



Green Library Transition in Bayelsa and Rivers States, Nigeria: Awareness and Perception of Librarians in University Libraries

Bulorgbamu Cocodia 

The Institute Library, International Institute of Tourism and
Hospitality, Yenagoa, Bayelsa State

Email: bulorc@yahoo.com

¹Kolawole Francis Ogunbodede 

University Library
University of Africa, Toru-Orua,
Bayelsa State, Nigeria

Email: kolawoleogunbodede@yahoo.com

Abstract

The study investigates the awareness and perceptions of green library practices among librarians in university libraries in Bayelsa and Rivers States, using both quantitative and qualitative methods through surveys and interviews. Out of 76 librarians, 68 completed an online questionnaire, which was analysed through frequency counts and percentages. Statistical analysis with SPSS version 29 showed high reliability (Cronbach's alpha of 0.87). Findings revealed a moderate awareness of green practices among librarians, who mainly rely on books, journals, online content, and colleagues for information. Institutional support for green initiatives was weak due to insufficient training, funding, and policies. Although librarians have positive views on implementing green practices, barriers include limited professional development opportunities and resistance to change. Recommendations include regular training, awareness campaigns, adoption of energy-efficient technologies, and prioritising funding for sustainable activities in university libraries.

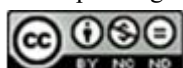
Keywords: Green Library, Librarians, Awareness, Perception, University Libraries

<https://dx.doi.org/10.4314/udslj.v20i1.5>

Introduction

University libraries play a significant role in promoting Sustainable Development Goals (SDGs). In the view of Tyonum and Ezeogu (2015), libraries and education are antidotes to the sustainable development of any country. University libraries contribute to education by offering essential and credible information materials. Being one of the key sources of knowledge and learning, libraries have a crucial role in advocating for environmental sustainability through the adoption of green library practices (Lahyani et al., 2024). Green library initiatives have rapidly developed as strategies for incorporating sustainable development into library organisations all over the world. Sustainable or green libraries are

¹ Corresponding Author

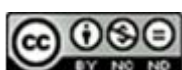


libraries that incorporate environmentally friendly practices and technologies into their operations to minimise their environmental impact. According to Khalid et al. (2021), a green library is a library that implements eco-friendly operational procedures and projects that promote green thinking throughout society. Various sustainable practices in libraries include energy efficiency, the use of environmentally friendly building materials, and effective waste handling methods with patron-friendly environmental approaches. These practices aim to minimise library environmental effects while promoting efficient resource utilisation between students and library personnel (Adeyemi et al., 2024). Sustainable development initiatives are expanding globally, including in Nigeria.

The early perception of the concept led developed nations to adopt green building designs for the control of global warming and the reduction of environmental library practices (Emmanuel & Okojie, 2022; Singh & Mishra, 2019; Aulisio, 2013). Most university libraries in developed countries are implementing environmentally friendly building structures to reduce their environmental impacts (Maina & Gichohi, 2024; Qutab et al., 2016). The implementation of sustainable practices involves deploying solar power energy systems, utilising green materials, installing rainwater collectors, and establishing energy-efficient buildings and control systems. The concept of green library practices is currently at an early development phase throughout Nigeria. Few university libraries in Nigeria have adopted environmental sustainability practices through solar energy system installations; however, the overall adoption of sustainable practices remains minimal due to a lack of adequate funding, technical expertise, and/or insufficient policies to promote environmental sustainability (Ismael et al., 2024; Adeyoyin et al., 2019). For example, the University of Lagos library, the University of Ibadan library, and the Federal Polytechnic, Orogun, are among the institutions that have implemented energy-efficient systems and sustainable architectural designs.

The current environmental problems of deforestation, pollution, and inconsistent power supply throughout Nigeria make solar energy a viable solution for the power and energy requirements of Nigerian citizens. University libraries face environmental challenges due to unstable power outages, which disrupt their operations, impede access to online materials, and limit the services provided to students and faculty members. Deforestation and pollution degrade the overall quality of life and user health in the university environment, which affects library spaces and services, ultimately leading to diminished user satisfaction. Deforestation can contribute to climate change, leading to extreme weather patterns that can damage buildings through prolonged wet conditions, which in turn allow mould growth (United States Environmental Protection Agency, 2024; Aba et al., 2023). Libraries experience resource deterioration due to pollution, which creates unpleasant environmental conditions that pose a threat to user safety and well-being.

Such environmental obstacles can restrict access to library information resources and discourage users from visiting libraries, leading to decreased user engagement with library services (Aba et al., 2023; Udo & Ben, 2022; Osunride & Adetunla, 2016). In this regard, embracing green practices can help mitigate the negative impact on libraries by promoting sustainability and reducing their environmental footprint. Libraries can adopt power-saving technologies, including LED lighting and efficient HVAC systems, to reduce power usage and lower expenses (Zheng et al., 2013). The implementation of solar panels as renewable energy solutions enables libraries to reduce their reliance on conventional fossil fuels and, consequently, minimise greenhouse gas emissions. The implementation of green practices enables libraries to adopt recycling initiatives, coupled with waste reduction strategies, for a



reduced environmental footprint from their operations (Wang & Li, 2011). The library supports environmental conservation through the selection of sustainable building materials and the implementation of digital resources to reduce paper consumption. Libraries should operate as environmental educational centres by conducting programs that educate people about sustainability matters at their community facilities. The environmental responsibility culture among users grows stronger through these efforts, which boost library services to the community. Libraries that implement green practices fulfil the requirements of four particular Sustainable Development Goals (SDGs) designated as SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action) (Kolawole & Oladokun, 2024). The implementation of such practices enables libraries to enhance the quality of education and local well-being, driving sustainability improvements in the future.

Additionally, green libraries provide guidance and serve as reference points in understanding sustainability principles, teaching sustainable practices to faculty members, staff, and students. They motivate the educational community and societal members to practice environmental friendliness while developing environmentally conscious leaders for future generations (Okpidi-Urhibo, 2023). The implementation of green practices across Nigeria would contribute to resolving contemporary environmental challenges, including deforestation, pollution, and inadequate waste management systems within organisations. By implementing energy-efficient measures and sustainable resource utilisation, green practices can decrease reliance on non-renewable energy sources, reduce stress on the national electricity supply, and yield a longer-term return on investment. Ultimately, adopting green practices in university libraries serves as a model for other sectors and a catalyst for making Nigeria a more sustainable country shortly.

University libraries in Nigeria can adopt several green practices to reduce their negative environmental impacts and achieve sustainable goals. These practices may entail incorporating green building designs or incorporation of new energy efficient technologies into existing buildings; ensuring its team operates within a paperless environment; ensuring the firm employs environmentally responsible ways of disposing of waste; promoting the proper management and conservation of water and energy resources; and adopting sustainable procurement practices (Asim & Ahmad, 2022). To promote this concept, university libraries play a crucial role in encouraging sustainable, eco-friendly practices in Nigeria. They can play a paramount role by adopting environmentally friendly approaches, acting as models, and setting the pace for practising environmentally friendly practices (Asim & Ahmad, 2022). University libraries can also help create awareness about environmental literacy among students, faculty members, and the broader community. Various activities, such as awareness campaigns, workshops, and exhibitions on sustainability, can help sensitise individuals to develop eco-friendly practices. Additionally, partnerships and the exchange of knowledge between academic institutions, governmental bodies, and environmental non-governmental organisations can contribute to increasing the application of green library concepts and environmentally friendly policies. Through the exchange of ideas, samples, anecdotes, and success stories, libraries can learn from one another and motivate each other to work towards the development of a sustainable environment (Zakaria & Hendi, 2024; IFLA, 2024).

Nonetheless, the implementation of green libraries in universities in Nigeria largely depends on the awareness, attitudes and perceptions of librarians towards environmental practices. Librarians, as information professionals and key decision makers in the acquisition of

resources, play a significant role in the success of green practices. In this regard, their level of awareness and perception towards sustainability has a direct implication on the practice of sustainable development within the institution. Although green libraries are becoming a global trend, there are limited studies on the awareness and perception of green library practices among librarians in university libraries in Nigeria. This creates a substantial information gap that this study will address. The success of sustainability initiatives at university libraries depends heavily on the attitudes of librarians, as they serve as important promoters of these efforts and institutional decision-makers. Positive frameworks combined with strong awareness about green libraries serve as strong indicators for the successful implementation and spread of green library advocacy throughout Nigerian universities. This research aims to evaluate the knowledge and perception levels of librarians regarding sustainable green library practices in university libraries in Bayelsa and Rivers States.

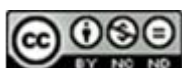
Problem Statement

Libraries play a crucial role in environmental conservation in Nigerian universities by incorporating green features into their facilities. The principles of environmental sustainability have been widely adopted and practised by libraries in the developed world; however, the adoption of green practices in Nigerian university libraries remains limited. This raises concerns that librarians in these institutions may lack adequate awareness, positive perceptions, and commitment to embracing green initiatives. Awareness and understanding of librarians regarding environmental practices, as well as their willingness and capacities to support green library practices, will determine the pace and effectiveness of green practice implementation in their library. However, despite the growing importance of sustainability, there is limited understanding of green libraries among librarians in university libraries within Bayelsa and Rivers State, Nigeria. The existing literature lacks an inclusive understanding of their awareness, perceptions, and practical steps for integrating these practices. To address this gap, this research aims to establish their level of awareness, perceptions, and the practical measures or approaches for implementing green library practices in university libraries. In this regard, the study aims to contribute to the body of knowledge by presenting possible measures that will help champion green library practices in university libraries across Nigeria.

This study, therefore, examines the level of awareness and perceptions of librarians towards sustainable green library practices in university libraries in Bayelsa and Rivers States. Its specific objectives are to assess the level of awareness of green library practices among librarians in university libraries in Bayelsa and Rivers States; examine librarians' perceptions about the implementation of green library practices within their institutions; and determine practical steps for incorporating green library practices into university libraries in Bayelsa and Rivers States. Based on the objectives, the study seeks to answer the following questions:

1. What is the level of awareness of green library practices among librarians in university libraries in Bayelsa and Rivers States?
2. How do librarians perceive the implementation of green library practices within their institutions?
3. What practical steps can be taken to incorporate green library practices in university libraries in Bayelsa and Rivers States?

Literature Review



Three main principles serve as the framework for this literature review: the level of awareness of green library practices among librarians, perceptions of librarians towards the implementation of green library practices, and the strategies for integrating green library practices.

Level of Awareness of Green Library Practices among Librarians

Emmanuel and Okojie (2022) examined awareness as a strategic tool for implementing green libraries by academic librarians in Nigeria. The study employed a descriptive survey research design with a population of 170 academic librarians from twelve university libraries in the North Central geopolitical zone. The findings showed that the respondents had poor knowledge of the concept of green practices. In a similar vein, Okpidi-Urhibo (2023) examined green library practices, perceptions, and the degree of adoption among academic libraries in Nigeria. The survey research method was used in the study. The results showed a low level of awareness and implementation of the concept of the green library. Similarly, Asim and Ahmad (2022) explored the adoption of green practices in university libraries in Pakistan. The findings reveal a lack of awareness about green library practices, policies, and technologies for a paperless environment, among other areas. In another study, Oyelude and Alabi (2013) examined green initiatives within the context of Nigerian libraries. The questionnaire was administered to librarians registered in the Nigerian Library Association (NLA) Online Forum. The finding shows that the level of awareness of greening initiatives among Nigerian librarians is still relatively low. Also, Khalid and Batool (2020) conducted a study on the green environment, practices, attitudes, and future strategies of Pakistani university librarians. The data were mapped through in-person interviews with 27 librarians, observation, document review, and photographs. The majority of librarians were unfamiliar with, or had a limited or different understanding of, green work practices. In general, the studies highlighted the low level of awareness and knowledge of the green library concept among librarians, which explains the need for increased educational activities to promote environmental responsibility practices.

Perceptions of Librarians towards the Implementation of Green Library Practices

Ren (2022) investigated librarians' perceptions about their provision of environmental education services in Georgia. The study chose a survey method for data collection. The findings indicate that librarians generally have a positive attitude towards adopting environmentally sustainable practices within libraries. Similarly, Ogbomo and Edegbo (2022) investigated librarians' perceptions of transforming existing buildings into a new library for sustainable development in South-South Nigeria. The study employed a descriptive research design, and the population consisted of 32 librarians, who served as the sample for the study. The findings suggest that librarians have a high perception of the transformation of existing buildings for library purposes, supporting sustainable development. In another study, Noh (2021) examined Korean librarians' perceptions of the UN SDGs and strategies to advance libraries. This paper reveals that librarians hold a favourable opinion concerning the integration of sustainability in libraries. Concerning environmental education to upgrade existing buildings, as well as behaviour change for the library's miscellaneous policies, the role librarians play in supporting or opposing sustainable development objectives within the library demonstrates their sensitivity to the various sustainable development ideas presented by the UN SDGs. In general, these works demonstrate that librarians have a favourable view

of sustainability within libraries, encompassing changes in library buildings and other sustainable development projects.

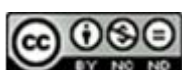
Strategies for Integrating Green Library Practices

Gupta (2020) categorised four primary measures and practices to help develop a green library. These include implementing green practices for green library design and interior, establishing a green collection and promoting green literacy, and adopting innovative smart technologies to optimise the library's functioning. Likewise, the studies by Emmanuel and Okojie (2022) outlined five strategies for improving the implementation of green libraries in Nigerian libraries. The strategies include an aggressive sensitization on the concept of green library initiative, easy access to information on how to go about the implementation of green library, conducting seminars to educate librarians on how to green up their libraries, and networking with other librarians who understand or have already incorporated the concept of green libraries in the LIS curriculum.

In the same vein, Alabi (2020) noted that strategies futuristic libraries could use in improving environmental consciousness include making eco-friendly information accessible, regular exhibitions on themes relating to the environment, awareness campaigns on waste reduction and education, creating recycling points for books, newspapers, etc., organizing special events, such as “sustainability day,” “climate week,” and “environmental project of the year” to disseminate goals of environmental sustainability on environmental issues, and collaborating with other professionals in forming a solid team to combat environmental pollution. Ajani et al. (2024) noted that many libraries in developed countries have achieved remarkable performance through programs such as green building initiatives, community and social responsibility programs, partnerships, digitisation of collections, climate change communication, and a culture of ethical responsibility. Thus, the literature indicates a range of activities, practices, and programs through which libraries can develop ideas to organise green sustainable libraries and increase awareness of environmental issues among the community and library members while also enhancing the practice of environmental sustainability in libraries.

Methodology

The study adopted both the quantitative and qualitative research methods. The quantitative part employed the descriptive survey as its research method, while the qualitative part used interviews. The study population consisted of 76 librarians from university libraries in Bayelsa and Rivers State, Nigeria. The universities include the University of Port Harcourt, Rivers State (22); Ignatius Ajuru University of Education, Port Harcourt, Rivers State (9); Rivers State University (14); the Federal University, Otuoke (11); Niger Delta University, Bayelsa State (12); Bayelsa Medical University, Bayelsa State (4); and the University of Africa, Bayelsa State (7). The census sampling technique was employed in this study, and the data were collected through an online survey. The study population consisted of 76 librarians, representing the total number of librarians from university libraries in Bayelsa and Rivers State. The librarians offer direct services in the university libraries and are therefore in a vantage position to provide informed responses regarding the research topic. The census was conducted to provide the entire population of librarians an opportunity to participate in the study. Since the target population was small, it was appropriate to use census sampling to ensure that no viewpoint was omitted, which could occur with other sampling techniques,



such as random or stratified sampling. This enhances the reliability of the study results and facilitates the generalisation of the findings within the study's context.

For the quantitative part, the online questionnaire was used as the instrument for data collection. The first procedure involved administering the online questionnaire to the 76 librarians. The questionnaire was distributed via the professional WhatsApp platforms of the Nigerian Library Association in Bayelsa and Rivers States, which are restricted to librarians. The questionnaire was also sent privately to the respondents to encourage timely responses. The respondents were given one month, from July 1st to July 31st, to respond to the questionnaire. It was clearly stated on the questionnaire that the respondents should not fill it out more than once. However, out of the 76 librarians, 68 completed the questionnaire, resulting in a response rate of 89 per cent. The research procedures were conducted ethically during the distribution of the questionnaire. Initially, the researchers introduced themselves and the purpose of the study to the participants, obtaining their consent. All participants who completed the questionnaire process did so voluntarily.

For the qualitative aspect, interviews were conducted to gain deeper insights into the librarians' perspectives. A total of 76 interviews were conducted, comprising 40 phone interviews and 36 face-to-face interviews. The interview questions were designed to complement the questionnaire and explore themes that emerged from the survey responses. The research procedures were conducted ethically throughout the data collection process. The researchers introduced themselves, explained the purpose of the study, and obtained consent from all participants. Additionally, the researchers highlighted the confidentiality of their responses and reminded them. All participants who took part in the interview process did so voluntarily. The interview was conducted over five days, with an average session lasting 30 minutes, and took place from February 10th to February 14th, 2025.

Face and content validity testing, conducted by specialists in measurement, evaluation, and library and information science, ensured the appropriateness of the questionnaire for the study. The instrument's reliability was confirmed with a Cronbach's alpha of 0.87. Data analysis was performed using frequency counts and simple percentages. Additionally, SPSS version 29 facilitated the calculation of the mean, with Cronbach's alpha computation validating the instrument's reliability. Responses to the questionnaire were measured and analysed with a nominal scale and a 4-point Likert-type scale. A criterion score of 2.5 was adopted for research questions 1 through 3. The criterion score was obtained as follows: $\text{Criterion score} = (4 + 3 + 2 + 1)/4 = 2.5$. The choice of a 2.5 criterion score on a 4-point Likert scale is significant in interpreting survey results, as it mathematically represents the midpoint between the lowest value (1) and the highest value (4). This score provides a middle ground for respondents, allowing them to express a stance that is neither strongly negative nor strongly positive. While the scale itself does not include an explicit neutral option (as in a 5-point scale), the 2.5 score serves as a functional midpoint between disagreement and agreement, offering an intermediate response. For research question 1, mean scores below 2.5 were considered indicative of low-level awareness, mean scores between 2.6 and 3.0 were considered moderate-level awareness, and mean scores of 3.1 and above were considered indicative of high-level awareness. For research question two, the mean scores of 2.5 and above were considered positive perceptions, and those below 2.5 were deemed negative perceptions. For research question three, mean scores below 2.5 were considered as disagreement, and scores above 2.5 were considered as agreement.

The qualitative data obtained from interviews were analysed thematically. The responses were transcribed, coded, and categorised into themes that aligned with the questions. Patterns and recurring themes were identified to provide deeper insights into the librarians' perspectives, complementing the quantitative findings. The integration of both quantitative and qualitative methods ensured a comprehensive understanding of the research problem and enhanced the validity of the study findings.

Study Findings

Demographic Information

The results in Table 1 suggest that females comprised the majority of the librarians involved in the study:

Gender	Frequency	Percentage %
Male	28	41
Female	40	59
Total	68	100

Level of Awareness of Green Library Practices among Librarians in University Libraries in Bayelsa State

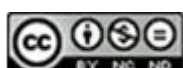
Table 2 presents the responses to the question “What is the level of awareness of green library practices among librarians in university libraries in Bayelsa State?”:

Table 2: Librarians' Level of Awareness of Green Library Practices

S/N	Librarians Perceptions	VH	H	L	VL	Mean
1.	I am aware of the importance of waste reduction and recycling in libraries	24	28	10	12	3.1
2.	I am knowledgeable about the environmental benefits of using sustainable materials in libraries	30	26	6	6	3.1
3.	I am aware of the concept of green libraries	28	26	4	10	3.0
4.	I am familiar with the environmental policies related to library operations	22	26	10	10	2.8
5.	I know about the energy-efficient technologies used in green libraries	16	20	18	14	2.6
6.	I have received training on green library practices	10	14	14	30	2.0
	Grand Mean					2.7

The results in Table 2 reveal that items 1-5 have a higher mean value than the criterion mean (2.5), while item 6 falls below the criterion mean of 2.5. Nevertheless, the grand mean (2.7) indicates that librarians have moderate awareness of green library practices.

The results from interviews with 46 librarians on access to information, channels of awareness, and institutional support complemented these results. In this regard, one librarian noted: “*We rely heavily on books, journals, and online resources, whereas 22 rely on research reports, webinars, and NGO publications,*” which captured the views of the other 46



librarians. On awareness channels, 35 librarians indicated that Professional conferences and workshops serve as vital avenues for acquiring the latest knowledge and insights in the field, even though not everyone has the opportunity to participate, often due to financial limitations that restrict access to these invaluable events. Specifically, one of them said: *“Professional conferences and workshops are our main sources of information, but not everyone gets the opportunity to attend due to funding constraints.”* This evidential statement captures the sentiments of many other librarians. On the other hand, 24 responding librarians noted that colleagues and social media play a crucial role in keeping them updated on recent events.

Despite offering abundant information, these platforms often fall short in reliability and structured organisation, making it daunting to navigate the complexities of shared content. For example, one of them said: *“Colleagues, and social media help us stay updated, but social media are not always reliable or structured.”* However, nine (9) librarians noted that their institution currently lacked formal training programmes focused on green initiatives or dedicated platforms for information sharing. Instead, they predominantly engaged in the learning journey through self-directed research and participation in external programmes, seeking knowledge and insights from various sources outside their immediate environment. This approach encouraged individual exploration and the discovery of innovative practices related to sustainability. Explaining, one of the librarians said: *“Our institution does not provide structured training on green initiatives or information-sharing platforms. We learn mostly through personal research and external programmes.”*

Regarding institutional support, 14 librarians acknowledged that their library had a formal policy in place to facilitate and enable green library initiatives. As one of them pointed out, *“Our library has a formal policy for green initiatives, but it is often not prioritised.”* Conversely, a significant number of the responding 44 librarians noted the absence of such a policy. Indeed, one of them explicitly reported: *“There are no clear policies regarding green practices in our institution, so it is hard to know where to start.”* Another 10 respondents were uncertain. Explaining, one of the librarians said, *“We are not sure if there are formal policies for green initiatives in my library. There is no clear communication on this matter.”* When it comes to funding, 19 librarians bemoaned the lack of dedicated budgets for such library functions and projects. Lamenting over this worrisome dearth of funding, one of the librarians said: *“We do have some dedicated funding for green projects, but it is minimal.”* In comparison, 49 librarians reported being uncertain about the availability of specific funding dedicated to green initiatives. Moreover, they stated that it remains unclear whether the current library budget includes support for such environmentally focused projects.

Librarians’ Perceptions of Implementing Green Library Practices in Their Institutions

The respondents further responded to the research question: “What are the perceptions of librarians towards the implementation of green library practices within their institutions?” Their responses are as presented in Table 3:

Table 3: Librarians’ Perception of Implementing Green Library Practices

S/N	Librarians Perceptions	SA	A	D	SD	Mean
1.	Implementing green library practices is essential for sustainability	32	30	6	-	3.3

2.	The implementation of green practices will improve the library environment	28	32	4	4	3.2
3.	The implementation of green library practices should be a priority in our library	26	32	6	4	3.2
4.	Green library practices enhance the reputation of the institution	30	26	6	6	3.1
5.	Green practices in libraries will lead to cost savings in the long run	26	28	4	10	3.0
6.	I believe that green library practices are feasible in my institution	12	42	8	6	2.8
	Grand Mean					3.1

Table 3 reveals that items 1-6 have mean scores above the criterion mean (2.5); furthermore, the grand mean (3.1) is greater than the criterion mean (2.5), indicating that librarians have positive perceptions of the implementation of green library practices within their institutions.

The study findings closely align with insights gathered from interviews regarding the professional development opportunities available and attendant challenges in implementing green initiatives. In terms of professional development, 26 librarians reported their participation by stating, "I have attended workshops or seminars focused on green practices." In contrast, 42 librarians expressed their interest in such educational programmes, observing, "I have not attended any workshops on green practices, but I would be eager to participate if these programmes were made available."

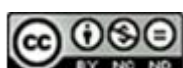
Regarding the challenges encountered, a significant 48 librarians identified insufficient funding as a major obstacle, with one remarking, "Funding is the biggest hurdle; we simply lack the resources necessary for sustainability projects." In addition, 11 librarians identified critical knowledge gaps within their teams, with one noting, "There is a pervasive lack of awareness about sustainable methods among staff." Nine (9) others identified a troubling resistance to change, with one librarian expressing, "Some colleagues are resistant because they perceive green practices as unnecessary changes; there is comfort in traditional methods, and many are hesitant to adapt." These findings paint a compelling picture: while there is notable interest in green practices among librarians in Nigerian universities, significant barriers such as inadequate funding, knowledge deficits, and an aversion to change hinder progress toward sustainable initiatives.

Practical Steps for Integrating Green Library Practices in Bayelsa University Research

Furthermore, the respondents provided answers to the third and final question of the study: "What are the practical steps for integrating green library practices in university libraries in Bayelsa State?" Table 4 tabulates and summarises their responses:

Table 4: Practical Steps for Integrating Green Library Practices

S/N	Practical Steps for Integrating Green Library Practices	SA	A	D	SD	Mean
1.	Conducting regular training sessions on green library practices is important	40	24	2	2	3.5



2.	Promoting awareness campaigns on green practices among library users is essential	42	20	6		3.5
3.	Implementing a waste reduction and recycling program	34	32	-	2	3.4
4.	Using energy-efficient technologies should be a priority	34	32	2		3.4
5.	Developing a policy on sustainable procurement for library resources is necessary	30	34	4		3.3
6.	Collaborating with other institutions to share green library initiatives is beneficial.	36	24	4	4	3.3
	Grand Mean					3.4

Table 4 shows that items 1-6 have mean scores that are above the criterion mean (2.5), more so, the grand mean (3.4) is greater than the criterion mean (2.5), which shows that all the items listed in Table 4 are the practical steps for integrating green library practices in university libraries in Bayelsa State.

During interviews, 68 librarians reached a strong consensus on the importance of integrating sustainable practices into university libraries. Forty-seven (43) librarians underscored the necessity of conducting regular, comprehensive reviews to assess and enhance sustainability efforts, ensuring their relevance in light of ongoing environmental changes. Moreover, 41 librarians emphasised the importance of fostering a culture of sustainability among staff, promoting eco-friendly routines in daily operations. This grassroots approach is viewed as crucial for cultivating a sustainable future within the library community.

All 68 librarians unanimously concurred on the urgent need for universities to establish formal green policies, which would provide a structured framework for implementing sustainable practices and encourage collaboration with organisations focused on environmental goals. They highlighted the importance of prioritising access to sustainable materials and investing in eco-friendly infrastructure, recognising these as key components of a green library. To address financial challenges, they recommended pursuing external grants and forming partnerships to fund and expand green initiatives.

Overall, the findings suggest that the successful adoption of green practices in universities relies on the establishment of formal policies, active staff engagement, the provision of sustainable resources, and the development of strong external collaborations. These elements are essential for overcoming financial and structural barriers and ensuring a sustainable future for library institutions.

Discussion of Findings

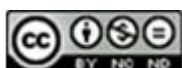
Librarians show a moderate level of awareness of green library practices according to the findings from the first research question. The moderate level of awareness of green library practices among librarians in university libraries in Bayelsa and Rivers State may be due to limited training opportunities, the concept being relatively new, a lack of necessary resources, and inadequate institutional backing. Nigerian university libraries can address these issues by raising awareness about green practices, enhancing training, and developing comprehensive policies, while also fostering sustainable cultural implementation to promote better awareness and implementation of green practices. To enhance awareness and promote optimal practice of green library procedures, university libraries in Nigeria should incorporate these practical

steps. They can create more awareness by designing spaces with natural materials that appeal to young readers. This idea not only enhances the learning environment but also enables young individuals to become more aware of and sensitive to environmental conservation (Oedema, 2024). University libraries could also incorporate environmental campaigns, such as those promoting student-led campus sustainability projects or sustainability initiatives showcased in the library. They could collaborate with international organisations or institutes to exchange knowledge or host exchange programs, thereby enhancing the staff and students' understanding of green practices.

The results from interviews on access to information, channels of awareness, and institutional support show that the majority of librarians rely on books, journals, online resources, research reports, webinars, and NGO publications. For the majority of librarians, awareness was primarily sourced from professional conferences, workshops, social media, and colleagues; however, a smaller group highlighted a lack of structured training or information-sharing platforms within their institutions. Institutional backing remained weak because most librarians reported having no formal policies for green initiatives, except for a few who did report such policies, and other librarians were unsure about the available support. A small percentage of librarians reported that their libraries had obtained funding for green initiatives, while most respondents were unsure whether their libraries had received such funds. Librarians primarily access resources, including books, journals, and online content. At the same time, a smaller number rely on research reports, webinars, and publications from governmental or non-governmental organisations, indicating differing exposure to information resources. Most librarians build awareness through professional networks such as conferences and workshops; however, a smaller group of librarians sometimes rely on social media platforms or their colleagues for this purpose. All the surveyed respondents pointed out that their institutions show weak support toward green initiatives because they lack organised training programs, specific funding, and official policies. Library sustainability programs primarily exist due to independent initiatives with limited resources, as institutions have not sufficiently supported them through established training programs and financial support.

The findings from the interview imply that librarians primarily rely on traditional and digital resources for information, with professional networks being key to awareness. However, institutional support for green initiatives is weak, with limited policies, funding, and structured training, leaving sustainability efforts largely dependent on individual initiatives. However, the findings of this study are not in agreement with those of Okpide-Urhibo (2023), Emmanuel and Okojie (2022), and Oyelude and Alabi (2013), who, in their studies, found low levels of awareness among librarians.

The second research question yielded responses indicating that librarians have positive perceptions about the implementation of green library practices within their institutions. The positive perception toward green library practices among librarians suggests readiness to adopt sustainability in the course of their practice. Additionally, the possibility of improved service delivery, innovation, and exposure to international best practices also enhances their positive perception. The integration of these factors contributes to a positive impression of the adoption of green practices within Nigerian university libraries. Hence, institutions should provide enhanced commitment and resources for the successful implementation of green practices. The results of interviews on professional development opportunities and challenges related to green initiatives indicate that only a small number of librarians have participated in



workshops or seminars on green practices. At the same time, the majority have not taken advantage of such professional development opportunities.

Most respondents expressed interest in professional development opportunities if their institutions provided them with such opportunities. As for the challenges, most librarians reported insufficient university funding in Nigeria as their primary obstacle, along with knowledge deficiencies and resistance to change. The study, therefore, reveals a lack of available professional training on green initiatives, as most librarians have not yet participated in corresponding workshops or seminars and do not yet manifest an interest in these subjects. More training initiatives, coupled with strategic advocacy efforts, will help secure sufficient funding. The primary obstacle to implementing green initiatives in Nigeria arises from insufficient university funding, which constitutes a significant challenge. The lack of awareness among personnel and their reluctance to change could be addressed through awareness campaigns and continuous training on green initiatives. University libraries in Bayelsa and Rivers States must enhance their sustainability efforts through stronger institutional backing, combined with adequate financial support and training programs aligned with their sustainability objectives. These research findings corroborate similar results discovered by Ren (2022) and Ogbomo and Edegbo (2022), as librarians generally hold positive views about green library practices.

The third research question investigates specific measures which policymakers should implement to integrate green practices in university libraries in Bayelsa and Rivers States. These measures include conducting training programs, as well as running green library awareness campaigns in conjunction with waste minimisation and recycling efforts, and the adoption of renewable energy systems. Findings from the interviews indicate that integrating green library practices necessitates that employees incorporate sustainability into their daily library work, as well as conduct periodic assessments to enhance current green library practices. Regarding green policy, the results indicate that universities should create formal green policies and also enter into partnerships with green initiative companies, representing an essential step for implementing green initiatives. Again, university libraries must source external funding and partnerships to improve library funding for green initiatives and to provide sustainable materials and eco-friendly infrastructure. The practical implementation of green library practices in universities becomes possible through the adoption of formal policies, staff engagement, the use of sustainable resources, and external collaboration, which help universities address their financial and structural barriers. Gupta (2020) and Alabi (2020) reach similar conclusions.

Conclusions and Recommendations

Research question one suggests that librarians possess a moderate level of awareness of green library practices, as indicated by the initial findings. Interviews reveal that librarians primarily utilise resources such as books, journals, and online content. Additionally, they gain awareness through conferences, workshops, social media, and colleagues. However, institutional support for green initiatives is limited due to a lack of organised training, dedicated funding, and official policies. Research question two reveals that librarians generally hold positive views about adopting green practices in their institutions. The interviews suggest that most have not engaged in related professional development opportunities, citing barriers such as inadequate university funding in Nigeria, knowledge gaps, and resistance to change. The third research question recommends that policymakers

implement specific actions such as training programmes, green awareness campaigns, waste reduction and recycling initiatives, and the adoption of renewable energy systems to embed green practices in university libraries in Bayelsa and Rivers States. Interview data emphasise that integrating green practices requires staff to incorporate sustainability into daily tasks, conduct regular assessments, establish formal green policies, partner with green organisations, secure external funding, and provide eco-friendly materials and infrastructure.

Based on the findings, the researchers recommended that the university library management should prioritise adopting green library practices by allocating sufficient funds for sustainable activities. Additionally, there should be other special staff development activities, such as capacity and skills enhancement, to enable librarians to acquire the necessary skills for the effective implementation of green practices. University libraries should also partner with environmental agencies to promote awareness and implementation of green library activities. In addition, staff and students should also be encouraged to adopt recycling programs and energy-saving practices to enhance the institution's environmental and social responsibility.

Conflict of Interests Declaration

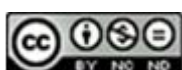
The authors declared no potential conflicts of interest concerning the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

References

- Aba, J. I., Makinde, O. T., Omigie, C. A., & Ademola, A. (2023). *Perceived effect of climate change on library resources in universities in Edo State, Nigeria. Communicate: Journal of Library and Information Science*, **25**(2).
- Adeyoyin, S. O., Alawiye, M., K., & Ewulo, O. R. (2019). Awareness and use of solar energy as an alternative power source for ICT facilities in Nigerian university libraries and information centres. *Library Philosophy and Practice*, 2372. <https://digitalcommons.unl.edu/libphilprac/2372>
- [Ajani, Y. A.](#), [Tella, A.](#), & [Enakrire, R.T.](#) (2024). The green library revolution: A catalyst for climate change action. *Collection and Curation*, 43(2), 60-67. <https://doi.org/10.1108/CC-10-2023-0032>
- Alabi, A. O. (2020). Assessment of environmental consciousness among patrons in selected academic and public libraries in Lagos Metropolis. *Electronic Green Journal*, 1(43). <https://api-ir.unilag.edu.ng/server/api/core/bitstreams/5b4650af-a743-4c6b-ba55-f01548598bdc/content>
- Asim, M., & Ahmad, P. (2022). Adopting green practices: Challenges for university libraries of Pakistan" (2022). *Library Philosophy and Practice* (e-journal). 7153.
- Asim, M., & Ahmad, P. (2022). Adoption of green practices in university libraries of Pakistan: A qualitative study. *Library Philosophy and Practice* (e-journal), 6944. <https://digitalcommons.unl.edu/libphilprac/6944>



- Das, R. K., & Singha, A. (2023). Operating sustainable academic libraries with special reference to the university libraries of Assam. *International Journal of Creative Research Thoughts*, 11(12), 1–9.
- Emmanuel, H., & Okojie, V. (2022). Awareness: A strategic tool for the implementation of green libraries by academic librarians. *Ghana Library Journal*, 27(2), 139–292. <https://dx.doi.org/10.4314/glj.v27i2.11>
- Gupta, S. (2020). Green Library: A strategic approach to environmental sustainability. *International Journal of Information Studies & Libraries*, 5(2), 82–92. <https://digitalcommons.unl.edu/libphilprac/7153>
- IFLA (2024). The IFLA guidelines for green and sustainable libraries. <https://www.ifla.org/the-ifla-guidelines-for-green-and-sustainable-libraries/>
- Khalid, A., & Batool, S. H. (2020). A qualitative case study of green environment: Practices, attitudes and future strategies of Pakistani university librarians. *Electronic Green Journal*, 1, 44, 1–21. <https://doi.org/10.5070/G314443701>
- Kolawole, D. T. O., & Oladokun, B. D. (2024). Sustainable practices in Nigerian libraries: exploring the role of green libraries in promoting eco-friendly reading spaces. *International Journal of Knowledge Content Development & Technology*. <https://ijkcdt.net/xml/42075/42075.pdf>.
- Lahyania, K., Diabb, G., & Moukhliiss, G. (2024). Role of academic libraries in the achievement of sustainable development goals case study: The Mohamed Sekkat University Library. *Procedia Computer Science*, 236, 566–573.
- Mwanzu, A., Bosire-Ogechi, E., & Odero, E. (2022). The emergence of green libraries in Kenya: Insights from academic libraries. *The Journal of Academic Librarianship*, 49(5). <https://doi.org/10.1016/j.acalib.2022.102601>.
- Noh, Y. (2021). Study on the perception of South Korean librarians of the UN sustainable development goals (SDGs) and the strategy to support libraries. *Profesional de la información*, 30(4), e300404. <https://doi.org/10.3145/epi.2021.jul.04>
- Ogbomo, M. O., & Edegbo, W. O. (2022). Librarians' perception of transforming existing buildings into new library buildings for sustainable development in south-south, Nigeria. *Delsu Journal of Educational Research and Development*, 19(1), 1-12.
- Okpidi-Urhibo, E. (2023). Green library initiative in Nigeria: Insights and levels of implementation in academic libraries. *Library Philosophy and Practice* (e-journal), 7802. <https://digitalcommons.unl.edu/libphilprac/7802>
- Okpidi-Urhibo, E. (2023). Green library initiative in Nigeria: Insights and levels of implementation in academic libraries. *Library Philosophy and Practice*, 7802. <https://digitalcommons.unl.edu/libphilprac/7802>
- Osunride, A. A., & Adetunla, B. O. G. (2016). Preservation and conservation of library materials in university libraries in south-west, Nigeria. *International Journal of Online and Distance Learning*, 1(1), 1, 12–25.
- Oyelude, A. A., & Alabi, A. O. (2013). Greening: Pluses and minuses of Nigerian libraries in promoting environmental sustainability. Conference: IFLA World Library and Information Congress. In Singapore. https://www.researchgate.net/publication/259620215_Greening_Pluses_and_Minuses_ofNigerian_Libraries_in_Promoting_Environmental_Sustainability?

- Qutab, S., Ali, Z. F., & Ullah, F. S. (2016, June 29). *Environmentally Sustainable Library Buildings: Opportunities and Challenges for Asian Countries*. <https://library.ifla.org/id/eprint/1432/1/215-qutab-en.pdf>
- Ren, X. (2022). Librarians' attitudes toward providing environmental education services in Georgia. *Georgia Library Quarterly*, 59(2). <https://doi.org/10.62915/2157-0396.2416>
- Tyonum, N. M., & Ezeogu, P. A. (2015). Library and education: Panacea for sustainable development in Nigeria. *Asian Journal of Information Science and Technology*, 5(2), 28- 31.
- Udo, C. & Ben, E. N. (2022). Library environmental factors and students' patronage of library services in the University of Uyo main library" (2022). *Library Philosophy and Practice*, 7091. <https://digitalcommons.unl.edu/libphilprac/7091>
- United States Environmental Protection Agency (EPA). (2024). *Climate adaptation – Indoor fungi, mould, and health*. Retrieved from <https://www.epa.gov/arc-x/climate-adaptation-ndoor-fungi-mold-and-health>
- Wang, X., & Li, H. (2011). *Energy saving and green building design of libraries: The case study of Zhengzhou Library*. Library Society of China & National Library of China. Retrieved from <https://www.ifla.org/past-wlic/2011/196-wang-en.pdf>
- Zakaria, M. S., & Hendi, O. M. (2024). IFLA green library award from 2016 to 2023: An examination of the best practices. *Public Library Quarterly*, 1–29. <https://doi.org/10.1080/01616846.2024.2400746>
- Zheng, R. M., Liu, G. X., & Xu, Y. H. (2013). Smart lights technology is used in library energy-saving. In *Advanced Materials Research* (Vol. 773, pp. 227–232). Trans Tech Publications, Ltd. <https://doi.org/10.4028/www.scientific.net/amr.773.227>

