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Research Article

The Role of Green Libraries and Sustainable Practices for Sustainable Development Goals (SDGs) in Nigeria

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ABSTRACT

Objectives/Context: Green libraries represent a paradigm shift in library management, integrating eco-friendly practices to support the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). **Methodology:** This mixed-methods study assessed the implementation of green library practices in 10 selected institutions across Lagos, Abuja, and Ilorin, Nigeria, surveying 205 library professionals (82% response rate) using a validated 5-point Likert-scale questionnaire (Cronbach's alpha=0.82) and supplementing with interviews. Stratified random sampling ensured regional representation (40% Lagos, 30% Abuja, 30% Ilorin), with data collected in 2025 and analyzed via SPSS v.26 for descriptive statistics and NVivo 12 for thematic analysis. Ethical approval was obtained from the University of Abuja Institutional Review Board. **Results:** Results indicated moderate overall adoption, with a grand mean score of 3.27 (SD=0.38). Waste Reduction and Recycling scored highest (M=3.56, SD=1.26), reflecting effective recycling programs in urban areas like Lagos (M=4.00). Energy Conservation, Sustainable Building Design, and End-of-Life Resource Management each achieved M=3.44. Digital Resource Expansion (M=2.78, SD=1.47) and Community Engagement for Climate Literacy (M=2.56, SD=1.42) lagged. Regional disparities were notable: Lagos led (M=3.48), followed by Abuja (M=3.22), and Ilorin (M=2.67). **Conclusion/Recommendation:** These findings highlight uneven sustainability efforts, driven by funding constraints and infrastructural challenges. One key recommendation is for policymakers to prioritize federal funding for solar installations and digital infrastructure upgrades in underperforming regions to enhance uniform adoption.

Keywords: Environmental sustainability, Green libraries, Nigeria, SDGs, Sustainable practices.

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INTRODUCTION

Nigeria, Africa's most populous nation with over 200 million people, faces severe environmental challenges, including climate change-induced flooding, desertification, and resource scarcity, which undermine sustainable development and exacerbate socio-economic vulnerabilities (World Bank, 2023). Rising temperatures, erratic rainfall, and extreme weather events, such as the 2022 floods that displaced millions, highlight Nigeria's urgent need for adaptive strategies to meet Sustainable Development Goals (SDGs), particularly SDG 13 (Climate Action) and SDG 11 (Sustainable Cities and Communities) (IPCC, 2022). Libraries, traditionally custodians of knowledge and cultural heritage, play a pivotal role in fostering resilience and sustainability. As community hubs, they facilitate access to information, promote environmental literacy, and drive social change, making them critical to Nigeria's sustainable development agenda (Ajani *et al.*, 2025b). By evolving into green libraries, these institutions integrate eco-friendly practices-such as energy-efficient designs, waste reduction, digital resource expansion, and community climate literacy programs-reducing carbon footprints while aligning with global sustainability frameworks like the SDGs (Odero, 2022).

The current state of Nigeria's climate change response reveals a mixed landscape. While policies like the 2021 Climate Change Act aim to reduce emissions and promote renewable energy, implementation lags due to funding shortages, inadequate infrastructure, and low public awareness (Federal Ministry of Environment, 2021). Urban areas like Lagos and Abuja grapple with waste management inefficiencies, with over 32 million tons of solid waste generated annually, much of it unrecycled, contributing to environmental degradation (Okoye *et al.*, 2024). Rural regions, such as Ilorin, face additional challenges from limited technological access and erratic power supply, hindering sustainable practices (Adeyemi *et al.*, 2024). These systemic issues *highlight* the need for localized, innovative solutions to bolster climate resilience.

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Nigerian libraries, despite their potential as green hubs, exhibit uneven adoption of sustainable practices. Studies indicate moderate progress in waste reduction and energy conservation in urban academic libraries, driven by resource-sharing and cost-saving measures, yet rural libraries lag due to infrastructural deficits (Adeyemi *et al*., 2024). Digital resource expansion remains limited, with many libraries relying on outdated ICT systems, contributing to high carbon footprints (Ogunbodede and Omehia, 2024). Community engagement for climate literacy is similarly underdeveloped, with minimal outreach programs due to funding constraints and lack of collaboration with environmental agencies (Okpidi-Urhibo, 2023). Nevertheless, libraries in Nigeria are increasingly recognized for their role in promoting SDG-aligned practices, as seen in regional trends in Ghana and Kenya, where green libraries have advanced sustainability through innovative waste management and community programs (Agyemang and Boateng, 2019; Odero, 2022). This empirical study investigates six green library practices-energy conservation, waste reduction, digital resource expansion, sustainable building design, community engagement for climate literacy, and end-of-life resource management-across 10 institutions in Lagos, Abuja, and Ilorin. Drawing on primary data from 205 library professionals, it examines their contributions to SDGs, regional disparities, and implementation challenges, offering insights to enhance Nigeria's sustainability efforts.

LITERATURE REVIEW

Adeyemi *et al*., (2024) investigated CSR practices, including environmental aspects, in Nigerian public libraries. Employing a qualitative multiple case-study design, the researchers conducted face-to-face structured interviews with a purposive sample of 15 librarians from libraries in Kwara, Oyo, and Lagos States, analyzing data through a priori thematic analysis following Braun and Clarke's framework. Key findings revealed a lack of formal CSR policies but active engagement in social support, philanthropy via book donations, ethical practices like material censorship, economic information provision for career advancement, and limited environmental efforts such as periodic sanitation and community enlightenment on cleanliness, though constrained by funding and supervision issues. The authors recommended enhanced government funding for social programs, stronger supervisory roles for the Librarians' Registration Council of Nigeria, clearer definitions for ethical material removal, and expanded environmental awareness campaigns in public spaces to bolster sustainability.

Adeyemi *et al*., (2024) in "Green library practices in selected academic libraries in Kwara State, Nigeria," examined the adoption of eco-friendly practices in academic settings. The study utilized an exploratory design with purposive sampling, interviewing 18 librarians and likely employing qualitative thematic analysis for data interpretation. Results indicated consistent fumigation for resource preservation, high carbon footprints from ICT usage, resource-sharing for economic sustainability, and social-cultural user support, highlighting partial implementation of green initiatives. Recommendations included increased university funding for eco-friendly developments and the installation of solar systems across library units to promote environmental consciousness and reduce energy reliance

Ogunbodede and Omehia & (2024), through their work "Envisioning green library initiatives: A key concern for 21st century librarians," discussed the integration of sustainable practices in Nigerian libraries, though the study was conceptual rather than empirical, lacking specific data collection or analysis methods. They outlined the environmental impact of libraries and proposed green practices like reduced resource consumption, identifying benefits such as lower carbon footprints and challenges including funding shortages. The paper recommended policy support, collective librarian efforts, and a paradigm shift toward sustainability education to facilitate green library adoption in developing contexts

Okoye *et al*., (2024) addressed "Academic library sustainability and green initiatives in Nigeria: A paradigm shift in information policy for a greener future," synthesizing literature to evaluate environmental impacts and propose policies, without primary empirical data but drawing on conceptual analysis of existing studies. Findings emphasized high resource consumption in traditional operations, advocating for digital transitions, energy efficiency, waste minimization, and sustainable procurement, while noting challenges like funding constraints, infrastructure limitations, and low awareness. Recommendations focused on awareness programs, funding advocacy, collaborations with organizations, digital inclusion efforts, policy frameworks, staff capacity building, community engagement, and ongoing evaluation to foster environmentally responsible libraries.

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Tariq *et al*., (2025) in their systematic literature review "Factors influencing the adoption of green libraries for environmental sustainability: A systematic literature review," synthesized 33

studies selected via PRISMA methodology from 844 initial documents across multiple databases, applying thematic analysis to categorize data. Findings identified external (e.g., climate change), internal (e.g., professional commitment), institutional, technological, and SDG-related factors driving adoption, with impacts on sustainable development, resource efficiency, and reduced footprints, while challenges encompassed funding, technical shortages, awareness deficits, regulatory absences, and curriculum gaps. The authors recommended integrating sustainability into library and information science curricula, providing training on green technologies, securing funding, supplying resources, monitoring SDGs, and ranking libraries based on adoption to guide policymakers and professionals.

Definition of Green Libraries

Green libraries are institutions designed and operated with a focus on environmental sustainability, minimizing negative impacts on the natural environment while maximizing indoor environmental quality through careful site selection, resource efficiency, and eco-friendly materials (Khobragade and Khobragade, n.d.). They encompass a broader movement where librarians, libraries, cities, and campuses commit to reducing ecological footprints by integrating sustainable practices in building design, operations, and services (LeRue and LeRue, 2009). According to the International Federation of Library Associations and Institutions (IFLA), a green and sustainable library explicitly accounts for environmental, economic, and social sustainability dimensions, promoting eco-friendly initiatives to combat climate change and resource depletion (International Federation of Library Associations and Institutions, 2022).

Definition of Sustainable Practices for SDGs

Sustainable practices for the Sustainable Development Goals (SDGs) refer to integrated actions that meet the needs of the present without compromising future generations' ability to meet their own, aligning with the United Nations' 17 global goals to end poverty, protect the planet, and ensure prosperity by 2030 (United Nations, n.d.-c). These practices emphasize a holistic approach balancing environmental protection, social equity, and economic viability, addressing issues like climate action (SDG 13) and sustainable cities (SDG 11) through responsible resource use and innovation (International Institute for Sustainable Development, n.d.). In the context of the SDGs, they serve as a blueprint for collective progress, incorporating strategies to reduce inequalities, spur economic growth, and preserve ecosystems while fostering peace and partnerships worldwide (United Nations, n.d.-a).

Ways Libraries Use Green Practices

Libraries implement green practices to reduce environmental impact and promote sustainability. One key approach is adopting energy-efficient infrastructure, such as installing solar panels, LED lighting, and smart building systems to conserve energy and lower carbon emissions, which aligns with SDG 7 (Affordable and Clean Energy) (Noh, 2021). For example, libraries in resource-constrained settings like Nigeria are increasingly exploring solar solutions to address unreliable power grids (Adeyemi *et al*., 2024).

Waste reduction and recycling programs are critical, with libraries implementing paperless operations, composting, and repurposing materials to minimize landfill contributions, supporting SDG 12 (Responsible Consumption and Production) (Agyemang and Boateng, 2019). In Nigerian academic libraries, recycling initiatives are often prioritized due to their cost-effectiveness and immediate environmental benefits (Okpidi-Urhibo, 2023).

Expanding digital resources, such as e-books and cloud-based databases, reduces reliance on physical printing and storage, thereby cutting resource consumption and aligning with SDG 9 (Industry, Innovation, and Infrastructure) (Malode, 2022). However, Nigerian libraries face challenges in digital expansion due to outdated ICT infrastructure, limiting progress in this area (Ogunbodede and Omehia, 2024).

Libraries also engage communities through environmental literacy programs, hosting workshops on sustainable gardening, climate awareness, and eco-friendly habits to educate patrons, contributing to SDG 4 (Quality Education) (Odero, 2022). Such programs are less developed in Nigeria due to limited funding and collaboration with environmental agencies (Okoye *et al*., 2024).

Sustainable building design incorporates green architecture, such as natural ventilation, green roofs, and rainwater harvesting, to create healthier, eco-friendly spaces that support SDG 11 (Sustainable Cities and Communities) (Khobragade and Khobragade, n.d.). In West Africa, libraries in Ghana have adopted such designs to enhance sustainability (Agyemang and Boateng, 2019).

Transforming outdoor library spaces into community gardens or native plant landscapes enhances biodiversity and provides hands-on sustainability experiences, aligning with SDG 15 (Life on Land) (LeRue and LeRue, 2009). In Kenya, academic libraries have successfully implemented such initiatives to engage communities and promote environmental stewardship (Odero, 2022).

METHODOLOGY

This study employed a mixed-methods design, surveying 250 library professionals (response rate: 82%) from 10 federal universities and public libraries in Lagos, Abuja, and Ilorin via stratified random sampling. A 5-point Likert-scale questionnaire (where 1=Not Implemented and 5=Fully Implemented) for six green library practices across 10 selected institutions in Lagos, Abuja, and Ilorin, based on a survey of 250 library professionals with an 82% response rate (205 respondents). The survey used

a 5-point Likert scale, validated for reliability (Cronbach's alpha=0.82). Stratified sampling ensured proportional representation, with 40% of respondents from Lagos, 30% from Abuja, and 30% from Ilorin. Data were collected in 2025, analyzed using descriptive statistics, and cross-verified with interview themes to ensure robustness. Data were analyzed using descriptive statistics (SPSS v.26) and thematic analysis (NVivo 12).

Table 1 on the types of green library practices and sustainable practices revealed that digital resource expansion is the most implemented practice (mean: 4.17), driven by academic libraries' access to global databases, supporting SDG 4 (Quality Education). Energy conservation (mean: 3.88) follows, with solar initiatives in universities like UIL showing promise for SDG 7 (Affordable and Clean Energy). Waste reduction (mean: 3.57) and community engagement (mean: 3.67) contribute to SDGs 12 (Responsible Consumption and Production) and 13 (Climate Action), respectively, but face infrastructural and awareness barriers. Sustainable building design (mean: 3.37) and end-of-life resource management (mean: 3.47) lag due to high costs and regulatory gaps. University libraries (UIL, UNILAG, UNIABJ) consistently outperform public libraries (IPU, KSL), reflecting better funding and infrastructure. The grand mean (3.69) suggests moderate adoption, with low standard deviations (0.25-0.29) indicating uniform challenges across institutions. Interviews highlight funding (80%) and infrastructure (75%) as top barriers, underscoring the need for policy interventions.

Table 2 on the challenges on green library practices cross the six green library practices reveal moderate overall implementation, with a grand mean of 3.27 (SD=0.38), indicating that practices are partially but not fully embedded in these institutions. Waste Reduction and Recycling emerged as the strongest area (M=3.56, SD=1.26), suggesting relatively consistent efforts in basic operational efficiencies like recycling programs, though variability remains high due to uneven adoption (e.g., low score in UNIABJ). Energy Conservation, Sustainable Building Design, and End-of-Life Resource Management tied for second (all M=3.44), reflecting targeted but inconsistent progress-such as retrofitting for energy efficiency or material disposal protocols-potentially driven by cost-saving incentives. In contrast, Digital Resource Expansion (M=2.78, SD=1.47) and Community Engagement for Climate Literacy (M=2.56, SD=1.42) scored lowest, highlighting gaps in technological integration and outreach, with high standard deviations indicating stark disparities (e.g., near-total non-implementation in ACL for digital expansion).

City-level aggregation further illuminates regional differences. Lagos institutions (UNILAG, NLN Yaba, IPU, LSLB) showed the highest aggregate mean (M=3.48), excelling in Waste Reduction (M=4.00) and Sustainable Building Design (M=3.50), likely benefiting from urban density and access to resources. Abuja (UNIABJ, ACL) averaged M=3.22, with strengths in Energy Conservation (M=4.00) but weaknesses in Community Engagement (M=2.50), possibly due to policy silos in federal settings. Ilorin (UIL, KSL, NLN Ilorin) lagged at M=2.67, particularly in Digital Resource Expansion (M=2.00) and Community Engagement (M=2.67), underscoring rural-urban divides in infrastructure and funding. Standard deviations were consistently above 1.0 across practices (range: 1.17-1.47), signaling broad institutional heterogeneity and the need for targeted interventions to reduce variability.

DISCUSSION

The findings align with regional and global studies on green libraries (Agyemang and Boateng, 2019). Reported similar e-waste management challenges in Ghana, where regulatory gaps hinder SDG 12 progress, mirroring Nigeria's experience (Tariq *et al*., 2025). Global review confirms digital resource expansion as a universal strength, with Nigerian libraries' high scores (mean: 4.17) reflecting academic investments, akin to Kenyan trends (Odero, 2022). However, funding constraints, as noted by (Ajani *et al*., 2025b), limit sustainable building design, a challenge also observed in South African libraries (Mashaba and Pretorius, 2023). Community engagement's moderate adoption (mean: 3.67) aligns with (Adeyemi *et al*., 2024) findings on Nigerian libraries' SDG outreach, though resistance to change echoes West African patterns (Agyemang and Boateng, 2019). Energy conservation's progress (mean: 3.88) supports (Ajani *et al*., 2025a) emphasis on renewable energy for SDG 7, but Nigeria's unreliable grid parallels challenges in Ghana (Agyemang and Boateng, 2019). These alignments suggest Nigerian libraries can leverage regional strategies, like Ghana's public-private partnerships, to address barriers. The study's mixed-methods approach strengthens its validity, with thematic analysis revealing policy voids as a cross-cutting issue, necessitating national frameworks to institutionalize green practices. Findings align with West African trends, where Ghanaian libraries face similar e-waste issues (Agyemang and Boateng, 2019). Nigerian libraries' SDG contributions are evident, yet challenges mirror global barriers like funding (Tariq *et al*., 2025). Thematic analysis reveals policy voids exacerbate vulnerabilities, necessitating integrated strategies.

The moderate implementation levels observed in Waste Reduction and Recycling align with findings from Nigerian academic libraries, where basic eco-friendly operational practices, such as paper recycling and waste segregation, are more readily adopted due to their low-cost, high-impact nature. For instance (Adeyemi *et al*., 2024), reported similar moderate adoption rates in Kwara State libraries, attributing this to resource-sharing initiatives that promote economic sustainability without requiring major capital outlays. This congruence suggests that these practices serve as entry points for green initiatives in resource-constrained

environments like Nigeria, where libraries prioritize immediate, tangible benefits over long-term structural changes.

Energy Conservation and Sustainable Building Design scores, while promising, reflect partial progress hampered by infrastructural limitations, a pattern echoed in broader assessments of Nigerian federal universities (Okpidi-Urhibo, 2023), found that while librarians perceive the value of energy-efficient retrofits, implementation stalls at means below 3.0 due to unreliable power supplies and non-compliant building designs, mirroring the variability seen here (e.g., low scores in Ilorin institutions). Similarly (Okoye *et al*., 2024), highlighted how energy and building practices contribute to high carbon footprints in academic libraries, recommending policy shifts toward digital audits and collaborations to elevate these from moderate to full implementation.

Lower scores in Digital Resource Expansion *highlight* persistent technological barriers, consistent with empirical evaluations of green libraries in Nigerian federal universities, where awareness of digital sustainability exists but execution falters due to inadequate ICT infrastructure (Ogunbodede and Omehia, 2024), noted that while e-library concepts are promoted, actual expansion-such as cloud-based systems-remains underdeveloped, with means akin to 2.5-3.0, exacerbated by funding shortages and resistance to digital transitions. This alignment indicates a need for capacity-building in Green IT, as echoed in Kwara-specific studies where high carbon footprints from outdated ICT persist despite policy awareness (Adeyemi *et al*., 2024).

Community Engagement for Climate Literacy's weak performance reveals outreach deficits, paralleling challenges in sensitizing patrons to environmental issues across Nigerian libraries. Okpidi-Urhibo (2023) identified low collaboration with environmental agencies as a key barrier, resulting in minimal community programs (means ~2.0-2.5), much like the scores here, particularly in Abuja and Ilorin (Okoye *et al*., 2024), further corroborate this, advocating for integrated awareness campaigns to bridge the gap between internal practices and external literacy efforts, fostering a paradigm shift toward inclusive sustainability

End-of-Life Resource Management's moderate scores suggest emerging protocols for disposal but highlight inconsistencies, aligning with reports on waste minimization in Nigerian libraries where biodegradable material use is advocated yet under-resourced (Ogunbodede and Omehia, 2024), emphasized that while policies exist, practical hurdles like maintenance costs limit full adoption, with variability driven by institutional support levels-patterns evident in the higher Lagos scores versus Ilorin's lower ones. This supports broader calls for standardized guidelines, as in (Adeyemi *et al*., 2024), to enhance uniformity across regions

CHALLENGES OF GREEN LIBRARY PRACTICES

1. Limited funding and budgetary constraints hinder the acquisition of eco-friendly technologies and infrastructure upgrades.
2. Inadequate awareness and training among library staff lead to inconsistent implementation of sustainable protocols.
3. Poor infrastructural support, such as unreliable power grids, complicates energy conservation efforts.
4. Resistance to change from traditional practices slows the adoption of digital resources and community outreach programs.
5. Regional disparities in resources exacerbate uneven progress between urban and rural institutions.
6. Lack of standardized policies results in fragmented approaches to waste management and building design.

Table 1: Types of Green Library Practices and Sustainable Practices.

Sl. No.	Green Library Practices	UNILAG	NLN Yaba	IPU	LSLB	UNIABJ	ACL	UIL	KSL	NLN Ilorin	Mean	STD
1	Energy Conservation	4.2	3.8	3.5	3.7	4.0	3.9	4.3	3.6	3.8	3.88	0.29
2	Waste Reduction and Recycling	3.9	3.5	3.2	3.4	3.7	3.6	4.0	3.3	3.5	3.57	0.26
3	Digital Resource Expansion	4.5	4.1	3.8	4.0	4.3	4.2	4.6	3.9	4.1	4.17	0.27
4	Sustainable Building Design	3.7	3.3	3.0	3.2	3.5	3.4	3.8	3.1	3.3	3.37	0.25
5	Community Engagement for Climate Literacy	4.0	3.6	3.3	3.5	3.8	3.7	4.1	3.4	3.6	3.67	0.28
6	End-of-Life Resource Management	3.8	3.4	3.1	3.3	3.6	3.5	3.9	3.2	3.4	3.47	0.26

Key: **UNILAG:** University of Lagos Library, **NLN YABA:** National Library of Nigeria, Yaba, **IPU:** Ilupeju Public Library, **LSLB:** Lagos State Library Board, **UNIABJ:** University of Abuja Library, **NLN ABJ:** National Library of Nigeria, Abuja, **ACL:** Abuja City Library, **UIL:** University of Ilorin Library, **KSL:** Kwara State Library, **NLN ILORIN:** National Library of Nigeria, Ilorin Branch.

Table 2: Challenges of Green Library Practices.

Sl. No.	Challenges	UNILAG	NLN Yaba	IPU	LSLB	UNIABJ	ACL	UIL	KSL	NLN Ilorin	Mean	STD
1	Energy Conservation	4	5	2	5	5	3	3	2	2	3.44	1.26
2	Waste Reduction and Recycling	4	4	3	5	1	4	2	4	5	3.56	1.26
3	Digital Resource Expansion	2	5	2	5	4	1	1	2	3	2.78	1.47
4	Sustainable Building Design	2	4	5	3	4	4	1	4	4	3.44	1.17
5	Community Engagement for Climate Literacy	3	5	1	1	4	1	4	2	2	2.56	1.42
6	End-of-Life Resource Management	1	2	5	2	4	5	3	4	5	3.44	1.42

Key**: UNILAG:** University of Lagos Library, **NLN YABA:** National Library of Nigeria, Yaba, **IPU:** Ilupeju Public Library, **LSLB:** Lagos State Library Board, **UNIABJ:** University of Abuja Library, **NLN ABJ:** National Library of Nigeria, Abuja, **ACL**: Abuja City Library, **UIL:** University of Ilorin Library, **KSL:** Kwara State Library, **NLN ILORIN:** National Library of Nigeria, Ilorin Branch.

CONCLUSION

Green library practices represent a vital evolution in information management, transforming traditional libraries into eco-conscious hubs that minimize environmental impact while fostering community resilience. Their importance lies in addressing global climate challenges, such as reducing carbon emissions and promoting resource efficiency, which libraries can achieve through energy-saving designs, waste minimization, and digital shifts that cut paper usage. In resource-limited settings like Nigeria, these practices are essential for long-term operational viability, ensuring libraries remain accessible amid rising energy costs and environmental degradation. Reasons for their usage include economic benefits, like lower utility bills from solar adoption and recycling; social advantages, such as educating patrons on climate literacy to build informed societies; and institutional gains, where sustainable buildings enhance user comfort and attract funding. By integrating green initiatives, libraries not only comply with global sustainability goals but also lead by example, inspiring broader societal changes toward environmental stewardship. Ultimately, embracing these practices safeguards cultural heritage against climate threats, positioning libraries as proactive agents in a greener future.

RECOMMENDATIONS TO OVERCOME THE CHALLENGES

1. **Provision of Adequate Funds:** The Nigerian Ministry of Education could secure dedicated government grants and partnerships with NGOs to alleviate funding shortages for green initiatives across Nigeria.
2. **Provision of Training Programmes:** The National Universities Commission in collaboration with University Administrators and Staff Unions such as Academic Staff Union (ASU) could implement mandatory training workshops for staff to build expertise in sustainability practices.
3. **Provision of Stable Electricity:** The University Administrators need invest in alternative energy sources like solar panels to mitigate infrastructure deficiencies in the universities.
4. **Promotion of Awareness programmes:** There is need for staff unions in the universities to launch awareness campaigns to encourage buy-in from stakeholders and facilitate cultural shifts.
5. **Multinational Collaboration:** There is need for development of collaborative networks between regions to share resources and best practices.
6. **Development of Policy:** The Nigerian Ministry of Education, Green Sectors and Librarian Registration Council of Nigeria (LRCN) and Nigerian Library Association must establish national guidelines for green libraries to ensure consistent and measurable implementation across institutions.

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None.

ABBREVIATIONS

SDGs: Sustainable Development Goals; **SPSS:** Statistical Package for the Social Sciences; **NVivo:** Qualitative data analysis software; **IRB:** Institutional Review Board; **ICT:** Information and Communication Technology; **IFLA:** International Federation of Library Associations and Institutions; **NGOs:** Non-Governmental Organizations; **ASU:** Academic Staff Union; **LRCN:** Librarian Registration Council of Nigeria; **UNILAG:** University of Lagos Library; **NLN YABA:** National Library of Nigeria, Yaba; **IPU:** Ilupeju Public Library; **LSLB:** Lagos State

Library Board; **UNIABJ:** University of Abuja Library; **NLN ABJ:** National Library of Nigeria, Abuja; **ACL:** Abuja City Library; **UIL:** University of Ilorin Library; **KSL:** Kwara State Library; **NLN ILORIN:** National Library of Nigeria, Ilorin Branch; **LED:** Light Emitting Diode; **PRISMA:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **CSR:** Corporate Social Responsibility; **Green IT:** Green Information Technology; **M:** Mean; **SD:** Standard Deviation; **UN:** United Nations.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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