

Livelihood Correlate of Urban Agriculture in Ogbomoso, Nigeria

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Abstract

Urban agriculture (UA) is a support mechanism for achieving the current seventeen Sustainable Development Goals (SDGs), which are geared towards minimising unemployment and food insecurity and creating a greener city. Town planners and policymakers should not be swayed by the merits of urban agriculture but rather have an in-depth comprehension of UA as a sub-unit of the urban system, especially with regard to waste-handling techniques. This paper examines the livelihood correlate of UA in the study area. A survey research design was employed in this research. Using the accidental sampling technique, 251 urban farmers were surveyed from 22 selected urban farms. The data were analysed using descriptive statistics in the form of frequency Tables and Charts. A 5-point Likert scale was equally involved in analysing UA's contribution to livelihood in the study area. Data from the 251 urban farmers revealed that UA had a significant contribution to the livelihood of Ogbomoso through employment, with the highest positive index value of 0.51. At the same time, an increase in GDP and revenue shows an insignificant contribution with a negative index value of - 1.24. It was also discovered that 69.7% of the sampled urban farmers depended on waste material, whereas 25.9% used industrial waste as animal feed in UA practice. Therefore, this paper concludes that due to the livelihood contribution relating to employment opportunities, food security, and promotion of urban sustainability, town planners and decision-makers need to integrate UA into the urban setting with appropriate policies.

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

Introduction

Urbanisation is a global phenomenon with varying intensity and pace across continents and countries (Reinhard & Yasin, 2011; Litman, 2011; Agbola & Adegoke, 2011). It is a human agglomeration which, in the 21st century, features an unprecedented concentration of people in increasing numbers of urban centres (Agbola & Adegoke, 2011). Since urbanisation is a continual process, it has placed great demands on urban infrastructure and service with its attendant environmental problems, which decrease the standard of living of urban dwellers.

According to Agbola and Adegoke (2011), Nigeria's rapid urbanisation, like other emerging nations, has outpaced available financial and human resources. Nevertheless, the transformational forces of urbanisation in the country remain irreversible. These changing urban dynamics pose severe environmental challenges, unemployment, high crime rates, and food scarcity. Therefore, city dwellers have resorted to urban food production to solve the problem of food scarcity and unemployment (Jacobi et al., 2000). Urban food

production that results from urbanisation is known as urban agriculture or urban farming.

Urban agriculture (UA) is commonly defined as an agricultural industry that grows or raises processes. It distributes a variety of food and non-food products within or on the outskirts of a city, (re-)using human and material resources, products, and services found in and around that city, and in turn supplying human and material resources, products, and services to that city (Mougeot, 2001). Urban agriculture is not limited to the cultivation of fruit, vegetables and other food-generating plants. It includes horticulture, aquaculture, arboriculture, apiculture, vermiculture, silkworms, livestock rearing and husbandry, medicinal plants, herbs and mushrooms (Egziabher, 1994; Smit et al., 1996). Urban agriculture can be found in open spaces, empty lots, roofs, backyards, roadsides, windowsills, communal gardens, and any space used (Smit et al., 1996). At the micro-scale, such activities can range from subsistence farming to more recreational sorts of agriculture, as well as small-scale semi-commercial gardening and animal husbandry, as well as medium and large-scale commercial companies.

While there is a rising awareness of the importance of urban agriculture in ensuring food security and reducing poverty among urban people, it is still primarily an unorganised industry that is not included in agricultural policy or urban planning. This renders it fragile and puts its long-term viability in jeopardy. The practice of urban agriculture in Ogbomoso, Nigeria, is not immune to such high-level risk and uncertainty. Agriculture in cities and peri-urban areas helps local economic growth and poverty reduction. Structural adjustment, jobless growth, deindustrialisation, and growing urbanisation have all aided this function, and it is estimated that UA accounts for between 20% and 60% of African family income (Smith, 2002). While UA plays a vital role in issues such as urban food security, income, and gender empowerment, it is still viewed as an informal sector by governments and decision-makers who do not see it as a viable urban livelihood option that complements rural agriculture and improves the national food system's efficiency.

The most significant urban expansion will occur in nations that are least able to feed their cities, as shown in Nigeria and other portions of Sub-Sahara Africa (Ogunmodede, 2017). Ogbomoso is not an exception, with its growth and development in exponential progression. Many citizens have resolved to farm within the urban system to solve the problems of food insecurity, unemployment, and poverty, among others. Moreover, despite the socio-economic and environmental benefits that urban agriculture brings to Ogbomoso, the industry has faced a succession of lawsuits over the years due to a lack of required protective policies and legal frameworks. Due to litigation issues, Iwagba farm, Ogbomoso's second largest piggery farm, which formerly employed over a hundred piggery farmers, has decreased its workforce to less than ten farmers.

This paper, therefore, seeks to reveal the livelihood correlate (connections with and contributions to socio-economic and basic necessities of life) of urban agricultural practice in Ogbomoso, Nigeria, as a step towards suggesting urban planning measures for sustainable agricultural practice in the study area.

Literature Review

Theoretical Constructs Around Urban Agriculture

Von Thunen's model is one of the earliest models that attempted to explain agricultural land use. This is a model for analysing agricultural locations' patterns. It

is a pioneer work developed by a German, Johann Heinrich Von Thunen (1783-1850). He developed the model of agricultural land use in 1826. In constructing his model, he used the data from his agricultural estate, Mecklenburg, in Germany. Most of the data used in explaining his theory were obtained by him through practical experience, including detailed cost accounting of his estate. He attempted to construct a theoretical model of land use patterns, presenting a specific configuration of cities and villages. Von Thunen's model was created before industrialisation and, as such, was based on some highly limiting assumptions.

Von Thunen assumed that the city is centrally positioned within an "Isolated State" that is self-sufficient and unaffected by outside influences. An uninhabited wasteland surrounds the Isolated State. The state's geography is essentially flat, with no rivers or mountains to break up the landscape. The state's soil quality and climate are both constant. Farmers in the Isolated State drive their oxcarts through terrain to the centre city to sell their produce. Therefore, there are no roads. Farmers act to maximise profits. The key objective of Von Thunen's theory or model was to show that agricultural land use varies with distance from the market. He had two basic postulates:

Distance from the market decreases the production intensity of a particular commodity, where production intensity is the number of inputs per unit area of land.

The types of land use will vary with distance from the market.

Von Thunen's model is an excellent illustration of the cost of land versus transportation. The cost of land rises as one goes closer to a metropolis. Farmers in the Isolated State strike a balance between transportation, land, and profit to create the most cost-effective market product. Of course, in the actual world, things do not always go as postulated in the model. As such, Urban Agriculture practices defy Von Thunen's model, as it is a system involving farms within and on the city's fringe, among other related attributes.

Types and Benefits of Urban Agriculture

Urban Agriculture can take place both within cities and in peri-urban settings. The activities might occur on the homestead (on-plot) or off-plot, on private, public, or semi-public property and can be undertaken in different forms. Olawepo (2012) and Kareem and Raheem

(2012) highlighted the common types of urban agriculture, including market gardening, compound and yard farming, open land subsistence farming, and expanded commercial farming. Others are constricted surrounding land farming, Greenhouse farming, and hydroponics.

Market gardening is used in the production of perishables and staple foods. It can be found near residences, riverbanks, dumpsites, and other outskirts-of-town settings. For example, such farms are supported in Nigeria by self-sponsored irrigation projects in the marshes and Fadama (low-lying marshy plains) along city roads. These are typically found in low-density areas and on the outskirts of cities. Non-indigenous farmers produce vegetables such as lettuce, spinach, orchards, and wine tapping, particularly in Southern Nigeria. Compound and yard farming is frequent in walled residences, especially in the city's central districts, newly created neighbourhoods, and residential quarters distributed across the city. These gardens are parcels of land that surround houses. They are mainly small-scale farms that are walled in. Farmers in this practice mostly grow perennial crops and cereals for domestic use. Most people grow food in backyard gardens to supplement their meals with seasonal produce. Excess meals are kept and given as presents to friends, neighbours, and co-workers (Community Food Security Coalition, 2003).

Open-land subsistence farming is most common among farmers who grow crops for both personal and commercial use. It is a common practice among landowners who have not developed their properties. The majority of the outputs are for personal use or to augment income. In Nigeria, it has been shown that roughly 16% of urban inhabitants engage in subsistence farming (Kareem & Raheem, 2012). On urban landforms, this is the most typical form of agriculture. Grain, vegetables, tubers, orchards, and Fadama farm crops in irrigated areas are the main crops included. Expanded commercial farming is generally practised by urban landowners, big-time farmer retirees, nomadic farmers, and migrants and is located in nearby communities. Fish farming, piggery, cattle husbandry, and grain crops are handled on large land areas, and mechanisation is involved in certain circumstances.

Constricted surrounding land farming appears on farmlands in nearby villages that have been absorbed by the city's expansion. The property is held by the peasants, who tilled it for economic purposes. It is also popular to raise livestock in this area. Commercial poultry farming and animal husbandry are examples of livestock production. Multiple cropping, in which a farmer combines more than one crop at a time, is the most common method of urban crop production. A farmer can cultivate as much as 1.5 hectares of land, notably on farms on the outskirts of town, while smaller farms are located within the town (Ogunmodede, 2017).

Greenhouse farming involves cultivating crops in a greenhouse ecosystem. A greenhouse is a building with walls and a roof composed primarily of transparent material, such as glass, where plants that require controlled climatic conditions are cultivated. Hydroponics is the technology of growing plants in nutrient solutions with mechanical support of sand, gravel, vermiculture, rock wool or sawdust (Department of Agriculture, Forestry and Fisheries, 2011). In this case, the soil is absent. Plant nutrition levels may be controlled using hydroponics. Plants cultivated hydroponically have a substantially higher yield than plants grown in soil because of the greater control over nutrients. Vegetables, tomatoes, cucumbers, and peppers are examples of crops developed with this technology (Department of Agriculture, Forestry and Fisheries, 2011).

The benefits of urban agriculture are numerous. Urban agriculture's contribution to food security and healthy nutrition is undoubtedly its most valuable asset (Veenhuizen, 2000). Urban agriculture has the potential to enhance both food consumption and food quality. Sixty percent of the food low-income people in Harare consumed was self-produced (Bowyer-Bower & Drakakis-Smith, 1996). From their urban gardens, urban farmers got 40 to 60% or more of their family food needs (Maxwell & Zziwa, 1992). A considerable amount of food is produced for various population groups and their personal consumption needs.

Urban agriculture reduces household food expenditures; impoverished people in developing nations typically spend much of their income on food. As a result, growing the rather pricey veggies saves money. Produce sales generate revenue. Swine, urban

cowshed-based milk, maize, and vegetable/legume production all provide 10-40%, 100%, 10-30%, and 80% of family income in Mexico City, respectively (Bakker et al., 2000).

The creation of connected micro-enterprises, the manufacturing of critical agricultural inputs, and the processing, packaging, and selling of products are all aided by urban agriculture. These businesses' activities or services may owe their existence to urban agriculture partly or entirely. Animal health care and transportation are two more services provided by independent organisations. Collecting and composting municipal garbage, manufacturing organic insecticides, and tool fabrication are examples of input production and delivery services.

Urban agriculture is a component of the urban ecosystem and has the potential to play a significant role in urban environmental management. The disposal of rubbish has become a significant issue in most cities. Urban agriculture can resolve such issues by converting garbage into a valuable resource. More wastewater and organic garbage will be produced as a city grows. Municipal wastes that are a nuisance to the environment are composted or utilised as animal feed in many cities, reducing environmental and health concerns.

It may also have a favourable influence on the city's greening and cleansing by converting unused open areas into green zones and keeping buffer and reserve zones free of housing, all of which will positively impact the microclimate (shade, temperature, sequestration of CO₂). Degraded open areas and abandoned lands are frequently exploited as informal trash dumpsites, threatening public safety and health. When such areas are transformed into productive green spaces, not only is an unhealthy condition remedied, but the surrounding community will also benefit from the green space, whether passively or actively.

Empirical Studies

According to Aduloju (2021), in his study on analysis of urban agriculture in open spaces across residential densities in the Ilorin metropolis, 48.8% of urban-producing households are labelled urban poor as they earn below the approved minimum wage of ₦30,000. However, it was revealed that about nine hundred and two (902) persons are provided with employment through the practice of UA in the Ilorin metropolis, and

further findings revealed that social cohesion, increased income and increased food affordability are essential assets of urban agriculture. He concluded that raising awareness among government agencies was required to promote and position UA as a sustainable strategy towards feeding the city.

De Zeeuw (2011) examined the relationship between urban agriculture, cities and climate change and discovered that urban waste recycling was a common environmental benefit associated with urban agriculture by helping to reduce the volume of urban waste, thereby improving the quality of life in urban areas. De Zeeuw's observation appears valid when viewed against Blanke and Burdick (2005) and Ghosh (2004) that urban food production helps to reduce greenhouse emissions and UA contribute to the amelioration of global climate change, which persists in the world.

According to Hodgson et al. (2011) and Smit et al. (1996), UA produces 15–20% of the global food supply. For example, in Shanghai, 60% of veggies and 90% of eggs consumed by city people were produced through UA. In contrast, in Harare, Zimbabwe, the urban poor produced 90 to 100% of green vegetables. Hodgson also thought the metropolitan region could supply vital infrastructure, labour, and cheap transportation for cost-effective food production with structural connectedness and governance.

The literature examined indicates that UA has substantially contributed to urban inhabitants' livelihoods through social cohesion, food security, income production, and poverty alleviation, among other things. Urban agriculture is on the rise in Nigeria, where the desire and necessity to feed more mouths is on the rise. Through the Fadama programme, Operation Feed the Nation, and the Green Revolution, among other initiatives, successive governments have encouraged mass participation in agricultural production in rural and urban areas in the last three decades, boosting the morale of urban dwellers in agricultural practices. This study explores the practice of urban agriculture in Ogbomoso, Nigeria, with a primary focus on the type, scale and contribution of the practice to the livelihood of residents in the study area.

The Study Area

Ogbomoso is a town in Oyo State, southwestern Nigeria, founded in the mid-17th century. It lies between

latitude 08° 02' 35"N to latitude 08° 14' 17"N and longitude 04° 14' 39"E to longitude 04° 17' 29"E. It is a derived savannah. Ogbomoso is about 240km northeast of Lagos, 105km northeast of Ibadan, 52km northwest of Ilorin and 58km northwest of Osogbo. Ogbomoso land covers roughly 3547.89sq km land area. The town is the gateway to the western part of Nigeria from Northern Nigeria. The present population of Ogbomoso is estimated to be 584,592 (projected from 2006 National Population Census data). Ogbomoso is in a transitional zone between the rainforest and the savannah. The larger part of the plateau in Ogbomoso is about 340m - 370m above sea level. Low wooded hills and steep-sided ridges rise suddenly from the surrounding terrain, providing moderate relief. Ogbomoso town is considered a lowland rainforest, influenced by agricultural activities, mixed farming and crop rotation. See Figures 1 and 2 for the location of the study area and the farms.



Figure 1: The location of Ogbomoso in Oyo State and Oyo State within the National Setting
Source: Oyo State Ministry of Land, Housing and Surveying, 2018 (Authors' modification)

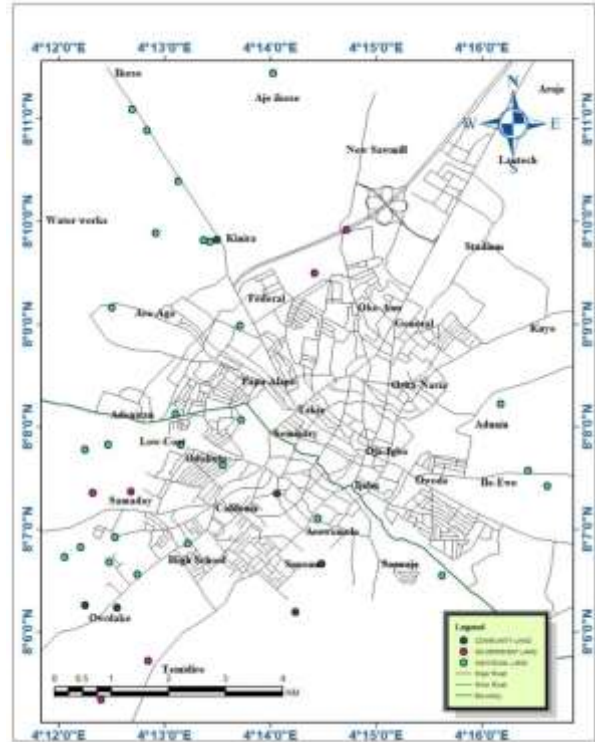


Figure 2: Spatial Distribution Map of the 45 identified urban farms in Ogbomoso

Source: Authors' design, 2021.

Methodology of Research

This study employed a survey design to obtain relevant data from urban farmers. The study made use of both primary and secondary data. Primary data were sourced directly from urban farmers through a structured questionnaire. In contrast, secondary data were obtained from the Oyo State Agricultural Development Programme (OYSADEP), Piggery Association of Nigeria, Poultry Association of Nigeria and Fishery Association of Nigeria. A structured questionnaire was designed to obtain information on the livelihood correlate of UA in the study area. Twenty-two (22) urban farms were randomly selected from the 45 identified urban farms. Two hundred and fifty-one (251) urban farmers were sampled, amounting to 50% of the total number of urban farmers within the 22 selected urban farms. The survey took place between 7:30 am to 12 noon and between 3 pm to 6:30 pm, which are the periods that most farmers were usually on their forms. A simple random sampling technique without replacement was employed for selecting urban farms, while an accidental sampling technique was

employed for selecting urban farmers. Descriptive analysis was engaged in data analysis. This involved using tables and charts to present responses based on their frequencies. Also, a Likert scale was employed to analyse the contribution of UA to livelihood in the study area.

Results and Discussion

Socio-Economic Characteristics

It was observed that 59.8% of the sampled urban farmers were male, while 40.2% of them were female urban farmers (Table 1). Over 79% of the sampled urban farmers were of the active/independent age group of 21-60 years. The predominance of males corroborates the view of Jongwe (2014) that males are the predominant gender distribution in urban agriculture due to the conflict associated with urban lands and the labour-intensive nature of UA. Furthermore, it was discovered that the majority (65%) of the sampled urban framers have tertiary education. This is attributed to the high unemployment rate coupled with the high inflation rate, which pushes people to augmenting strategy. In the same vein, 80.9% of them are employed urbanites. The study showed that 19.9%, 43.0%, 28.7%, and 8.4% of the urban farmers earn between below ₦30,000, ₦31,000 – ₦60,000, ₦61,000 – ₦90,000 and above ₦91,000 respectively on a monthly basis (at USD1 = ₦410).

Table 1: Socio-Economic Characteristics

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, 2021

NB: USD1 = 410 Naira; October, 2021

Type of Urban Agriculture

Findings revealed that 57.8% of the sampled urban farmers are into livestock farming, followed by 30.7% of the urban farmers who are into crop farming, while only 11.6% of them are into mixed farming (Table 2). This finding implies that livestock farming is the dominant UA practice in Ogbomosho. This is associated with the rugged nature of crop farming, the high-water demand by crop farming, and the need for fertile soil.

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
Total	251	100

Source: Authors’ fieldwork, 2021.

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 4. The implication is that most urban farmers see UA as a means of income.

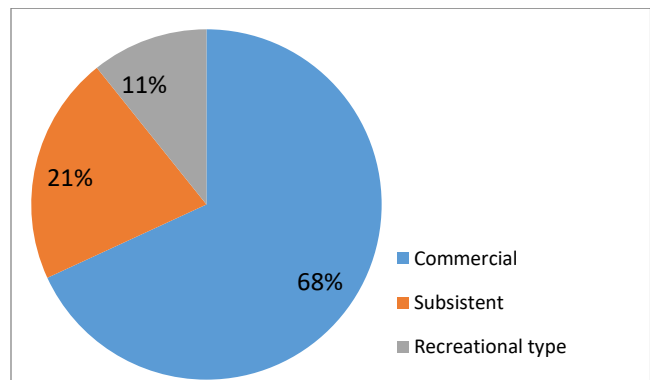


Figure 4: Scale of Production

Source: Authors’ fieldwork, 2021.

Role of UA Regarding Employment Opportunity

Findings from this study indicated that 33.9% of the urban farmers engage workers in urban farming activities while the remaining 66.1% of the respondents did not employ farm workers. Out of 33.9% of urban farmers that employed workers in urban farming practice, 26.3%, 4.0%, and 2.4% of them affirm that they have gainfully secured employment for less than five persons, between 6-10 people and 15-20 people, respectively, in their urban farmland. Only 1.2% employed 11- 15 people in their urban farmland (Table 3). The Nigerian National Bureau of Statistics estimates that 40.1% or about 83 million Nigerians live in poverty, with a projected 45% increase by 2022. With the World Bank income poverty threshold of \$3.20 per day, Nigeria is at a poverty rate of 71%, which indicates that half of the total population lives in poverty. Sixty-eight per cent (68%) of the sampled urban farmers resort to the commercial type of UA to augment their household income (Figure 4).

Conversely, the commercial type of UA has helped 79.1% of the sampled urban farmers to scale through the minimum wage of ₦30,000, as revealed in Table 1. In comparison, 33.5 % of the sampled urban farmers use UA to supplement their household income. Moreover, the role of UA regarding employment cannot be overemphasised, as findings indicate that 31.1% of the sampled urban farmers engage in UA due to unemployment (Table 4). The implication is that UA provided employment opportunities for both the urban farmers and urban dwellers they employed. This was corroborated by the findings of Ayaga et al. (2005) that relatively paid jobs exist around UA. This implies that the role of UA in employing urban dwellers cannot be questioned.

Table 3: Role of UA Regarding Employment Opportunity

No workers engaged	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, 2021.

Reason for Engaging in UA

Poverty and hunger are deeply rooted in sub-Saharan Africa. Millennium Development Goal 1 and Sustainable Development Goals 1 & 2 emphasise the need to eradicate poverty and hunger in the world. Several measures and approaches have been geared towards achieving these goals. In this regard, many scholars have viewed urban agriculture as one of the newest informal sectors that can go a long way in eradicating poverty and hunger. Hovorka et al. (2009) opined that UA is a safety net for low-income people and families seeking to supplement their declining income. Many urban dwellers have keyed into practising food production. Urban agriculture aligns itself with this fact. As the findings in Table 4 show, 35.5% of the respondents engaged in UA to complement their income. In comparison, 31.1% and 27.9% of urban farmers engaged in UA due to unemployment, food insecurity and malnutrition, respectively. Only 7.6% of the respondents practice UA for leisure. This implies that urban agriculture is no longer a leisure activity as an insignificant portion of 7.6% of the urban farmers engaged in UA for leisure. This result corroborated Smith's (2002) finding that UA contributes to between 20% and 60% of African household income.

Table 4: Reason for Engaging in UA

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

Source: Authors' fieldwork, 2021.

Source of Waste Use in UA

Further investigation revealed that 69.7% of the sampled urban farmers used waste materials as feed or manure. The remaining 30.3% of the sampled urban farmers did not use waste materials. Out of the 69.7% sampled urban farmers, 25.9% engaged in the use of industrial waste, followed by those that engaged in the use of all of the waste with 23.9%. In contrast, 3.6% and 13.5% of urban farmers depend on domestic/restaurant waste and agricultural waste, respectively. Only 2.8% engage in the use of abattoir waste (Table 5). From the

investigation, it was revealed that cassava peels, palm kernel cake (PKC), brewery waste, blood, and bone which are end-products from beverage, food production, palm oil production industries and abattoirs, have been constituting a nuisance to the environment are used by livestock farmers as feed. In contrast, dung from poultry is used by crop farmers as manure. Fish farmers also depend on carcasses and maggots from the dung from poultry farms. This implies that UA has the potential of helping to achieve SDGs (goals 11 & 13) and MDGs (goal 7) when appropriately managed. This backed up the World Bank's (2012) assertion that UA is aligned with the primary aims of inclusive urban green development.

Table 5: Source of Waste Use in UA

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, 2021.

Contribution of UA to Livelihood in the Study Area

Table 6 reveals the five-point Likert scale order of contribution of UA to livelihood in the study area. UA has contributed to the livelihood of Ogbomoso Township through the "provision of employment", with the highest positive index value of 0.51, closely followed by food security with 0.48. This is followed in decreasing order by the source of income, promotion of urban sustainability, creation of profitable businesses, increase in community resilience, decrease in crime rate and poverty reduction, which has a positive index value of 0.47, 0.40, 0.38, 0.36, 0.19 and 0.04 respectively. From this analysis, UA has significantly contributed to providing employment, and food security, creating profitable businesses, increasing community resilience, and promoting urban sustainability. In contrast, UA has a low significant contribution to reducing poverty and decreasing the crime rate. Further consultation reveals that UA has successfully provided employment opportunities (both direct and indirect) to households. Among these are farmers, middlemen between pig buyers and urban farmers, urban farm workers and

artisans (like bricklayers, plumbers and carpenters). UA has also supported the creation of profitable businesses, as a series of agro-allied-based ventures (such as feed mills and veterinary clinics) are springing up. While an increase in food affordability, improved access to land, increased social cohesion and increased GDP and revenue show an insignificant contribution with an index value of - 0.37, - 0.61, - 0.65 and - 1.24, respectively. This outcome supported the finding of Sen (1991) that UA may provide paid jobs for employees on urban farms. The Likert scale results of households on the contribution of UA to livelihood in the study affirmed a significant contribution of UA to the creation of profitable businesses, increase in community resilience and provision of employment with a significant index value of 0.75, 0.45, and 0.33 respectively while the result show an insignificant contribution to the reduction in the marginalisation of vulnerable groups and increase in GDP and revenue with an index value of -0.34 and -0.41 respectively.

Table 6: Contribution of UA to Livelihood in the Study Area

VARIABLES OF EVIDENCE	RANKING					EWV	N	EW V/N	X̄	D	D²	
	5	4	3	2	1							
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	143	66	35	7	0	1098	251	4.37	0.48	0.23		
Reduction in poverty	95	61	77	18	0	986	251	3.93	0.04	0.0016		
Increase in GDP and revenue	29	21	35	166	0	666	251	2.65	1.24	1.537	-	
Increase social cohesion	45	40	96	70	0	813	251	3.24	0.65	0.423	-	
Increase in food affordability	71	48	73	59	0	884	251	3.52	3.8	9	0.37	0.137
Promote urban sustainability	147	41	53	10	0	1078	251	4.29	0.40	0.16		
Increase in community resilience	141	51	40	19	0	1067	251	4.25	0.36	0.1296		
Creation of profitable businesses	152	45	46	8	0	1094	251	4.36	0.47	0.22		
Decrease in criminal rate	119	54	58	20	0	1025	251	4.08	0.19	0.0361		
Total								46.64				

Source: Authors' Fieldwork, 2021

Recommendations

Based on the findings, the following recommendations are suggested urban planning measures for sustainable urban agricultural practice in the study area.

Looking at the result of findings on the livelihood contribution of urban agriculture in relation to food security, creation of profitable businesses and employment opportunities that exist around UA, the land around the Water Corporation should be reserved by the State government for irrigation farming with appropriate strategies. An example of this is Asa Dam in Ilorin. Town planners should draw residential layout designs to include individual and community gardens. For instance, cities like Vancouver (Canada), Kampala (Uganda), Chicago (USA) and Dar es Salaam (Tanzania) are experimenting with house and community gardening as part of their new public housing developments and slum rehabilitation programmes (Veehuizen, 2006).

However, NITP and TOPREC should review residential plot sizes (by increasing such) as a matter of urgency in order to provide access to backyard farming; and mandating it. This will not only enhance food security and beautify the scenery (through horticulture) but also provide the environment with good fragrance and the capacity to sink carbon dioxide. This will make land accessible to urban farmers.

It is also crucial for town planners to orientate and re-orientate households on urban land use, especially in the face of renewed environmental challenges, food insecurity, unemployment, and rural-urban migration, among others. There is a need to promote urban agricultural diversification, which encourages the production of high-valued food items (such as mushrooms) that need minimal growing space yet provide high monetary returns and dietary function.

Moreover, with the contribution of UA to the promotion of urban sustainability and increase in community resilience, UA should be used by consultant town planners to create a buffer zone between conflicting land uses. This comes in handy in the process of developing or reviewing the Master Plan for Ogbomoso town. There is also a need to formalise urban agriculture. The state government should develop a policy and enact laws that will incorporate and integrate agricultural land use into the urban system as a

component, primarily through the provision of agricultural zones and the creation of more farm settlements. Reviewing planning laws for a sustainable urban agricultural practice is also essential.

Conclusion

Urban food production has been one of the newest informal signatures, which has contributed significantly to the social, economic and ecological development of urban areas. Growing food within the urban area has become a lucrative venture for many entrepreneurs all around the world because relatively few paid jobs exist around UA beyond its food provision. Urban agriculture has become a significant source of income in urban areas, and the government and decision-makers should carefully examine it as a viable urban livelihood choice. The environmental and societal advantages UA provides are as many as the physical forms it may take.

UA is a support mechanism for achieving the current seventeen Sustainable Development Goals (SDGs), which are geared towards minimising unemployment and food insecurity and creating a greener city. Town planners and policymakers should not be carried away by the merit of UA but rather have an in-depth understanding of UA as a component of the urban system while formulating urban planning policies. This will prevent UA from becoming an uncontrolled activity in the quest for sustenance and economic improvement, which urbanisation and industrialisation equally promote. Urban planners, decision-makers and all urban stakeholders should see the need to embrace urban agriculture as a livelihood option in the urban area and develop appropriate strategies to ensure its sustainability.

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