Factors Influencing Non-Compliance with Zoning and Development Control Regulations in Badagry, Lagos State

FUNMILAYO A. BASHUA¹, OLADIPO A. DARE-ABEL², SAMUEL A. DARAMOLA³, OLUWATOYIN O. AJAYI⁴

^{1,2,3,4} Department of Architecture, College of Environmental Science and Management, Caleb University, Imota, Ikorodu, Lagos, Nigeria

Abstract- This study investigates the factors influencing non-compliance with zoning and development control regulations in Badagry, a rapidly urbanizing peri-urban area in Lagos State, Nigeria. Despite the existence of regulatory frameworks aimed at ensuring orderly urban development, widespread violations persist, particularly in fringe communities. Utilizing a quantitative approach, structured questionnaires were administered to 400 residents across five selected communities: Ibereko, Imeke, Ajara Torikoh, Aradagun, and Ajara Topa. The findings reveal that while there is a moderate level of awareness regarding zoning laws and their implications, this does not consistently translate into barriers compliant behavior. Kev include institutional inefficiencies, such as inadequate government support, lack of technical assistance, and bureaucratic bottlenecks in permit processing. Socioeconomic constraints, particularly the perceived high cost of compliance, further deter residents from adhering to planning regulations. Additionally, inadequate infrastructure, especially poor drainage and road networks, and weak environmental services, such as waste management, contribute to non-compliance. However, cultural beliefs and positive perceptions about the benefits of compliance offer potential leverage points for reform. The study concludes that non-compliance is not rooted in ignorance or defiance, but in structural, economic, and institutional limitations. It recommends a shift from enforcement-centric approaches to participatory, inclusive, and contextsensitive planning strategies to enhance regulatory compliance in peri-urban Nigerian communities.

Indexed Terms- Compliance, Infrastructure, Institutional capacity, Urban planning, Zoning regulations

I. INTRODUCTION

Urbanization across the globe has significantly influenced land use patterns, spatial organization, and infrastructural development (Padon, Iamtrakul & Thanapirom, 2021). In rapidly growing urban centers, especially in developing countries like Nigeria, this growth often outpaces the implementation and enforcement of spatial planning instruments such as development control zoning and regulations (Thompson & George-Ibikiri, 2024). These regulatory frameworks are essential tools for guiding urban development, ensuring orderly land use, protecting environmental quality, and promoting public health and safety (Konyango, Hayombe & Owino, 2021). However, despite the existence of frameworks, widespread non-compliance such continues to be a persistent issue, undermining the goals of sustainable urban development (Tolu-Alalade, Bede, Odukova & Odefadehan, 2025).

In Nigeria, zoning and development control regulations are largely administered by local and state planning authorities under the aegis of the Urban and Regional Planning Law of 1992 (Ogunseye, 2022). These controls are meant to regulate land use types, building forms, densities, and setbacks, among others (McDonald, Aronson, Beatley, Beller, Bazo, Grossinger & Spotswood, 2023). In Lagos State, the most urbanized state in Nigeria, these regulatory frameworks are more crucial than ever, particularly in fast-expanding peri-urban areas such as Badagry.

Badagry, located in the western corridor of Lagos State, is experiencing accelerated urbanization due to improved infrastructure, proximity to the Republic of Benin, and plans for major development projects such as the proposed Badagry Deep Sea Port (Adagun, 2021). These transformations have led to increased pressure on land, heightened demand for housing, and, consequently, widespread violations of planning regulations.

Previous studies on zoning and development control in Nigeria have identified various factors contributing to non-compliance, ranging from institutional weaknesses, corruption, and inadequate monitoring mechanisms to lack of public awareness and economic pressures. Research by Oyesiku (2004), Aluko (2010), and Egbu et al. (2016) emphasizes the interplay between socioeconomic conditions and weak enforcement in driving land use conflicts and regulatory breaches (Adepoju, Audu & Adewoyin, 2024). However, much of the existing literature focuses on core urban centers like Ikeja, Lagos Island, and Ibadan, with limited empirical attention paid to peripheral towns like Badagry. This geographical gap restricts a comprehensive understanding of the nuanced drivers of noncompliance in fringe areas where formal and informal systems often intersect.

This study contributes to the scholarly conversation by investigating the specific factors influencing noncompliance with zoning and development control regulations in five selected communities within Badagry town: Ibereko, Imeke, Ajara Torikoh, Aradagun, and Ajara Topa. The research is guided by the hypothesis that non-compliance is not merely a result of ignorance or defiance but is shaped by a complex interaction of institutional inefficiencies, socioeconomic constraints, and community perceptions of planning authorities.

To gather data, this study employed a quantitative approach through the administration of structured questionnaires to selected residents across the five communities. This method was chosen for its effectiveness in capturing diverse resident perspectives on compliance behaviors, perceived challenges, and attitudes toward planning regulations. Given the low literacy rate and limited access to planning information in these areas, a questionnairebased approach allowed for direct engagement and standardized data collection. The findings from this study reveal significant gaps in awareness, enforcement, and institutional coordination, and point to the need for more community-centered and context-sensitive regulatory practices. This research is not only relevant for policymakers and planning authorities in Lagos State but also contributes to broader discourses on urban governance and planning compliance in rapidly urbanizing African towns.

A roadmap of this paper is as follows: the next section outlines the methods used in the study, followed by the presentation of results in the third section. The fourth section discusses the implications of the findings in the context of existing literature and planning policy. The paper concludes with recommendations for improving compliance through inclusive governance and regulatory reforms.

II. METHODS

This study employed a quantitative research design utilizing structured questionnaires to collect data from residents of five selected communities in Badagry town: Ibereko, Imeke, Ajara Torikoh, Aradagun, and Ajara Topa. Badagry is one of the oldest towns in Lagos State, located in the western part of the state and sharing a border with the Republic of Benin. The selected communities were chosen through purposive sampling. These areas represent a cross-section of peri-urban neighborhoods within Badagry that have experienced significant residential expansion in recent years, alongside observable instances of non-compliance with zoning regulations such as unauthorized land use conversions and building setbacks violations.

The questionnaire was designed in English and structured to capture Demographic Information, Compliance Behavior, and Barriers to Compliance. The questions included multiple-choice, Likert-scale, and open-ended items. Each questionnaire was administered to one adult household member per selected household, specifically someone with knowledge of the building's construction history or ownership status, as this ensured informed responses related to zoning and development control compliance. The sample size for the study was determined using Yamane's (1967) formula for calculating sample size from a finite population:

$$n = \frac{N}{1 + Ne^2}$$

Where: n = sample size, N = population size, e = level of precision (assumed at 0.05 for 95% confidence level)

Using a total estimated population of 69,326 across the five selected communities, a sample size of 400 respondents was determined. The sample was then proportionally allocated to each community based on its population size to ensure fair representation. Table 1 shows the population distribution and the proportional sample size drawn from each area.

Table 1: Population and Sample Size by Community

1		1 0
Area	Population	Proportional Sample
		Size
Ibereko	14,000	81
Imeke	12,500	72
Ajara	15,000	87
Torikoh		
Aradagun	14,300	82
Ajara	13,526	78
Тора		
Total	69,326	400

Source: Author's Fieldwork (2025)

The completed questionnaires were reviewed for consistency and completeness before being coded for analysis. Data entry and analysis were conducted using IBM SPSS Statistics Version 26. Participation in the study was entirely voluntary. Anonymity and confidentiality of responses were assured, and respondents were informed that they could withdraw from the survey at any point without any consequences. While the questionnaire-based approach allowed for structured and comparable data, it had limitations, such as reliance on self-reported behaviors which may be influenced by social desirability bias. Furthermore, the absence of geospatial verification limited the ability to crosscheck compliance behaviors with physical development data.

III. RESULTS

Table 2: Questionnaire Response Rate

· · · · · · · · · · · · · · · · · · ·		1	
Questionnaires	Frequency	Percentage	
		(%)	
Number Filled	313	77.25%	
Number Not	87	21.75%	
Filled			
Total	400	100%	
	11 1 (2025)	1	

Source: Author's fieldwork (2025)

The questionnaires were administered to the participants (building owners in different parts of Badagry, Lagos state). Three hundred and thirteen (313) responses were collected and compiled, which ensured an approximately 22% response rate.

Table 3: Mean scores analysis of the Factors Influencing Compliance

S/N		SA	А	Ν	D	SD	Х
1	I have participated in community meetings related to planning and development.	18	50	76	92	77	2.26
2	I am aware of regular inspections and penalties imposed for non-compliance.	38	67	111	79	18	2.76
3	I am aware of the zoning and development control guidelines.	34	60	127	83	9	2.73
4	The building permit	11	48	129	109	16	2.39

© JUN 2025 | IRE Journals | Volume 8 Issue 12 | ISSN: 2456-8880

	processing system is efficient and transparent.							
5	The cost of compliance with zoning guidelines is affordable.	6	36	92	127	52	2.08	
6	My neighbors and community members generally comply with zoning guidelines.	6	52	133	104	18	2.36	
7	I have easy access to information about zoning and development control guidelines.	13	40	134	110	16	2.37	
8	The government provides adequate support and resources for compliance.	5	20	86	116	86	1.86	
9	I am knowledgeable about the legal consequences of non-compliance.	36	49	121	91	16	2.66	
10	I have access to technical assistance for compliance with zoning guidelines.	6	29	90	140	48	2.03	
11	My cultural beliefs and values support compliance with zoning guidelines.	58	113	102	33	7	3.19	
12	I believe that complying with zoning guidelines has clear benefits.	101	94	76	34	8	3.43	
Grand	Grand mean							

Source: Author's Fieldwork (2025)

Respondents showed the highest level of agreement with the statement "I believe that complying with zoning guidelines has clear benefits", which recorded a mean score of 3.43, indicating general agreement and a positive perception of the usefulness of compliance. Similarly, "My cultural beliefs and values support compliance with zoning guidelines" had a relatively high mean of 3.19, suggesting that cultural norms and values are moderately supportive of compliance behavior in the study area. Awarenessrelated factors such as "I am aware of regular inspections and penalties imposed for noncompliance" (2.76), "I am aware of the zoning and development control guidelines" (2.73), and "I am knowledgeable about the legal consequences of noncompliance" (2.66) all scored above the grand mean, implying that a significant portion of respondents have a fair level of awareness of planning regulations and their implications.

In contrast, statements such as "The government provides adequate support and resources for compliance" (1.86) and "I have access to technical assistance for compliance with zoning guidelines" (2.03) had the lowest mean scores, indicating general disagreement and pointing to institutional shortcomings in providing support and guidance for compliance. Other factors such as "The cost of compliance with zoning guidelines is affordable" (2.08), "My neighbors and community members generally comply with zoning guidelines" (2.36), and

© JUN 2025 | IRE Journals | Volume 8 Issue 12 | ISSN: 2456-8880

"I have easy access to information about zoning and development control guidelines" (2.37) also fell below the grand mean, highlighting economic and informational barriers that may hinder compliance efforts. The factor "The building permit processing system is efficient and transparent" scored 2.39, indicating a perception that bureaucratic inefficiencies may contribute to non-compliance. Participation and engagement were relatively low, with "I have participated in community meetings related to planning and development" receiving a mean score of 2.26, suggesting limited civic involvement in planning matters.

S/N		SA	А	Ν	D	SD	Х
1	The road network in my area is adequate and compliant with development control guidelines.	10	59	139	93	12	2.48
2	The drainage system in my area is effective and compliant with guidelines.	2	35	132	133	11	2.20
3	Public services such as schools, healthcare facilities, and recreational spaces are available and adequate in my area.	20	82	134	66	11	2.72
Gran	d mean	-	•	•	•		2.47
SA: S	Strongly agree, A: Agree, N: Ne	eutral, D: Di	isagree, SE): Strongly di	sagree, X: M	ean	

Source: Author's Fieldwork (2025)

Respondents showed the highest level of agreement with the statement "Public services such as schools, healthcare facilities, and recreational spaces are available and adequate in my area", which recorded a mean score of 2.72, slightly above the grand mean of 2.47, indicating moderate agreement and a relatively positive perception of access to basic public services. The statement "The road network in my area is adequate and compliant with development control guidelines" had a mean score of 2.48, almost equal to the grand mean, reflecting a neutral to slightly disagreeing view about road adequacy and compliance in the communities. The lowest-rated factor was "The drainage system in my area is effective and compliant with guidelines", which scored 2.20, indicating general disagreement and a perception of poor drainage infrastructure in the study area.

Table 5: A	Analysis	of the	Environmental	Factors
------------	----------	--------	---------------	---------

S/N		SA	А	Ν	D	SD	Х
1	Development in my area adheres to guidelines for protecting ecologically sensitive areas.		83	162	52	9	2.66
2	Waste management practices	5	42	170	87	9	2.40

© JUN 2025 | IRE Journals | Volume 8 Issue 12 | ISSN: 2456-8880

	in my area comply with waste disposal regulations.						
3	My building includes energy- efficient features in its design.	24	64	169	52	4	2.75
Grand mean							2.60
SA: St	SA: Strongly agree, A: Agree, N: Neutral, D: Disagree, SD: Strongly disagree, X: Mean						

Source: Author's Fieldwork (2025)

The factor with the highest level of agreement was "My building includes energy-efficient features in its design", which recorded a mean score of 2.75, above the grand mean of 2.60. This suggests a moderate acknowledgment among respondents of incorporating some energy-efficient elements in their buildings. The statement "Development in my area adheres to guidelines for protecting ecologically sensitive areas" had a mean score of 2.66, also slightly above the grand mean, indicating a fair level of perceived compliance with environmental protection measures related to land development. Conversely, the factor "Waste management practices in my area comply with waste disposal regulations" had the lowest mean score of 2.40, suggesting a general perception of noncompliance or ineffective waste management practices in the study area.

IV. DISCUSSION

The results of this study provide significant insights into the multifaceted factors influencing noncompliance with zoning and development control regulations in Badagry, Lagos State. When compared with existing research, the results reflect both common patterns and context-specific deviations, especially as they pertain to peri-urban areas where formal planning systems encounter informal urbanization dynamics.

A. Institutional Awareness and Perception

One of the most striking outcomes of the analysis was the relatively high mean scores recorded for awareness-related factors such as knowledge of zoning guidelines (2.73), awareness of inspections and penalties (2.76), and knowledge of legal consequences (2.66). These findings suggest that many residents are not completely uninformed about planning regulations. This contrasts with earlier assumptions in studies like Konadu, Takyi, Amponsah, Senior & Liwur (2025) and Asomaniwaa (2022), which emphasized ignorance as a dominant cause of non-compliance. However, these studies primarily focused on urban centers, whereas the Badagry context reveals that awareness does not necessarily translate to compliance, particularly when institutional weaknesses persist. Indeed, institutional shortcomings were strongly evident in the responses. Factors such as government support (1.86), access to technical assistance (2.03), and permit processing efficiency (2.39) all recorded below-average mean scores. These align with the observations of Frimpong, Watson, Amoako, Grooms, Osei, Osei & Appiah (2022), who highlighted the role of bureaucratic inefficiencies and corruption in weakening compliance efforts. The inadequacy of institutional support undermines residents' willingness or ability to follow the rules, regardless of their awareness.

B. Socioeconomic and Cultural Influences

Economic constraints emerged as another critical barrier to compliance. The perception that compliance is unaffordable (mean score of 2.08) reflects findings from Shah, Mulliner, Singh & Ahuja (2022) and Jimmy & Lombard (2024), who argued that high costs associated with formal approvals and construction standards deter low- and middle-income residents from engaging with the planning system. This financial burden is compounded by the low score for community participation (2.26), suggesting a disconnection between residents and decisionmaking processes, a theme consistent with UN-Habitat recommendations for more inclusive planning frameworks. Interestingly, cultural beliefs and perceived benefits of compliance recorded the highest mean scores (3.19 and 3.43, respectively).

These findings offer a hopeful perspective, while institutional and economic barriers exist, the intrinsic value residents place on orderly development remains. This is supported by Banso, Coker, Uzougbo & Bakare (2023), who argue that long-term sustainable development must leverage local values and perceptions as part of regulatory design and implementation.

C. Physical and Infrastructure Conditions

The study also revealed gaps in infrastructure provision, particularly in drainage systems, which scored a low mean of 2.20. This corroborates findings by Okereke, Okanya, Okereke, Umar, Yakubu, Ezugwu & Kontei (2024), who described inadequate infrastructure in Lagos' peripheries as both a symptom and a cause of regulatory noncompliance. Where basic services are lacking, residents are often compelled to self-develop without regard for existing guidelines. While access to public services like healthcare and schools (2.72) was rated slightly above average, road and drainage systems lagged, indicating an uneven development landscape that complicates compliance efforts.

D. Environmental Considerations

Environmental compliance presented a mixed outlook. Energy-efficient building practices (2.75) and adherence to protection of ecologically sensitive areas (2.66) had moderately positive responses, suggesting that there is a baseline of environmentally conscious behavior among residents. However, waste management (2.40) remains a challenge, consistent with the findings of Amos, Abiodun, Olalekan, Tolulope & Opeodu (2024) and Kugbayi & Adegbami (2024), who noted the inefficiency of waste disposal systems in Lagos' suburban regions. Non-compliance in this domain reflects both systemic gaps and limited environmental education.

E. Implications and Contributions

These findings highlight that non-compliance in Badagry is less about deliberate defiance and more a result of structural deficiencies, economic realities, and institutional disconnects. The study supports the argument advanced by scholars like Cobbinah & Finn (2023), who contend that conventional planning models often fail in African contexts due to their failure to adapt to local social and economic conditions. This research adds empirical depth to the existing body of knowledge by providing a nuanced, community-based perspective from a peri-urban locality in Nigeria, a context often underrepresented in planning literature. It also underscores the importance of integrating resident awareness, infrastructural investment, and administrative reform in future zoning and development control strategies.

CONCLUSION

This study set out to investigate the key factors influencing non-compliance with zoning and development control regulations in five selected communities within Badagry, Lagos State. Using a structured questionnaire distributed among adult residents with knowledge of local development activities, the research identified a complex interplay of institutional, socio-economic, infrastructural, and environmental factors affecting regulatory adherence. The findings revealed that although there is a fair level of awareness among residents regarding zoning laws, development control guidelines, and legal consequences for non-compliance, this awareness does not consistently lead to actual compliance. Institutional deficiencies, such as the lack of adequate government support, technical assistance, and efficient permit processing systems, emerged as barriers. Socioeconomic significant factors. especially the affordability of compliance and perceived bureaucratic difficulties, further discourage adherence to planning regulations. Physical and infrastructural conditions, particularly poor drainage systems and marginally acceptable road networks, also contribute to patterns of non-compliance, reinforcing the argument that inadequate service delivery can weaken the legitimacy of development control efforts. Environmental compliance was moderately observed, with some positive attitudes toward energy-efficient building practices, but waste management remains a weak link. This study contributes to the broader discourse on urban governance by highlighting that non-compliance in peri-urban contexts like Badagry is often not due to defiance, but rather a reflection of systemic, economic, and institutional challenges. Planning frameworks must therefore move beyond enforcement-centric approaches to more participatory and context-sensitive models.

Future research could expand to other peri-urban and metropolitan zones in Lagos or neighboring states to allow for comparative analysis of compliance patterns. Investigating the effectiveness of digital permitting systems, participatory planning processes, or community-led monitoring could provide practical strategies for improving enforcement and community engagement. Additionally, assessing the role of informal land market dynamics and traditional land authorities would shed more light on grassroots planning realities in rapidly urbanizing areas. Based on the findings of this study, the following recommendations are proposed:

- i. Strengthen Institutional Capacity: Planning agencies should improve service delivery, streamline permit processing, and offer accessible technical support to residents seeking compliance.
- ii. Subsidize Compliance Costs: Government should consider targeted subsidies or flexible payment options to reduce the financial burden of compliance on low-income residents.
- Promote Civic Engagement: Community meetings, awareness campaigns, and participatory planning workshops should be institutionalized to increase local involvement in development decisions.
- iv. Enhance Infrastructure Provision: Investments in road networks, drainage systems, and public services must be prioritized to align physical development with regulatory expectations.
- v. Integrate Environmental Oversight: Waste management enforcement and incentives for green building practices should be embedded into development control policies.

REFERENCES

- ADAGUN, R. O. (2021). URBAN MIGRATION AND INFRASTRUCTURAL DEVELOPMENT IN LAGOS METROPOLIS, 1899-1999 (Doctoral dissertation).
- [2] Adepoju, O. S., Audu, H. A., & Adewoyin, I. B. (2024). Land Reforms and Resource-Based Conflicts Management: A Case Study of Lagos and Ogun States, Nigeria. *International Journal* of Environmental Design and Construction Management.

- [3] Amos, O. O., Abiodun, O. A., Olalekan, O. E., Tolulope, O., & Opeodu, A. A. (2024). Evaluating urban service delivery in Lagos State Nigeria: A bid to enhance sustainable waste management. *Discovery*, 60, e7d1405.
- [4] Asomaniwaa, E. (2022). House owners' adherence to the laws regulating Ghana's housing plan and design in the Gomoa East District (Doctoral dissertation, University of Education, Winneba).
- [5] Banso, A. A., Coker, J. O., Uzougbo, N. S., & Bakare, S. S. (2023). The nexus of law and sustainable development in south west Nigerian public policy: A review of multidisciplinary approaches in policy formation. *International Journal of Applied Research in Social Sciences*, 5(8), 308-329.
- [6] Bashua F. A. (2025). Assessment of Compliance of Residential Building Developments to Zoning and Development Control Guidelines in the Badagry Master Plan, Lagos State, Nigeria (Unpublished Doctoral dissertation, Caleb University, Lagos).
- [7] Cobbinah, P. B., & Finn, B. M. (2023).
 Planning and climate change in African cities: Informal urbanization and 'just'urban transformations. *Journal of planning literature*, 38(3), 361-379.
- [8] Frimpong Boamah, E., Watson, V., Amoako, C., Grooms, W., Osei, D., Osei Kwadwo, V., ... & Appiah, G. K. (2022). Planning corruption or corrupting planning? A Sub-Saharan Africa perspective. *Journal of the American Planning Association*, 88(3), 377-391.
- [9] Jimmy, E. N., & Lombard, M. (2024). Entangled Rationalities: Planning Responses to Informal Housing Practices Within Middle-Income Neighbourhoods in Nairobi City, Kenya. *Planning Theory & Practice*, 25(3), 299-320.
- [10] Konadu, A., Takyi, S. A., Amponsah, O., Senior, A. Y., & Liwur, S. B. (2025). Noncompliance with planning regulations and their implication for the achievement of the sustainable development goals: insights from physical planners in the Ashanti Region of Ghana. SN Social Sciences, 5(4), 44.

- [11] Konyango, C. O., Hayombe, P. O., & Owino, F. O. (2021). Effectiveness of planning tools in managing the spatial stability of peri-urban areas.
- [12] Kugbayi, O., & Adegbami, A. (2024). Publicprivate partnership and urban solid waste management: a case study of Lagos State, Nigeria. *International Journal of Environment* and Waste Management, 35(1), 117-130.
- [13] McDonald, R. I., Aronson, M. F., Beatley, T., Beller, E., Bazo, M., Grossinger, R., ... & Spotswood, E. (2023). Denser and greener cities: Green interventions to achieve both urban density and nature. *People and Nature*, 5(1), 84-102.
- [14] Ogunseye, N. O. (2022). Property Developers' Experiences with the Planning Approval Process in Ogun and Oyo States of Nigeria: A Comparative Analysis. *Nakhara: Journal of Environmental Design and Planning*, 21(3), 225-225.
- [15] Okereke, G. K. O., Okanya, V. A., Okereke Joy, A., Umar, L., Yakubu, A., Ezugwu, C., & Kontei, E. (2024). EFFECT OF CONTRAVENTIONS OF BUILDING REGULATIONS AND INFORMAL LAND SUBDIVISION ON THE QUALITY OF BUILT ENVIRONMENT IN ENUGU STATE, NIGERIA.
- [16] Padon, A., Iamtrakul, P., & Thanapirom, C. (2021, April). The study of urbanization effect on the land use changes and urban infrastructures development in the Metropolitan Areas, Thailand. In *IOP conference series: earth and environmental science* (Vol. 738, No. 1, p. 012077). IOP Publishing.
- [17] Shah, M. N., Mulliner, E., Singh, T. P., & Ahuja, A. K. (2022). Critical success factors for affordable housing: evidence from lower-middle income and high-income economies. *Journal of Surveying, Construction and Property*, 13(1), 1-19.
- [18] Thompson, J. E., & George-Ibikiri, S. (2024). Evaluation of challenges in the enforcement of planning and development laws in land development in Nigeria. Unizik Law Journal, 20(1).

[19] Tolu-Alalade, J. O., Bede, G. C., Odukoya, O. F., & Odefadehan, C. (2025). A Study on Compliance Rates of Landowners with Building Regulations and Plan Approval Procedures in Imota, Ikorodu. *African Journal of Environmental Sciences and Renewable Energy*, 19(1), 76-93.