Assessment of Arable Farmers' Response to the Impact of Urbanisation in Ilorin Metropolis, Kwara State, Nigeria

Olabanji, O. P.[*1]*; Ayodele, G. A.*[1]*; Olabanji, F. A.*[2] *and Olasehinde, E. M.*[1]

[1]*Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ilorin, P.M.B 1515, Ilorin, Nigeria*
[2]*Department of Agricultural Technology, School of Science and Technology, Federal Polytechnic Offa, PMB 420, Offa, Kwara State, Nigeria.*

KEYWORDS

Agricultural land, Environment, Farming systems, Food security, Urbanization.

***CORRESPONDING AUTHOR**

olabanji.op@unilorin.edu.ng
+2348027196747

ABSTRACT

Expansion of urban areas, causing demand for more residential, commercial, and industrial spaces, poses profound impacts on rural farming community land that feeds the populace. Urbanization not only reduces the amount of land available for food production but also leads to fragmentation of agricultural landscapes, making farming activities more challenging. This study sought to assess the response of arable farmers to the impacts of urbanization in Ilorin Metropolis, Kwara State, Nigeria. A three-stage sampling procedure was used in selecting one hundred and sixty-seven respondents for the study. Data were obtained using a structured questionnaire and was analyzed through frequencies, percentages, means, standard deviation and chi-square. The result revealed that majority of the respondents were males (73.7%), married (87.4%) and with an average age of about 56.7 years. About half (59.1%) of the respondents indicated awareness of urban farming techniques. Diversification into livestock production ($\bar{x}$=1.67) and engaging in non-farming activities ($\bar{x}$ =1.55) were the major responses of the farmers to the impacts of urbanization. The results also revealed that age, primary occupation and household size have a significant relationship with the farmers' responses to the impacts of urbanization at $p<0.05$ level of significance. The study concluded that more awareness in the form of educational programmes should be deployed to farmers on urban agriculture practices and recommended formulation of policies that balance urban development with agricultural sustainability in Nigeria.

INTRODUCTION

In Nigeria, rapid urban expansion has transformed rural and peri-urban landscapes, leading to significant changes in land use patterns, economic activities, and environmental conditions. Rapid urbanization, a common feature in most developing countries, has posed a significant threat to agricultural land (Suhartini and Jones, 2019). As cities grow, more land is acquired for expansion and development, leaving less land available for agricultural use, ultimately hampering overall food supply (Follmann *et al*., 2021).

Urbanization has a significant impact on rural communities as it affects the social, economic, and cultural well-being of the rural dwellers (Sakketa 2023; Ma and Yin, 2024). Rural farmers who are displaced by urbanization may face difficulties to continue farming activities. Aside loss of agricultural land, displacement of rural dwellers as a result of urbanization can lead to the erosion of rural communities.

Over the past few decades, Ilorin metropolis has witnessed a surge in population growth, infrastructural development, and spatial expansion, driven by factors such as rural-urban migration, industrialization, and government policies promoting urban development (Olabanji *et al.*, 2021). While urbanization fosters

economic opportunities, improves access to services, and enhances infrastructure, it also exerts pressure on agricultural land, threatening the livelihoods of arable farmers in peri-urban and rural areas surrounding the metropolis. The city expansion has led to the encroachment of farmlands for residential, commercial, and industrial purposes. The conversion of arable land to non-agricultural uses limits farmers' access to land, reduces agricultural productivity, and disrupts farming systems.

Understanding farmers' responses to urbanization is crucial in developing sustainable land management policies, ensure food security, and support the resilience of farming communities. It is against this background that the study was designed to assess arable farmers response to the impact of urbanization in Ilorin Metropolis, Kwara State.

Hypothesis for the Study

Ho_1: There is no significant relationship between sociodemographic background of the farmers and their response to the impact of urbanization.

METHODOLOGY

Study Area

The study was conducted in the metropolis of Ilorin, the state capital of Kwara. The people of Ilorin are both of Yoruba and Fulani origin. Ilorin metropolis encompasses three of the sixteen local government areas in Kwara state (that is, Ilorin East, Ilorin South, and Ilorin West). The capital city of Ilorin is situated 306 km inland from the coastal city of Lagos and 500 km from the Federal Capital, Abuja. Ilorin is located at latitude 8.49664 and longitude 4.54214. It is part of Africa and the northern hemisphere 8°29'47.9" N 4°32.528' E. Ilorin South has its headquarters at Fufu; Ilorin East at Okeoyi; and Ilorin West at Wara-osin. Majority of the people in the area are artisans, civil servants and subsistence farmers. The area is predominantly peri-urban. Agriculture is mainly a secondary occupation for most of the citizens of this area. The culture of the people is heterogenous, however, there is commonality of shared norms which ensures social order and harmony. Ilorin is a fast-growing metropolitan city, with a projected population of 847,580 in 2006 (NPC, 2006), the city has been projected to have a population of 1,000,477 persons in 2022 (UN, 2022). The dry and wet seasons are the two primary climate seasons of the state, with a transitional cold and dry harmattan phase that typically lasts from December to January. The Niger River and its tributaries cross the plains and rainforests, which make up the majority of the natural vegetation. The city is home to people of several Nigerian ethnic groups, including the Yoruba, Hausa, Igbo, Fulani, Nupe, and Baruba. Ilorin is one of the fastest growing cities with highly heterogeneous population in Nigeria. Her population of 36,000 in 1911 was found to have increased to 847,580 in 2006 (NPC, 2006) and the current metro area population of Ilorin in 2025 is 1,100,000, a 3.38% increase from 2024. Hence, Ilorin is experiencing fast rate of urbanization, hence Ilorin has become an urban centre.

Sampling Procedure and Sample Size

A three-stage sample was used in selecting respondents for the study. In the first stage, the three local government areas that form Ilorin metropolis were purposively selected due to the rising pace of urbanization in the areas. In the second stage, five communities where farming activities still take place were purposively selected in each LGA. In the last stage, a proportionate sampling technique was used to randomly select 10% of farming households in each community. Information on the number of farming households in each community was compiled through the assistance of the community leaders (as used by Olabanji and Ogunlade, 2020). This gives a total of one hundred and sixty-seven (167) respondents for the study. The plot manager for each household was interviewed. Data were collected with the aid of a structured interview schedule. The data collected were presented using percentages, and analyzed with mean, standard deviation and chi-square. The socio-demographic background of the respondents was determined using frequency counts and percentages. The level of awareness of urban agricultural practices was assessed using a dichotomous response of aware (1) and not aware (0). The response to the impacts of urbanization was captured using three-point likert-type scale of 2= 'action taken', 1= 'action considered', 0 = 'Not an option'. The constraints faced in responding to the impacts of urbanization were identified using a three-point likert-type scale of 'major constraint' (2), 'mild constraint' (1) and 'not a constraint' (0). The scale measured as $X = \Sigma x / n$ Where, X = likert value, Σ = summation, n = total respondents / sample size was used to form the basis for deciding the major constraints faced. Thus, the decision rule holds that $X= (2 + 1 + 0) / 3 = 1.0$ so, constraints > 1.0 were considered major while those < 1.0 were considered not important constraint. Chi-

square analysis was used to test the hypothesis. For all purposes, p-value of 0.05 was considered as the level of significance.

The formular for chi-square was specified as

$$X^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

Where,
χ^2 = Chi-square
Σ = Summation
O_i = Observed outcome
E_i = Expected outcome

RESULT AND DISCUSSION

Sociodemographic Background of the Respondents

Table 1 presents the distribution of respondents based on key sociodemographic variables. The table shows that majority (73.7%) of the respondents are male, while 26.3% are female. This is a common phenomenon in agricultural settings in Nigeria where men are typically known to engage in production activities, while women focus on processing of produce and household food production. The relatively low participation of women could be due to cultural norms and land ownership restrictions (Batil and Suresh, 2018). The mean age of the respondents was 56.7 years, with the majority falling between 51 - 60 years (36.5%), 61 years and above (24.5%). This indicates an aging farming population, which is a major concern for agricultural sustainability. Olabanji and Ogunlade (2020) mentioned that older farmers are often less open to adopting new technologies and modern farming methods. Furthermore, a significant proportion (87.4%) of the respondents are married, while only 9.6% are single. This suggests that farming is often associated with family responsibilities, where married individuals engage in agriculture as a means of livelihood stability. Additionally, the table reveals that 16.8% of respondents have no formal education, while 45.5% have only a primary school certificate. This indicates low literacy levels, which can negatively impact agricultural creativity, as education plays a key role in the adoption of modern farming techniques. The finding also shows that 56.3% of the respondents are artisans, while only 24.6% identify farming as their primary occupation. The relatively high percentage of artisanship may indicate that urbanization is shifting the economic focus from farming to non-agricultural occupations. The average household size is 7 persons, with 63.8% of households having between 6-10 members. Large household sizes can be both an advantage and a disadvantage. On one hand, a larger family provides more labor for farming activities (Olabanji and Olabanji, 2020). On the other hand, it increases dependency ratios, potentially putting financial strain on farming households.

Level of Awareness of Urban agricultural practices

Data on Table 2 shows farmers' responses to awareness on urban agricultural practices. On the average, the respondents are generally aware of urban agricultural practices (59.1%). Several urban agricultural practices, such as backyard gardening (89.2%), guerrilla gardening (89.2%), vertical farming (88.0%), balcony/container gardening (80.1%), and rooftop gardening (78.4%), exhibit high awareness levels among the respondents. These results align with the studies of Zezza and Tasciotti (2010) where it was asserted that small-scale urban farming techniques are more common in developing countries due to their low cost and ease of adoption. The high awareness of these methods suggests that the farmers are familiar with visible and traditional forms of urban farming.

Table 1: Distribution of respondents according to sociodemographic background

Sociodemographic Variables	Frequencies (N=167)	Percentages (%)	Mean
Sex			
Male	123	73.7	
Female	44	26.3	
Age (in years)			
Below 30	05	3.0	
30-40	21	12.6	
41-50	39	23.4	56.7 years
51-60	61	36.5	
61 and above	41	24.5	
Marital Status			
Married	146	87.4	
Single	16	9.6	
Divorce/separated	02	1.2	
Widow	03	1.8	
Educational Attainment			
No Formal Education	28	16.8	
Primary School Certificate	76	45.5	
Secondary School Certificate	58	34.7	
Post-Secondary Education	05	3.0	
Primary Occupation			
Trading	28	16.7	
Civil Servant	04	2.4	
Artisanship	94	56.3	
Farming	41	24.6	
Household Size (persons)			
Less than 5	39	23.4	
6-10	106	63.5	7 Persons
11-15	14	8.4	
Above 16	08	4.8	

Source: Field Survey, 2025

Table 2: Distribution of respondents based on responses to awareness of urban agricultural practices

SN	Urban Agricultural Practices	Aware	Not Aware
1	Rooftop gardens (transforming rooftop spaces into productive gardens)	78.4	21.6
2	Vertical farming (cultivating plants in vertically stacked layers)	88.0	12.0
3	Hydroponic systems (growing plants without soil, using nutrient-rich water solutions)	30.5	69.5
4	Aquaponic systems (creating a symbiotic environment where fish waste provides nutrients for plants, and plants help purify the water for fish)	29.3	70.7
5	Backyard and home gardening (cultivating food in personal residential spaces)	89.2	10.8
6	Balcony and container gardening (utilizes containers to grow plants in small spaces)	80.1	19.9
7	Indoor farming (growing crops inside buildings or homes under controlled environments)	23.4	76.6
8	Guerrilla gardening (planting crops on vacant or neglected urban land without formal permission)	89.2	10.8
9	Green walls (vertical structures covered with vegetation, which can be attached to exterior or interior walls of buildings)	23.4	76.6
	Cumulative Average	59.1	40.9

Source: Field Survey, 2025

Farmers Responses to the Impacts of Urbanization

Table 3 presents farmers' responses to urbanization pressures. Diversification into livestock production, was the most popular response to urbanization (WMS = 1.64). This supports the argument that livestock farming requires less land than crop farming, making it a viable alternative when farmland is lost to urban expansion (Weindl *et al.*, 2017). Gebrehiwot and van der Veen (2013) also suggested that livestock farming provides a more stable income, as it is less affected by seasonal changes and land shortages. Engagement in non-farm activities (WMS = 1.55), indicating that rural households increasingly depend on non-agricultural income sources. This aligns with the livelihood diversification theory (Ellis, 2000), which argued that farmers adopt multiple income strategies to mitigate risks associated with urban expansion and loss of land. Engagement in non-farm activities (e.g., trading, artisanship) helps rural households manage economic instability caused by urbanization. However, excessive dependence on non-farm activities could lead to de-agrarianization, threatening food security and local agricultural production. Additionally, outright quitting of farming activities (WMS = 1.44) was also considered as response to the impact of urbanization. This aligns with urban transition theories, which argued that rapid urban growth often forces rural dwellers to abandon traditional farming for wage labor in urban areas (Tacoli, 2004). Furthermore, the respondents indicated relocation of farm activities to less urbanized areas (WMS = 0.98) as a strategy to cope with the impact of urbanization. Land tenure insecurity and the high cost of acquiring new farmland may discourage farmers from relocating (Abass and Agyemang, 2018). The finding aligns with the study by Satterthwaite *et al*. (2010), which suggested that urbanization-induced displacement reduces access to fertile land, forcing farmers to adopt other coping strategies.

Table 3: Distribution of respondents based on responses to the impacts of urbanization

SN	Responses	Action taken	Action considered	Not an option	WMS	Std. Dev
1.	Engaging in non-farm activities	109 (65.3)	41 (24.6)	17 (10.1)	1.55	0.903
2.	Relocation of farm activities to less urbanized areas	56 (33.5)	47 (28.1)	64 (38.3)	0.95	1.003
3.	Intensification of production through modern farming techniques	32 (19.2)	67 (40.1)	68 (40.7)	0.78	0.897
4.	Diversification into livestock production	119 (71.3)	40 (24.0)	08 (4.7)	1.67	0.911
5.	Outright quitting of farming activities	103 (61.7)	34 (20.3)	30 (18.0)	1.44	1.012
6.	Planting crops on vacant or neglected urban land without formal permission	21 (12.6)	73 (43.7)	73 (43.7)	0.69	0.922

Source: Field Survey, 2025

Constraints faced by the arable farmers in response to the impact of urbanization

The date on Table 4 shows the major constraints faced by farmers in adapting to urbanization. Transportation and logistics challenges was ranked as the most important constraint with a Weighted Mean Score (WMS) of 1.81. Poor road networks and increasing transportation cost makes it difficult for farmers to access long distance farms (Jayne *et al*., 2014). Decline in labor availability was ranked as the second most significant constraint in the response to the impact of urbanization. This aligns with findings by Dokubo *et al*. (2023), which highlighted that urban migration reduces the rural labor force, particularly among young people. The preference for urban employment over farming is a common trend in many developing economies (Mendola, 2007). High cost of farmland was identified as the third most important constraint (WMS = 1.67). As cities grow, farmland is increasingly converted into residential, commercial, and industrial use, leading to land speculation and inflated land prices (Feola *et al*., 2020). Jayne *et al*. (2014) found that land tenure insecurity and increasing land prices forced many smallholder farmers to either lease land at high costs or abandon farming altogether.

Table 4: Distribution of respondents based on constraints faced in responding to the impact of urbanization

Constraints	WMS	Std. Dev	Rank
High cost of farmland	1.67	1.003	3rd
Soil degradation and pollution	0.87	0.834	9th
Poor access to credit facilities	1.55	0.967	4th
Decline in labor availability	1.73	1.032	2nd
Encroachment and land conflicts	1.39	0.884	5th
Limited government support and policy issues	1,01	0.977	7th
Environmental regulations and restrictions	1.28	0.990	6th
Loss of Indigenous Knowledge and Practices	0.94	1.145	8th
Transportation and logistics challenges	1.81	1.019	1st

Source: Field Survey, 2025

Test of Hypothesis

The Data in Table 5 presents the chi-square analysis results of the relationship between farmers' sociodemographic characteristics and their responses to the impacts of urbanization. The result shows that age ($p = 0.012$), primary occupation ($p = 0.013$), and household size ($p = 0.008$) were significant factors, while sex, marital status, and educational attainment do not show significant associations. Older farmers are generally more resistant to change, while younger farmers are more adaptive and willing to adjust to new trends. Also, studies by Odoh *et al*. (2019) highlighted that farmer with non-agricultural income streams, such as trading or service jobs, tend to adapt better by integrating urban economic opportunities into their livelihood strategies. Additionally, household size plays a crucial role in determining how farmers respond to urbanization, due to labor availability and economic demands. Larger households may have more available labor for farming but also higher financial needs, influencing decisions to sell land or seek urban employment.

Table 5: Chi-square analysis of association between Sociodemographic background of the farmers and response to the impact of urbanization

Variables	Chi-square	Degree of Freedom	P-value	Decision
Sex	19.018	1	0.231	Not Significant
Age	14.092	4	0.012	Significant
Marriage	6.812	3	0.464	Not Significant
Educational attainment	10.205	3	0.069	Not Significant
Primary occupation	12.631	3	0.013	Significant
Household size	23.428	3	0.008	Significant

Source: Field Data Computation, 2025

CONCLUSION AND RECOMMENDATION

The findings of the study revealed that urbanization has significantly affected agricultural land availability, forcing farmers to adopt various coping strategies such as engaging in non-farm activities, diversifying into livestock farming, relocating farm activities, and in some cases, quitting farming altogether. The study concluded that urbanization presents both challenges and opportunities for arable farmers. While it threatens land availability and traditional farming practices, it also creates avenues for innovation in urban agriculture and livelihood diversification. The study therefore recommends that extension services should train and encourage farmers to practice advanced urban agriculture techniques such as hydroponics, aquaponics, and indoor farming to improve productivity in limited spaces. Financial institutions should develop flexible loan schemes tailored to smallholder farmers to help them invest in modern agricultural techniques and land acquisition. Policies should protect agricultural land from uncontrolled urban expansion by designating specific zones for farming and ensuring land tenure security for farmers.

Implication for Agricultural Extension in Nigeria

The findings of this study have significant implications for agricultural extension services in Nigeria, particularly in addressing the challenges posed by urbanization on arable farming. In adapting to the realities of urban expansion, agricultural extension services are required to develop targeted programs for farmers operating in peri-urban areas. Extension officers should focus on promoting urban agriculture techniques

such as vertical farming, hydroponics, and rooftop gardening to maximize food production in limited spaces. Given that poor access to credit was identified as a major constraint, agricultural extension services should collaborate with financial institutions and government agencies to create awareness about available funding opportunities, grants, and subsidy programs tailored to farmers in urban and peri-urban areas. Also, since many farmers are engaging in non-farm activities as an adaptation strategy, extension services should support farmers in integrating agribusiness and value addition to make farming more economically viable despite urbanization pressure. Additionally, agricultural extension officers should play an active role in advocating for land-use policies that protect agricultural land from excessive urban encroachment. They should also work with local governments to establish designated farming zones within urban areas. By implementing these strategies, agricultural extension services in Nigeria can enhance farmers' resilience to urbanization, ensuring continued food production and livelihood sustainability.

REFERENCE

Abass, S. K. and Agyemang A. S. (2018). Peri-urbanisation and loss of arable land in Kumasi Metropolis in three decades: Evidence from remote sensing image analysis. *Land Use Policy*, 72:470-479, https://doi.org/10.1016/j.landusepol.2018.01.013

Dokubo, E. M., Sennuga, S.O., Omolayo, A.F., Bankole O. and Barnabas, T.M. (2023). Effect of Rural-Urban Migration among the Youths and its Impacts on Agricultural Development in Kuje Area Council, Abuja, Nigeria. *Journal of Research in Science and Technology*, 4(2): 12-27.

Ellis, F. (2000). The Determinants of Rural Livelihood Diversification in Developing Countries. *Journal of Agricultural Economics*, 51, 289-302. https://doi.org/10.1111/j.1477-9552.2000.tb01229

Feola, G., Suzunaga, J., Soler, J and Wilson, A. (2020). Peri-urban agriculture as quiet sustainability: Challenging the urban development discourse in Sogamoso, Colombia. *Journal of Rural Studies*, 80:1-12, https://doi.org/10.1016/j.jrurstud.2020.04.032

Follmann, A., Willkomm, M. and Dannenberg, P. (2021). As the city grows, what do farmers do? A systematic review of urban and peri-urban agriculture under rapid urban growth across the Global South, *Landscape and Urban Planning*, 215:104186, https://doi.org/10.1016/j.landurbplan.2021.104186.

Gebrehiwot, T. and Van der Veen, A. (2013). Assessing the Evidence of Climate Variability in the Northern Part of Ethiopia. *Journal of Development and Agricultural Economics*, 5: 104-119.

Jayne, T. S., Chamberlin, J. and Headey, D. D. (2014). Land Pressures, the Evolution of Farming Systems, and Development Strategies in Africa: A Synthesis. *Food Policy*, 48, 1-17. https://doi.org/10.1016/j.foodpol.2014.05.014

Ma, R. and Yin, S. (2024). Rural Economic Transformation and Household Consumption Structure: An Empirical Study in the Context of Urbanization. *Journal of the Knowledge Economics* 15:18286–18302. https://doi.org/10.1007/s13132-024-01815-1

Mendola, M. (2007). The impoverishing effect of adverse health events: Evidences from Western Balkans. Policy Research Working Paper No 4444. The World Bank, Washington.

National Population Commission, (2006). Census 2006. Federal Office of Statistics, Abuja, Nigeria.

Odoh, N. E., Nwibo, S. U., Eze, A. V. and Igberi, C. O. (2019). Farm and Non-Farm Income Diversification Activities among Rural Households in Southeast, *Nigeria. Journal of Agricultural Extension*, 23 (2): 113-121. https://dx.doi.org/10.4314/jae.v23i2.12

Olabanji, F. A., Olabanji, O. P., Paul, A. B. and Oyegbami, G. A. (2021). Determinants of school-aged children's participation in family poultry production in Ilorin Metropolis of Kwara State, Nigeria. *International Journal of Agricultural Economics and Rural Development*. 11(1): 31-36.

Olabanji, O. P. and Olabanji, F. A. (2020). Risk management attitude and practices of backyard poultry farmers in Ifelodun Local Government Area of Kwara State, Nigeria. *Journal of Information, Education, Science and Technology*, 6 (1): 105-110.

Olabanji O. P. and Ogunlade, I. (2020). Scale development and validation for farmers' knowledge exchange: Implication for Agricultural Extension in Nigeria. *Journal of Bangladesh Agricultural University*. 18(4): 1029–1034.

Patil, B. and Babus V. S. (2018). Role of women in agriculture. *International Journal of Applied Research*, 4 (12): 109 -1 14.

Sakketa, T. G. (2023). Urbanisation and rural development in sub-Saharan Africa: A review of pathways and impacts. *Research in Globalization*, 6: https://doi.org/10.1016/j.resglo.2023.100133.

Satterthwaite, D., McGranahan, G. and Tacoli, C. (2010). Urbanization and Its Implications for Food and Farming. Philosophical Transactions of the Royal Society B: Biological Sciences, 365, 2809-2820. https://doi.org/10.1098/rstb.2010.0136.

Suhartini, N. and Jones, P. (2019). Urbanization and Urban Governance in Developing Countries. In: Urban Governance and Informal Settlements. The Urban Book Series. Springer, Cham. https://doi.org/10.1007/978-3-030-06094-7_2.

Tacoli, C. (2004). Rural-Urban Linkages and Pro-Poor Agricultural Growth—An Overview. OECD DAC POVNET Agriculture and Pro-Poor Growth Task Team, Helsinki, 17-18 June 2004, 17-18.

United Nations (UN, 2022). World urbanization prospects. Washington,USA, retrieved at: https://worldpopulationreview.com/world-cities/ilorin-population, 4th February 2025.

Weindl, I., Popp, A., Bodirsky, B. L., Rolinski, S., Lotze-Campen, H., Biewald, A., Humpenöder, F., Dietrich, J. P. and Stevanović, M. (2017). Livestock and human use of land: Productivity trends and dietary choices as drivers of future land and carbon dynamics. *Global and Planetary Change*, 159: 1-10, https://doi.org/10.1016/j.gloplacha.2017.10.002.

Zezza, A. and Tasciotti, L. (2010) Urban Agriculture, Poverty, and Food Security: Empirical Evidence from a Sample of Developing Countries. *Food Policy*, 35, 265-273.