.

4. Promotion of Urban Agricultural Diversification: Town planners and local authorities should promote urban agricultural diversification by encouraging the production of high-value food items such as mushrooms. These crops require minimal space while offering high monetary returns and nutritional value. Diversification will reduce dependency on staple crops and improve the resilience of urban farming systems.

5. Creating Buffer Zones Between Conflicting Land Uses: UA can be used to create buffer zones between conflicting land uses, such as between residential and industrial areas. This can be implemented through the development or revision of Makurdi's Master Plan, ensuring that urban farming areas are strategically located and do not interfere with other urban activities.

6. Formalizing Urban Agriculture: The state government should develop policies and enact laws to formalize urban agriculture, incorporating agricultural land use into the urban planning system. This includes establishing agricultural zones and creating more farm settlements within urban areas. By formalizing UA, the government can ensure its integration into the broader urban development process, enhancing its sustainability and providing the necessary support for farmers.

7. Reviewing Planning Laws: A review of existing planning laws is necessary to facilitate sustainable urban agricultural practices. The development of clear regulations and guidelines on land use for farming will ensure that urban agriculture is legally recognized and supported, providing long-term benefits to both urban farmers and the broader community.

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