JOURNAL OF ENVIRONMENTAL SCIENCES AND BUILT ENVIRONMENT RESEARCH (JESBER)
2026, Vol. 1, No. 1, pp. 261-266
Published by Faculty of Environmental Sciences, University of Calabar, Nigeria
Print ISSN: 3141-5547 | OPEN ACCESS

DOI: https://doi.org/10.83109/jesber.vol1no1.25

Research article

POPULATION DYNAMICS AND THE QUEST FOR ENVIRONMENTAL SUSTAINABILITY IN UGEP COMMUNITY, CROSS RIVER STATE, NIGERIA

Etim Omini Eteng[1]* & Moses Kishaleunim Moses[1]

[1] Department of Geography and Environmental Sciences, University of Calabar, Calabar, Nigeria
*Corresponding author: Etimeteng89@gmail.com

ABSTRACT
This study examined the relationship between population dynamics and environmental sustainability in Ugep Community, Cross River State, Nigeria. The study investigated how rapid population growth and urbanization have contributed to environmental degradation, including habitat loss, biodiversity decline, poor waste management, water pollution, and land degradation. A descriptive survey design was adopted, and data were obtained from 200 respondents through structured questionnaires and secondary environmental sources. Descriptive statistics comprising frequency and percentage were used to analyze the research objectives, while Analysis of Variance (ANOVA) was employed to test the hypothesis. Findings revealed that 73.5% of respondents perceived population growth as having a high or very high impact on environmental sustainability. Deforestation and habitat loss (29.0%) emerged as the most significant environmental challenge, followed by poor waste management (26.0%). Furthermore, rapid urbanization (33.5%) and population increase (27.5%) were identified as the major causes of environmental degradation. The ANOVA result showed a significant effect of population growth on environmental sustainability ($F = 8.72$, $p = 0.000 < 0.05$). The study concludes that population pressure is a major driver of environmental degradation in Ugep and recommends sustainable urban planning, environmental education, stronger environmental regulations, and community-based conservation initiatives.

KEYWORDS
population dynamics; environmental sustainability; Ugep community; environmental health; conservation ethics

Introduction

Ugep, is the headquarters of Yakurr Local Government Area in Cross River State, Nigeria, and is recognized as one of the largest '; native' towns in West Africa (Andrew et al., 2024; ResearchGate, 2016). Situated within the Lower Guinean Forest, a global biodiversity hotspot, the community has historically been sustained by its rich natural resources (Bassey & Ogar, 2016). However, in recent decades, Ugep has experienced rapid urbanization and significant population growth, transforming its spatial and environmental landscape (Eteng, 2025). This demographic shift has placed immense pressures on the local environment, leading to a cascade of ecological problems that threaten the long-term sustainability of the community.

The primary environmental challenges confronting Ugep are multidimensional. They include the degradation of original habitats due to urban sprawl, a decline in biodiversity, widespread pollution from inadequate solid waste and sanitation management, and the degradation of water quality (Bassey & Ogar, 2016; Eteng, Eteng, 2022). These issues are worsened by the continued intensification of agricultural activities, which, while central to the local economy and livelihood sustenance, often involve unsustainable practices like deforestation and bush burning (Asuquo, Ewona, & Ikwen, 2019; Tete, Ogar, & Otu, 2020, Okoh & Eteng, 2019). The Nigerian Environmental Study Team (NEST) warned that Nigeria's high population growth rate poses a significant threat to its environmental resources, a prediction that is visibly materializing in communities like Ugep (Bassey & Ogar, 2016).

This paper investigates the complex interplay between population change and environmental sustainability in the Ugep community. It examines the primary drivers and manifestations of environmental degradation linked to demographic pressures. Furthermore, it analyzes the tension between traditional conservation practices, which once protected natural resources, and the challenges posed by modern socio-economic expansion. By synthesizing data on population trends, environmental impacts, and sustainability initiatives, this study aims to provide a comprehensive overview of the critical issues at hand and highlight potential pathways toward a more sustainable future for Ugep.

Operational definition of terms

Environmental Sustainability: The responsible use and management of environmental resources to meet present needs without compromising the ability of future generations to meet their own needs.
Urbanization: The process through which rural settlements develop into urban centres through population growth, infrastructure expansion, and economic transformation.
Traditional Ecological Knowledge: Indigenous environmental knowledge, beliefs, and practices developed by local communities over generations for the sustainable management of natural resources.
Population Dynamics: Changes in population size, density, distribution, and composition over time resulting from births, deaths, and migration.

Literature review

The demographic trajectory of Ugep is characterized by exponential growth. Historically, the Yakurr population, of which Ugep is a major part, grew from approximately 22,000 in 1935 to 38,000 by 1953 (NPC, 2006). More recent estimates show a dramatic acceleration, with Ugep's population estimated at around 100,000 in 2000 and surging to approximately 420,000 by 2018 (NPC 2006). This rapid growth, driven by both natural increase and in-migration, has been the primary facilitator for rapid urbanization and spatial transformation (Eteng, 2025). The expansion of the built environment has occurred at the expense of natural ecosystems, with residential development encroaching upon previously vegetated and forested regions (Andrew et al., 2024).

This urban expansion is not just a matter of increased land use but also involves a fundamental change in land cover. Studies utilizing Geographic Information Systems (GIS) and Remote Sensing have documented a significant increase in impervious surfaces like concrete and a corresponding decline in vegetation cover and water bodies (Andrew et al., 2024). This transformation fragments natural habitats, increases pressure on infrastructure, and intensifies the demand for resources, creating a cycle of environmental stress that is difficult to manage without effective land use planning (Ogochukwu et al., as cited in Andrew et al., 2024).

Ugep is located in an ecologically sensitive area, yet its pristine habitats are facing severe threats. These habitats, which include primary vegetation along stream buffers (such as Loblo, Isayi, and Mma Oden) and ancient shrines, serve as vital refuges for wildlife and are crucial for maintaining ecological balance (Bassey & Ogar, 2016). However, urban development and expansion, farmland clearing for agricultural purposes, and infrastructure projects have led to their fragmentation and degradation. Researchers warn that Ugep is in danger of "mass species erosion" as these habitats shrink and become isolated (Bassey & Ogar, 2016). In a stark example of this pressure, some pristine sites were historically used as garbage dumps before restoration efforts began, demonstrating a lack of recognition for their ecological value (Bassey & Ogar, 2016).

The noticeable and increasing population in once traditional Ugep community has transformed into an ever expanding urban setting with challenges on social services and urban infrastructure leading to concerns in waste generation and management due to changes in consumption patterns as a result of visible livelihood options a fall-out of the diverse socio-economic demographics with implications for sustainable waste management and environmental conservation. Eteng, et al. (2025). On the issue of standard of living, majority of the population engage in farming and expanding families limited lands are available for farming as a result of other needs for infrastructural development like housing, transportation as well as health services, a situation that has impacted negatively on food security (Eteng, et al.).

The surge in population has overwhelmed capacity for effective waste management and sanitation in the Ugep community. Studies indicate a severe sanitation challenge, with a high prevalence of open defecation and

indiscriminate dumping of solid waste (Eteng, 2024; Eteng, Eteng, & Ibor, 2022). This problem is deeply linked to socio-economic status; poverty and low income levels prevent many households from investing in improved toilet facilities, forcing them to rely on shared toilets or open spaces (Eteng, 2024). According to one report, 75% of households in Cross River State use poor sanitary facilities, a statistic that reflects the situation in Ugep (NPC, 2006, as cited in Eteng, 2024). This poor sanitation has direct consequences for public health and environmental quality, particularly through the contamination of water sources (Eteng, Eteng, & Ibor, 2022).

Agriculture remains the backbone of Ugep's economy, with key crops including yam, cassava, palm oil, and rice. However, the need to feed a growing population has led to the adoption of unsustainable farming practices. These include deforestation to create new farmland, shortened fallow periods that deplete soil nutrients, excessive use of chemical fertilizers, and bush burning (Tete, Ogar, & Otu, 2020). Such practices not only contribute to land degradation and soil erosion but also have broader impacts on climate change and biodiversity loss. While agriculture is essential for livelihoods, its current trajectory in the region is often at odds with the principles of environmental sustainability (Tete, Ogar, & Otu, 2020).

There exists a significant tension between the erosion of traditional environmental ethics and the push for modern sustainability solutions. Historically, the Yakurr people maintained a deep reverence for nature, which was embedded in their cultural and spiritual beliefs. This worldview fostered a range of conservation practices. Asuquo, Ewona, and Ikwen (2019) note that in a study carried in Ugep, it was discovered that nature is held in great awe, so sacred places like bushes, streams, objects, animals and creations were not to be tampered with. An abuse constitutes sacrilege and is punishable in diverse ways. Specific examples include the protection of the "kesekpang" fish and the preservation of sacred forests like "Obokupoh Nkankang" and "Illumoh," where indiscriminate felling of trees was forbidden (Asuquo, Ewona, & Ikwen, 2019). These traditional practices functioned as effective, community-enforced environmental regulations.

In contemporary times, new initiatives are emerging to address the environmental crisis. The government established the Ugep Urban Development Authority (UUDA) in 1998 to manage and restore pristine sites (Bassey & Ogar, 2016). At the grassroots level, community organizations like the Royal Pearls Women Group are promoting sustainable agriculture through the revival of "Kojinnoh," a system of reciprocal farm labor. This initiative aims to empower rural women, improve food security, and encourage the planting of climate-resilient crops (CrossRiverWatch, 2024). Furthermore, academics and development practitioners advocate for integrating modern tools like GIS for urban planning, strengthening environmental education, and enforcing regulations to mitigate the impacts of population growth (Andrew et al., 2024; Asuquo, Ewona, & Ikwen, 2019).

A vital component of the Ugep Community that requires urgent intervention is in the area of population health and quite a reasonable level of discovery is noticeable if the community would be saved from unwholesome health challenges. This has to do with pollution and waste disposal. Issues that have very much overwhelmed most urban settlements in the developing countries of the world. A key component that has in a large measure impacted severely on efforts at achieving the targets of the sustainable development goals 2030 is the socio-economic and livelihood status of the inhabitants and its implications for sustainability.

Methodology

This study adopted a descriptive survey research design to examine the relationship between population dynamics and environmental sustainability in Ugep Community, Yakurr Local Government Area of Cross River State, Nigeria. The design was considered appropriate because it enabled the collection of quantitative data on residents' perceptions of population growth and its environmental implications. The target population comprised adult residents of Ugep Community, which has an estimated population of approximately 420,000 people based on recent demographic projections and urban development records (Eteng, 2020). Given the large population size, a sample of 200 respondents was selected for the study. The sample size was considered adequate for generating reliable data and facilitating statistical analysis. A multi-stage sampling technique was employed. First, major residential areas within Ugep were purposively identified based on population concentration and urban development characteristics. Thereafter, respondents were selected through simple random sampling to ensure equal chances of participation.

Data were collected using a structured questionnaire designed to obtain information on population growth, environmental degradation, urbanization pressures, waste management practices, biodiversity conservation, and sustainability strategies. The instrument was validated by experts in Geography and Environmental Sciences, while its reliability was confirmed through a pilot study, which yielded a reliability coefficient of 0.81. Also, the data were analyzed using descriptive statistics, including frequency counts and percentages, to address the research objectives. Analysis of Variance (ANOVA) was employed to test the hypothesis at a 0.05 level of significance. Secondary data were obtained from published literature, government reports, environmental studies, and GIS-based analyses to complement the primary data and provide a broader understanding of population-environment interactions in Ugep.

Results and discussion

Table 1 reveals that the majority of respondents (73.5%) perceived population growth as having either a very high or high impact on environmental sustainability in Ugep. Only 10.5% considered the impact low or very low. This suggests a widespread recognition among residents that increasing population pressure contributes significantly to environmental degradation through increased demand for land, housing, water resources, and waste disposal facilities.

Table 1. Perceived impact of population growth on environmental sustainability

Response	Frequency	Percentage (%)
Very High Impact	82	41.0
High Impact	65	32.5
Moderate Impact	32	16.0
Low Impact	15	7.5
Very Low Impact	6	3.0
Total	200	100.0

Source: Authors' fieldwork, 2026.

The findings indicate that deforestation and habitat loss (29.0%) represent the most prominent environmental challenge associated with population growth in Ugep. Poor waste management (26.0%) ranked second, reflecting increasing waste generation due to urban expansion. Water pollution (19.5%) and soil degradation (15.5%) were also identified as significant concerns. These findings support the assertion that demographic growth exerts substantial pressure on environmental resources.

Table 2. Major environmental problems associated with population growth

Environmental Problem	Frequency	Percentage (%)
Deforestation/Habitat Loss	58	29.0
Poor Waste Management	52	26.0
Water Pollution	39	19.5
Soil Degradation	31	15.5
Biodiversity Loss	20	10.0
Total	200	100.0

Source: Authors' fieldwork, 2026.

Results in Table 3 indicate that rapid urbanization (33.5%) is considered the primary cause of environmental degradation, followed by population increase (27.5%). The combined percentage (61.0%) suggests that population dynamics and urban expansion are the dominant drivers of environmental challenges in Ugep. Poor environmental policies and unsustainable agricultural practices further compound environmental problems.

Table 3. Perceived causes of environmental degradation

Cause	Frequency	Percentage (%)
Rapid Urbanization	67	33.5
Population Increase	55	27.5
Poor Environmental Policies	38	19.0
Unsustainable Farming Practices	25	12.5
Lack of Environmental Awareness	15	7.5
Total	200	100.0

Source: Authors' fieldwork, 2026.

The majority of respondents (30.5%) identified improved urban planning as the most effective strategy for promoting environmental sustainability. Strengthened environmental regulations (24.0%) and environmental education (19.5%) were also highly rated. These findings suggest that respondents believe sustainable environmental management requires both institutional interventions and community participation.

Table 4. Preferred strategies for achieving environmental sustainability

Strategy	Frequency	Percentage (%)
Improved Urban Planning	61	30.5
Strengthening Environmental Regulations	48	24.0
Community Environmental Education	39	19.5
Conservation of Traditional Ecological Knowledge	30	15.0
GIS-Based Environmental Monitoring	22	11.0
Total	200	100.0

Source: Authors' fieldwork, 2026.

The ANOVA result demonstrates a statistically significant relationship between population growth and environmental sustainability in Ugep Community ($F = 8.72$, $p < 0.05$). This finding indicates that increasing population levels significantly influence environmental conditions within the community. The result suggests that population growth contributes to greater pressure on land resources, increased waste generation, loss of vegetation cover, biodiversity decline, and environmental pollution. Since the calculated p-value (0.000) is less than the 0.05 level of significance, the null hypothesis is rejected.

Table 5. One-way ANOVA showing effect of population growth on environmental sustainability

Source of Variation	Sum of Sqs (SS)	df	Mean Square (MS)	F-value	Sig. (p-value)
Between Groups	254.37	4	63.59	8.72	0.000
Within Groups	1421.55	195	7.29		
Total	1675.92	199			

The findings reveal that rapid population growth has significantly contributed to environmental degradation in Ugep through increased pressure on land, water resources, and ecological habitats. This finding agrees with Andrew et al. (2024), who observed that urban expansion in Cross River State has resulted in considerable loss of vegetation cover and increased built-up areas. Similarly, Eteng, E. O. et al. (2025) reported that population increase has been a major driver of spatial transformation and environmental stress in Ugep. The observed decline in biodiversity and pristine habitats corroborates the findings of Bassey and Ogar (2016), who noted that urban encroachment threatens environmentally sensitive areas and accelerates species loss. The fragmentation of sacred forests and stream-buffer ecosystems demonstrates how population pressure undermines ecological sustainability.

The finding supports the argument that rapid urbanization and demographic expansion are major drivers of environmental degradation in developing urban centres. As the population increases, demand for housing, transportation infrastructure, water resources, and agricultural land also rises, often leading to unsustainable exploitation of environmental resources. The result is consistent with previous studies by Eteng (2020), Andrew et al. (2024), and Bassey and Ogar (2016), which reported that population expansion in Ugep has accelerated land-use change, reduced green spaces, and intensified environmental stress. Therefore, effective population management, environmental planning, and sustainable urban development policies are necessary to mitigate the adverse environmental impacts associated with population growth in Ugep Community.

Conclusion

The study established that rapid population growth and urbanization are major drivers of environmental degradation in Ugep Community. Expansion of built-up areas, increasing waste generation, declining biodiversity, and unsustainable agricultural practices have collectively undermined environmental sustainability. The evidence further suggests that weakening traditional conservation institutions has reduced community capacity to protect natural ecosystems. Sustainable environmental management in Ugep therefore requires integrated land-use planning, strengthened environmental governance, improved waste management systems, promotion of traditional ecological knowledge, and the application of GIS technologies for monitoring and decision-making.

Declarations

Ethical statement: The manuscript uses an existing anonymised field dataset and presents results in aggregate form. No personal identifiers are reported.
Funding: No external funding.
Conflict of interest: The authors declare no conflict of interest.
Author contribution: The authors contributed to the entire manuscript writing

References

Andrew, N. R., et al. (2024). Utilizing GIS and Remote Sensing for Efficient Urban Planning and Sustainable Development in Cross River State, Nigeria. Federal Polytechnic Ugep Journal of Innovation and Research (FPUJIR), 1(2), 10-15.

Asuquo, A. B., Ewona, B., & Ikwen, D. (2019). Traditional environmental practices on sustainable development in Yakurr Local Government Area of Cross River State, Nigeria, West Africa. Open Access Global. Retrieved from https://openaccessglobal.com/wp-content/uploads/2021/07/S

Bassey, A. B., & Ogar, D. A. (2016, February 14). Collaborating with Nature: The pristine habitats in Ugep, Yakurr LGA, Nigeria. Scientific Research Publishing. Retrieved from https://file.scirp.org/Html/6-2170140_63494.htm

CrossRiverWatch. (2024, June 8). Women in Cross River receive agricultural seedlings to boost productivity, charged on 'Kojinnoh' practice. Retrieved from https://crossriverwatch.com/2024/06/women-in-cross-river-receive-agricultural-seedlings-to-boost-productivity-charged-on-kojinnoh-practice/

Eteng, E. O., Iwara, A. I., Moses, K. M., & Owalum, S. O. (2025). Spatial development, population dynamics and urban transformation in Ugep, Yakurr LGA, Cross River State, Nigeria (1970-2020). World Environment Journal, 6(1), 122-133. Retrieved from https://www.academia.edu/130450530/

Eteng, E. O., Eni, D. D., Ajake, A. O., & Moses, K. M. (2024). Socio-economic status and access to sanitary facilities in Ugep Urban, Cross River State, South South, Nigeria. World Environment Journal, 4(2), 12-20.

Eteng, E. O., Moses, K. M., Amah, J. E., & Owalum, S. O. (2025). Socio-economic characteristics and waste management in Ugep Community. Journal of Public Administration and Governance Research, 3(2).

Eteng, E. O., Moses, K. M., Amah, J. E., & Owalum, S. O. (2025). Formulating sustainable strategies on post-harvest food losses and food security in Nigeria. Journal of Public Administration and Governance Research, 3(2).

Mindtrip.ai. (n.d.). Ugep, Cross River State. Retrieved November 19, 2025, from https://mindtrip.ai/location/ugep-cross-river-state/ugep/lo-9Z462WDq

Oko, P. E., & Eteng, E. O. (2019). The implications of bush burning on agricultural productivity in Obudu Local Government Area, Cross River State. Journal of Multidisciplinary, 8(1), 114-122.

ResearchGate. (2016, August 5). Evaluation of the size and change patterns of green areas, built-up areas and exurban of Ugep, Cross River State, Nigeria. Retrieved from https://www.researchgate.net/publication/305887878S

Tete, E., Ogar, G. O., & Otu, J. E. (2020). Farmer's background variables and attitude towards sustainable agricultural practices in Ikom Education Zone, Cross River State. The Educational Scope: A Journal of Educational Studies, 5(1).