

Intra-Urban Disparities in Housing and Infrastructure: Comparative Evidence from Utan Village and ECWA Staff Neighbourhood, Jos North, Nigeria

¹ Uyi, Ezeanah ²KIGBU Istifanus

Department of Urban and Regional Planning, Faculty of Environmental Sciences, University of Jos

Email Address: ezeanahu@gmail.com; aiskigi2013@gmail.com

Corresponding Author's Contact Information: ezeanahu@gmail.com

Abstract

Urbanisation in Nigeria has intensified disparities in access to basic infrastructure and housing conditions, particularly between planned and peri-urban settlements. This study examines intra-urban inequalities in Jos North Local Government Area by comparing Utan Village, a peri-urban settlement, with the ECWA Staff Neighbourhood, a formally planned area. Using a cross-sectional survey of 331 households, the study assessed electricity access, water sources, sanitation facilities, waste disposal practices, cooking fuel types, and housing conditions. The findings reveal significant disparities. ECWA Staff Neighbourhood shows higher electricity access (86%), reliance on boreholes (65%), flush toilets (94%), and gas for cooking (57%). Utan Village experiences intermittent or no electricity (44% and 9%), depends mainly on wells (66%), has widespread unimproved sanitation (47% bush defecation), and relies heavily on firewood and kerosene (69%). Waste disposal differs sharply, with open dumping dominant in Utan Village (67%) versus burning in ECWA Staff Neighbourhood (84%). These patterns reflect entrenched socio-economic inequalities, historical planning biases, and governance limitations, highlighting the spatial dimension of infrastructural marginalisation. The study concludes that targeted infrastructure upgrades and improved waste and energy management, supported by inclusive planning policies, are essential to reduce service gaps and improve housing quality in peri-urban communities.

Keywords: Basic-Infrastructure, Housing-conditions, Service-Disparities, Neighbourhood-Comparison, Jos North

1. Introduction

Urbanisation in Nigeria has accelerated rapidly over the past decades, creating significant challenges around housing provision and access to basic infrastructure and services. Jos North Local Government Area exemplifies these complex urban development dynamics. Empirical evidence reveals considerable infrastructure deficits in peri-urban areas: Azi et al. (2021) found that 65%–97% of residents reported inadequate roads, water supplies, electricity, and waste collection, while Dung-Gwom et al. (2022) highlight unplanned hilltop settlements with poor access and infrastructure limitations. Housing provision is further complicated by interactions between formal and informal governance structures that restrict service access (Uyi et al., 2024), and spontaneous population increases have led to housing shortages, overcrowding, and deteriorating living conditions (Jiboye et al., 2011).

Across Africa, rapid urbanisation often outpaces infrastructure development, resulting in inadequate housing, deficient water and sanitation systems, unreliable electricity, and poor waste management, particularly in low-income and peri-urban areas (Ezeanah, 2021; Mtapuri et al., 2023; Bettencourt & Marchio, 2025; Wamukoya & Muindi, 2025). Jos North exemplifies these conditions, characterised by spatially uncoordinated expansion and disparities in living conditions (Nnabuihe et al., 2021), which have broad implications for public health and socio-economic welfare. Literature on Sub-Saharan African cities consistently highlights contrasts between planned neighbourhoods and informal or peri-urban settlements in terms of housing quality and infrastructure availability (Parienté, 2017). The ECWA Staff Neighbourhood benefits from planned layouts and more regular provision of electricity, piped water,

sanitation, and waste collection. Conversely, Utan Village represents peri-urban settlements where infrastructure is lacking or unreliable, forcing residents to rely on alternative or informal systems (Ezeanah, 2018; Awe & Afolabi, 2017). Housing quality indicators such as building materials, room occupancy, access to utilities, and sanitation directly impact health, social stability, and economic development (Emankhu & Ubangari, 2017). Limited water and electricity access reduces educational and economic opportunities and increases disease risks (Ezeh et al., 2014; Olukanni et al., 2015; Ezeanah et al., 2025).

Rapid urbanisation and migration further compound challenges in peri-urban communities, where informal and slum housing developments proliferate due to limited supply, overcrowding, and poor structural quality (Gbadegesin, 2018; Mtapuri et al., 2023; Ezeanah, 2025). In contrast, neighbourhoods occupied by higher-income groups typically have stronger infrastructure frameworks (Nnabuihe et al., 2021). These disparities highlight persistent socio-spatial inequalities that existing policy and planning efforts have not fully addressed.

The historical growth pattern in Jos North is marked by unplanned expansion and has produced congestion, overcrowding, and infrastructure deficits (Awe & Afolabi, 2017; Ezeanah et al., 2025). Financial limitations, inferior construction materials, insufficient technical supervision, and lax enforcement of building codes make peri-urban settlements even less liveable (Emankhu & Ubangari, 2017). Environmental services and waste management also remain critical challenges. Inadequate waste disposal contributes to pollution, flooding, and disease (Echendu, 2023), while better-served neighbourhoods use more organised methods, despite ongoing challenges (Akanni et al., 2014). Inequalities also extend to cooking fuel use; low-income communities depend on firewood and kerosene, exposing residents to harmful indoor air pollution (Ilesanmi, 2012), whereas higher-income neighbourhoods rely on LPG/gas (Nnaji et al., 2021; Roche et al., 2024).

The study's theoretical framework draws on urban inequality literature, emphasising how socio-economic status, governance, and planning shape differential access to services and housing quality (Blimpo et al., 2020). Urban liveability frameworks reinforce the need for multidimensional evaluations of physical conditions, service accessibility, environmental quality, and social well-being (Mohit & Sule, 2015; Paul & Sen, 2021). Local research shows profound heterogeneity within Jos North LGA, which national-level data does not capture. Studies reveal distinct infrastructural and environmental challenges across neighbourhoods such as Angwan, Rukuba, and Fudawa (Elabo et al., 2020; Tifwa et al., 2024), with further evidence of localised variations in housing quality and health outcomes (Ezeanah et al., 2025). These findings highlight the importance of neighbourhood-level research for understanding and addressing urban complexities in the area.

However, despite extensive literature on urban infrastructure disparities in Nigeria, very few studies have conducted neighbourhood-level comparative analyses within Jos North, particularly contrasting peri-urban and planned residential areas. This limited focus constrains understanding of how intra-urban inequalities emerge and persist locally. Addressing this gap, the present study provides an evidence-based comparative assessment of infrastructure access, housing conditions, and urban services between Utan Village and the ECWA Staff Neighbourhood. The study examines electricity, water, sanitation, waste management, cooking fuel, and structural housing characteristics to illuminate the mechanisms driving intra-urban inequalities and to support equitable urban policy and sustainable development planning within Jos North LGA.

2. Materials and Methods

This research was conducted in the Jos North Local Government Area (LGA) of Plateau State, Nigeria, focusing on two neighbourhoods: Utan Village and the ECWA Staff Neighbourhood. Jos North LGA lies at the commercial and administrative centre of Jos City, characterised by varied socio-economic conditions and dynamic urban development patterns. Utan Village is situated at the peri-urban edge of the LGA, between latitudes 9°55'00"N and 10°00'00"N and

longitudes 8°50'00"E and 9°00'00"E (see Figure 1). Located about 5 kilometres from the centre of Jos, it attracts rural and urban migrants seeking affordable housing near the city. The neighbourhood exemplifies a low-income residential zone with challenges, such as inadequate infrastructure and substandard housing. The ECWA Staff Neighbourhood, positioned between latitudes 9°57'00"N and 10°01'00"N and longitudes 8°50'30"E and 8°55'00"E, lies approximately 2 km from the Jos central business district. It is a middle-income suburb with better access to basic services and generally improved housing conditions (see Figure 2). The two communities were purposively chosen to illustrate socio-economic disparities within the LGA, enabling a meaningful comparison of intra-urban differences (Rashid et al., 2013). The socio-economic and spatial characteristics of Jos North LGA, together with the contrasting attributes of these two communities, provide an appropriate framework for examining intra-urban disparities in basic infrastructure and housing conditions.

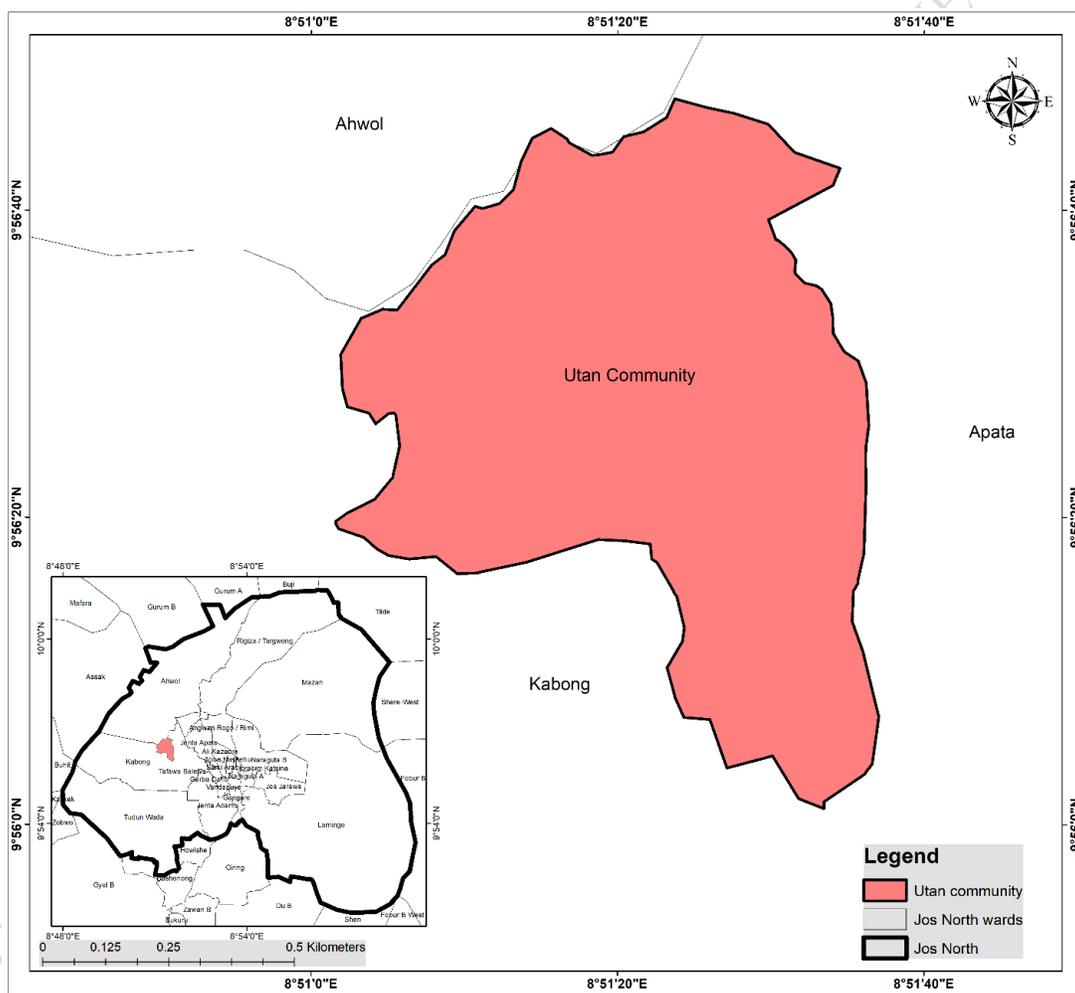


Figure 1: Map of Utan Village
Source: Authors fieldwork 2024

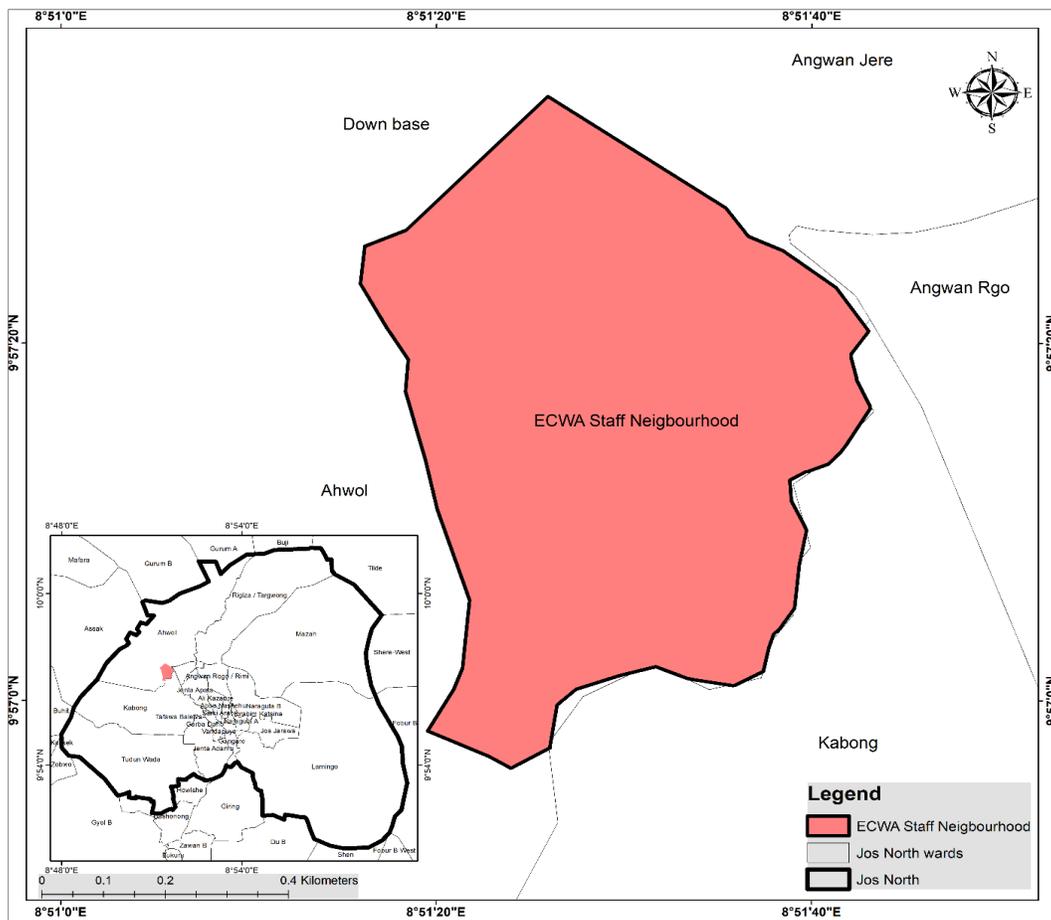


Figure 2: Map of ECWA Staff Neighbourhood.
 Source: Authors Fieldwork 2024.

This study employed a quantitative, descriptive research design to explore its objectives, which include access to electricity, water, sanitation, waste management, cooking fuel types, and structural housing characteristics in the two purposefully selected neighbourhoods of Jos North LGA. A cross-sectional survey was conducted using a structured, in-person questionnaire administered to adult residents or household heads in both study areas.

The questionnaire captured residents’ perceptions of neighbourhood-level access to basic services (Rashid et al., 2013). Structured administration ensured consistency and enabled the systematic collection of quantitative data for statistical analysis (Creswell & Creswell, 2017). Data were gathered over a two-month interval from September to November 2024, yielding a timely overview of household circumstances and service accessibility trends. Participant responses were documented and statistically analysed to gain insights into intra-urban disparities in basic infrastructure and housing conditions.

The survey design facilitated direct engagement with residents, yielding reliable information on socioeconomic and housing conditions. A stratified random sampling procedure was used to ensure proportional representation in both neighbourhoods. The population was divided into two strata: Utan Village (lower-income) and ECWA Staff Neighbourhood (higher-income).

Housing unit counts generated by Google Earth Pro and verified through local government and community records formed the sampling frames. Using tabulated random numbers, 331 households were chosen at random from these

frames. The sample size followed Roscoe (1975) recommendation of surveying at least 10% of households in community-based studies, ensuring broad coverage and statistical reliability. This sampling method improved external validity and ensured unbiased selection.

The research instrument was piloted in Anguwan Rogo, a neighbourhood outside the study area but socioeconomically similar, using 20 households to assess clarity, relevance, and reliability. Conducting the pilot in a different area prevented bias and ensured the instrument accurately measured the intended variables (Taherdoost, 2016). Validity was further established through expert review, observations, and comparison with secondary data sources. Descriptive statistics, including frequencies, percentages, and tables, were used to summarise access to electricity, water, sanitation, waste management, cooking fuel types, and housing conditions. Findings were interpreted in line with theoretical frameworks on urban liveability and residential satisfaction (Forrest & Kearns, 2001; Galster, 1987). This combination of quantitative analysis and descriptive comparison provided a detailed understanding of the differences in living conditions across the two neighbourhoods and supported a comprehensive evaluation of urban issues in Jos North LGA. The research adhered to ethical standards for studies involving human participants. Informed consent was obtained after explaining the study objectives. Participants were assured of anonymity, confidentiality, and voluntary participation, with the option to withdraw at any time without consequences.

3. Results and Discussion

This section presents the comparative evidence on intra-urban disparities in basic infrastructure and housing conditions between Utan Village and ECWA Staff Neighbourhood in Jos North, Nigeria. The analysis covers electricity, water supply, sanitation, waste management, and cooking fuel, highlighting how spatial and socio-economic factors drive inequalities.

Table 1: Access to Electricity

Neighbourhoods	Access to Electricity	Utan Village	ECWA Staff Neighbourhood	Total
	Available	87 (47%)	126 (86%)	213 (64.32%)
	Epileptic	81 (44%)	21 (14%)	102 (30.82%)
	Not Available	16 (9%)	0 (0%)	16 (4.85%)
Total		184	147	331

Source: Field Survey, 2024

Table 1 illustrates the infrastructural divide between ECWA Staff Neighbourhood and Utan Village. While 86% of households in ECWA Staff Neighbourhood reported having electricity, only 47% of households in Utan Village had access. Intermittent electricity supply is significantly more prevalent in Utan Village (44%) than in ECWA Staff Neighbourhood (14%), and 9% of Utan Village households lack electricity entirely. These findings highlight the infrastructural marginalisation of peri-urban communities and mirror earlier studies emphasising electricity access as a key determinant of housing quality, economic inclusion, and urban liveability (Ogunbajo et al., 2016; Ezeanah, 2020; Pandey et al., 2022). The disparities highlight uneven government investment and infrastructural prioritisation, favouring more affluent, planned neighbourhoods.

Table 2: Access and Sources to Water Supply

Category	Sub-Category	Utun Village (n=184)	ECWA Staff Neighbourhood (n=147)	Total (n=331)
Source of Water	Pipe-borne	0 (0%)	0 (0%)	0 (0%)
	Borehole	48 (26%)	96 (65%)	144 (43.49%)
	Well	122 (66%)	51 (35%)	173 (52.26%)
Water Access Status	Water Vendors	14 (8%)	0 (0%)	14 (4.23%)
	Available	184 (100%)	147 (100%)	331 (100%)
	Not Available	0 (0%)	0 (0%)	0 (0%)

Source: Field Survey, 2024

Although Table 2 indicates 100% access to water in both neighbourhoods, disparities in sources of supply emerge. Boreholes serve as the dominant source in ECWA Staff Neighbourhood (65%) versus 26% in Utun Village, while Utun Village relies heavily on wells (66%). Wells are vulnerable to contamination and seasonal fluctuations, whereas boreholes generally provide more reliable and hygienic water. The absence of pipe-borne water in both neighbourhoods highlights the collapse of centralised municipal water systems, leading to reliance on self-provided and informal water systems (Awe & Afolabi, 2017; Ezeanah, 2020). Limited reliance on water vendors further reflects economic constraints for Utun Village households. These findings illustrate infrastructural inequality shaped by socio-economic status, spatial location, and governance deficits.

Table 3: Type of Toilet by Neighbourhoods

Neighbourhoods	Type	Utun Village	ECWA Staff Neighbourhood	Total
	Flush	50 (27%)	138 (94%)	188 (56.80%)
	Pit	48 (26%)	9 (6%)	57 (17.22%)
	Bush	86 (47%)	0 (0%)	86 (26.00%)
Total		184	147	331

Source: Field Survey, 2024

Table 3 highlights stark differences in sanitation facilities between the two neighbourhoods, with ECWA Staff Neighbourhood showing predominantly improved sanitation while Utun Village relies heavily on unimproved options. In ECWA Staff Neighbourhood, 94% of residents have access to flush toilets, whereas only 27% of Utun Village residents use flush toilets; additionally, 47% rely on bushes for defecation and 26% use pit latrines. These disparities have serious implications for hygiene, environmental health, and disease transmission. Literature demonstrates that sanitation access is strongly influenced by income, education, and neighbourhood planning (Abubakar, 2017; Tiwari et al., 2022). The high prevalence of pit latrines and open defecation in Utun Village reflects typical informal settlement characteristics, including infrastructural neglect and limited financial resources, which collectively contribute to lower housing and environmental conditions in this neighbourhood.

Table 4: Method of Waste Disposal System

Neighbourhoods	Method of Waste Disposal	Utun Village	ECWA Staff Neighbourhood	Total
	Dumping in Stream	40 (22%)	18 (12%)	58 (17.52%)
	Burning	21 (11%)	123 (84%)	144 (43.49%)
	Open Dumping	123 (67%)	6 (4%)	129 (39.00%)
Total		184	147	331

Source: Field Survey, 2024

Table 4 shows a clear contrast in waste disposal methods between the two neighbourhoods, Utun Village relies mainly on open dumping, while ECWA Staff Neighbourhood predominantly burns waste. Specifically, 67% of Utun Village residents dispose of waste on vacant lands, reflecting informal settlement dynamics,

whereas 84% of ECWA Staff residents burn their waste, indicative of higher socio-economic status but still limited municipal waste collection. These environmentally harmful practices contribute to pollution, clogged drains, flooding, and vector-borne diseases (Echendu, 2023). Finally, the data highlight how inadequate waste management infrastructure disproportionately affects peri-urban communities like Utan Village, reinforcing intra-urban disparities.

Table 5: Sources of Fuel for Cooking

Neighbourhoods	Source	Utan Village	ECWA Staff Neighbourhood	Total
	Gas	12 (7%)	84 (57%)	96 (29.00%)
	Kerosene	56 (30%)	24 (16%)	80 (24.17%)
	Firewood	72 (39%)	3 (2%)	75 (22.66%)
	Charcoal	44 (24%)	36 (25%)	80 (24.17%)
Total		184	147	331

Source: Field Survey, 2024

Table 5 highlights a clear socio-economic divide in cooking-fuel use between the two neighbourhoods. ECWA Staff Neighbourhood predominantly uses gas (57%), whereas Utan Village relies mainly on firewood (39%) and kerosene (30%), with only 7% using gas, reflecting economic constraints and limited infrastructure. These differences have environmental and health implications, including indoor air pollution and deforestation (Ilesanmi, 2012; Ezeanah et al., 2025).

A uniform trend is evident across all indicators. ECWA Staff Neighbourhood experiences enhanced electricity reliability, safer water sources, improved sanitation, better waste disposal methods, and modern cooking fuels, in contrast to Utan Village, which encounters various levels of infrastructural deprivation. The observed disparities can be traced back to socio-economic differences, historical planning inequalities, and limitations in governance. Their observations indicate significant structural patterns of intra-urban inequality, highlighting how planned neighbourhoods receive public investment and services, in contrast to the underserved peri-urban settlements. The interconnected pattern of infrastructural gaps exacerbates environmental risks, constrains opportunities for social mobility, and perpetuates spatial inequality within Jos North. The results highlight the critical necessity for specific policies and interventions aimed at addressing infrastructure deficiencies, enhancing living conditions, and ensuring fair service delivery in underprivileged neighbourhoods.

4. Conclusion

This study has demonstrated substantial intra-urban disparities in basic infrastructure and housing conditions between Utan Village and the ECWA Staff Neighbourhood in Jos North, Nigeria. The study assessed all dimensions, including electricity access, water sources, sanitation types, waste disposal practices, and cooking fuel use. ECWA Staff Neighbourhood consistently exhibited better service provision, stronger infrastructure, and higher living standards. In contrast, Utan Village displayed characteristics typical of peri-urban and informally developed communities, including intermittent or absent electricity supply, reliance on unsafe water sources, widespread use of unimproved sanitation, environmentally harmful waste disposal methods, and heavy dependence on traditional cooking fuels. These disparities reflect deep-rooted socio-economic inequalities, historical planning biases, and governance deficiencies that shape the daily lived experiences of residents in different parts of Jos North.

The evidence shows that infrastructural and housing inequalities are not random but spatially patterned, following the divide between formally planned neighbourhoods and peri-urban settlements. While households in ECWA Staff Neighbourhood benefit from structured layouts, planned service delivery, and stronger economic capacities, residents

of Utan Village face heightened exposure to environmental hazards, higher health risks, and reduced quality of life. The findings therefore reinforce the broader literature on urban inequalities, which highlights how differential access to basic infrastructure reproduces socio-spatial disadvantages and limits opportunities for marginalised urban populations.

While this study provides robust comparative insights, it is important to acknowledge certain constraints. The survey focused on two neighbourhoods within Jos North, limiting the generalisability of findings to other peri-urban and planned settlements. Additionally, data collection relied on reported household information, which may introduce reporting biases. Recognising these limitations enhances the credibility of the study while highlighting opportunities for further research across a wider range of urban communities. The disparities identified call for targeted and coordinated policy action to address infrastructural gaps, weak planning systems, and limited governance capacity. Key priorities include improving electricity supply, expanding borehole and piped water networks, upgrading sanitation facilities, and establishing safer waste disposal systems in underserved peri-urban areas like Utan Village. Stronger urban planning and regulatory enforcement are needed to manage unplanned growth and integrate peri-urban settlements into formal development frameworks. Community-based collection and enhanced municipal support, coupled with public awareness initiatives, should strengthen waste management services. Promoting clean cooking fuels through subsidies, micro-credit options, and energy-access programmes will help reduce reliance on firewood and kerosene. These interventions should be grounded in participatory governance to ensure community needs guide implementation. Therefore, reducing socio-spatial inequalities requires inclusive, pro-poor urban policies that ensure equitable resource allocation and prioritise disadvantaged neighbourhoods in infrastructure planning.

Acknowledgments

We sincerely acknowledge the contributions of all individuals who made this study possible. Our deepest gratitude goes to the residents of Utan Village and ECWA Staff Neighbourhood in Jos North for their cooperation and willingness to provide the data necessary for this research. Their participation was invaluable in understanding intra-urban disparities in infrastructure and housing conditions.

We also extend our appreciation to our research assistants who supported data collection, entry, and analysis over the course of this study. Their dedication and attention to detail greatly enhanced the quality of the research. Special thanks go to my supervisor Prof. DSA Alaci for his mentorship and guidance throughout this project. Finally, we acknowledge the intellectual contributions of the authors whose works were referenced in this study, which provided critical context and support for the analysis. Any shortcomings in this study are solely our responsibility.

7. References

- Abubakar, I. R. (2017). Access to sanitation facilities among Nigerian households: Determinants and sustainability implications. *Sustainability*, 9(4), 547. <https://doi.org/10.3390/su9040547>
- Akanni, P. O., Oke, A. E., & Omotilewa, O. J. (2014). Implications of rising cost of building materials in Lagos State, Nigeria. *SAGE Open*, 4(4). <https://doi.org/10.1177/2158244014561213>
- Awe, F. C., & Afolabi, F. I. (2017). Assessment of housing quality in urban core of Ado-Ekiti, Nigeria. *Civil and Environmental Research*, 9(7). <https://www.iiste.org/Journals/index.php/CER/article/view/37765>
- Azi, M. B., Pius, W. W., & Muhammed, B. A. (2021). Challenges of basic infrastructural provision to building sustainable peri-urban communities in Jos Metropolis, Nigeria. *International Journal of Sustainable Building Technology*, 4(2), 40–50. <https://doi.org/10.37628/ijstd.v4i2.865>
- Bettencourt, L. M., & Marchio, N. (2025). Infrastructure deficits and informal settlements in sub-Saharan Africa. *Nature*, 1–8. <https://doi.org/10.1038/s41586-025-09465-2>
- Blimpo, M. P., Postepska, A., & Xu, Y. (2020). Why is household electricity uptake low in Sub-Saharan Africa?. *World Development*, 133, 105002. <https://doi.org/10.1016/j.worlddev.2020.105002>
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). Sage Publications.

- Dung-Gwom, J. Y., & Bashir, S. M. (2022). Planning, housing and environmental challenges of hilltop settlements in Zinariya and Azurfa areas of Jos, Nigeria. *Urban Studies and Public Administration*, 5(2), 6–35.
- Echendu, A. J. (2023). Flooding and waste disposal practices of urban residents in Nigeria. *GeoHazards*, 4(4), 350–366. <https://doi.org/10.3390/geohazards4040020>
- Elabo, A. (2020). Fading boundaries: Religion and spatial mapping of Nigeria's Jos North urban centre. *The Journal of World Christianity*, 10(1), 68–83. <https://doi.org/10.5325/jworlchri.10.1.0068>
- Emankhu, S. E., & Ubangari, A. Y. (2015). Analysis of housing quality in the peripheral area of Lafia Town. *International Journal of Geography and Regional Planning Research*, 1(3), 9–17.
- Ezeanah, U. (2018). *The delivery of quality housing in Benin City: The influence of formal and informal institutions* (Doctoral dissertation). University of Sheffield.
- Ezeanah, U. (2020). Basic infrastructure provision and its impact on people's experiences of housing quality in Benin City, Nigeria. *Journal of Environmental Science*, 20(1), 77–93.
- Ezeanah, U. (2021). Housing challenges in Nigeria. *Sustainable Housing*, 1, 1–11. DOI: 10.5772/intechopen.99263
- Ezeanah, U. (2025 a). Formal processes and informal practices: how policy systems and corruption constrain the delivery of housing in Nigeria. *Journal of Contemporary African Studies*, 43(1), 1–18. <https://doi.org/10.1080/02589001.2024.2408251>
- Ezeanah, U. (2025 a). Formal processes and informal practices: how policy systems and corruption constrain the delivery of housing in Nigeria. *Journal of Contemporary African Studies*, 43(1), 1–18. <https://doi.org/10.1080/02589001.2024.2408251>
- Ezeanah, U., Tifwa, H., Moga, M., Songden, S., Kudu, E., Alaci, D., & Rikko, L. (2025). Evaluating housing quality and liveability in Jos North Local Government Area: Implications for health and urban development. *International Journal of Earth Design and Innovation Research*. <https://doi.org/10.70382/mejedir.v8i4.035>
- Ezeh, O. K., Agho, K. E., Dibley, M. J., Hall, J., & Page, A. N. (2014). The impact of water and sanitation on childhood mortality in Nigeria: Evidence from demographic and health surveys, 2003–2013. *International Journal of Environmental Research and Public Health*, 11(9), 9256–9272. doi.org/10.3390/ijerph110909256
- Forrest, R., & Kearns, A. (2001). Social cohesion, social capital and the neighbourhood. *Urban Studies*, 38(12), 2125–2143. <https://doi.org/10.1080/00420980120087081>
- Galster, G. (1987). Identifying the correlates of dwelling satisfaction: An empirical critique. *Environment and Behavior*, 19(5), 539–568. <https://doi.org/10.1177/0013916587195001>
- Gbadegehin, J. T. (2018). *Towards a new policy direction for an improved housing delivery system in Nigerian cities: Theoretical, empirical and comparative perspectives*. <https://doi.org/10.7480/abe.2018.17>
- Ilesanmi, A. O. (2012). Housing, neighbourhood quality and quality of life in public housing in Lagos, Nigeria. *International Journal for Housing Science and Its Applications*, 36(4), 231–240.
- Jiboye, A. D. (2011). Urbanization challenges and housing delivery in Nigeria: The need for an effective policy framework for sustainable development. *International Review of Social Sciences and Humanities*, 2(1), 176–185.
- Mohammad, A. M., & Sule, A. I. (2015). City liveability and housing in Nigeria: A case study of low-income housing in Niger State. *Planning Malaysia: Journal of the Malaysian Institute of Planners*, 13(4), 399–412.
- Mtapuri, O., & Okem, A. E. (2023). Perceptions of inequality in an informal settlement in Durban, South Africa. In *Poverty, inequality, and innovation in the global south* (pp. 13–34). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-21841-5_2
- Nnabuihe, O. E., & Onwuzuruigbo, I. (2021). Designing disorder: Spatial ordering and ethno-religious conflicts in Jos metropolis, North-Central Nigeria. *Planning Perspectives*, 36(1), 75–93. <https://doi.org/10.1080/02665433.2021.1912038>
- Nnaji, M., Eze, A. A., Uzoma, C. C., & Nnaji, C. E. (2021, April). Addressing household cooking fuel options in Nigeria. In *IOP Conference Series: Earth and Environmental Science* (Vol. 730, No. 1, p. 012038). IOP Publishing. <https://doi.org/10.1088/1755-1315/730/1/012038>
- Ogunbajo, R. A., Bello, M. O., & Adebayo, M. A. (2016). Assessment of urban infrastructure quality and user satisfaction in low-income residential neighbourhoods in Minna, Nigeria. *ATBU Journal of Environmental Technology*, 9(1), 98–115.
- Olukanni, D., & Okorie, U. (2015). Empirical assessment of water sanitation, and hygiene practices in a semi-urban setting: A socio-economic and cultural mirror. *Journal of Scientific Research & Reports*, 8(7), 1–11. DOI: 10.9734/JSRR/2015/19998

- Pandey, B., Brelsford, C., & Seto, K. C. (2022). Infrastructure inequality is a characteristic of urbanization. *Proceedings of the National Academy of Sciences*, 119(15), e2119890119. <https://doi.org/10.1073/pnas.2119890119>
- Pariénté, W. (2017). Urbanization in sub-Saharan Africa and the challenge of access to basic services. *Journal of Demographic Economics*, 83(1), 31–39. <https://doi.org/10.1017/dem.2017.3>
- Paul, A., & Sen, J. (2021). Exploring a dynamic relationship between transportation strategies and community livability: The case of the Kolkata urban agglomeration. *Frontiers in High-Speed Rail Development*, 399–412.
- Pearson, A. L., Rzotkiewicz, A., & Zwickle, A. (2015). Using remote, spatial techniques to select a random household sample in a dispersed, semi-nomadic pastoral community: utility for a longitudinal health and demographic surveillance system. *International journal of health geographics*, 14(1), 33.
- Rashid, S., Ngah, T., & Eluwa, S. (2013). Neighbourhood choice factors and residents' satisfaction in old and new neighbourhoods of Slemani City, Kurdistan-Iraq. *Journal of Environmental and Earth Science*, 3(2), 72–80.
- Roche, M. Y., Slater, J., Malley, C., Sesan, T., & Eleri, E. O. (2024). Towards clean cooking energy for all in Nigeria: Pathways and impacts. *Energy Strategy Reviews*, 53, 101366. <https://doi.org/10.1016/j.esr.2024.101366>
- Roscoe, J.T. (1975) *Fundamental Research Statistics for the Behavioural Sciences*, 2nd edition. New York: Holt Rinehart & Winston
- Tifwa, H. Y. T., Edibo, J. O. E., Alaci, D. S. A., & Atser, J. A. (2024). Assessing urban neighbourhood resilience to COVID-19 pandemic in Jos, Plateau State, Nigeria. *Journal of African Development Studies*, 11(1), 65–80. <https://doi.org/10.56302/jads.v11i1.10294>
- Tiwari, P., Tirumala, R. D., & Shukla, J. (2022). Household choices of sanitation infrastructure and impact on disease in India. *Environment and Planning B: Urban Analytics and City Science*, 49(8), 2054–2071. <https://doi.org/10.1177/23998083221088293>
- Uyi, E., & Tifwa, H. Y. (2024). The role of inclusionary hybrid governance in housing delivery in Jos: A review. *African Journal of Environmental Sciences and Renewable Energy*, 14(1), 46–60. doi.org/10.62154/e3rtp05
- Wamukoya, M., & Muindi, K. (2025). The challenges of informal settlements and slums in urban Africa. *Urban Health in Africa*, 49, 1–17.