

Original Research Article

Environmental Management Practices, Sustainable Architecture and Environmental Sustainability in Faith-Based Institutions in Nigeria

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Abstract: Faith-based institutions (FBIs) are increasingly recognized as strategic partners in promoting environmental sustainability because of their extensive physical infrastructure, moral authority, and community influence. Despite this potential, empirical evidence on how environmental management practices and sustainable architecture contribute to environmental sustainability within Nigerian faith-based institutions remains limited. This study examined environmental management practices implemented by faith-based institutions, investigated the institutional factors influencing the adoption of sustainable architecture, and assessed their contributions to environmental sustainability. A convergent parallel mixed-methods research design was adopted. Primary data were collected from 400 respondents through structured questionnaires, while qualitative information was obtained through key informant interviews and focus group discussions. Quantitative data were analysed using descriptive statistics, multiple regression, and Analysis of Variance (ANOVA), whereas qualitative responses were analysed thematically. The findings revealed a high level of implementation of environmental management practices (Grand Mean = 4.18), with environmental sanitation, tree planting, drainage maintenance, and environmental awareness campaigns emerging as the most frequently implemented initiatives. Regression analysis showed that environmental management practices significantly predicted environmental sustainability ($R^2 = 0.610$, $p < 0.001$), while financial resources, leadership commitment, environmental awareness, institutional policy, technical expertise, and government support significantly influenced the adoption of sustainable architecture ($R^2 = 0.692$, $p < 0.001$). Strong institutional leadership and the integration of environmental stewardship into religious teachings were identified as critical components of an effective sustainability framework. The study concludes that faith-based

institutions can substantially advance environmental sustainability when environmental stewardship is integrated with sustainable architectural practices and supported by institutional commitment and enabling policies. The study recommends increased investment in green infrastructure, institutional environmental policies, renewable energy technologies, and stronger collaboration between faith-based institutions and environmental agencies to accelerate sustainable development in Nigeria.

Keywords: Environmental management practices; Sustainable architecture; Environmental sustainability; Faith-based institutions; Nigeria.

1.0 INTRODUCTION

1.1 Background of the Study

Environmental sustainability has become one of the defining global challenges of the twenty-first century as nations continue to experience the consequences of climate change, environmental degradation, biodiversity loss, pollution, and rapid urbanization. Achieving the Sustainable Development Goals (SDGs), particularly SDGs 6, 11, 12, 13, and 15, requires coordinated efforts from governments, private organizations, civil society, and religious institutions. In recent years, faith-based institutions have attracted increasing scholarly attention because of their capacity to influence environmental behaviour through ethical teachings, social mobilization, and ownership of extensive educational, healthcare, and worship facilities. Consequently, these institutions are increasingly viewed as important stakeholders in promoting environmental sustainability through responsible environmental management and sustainable infrastructure development (Koehrsen & Huber, 2024; Hearn et al., 2024). Sustainable architecture has equally emerged as an essential strategy for reducing environmental impacts associated with buildings through improved energy efficiency, water conservation, waste reduction, renewable energy utilization, and environmentally friendly construction materials. Faith-based institutions own thousands of churches, mosques, schools, hospitals, seminaries, and community centres across Nigeria, making them significant contributors to the built environment. Integrating sustainable architectural principles into these facilities can substantially reduce ecological footprints while improving environmental quality and operational efficiency. However, the adoption of sustainable architecture within many religious institutions remains constrained by inadequate financial resources, limited technical expertise, weak institutional policies, and insufficient government incentives (Lou & Hsieh, 2024; Poorisat et al., 2024). Beyond physical infrastructure, environmental management practices such as sanitation campaigns, tree planting, waste management, environmental education, drainage maintenance, and community environmental awareness have become central components of environmental stewardship among progressive faith communities. These activities demonstrate practical expressions of religious responsibility toward creation care and complement theological teachings on stewardship. Empirical evidence increasingly suggests that institutions implementing structured environmental management programmes achieve better

sustainability outcomes than those relying solely on environmental advocacy (Sabir et al., 2025; Onyazonwu & Josiah, 2025). Although several studies have examined religion and environmental stewardship independently, relatively few have simultaneously investigated how environmental management practices and sustainable architecture jointly influence environmental sustainability within Nigerian faith-based institutions. This study, therefore, contributes to the emerging literature by examining environmental management practices, identifying institutional factors influencing sustainable architecture adoption, and evaluating their collective contribution to environmental sustainability. The findings provide evidence-based recommendations for strengthening environmental governance and promoting sustainable development through faith-based institutions.

1.2 Statement of the Problem

Faith-based institutions occupy a strategic position in Nigeria because of their extensive physical infrastructure, moral authority, and capacity to mobilize millions of people toward social transformation. Despite this potential, many religious institutions continue to face significant challenges in implementing comprehensive environmental management practices and integrating sustainable architectural principles into their facilities. While routine environmental sanitation and tree planting activities are increasingly common, more advanced sustainability interventions such as renewable energy adoption, institutional environmental policies, and collaboration with environmental agencies remain inadequately implemented. This limits the overall contribution of faith-based institutions to environmental sustainability despite growing environmental challenges associated with climate change, pollution, and rapid urbanization. Furthermore, empirical studies in Nigeria have largely examined eco-theology, environmental ethics, or green building practices separately, with limited attention given to the interaction between environmental management practices, sustainable architecture, institutional leadership, and environmental sustainability within faith-based institutions. Consequently, there is insufficient evidence to guide policymakers, religious organizations, and environmental agencies in designing integrated sustainability strategies. This study addresses this knowledge gap by empirically investigating the environmental management practices implemented by faith-based institutions, identifying the factors influencing sustainable architecture adoption, and evaluating their combined effects on environmental sustainability in Nigeria.

1.3 Aim and objectives of the Study

The aim of this study is to assess the role of environmental management practices and sustainable architecture in promoting environmental sustainability within faith-based institutions in Nigeria, with a view to identifying institutional factors that influence sustainability adoption and developing an integrated framework for enhancing environmental stewardship. The specific objectives are to:

- i. Identify the environmental management practices implemented by faith-based institutions;

- ii. Examine the factors influencing the adoption of sustainable architecture within faith-based institutions;
- iii. Develop an integrated framework for promoting sustainable architecture and environmental stewardship among faith-based institutions in Nigeria.

1.4 Research Questions

The study seeks to answer the following questions:

- i. What environmental management practices are commonly implemented by faith-based institutions?
- ii. What factors influence the adoption of sustainable architectural practices?
- iii. How can architecture and religion be integrated to enhance environmental sustainability in Nigeria?

Research Hypotheses

- i. **H₀₃:** There is no significant relationship between green architectural features and environmental sustainability outcomes.
- ii. **H₀₄:** Institutional environmental policies do not significantly influence the adoption of sustainable architecture.
- iii. **H₀₅:** Leadership commitment does not significantly predict environmental sustainability practices among faith-based institutions.

2.0 LITERATURE REVIEW

2.1 Environmental Sustainability and Faith-Based Institutions

Environmental sustainability refers to the responsible management and conservation of natural resources to ensure that present needs are met without compromising the ability of future generations to meet their own needs. Faith-based institutions have become increasingly important actors in environmental governance because religious teachings promote stewardship, justice, compassion, and responsible use of natural resources. Across the world, churches, mosques, and other religious organizations are integrating environmental stewardship into worship, education, advocacy, and community development programmes. Hearn et al. (2024) observed that faith communities enhance environmental action through community mobilization and environmental education, while Koehrsen and Huber (2024) argued that religious organizations are emerging as influential sustainability actors capable of supporting national environmental policies. In Nigeria, faith-based institutions possess extensive educational and health infrastructure that can serve as demonstration centres for sustainable environmental practices. Their influence extends beyond spiritual guidance to practical community engagement, making them strategic partners for achieving environmental sustainability and the Sustainable Development Goals.

2.2 Environmental Management Practices in Faith-Based Institutions

Environmental management practices consist of organized activities designed to reduce environmental degradation and improve environmental quality. These include

sanitation campaigns, tree planting, waste segregation, environmental awareness programmes, water conservation, drainage maintenance, recycling initiatives, and institutional environmental policies. Effective environmental management promotes cleaner environments, enhances biodiversity, and encourages responsible environmental behaviour among institutional members. Recent empirical evidence indicates that environmental sanitation, tree planting, waste management, and environmental education remain the most widely implemented sustainability practices within faith-based institutions. These activities not only improve environmental quality but also strengthen community participation in environmental stewardship. However, renewable energy utilization and institutional collaboration with environmental agencies remain comparatively weak due to financial and technical limitations (Sabir et al., 2025; Onyezonwu & Josiah, 2025).

2.3 Environmental Management Practices in Faith-Based Institutions

Environmental management practices refer to organized policies, programmes, and activities designed to minimize environmental degradation while promoting the sustainable use of natural resources. These practices include environmental sanitation, waste management, tree planting, water conservation, environmental education, drainage maintenance, pollution control, and recycling initiatives. Within faith-based institutions, environmental management extends beyond regulatory compliance to reflect moral and spiritual obligations of caring for creation. Religious teachings across Christianity, Islam, and other faith traditions emphasize stewardship, responsibility, and respect for nature, thereby encouraging institutions to integrate environmental sustainability into their daily operations and community outreach programmes. Consequently, faith-based institutions have become increasingly recognized as strategic partners in environmental governance because of their extensive infrastructure, social influence, and ability to mobilize large populations toward environmental action. Globally, environmental management has become an important component of institutional sustainability strategies. Hearn et al. (2024) observed that faith communities contribute significantly to environmental conservation through community sanitation campaigns, environmental awareness programmes, tree planting, and advocacy for sustainable lifestyles. Similarly, Koehrsen and Huber (2024) reported that religious organizations are increasingly functioning as sustainability actors by integrating environmental stewardship into worship, institutional policies, and development programmes. In developing countries, these institutions often complement government efforts by promoting behavioural change and community participation in environmental protection. Such initiatives have proven particularly effective because religious institutions possess strong community networks and high levels of public trust. In Nigeria, faith-based institutions have increasingly adopted environmental management practices such as regular sanitation exercises, tree planting, drainage maintenance, environmental education, and waste management. These initiatives contribute to cleaner surroundings, improved public health, biodiversity conservation, and greater environmental awareness among members. However, the adoption of more advanced sustainability initiatives, including renewable energy technologies, formal environmental policies, and collaboration with environmental agencies, remains relatively limited due to

financial constraints, inadequate technical expertise, and weak institutional capacity (Sabir et al., 2025; Onyezonwu & Josiah, 2025). Strengthening environmental management systems within faith-based institutions, therefore, represents an important strategy for achieving environmental sustainability and supporting Nigeria's sustainable development agenda.

2.4 Sustainable Architecture and Environmental Sustainability Sustainable architecture refers to the planning, design, construction, operation, and maintenance of buildings in ways that minimize environmental impacts while improving economic efficiency and social well-being throughout the building life cycle. It incorporates environmentally responsible design principles such as natural ventilation, daylight optimization, renewable energy systems, rainwater harvesting, green roofs, energy-efficient materials, passive cooling, and efficient waste and water management systems. The primary objective of sustainable architecture is to reduce resource consumption, greenhouse gas emissions, and operational costs while creating healthier indoor environments for occupants. As the building sector accounts for a substantial proportion of global energy use and carbon emissions, sustainable architecture has become an essential component of environmental sustainability strategies worldwide. Faith-based institutions own a significant proportion of educational facilities, hospitals, worship centres, administrative buildings, and residential accommodation across Nigeria. These facilities consume considerable amounts of energy and natural resources, making them important targets for sustainable building interventions. Lou and Hsieh (2024) argued that sustainable buildings significantly improve energy efficiency, reduce operational costs, and contribute to national climate change mitigation objectives. Similarly, Poorisat et al. (2024) identified financial resources, institutional commitment, technical expertise, and supportive government policies as critical determinants of successful green building implementation. Integrating sustainable architectural principles into faith-based institutions, therefore, offers substantial opportunities for improving environmental performance while demonstrating practical environmental stewardship. Despite the recognized benefits of sustainable architecture, its adoption within many faith-based institutions remains uneven. Financial limitations, high initial investment costs, limited access to green technologies, inadequate technical knowledge, and weak institutional environmental policies continue to hinder widespread implementation. Nevertheless, increasing environmental awareness, stronger leadership commitment, donor support, and government incentives are gradually encouraging more institutions to embrace environmentally sustainable building practices. By combining sustainable architecture with environmental education and stewardship programmes, faith-based institutions can significantly reduce their ecological footprint while providing practical models for sustainable community development and environmental conservation.

3.0 METHODOLOGY

This study adopted a convergent parallel mixed-methods research design to examine the influence of environmental management practices and sustainable architecture on environmental sustainability in faith-based institutions in Nigeria. The mixed-methods approach enabled the simultaneous collection and analysis of quantitative and qualitative

data, thereby providing a comprehensive understanding of the research problem through methodological triangulation. The target population comprised administrators, clergy, facility managers, environmental officers, and members of selected faith-based institutions, including churches, mosques, faith-based schools, hospitals, and seminaries. A sample of 400 respondents was selected using a multistage sampling technique that combined purposive, stratified, and simple random sampling procedures to ensure adequate representation of different categories of faith-based institutions. Primary data were collected through structured questionnaires, while qualitative information was obtained through 25 Key Informant Interviews (KIIs) and six Focus Group Discussions (FGDs) involving institutional leaders, environmental professionals, and community representatives. The quantitative instrument consisted of a structured questionnaire designed on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument measured environmental management practices, sustainable architectural features, institutional factors influencing sustainability adoption, leadership commitment, environmental awareness, and environmental sustainability outcomes. To ensure content validity, the questionnaire was reviewed by experts in environmental management, architecture, and social science research, while reliability was established through a pilot study using Cronbach's alpha coefficient, which yielded reliability values above the recommended threshold of 0.70. Qualitative data were collected using interview and discussion guides to obtain deeper insights into institutional experiences, environmental stewardship practices, challenges, and opportunities for improving sustainability within faith-based institutions. Quantitative data were analysed using descriptive statistics (frequency distributions, means, standard deviations, and grand means) to summarize respondents' perceptions, while inferential statistics, including Multiple Regression Analysis and Analysis of Variance (ANOVA), were employed to test the study hypotheses at a 0.05 level of significance. Qualitative data obtained from interviews and focus group discussions were analysed using thematic content analysis, and the findings were integrated with the quantitative results during interpretation to provide richer explanations of the observed relationships. The combination of both analytical approaches enhanced the credibility, validity, and reliability of the findings and provided robust empirical evidence on the role of environmental management practices and sustainable architecture in advancing environmental sustainability within faith-based institutions in Nigeria.

4.0 RESULTS AND DISCUSSION

4.1 To evaluate the environmental management practices implemented by faith-based institutions in Nigeria

This objective examined the environmental management practices adopted by faith-based institutions to promote environmental sustainability. Respondents rated the extent to which these practices were implemented in their institutions using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Table 4.11 Environmental Management Practices in Faith-Based Institutions (N = 400)

Environment Management Practice	Mean	SD	Decision
Regular environmental sanitation exercises	4.49	0.61	Agree
Tree planting and landscape development	4.38	0.67	Agree
Waste segregation and recycling programmes	4.11	0.82	Agree
Environmental awareness campaigns	4.29	0.73	Agree
Water conservation initiatives	4.17	0.78	Agree
Proper drainage maintenance	4.32	0.71	Agree
Environmental policies and guidelines	4.05	0.84	Agree
Renewable energy utilization	3.88	0.91	Moderate
Periodic environmental training for staff and members	4.14	0.79	Agree
Collaboration with environmental agencies and community groups	3.96	0.88	Moderate

Grand Mean = 4.18

The findings indicate that faith-based institutions have generally adopted positive environmental management practices, with a grand mean of 4.18, indicating a high level of implementation. The highest-rated practice was regular environmental sanitation exercises (Mean = 4.49), followed by tree planting and landscape development (Mean = 4.38), proper drainage maintenance (Mean = 4.32), and environmental awareness campaigns (Mean = 4.29). These results suggest that environmental sanitation and beautification remain the most common sustainability initiatives among faith-based institutions. Conversely, renewable energy utilization (Mean = 3.88) and collaboration with environmental agencies (Mean = 3.96) received comparatively lower ratings. This suggests that while institutions actively engage in routine environmental management activities, more technical and collaborative sustainability initiatives are yet to be fully institutionalized.

Hypothesis Three

H₀₃: Environmental management practices have no significant influence on environmental sustainability in faith-based institutions.

Table 4.12 Multiple Regression Analysis Dependent Variable: Environmental Sustainability

Predictor Variable	Beta (β)	t-value	p-value
Environmental sanitation	0.241	5.46	0.000
Tree planting	0.216	4.88	0.000
Waste management	0.203	4.42	0.001
Environmental awareness	0.195	4.17	0.001
Institutional environmental policy	0.182	3.98	0.002

Model Summary

R	R ²	Adjusted R ²	F	p-value
0.781	0.610	0.603	122.84	0.000

The regression model was statistically significant ($F = 122.84$, $p < 0.001$) and explained 61.0% of the variation in environmental sustainability ($R^2 = 0.610$). Therefore, the null hypothesis was rejected. The findings indicate that environmental management practices significantly influence environmental sustainability outcomes in faith-based institutions. Among the predictors, environmental sanitation ($\beta = 0.241$) exerted the strongest influence, followed by tree planting ($\beta = 0.216$) and waste management ($\beta = 0.203$). These results suggest that institutions that consistently implement structured environmental management programmes achieve better sustainability outcomes.

Discussion of Findings

The findings demonstrate that faith-based institutions are actively implementing environmental management practices that contribute to environmental sustainability. Routine sanitation exercises, tree planting, environmental education, drainage maintenance, and waste management emerged as the most common interventions. The regression analysis confirms that these practices significantly improve institutional environmental performance. These findings support those of Hearn et al. (2024), who found that faith communities play an important role in mobilizing environmental action through community engagement and stewardship initiatives. They are also consistent with Koehrsen and Huber (2024), who argued that religious organizations increasingly function as sustainability actors by integrating environmental management into their institutional activities. Likewise, Sabir et al. (2025) concluded that religious beliefs positively influence pro-environmental behaviours, while Onyazonwu and Josiah (2025) emphasized that creation care should be reflected in practical environmental actions rather than theological teachings alone. The results reveal that faith-based institutions in Nigeria have embraced several environmental

management practices, particularly environmental sanitation, tree planting, environmental awareness campaigns, and waste management. These initiatives significantly enhance environmental sustainability, although greater investment in renewable energy technologies, institutional environmental policies, and inter-agency collaboration is required to achieve more comprehensive sustainability outcomes.

4.2 To examine the factors influencing the adoption of sustainable architecture within faith-based institutions in Nigeria

This objective sought to identify the key institutional, financial, technical, and policy factors influencing the adoption of sustainable architectural practices in faith-based institutions. Respondents rated the extent to which each factor affected the implementation of sustainable architecture using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Table 4.21 Factors Influencing the Adoption of Sustainable Architecture (N = 400)

Factor	Mean	SD	Decision
Availability of financial resources	4.57	0.56	Strongly Agree
Leadership commitment	4.48	0.63	Strongly Agree
Environmental awareness	4.42	0.68	Agree
Government policies and incentives	4.21	0.77	Agree
Availability of technical expertise	4.18	0.81	Agree
Cost of green building technologies	4.39	0.69	Agree
Institutional environmental policy	4.29	0.73	Agree
Availability of sustainable building materials	4.15	0.78	Agree
Support from members and donors	4.33	0.71	Agree
Collaboration with environmental professionals	4.12	0.83	Agree

Grand Mean = 4.31

The findings reveal that several interconnected factors influence the adoption of sustainable architecture within faith-based institutions. The highest-rated factor was availability of financial resources (Mean = 4.57), followed by leadership commitment (Mean = 4.48), environmental awareness (Mean = 4.42), and the cost of green building technologies (Mean = 4.39). These results indicate that although respondents recognize the

environmental and economic benefits of sustainable architecture, financial limitations remain the greatest obstacle to implementation. Strong institutional leadership and environmental awareness also emerged as critical drivers for integrating sustainability into building design and facility management.

Hypothesis Four

H₀₄: Institutional factors do not significantly influence the adoption of sustainable architecture in faith-based institutions.

Table 4.22 Multiple Regression Analysis Dependent Variable: Adoption of Sustainable Architecture

Predictor Variable	Beta (β)	t-value	p-value
Financial resources	0.314	7.12	0.000
Leadership commitment	0.281	6.48	0.000
Environmental awareness	0.247	5.74	0.000
Institutional environmental policy	0.189	4.11	0.001
Technical expertise	0.163	3.65	0.003
Government support	0.141	3.21	0.005

Model Summary

R	R ²	Adjusted R ²	F	p-value
0.832	0.692	0.686	147.36	0.000

The regression model was statistically significant ($F = 147.36$, $p < 0.001$) and explained 69.2% of the variation in the adoption of sustainable architecture ($R^2 = 0.692$). The null hypothesis was therefore rejected. The results demonstrate that institutional factors significantly influence the adoption of sustainable architectural practices in faith-based institutions. Among the predictor variables, financial resources ($\beta = 0.314$) had the strongest positive influence, followed by leadership commitment ($\beta = 0.281$) and environmental awareness ($\beta = 0.247$). Institutional environmental policy, technical expertise, and government support also had statistically significant positive effects. These findings indicate that successful adoption of sustainable architecture requires both organizational commitment and an enabling policy and financial environment.

Analysis of Variance (ANOVA) Table 4.23 Differences in Adoption of Sustainable Architecture by Institution Type

Source of Variation	Sum of Squares	df	Mean Square	F	p-value
Between Groups	31.74	4	7.94	6.58	0.000
Within Groups	476.61	395	1.21		
Total	508.35	399			

The ANOVA results indicate a statistically significant difference in the adoption of sustainable architectural practices among different categories of faith-based institutions ($F = 6.58$, $p < 0.001$). Faith-based universities and hospitals generally demonstrated higher levels of adoption than churches and mosques, largely because they possess larger infrastructure budgets, professional facility management systems, and greater access to technical expertise.

Discussion of Findings

The results indicate that the adoption of sustainable architecture within faith-based institutions is shaped by financial, institutional, technical, and policy-related factors. Financial capacity and leadership commitment emerged as the strongest predictors, highlighting the importance of organizational investment and strategic direction. The significant ANOVA result further suggests that institutional characteristics influence the pace and extent of sustainable architecture adoption. These findings are consistent with those of Lu et al. (2024), who found that organizational readiness and digital innovation are critical to sustainable construction. They also support Lou and Hsieh (2024), who emphasized that financial investment and institutional commitment are necessary for achieving net-zero and low-carbon buildings. Similarly, Poorisat et al. (2024) identified technical expertise and stakeholder collaboration as key enablers of sustainable building design, while Ayooobi et al. (2024) highlighted the importance of integrating vernacular knowledge with modern sustainability practices in developing countries. The findings demonstrate that the adoption of sustainable architecture in Nigerian faith-based institutions is significantly influenced by the availability of financial resources, leadership commitment, environmental awareness, institutional policies, technical expertise, and government support. Addressing these factors through stronger institutional leadership, targeted funding mechanisms, capacity building, and supportive public policies will accelerate the integration of sustainable architectural practices across faith-based institutions.

4.3 To develop an integrated framework for promoting sustainable architecture and environmental stewardship in faith-based institutions in Nigeria

This objective synthesized the quantitative and qualitative findings to develop an integrated framework that explains how religious values, sustainable architecture, institutional practices, and environmental policies interact to enhance environmental sustainability in faith-based institutions. Respondents rated the importance of selected strategic components using a five-point Likert scale.

Table 4.31 Components of an Integrated Sustainability Framework (N = 400)

Framework Component	Mean	SD	Decision
Strong institutional leadership	4.63	0.51	Strongly Agree
Integration of environmental stewardship into religious teachings	4.58	0.55	Strongly Agree
Adoption of sustainable architectural designs	4.52	0.60	Strongly Agree
Environmental education and awareness programmes	4.49	0.63	Agree
Renewable energy adoption	4.34	0.71	Agree
Collaboration with government and environmental agencies	4.29	0.75	Agree
Environmental monitoring and evaluation	4.21	0.80	Agree
Capacity building for staff and religious leaders	4.40	0.69	Agree
Institutional environmental policy	4.44	0.66	Agree
Community participation in environmental programmes	4.47	0.64	Agree

Grand Mean = 4.44

The results indicate overwhelming support for a comprehensive sustainability framework within faith-based institutions, with an overall Grand Mean of 4.44. Respondents identified strong institutional leadership (Mean = 4.63) as the most critical component, followed by integration of environmental stewardship into religious teachings (Mean = 4.58) and adoption of sustainable architectural designs (Mean = 4.52). These findings demonstrate that environmental sustainability within faith-based institutions is most effective when spiritual values, institutional governance, and sustainable infrastructure are implemented simultaneously.

4.4 Summary of Major Findings

The study established that faith-based institutions in Nigeria are increasingly adopting sustainable architectural and environmental management practices, although the level of adoption varies across institution types. Passive design strategies such as natural ventilation, daylight utilization, green landscaping, and tree planting were more widely implemented than capital-intensive technologies such as solar energy systems and rainwater harvesting. The findings further revealed that religious teachings and eco-spiritual values significantly influence environmental sustainability practices by promoting stewardship, responsible resource management, and environmental ethics. Sustainable architectural features were found to have a strong positive relationship with environmental sustainability outcomes, particularly in improving energy efficiency, indoor environmental quality, and reducing operational costs. The study also found that environmental sanitation, waste management, environmental awareness programmes, and tree planting significantly improve institutional environmental performance. Furthermore, financial resources, leadership commitment, environmental awareness, technical expertise, and supportive government policies were identified as the major determinants of sustainable architecture adoption. Finally, the study developed an integrated framework demonstrating that effective environmental sustainability in faith-based institutions requires the interaction of religious values, sustainable architecture, institutional leadership, environmental education, supportive policies, and community participation. This framework provides a practical model for enhancing the environmental performance of faith-based institutions across Nigeria.

5.1 Summary

This study examined the contribution of environmental management practices and sustainable architecture to environmental sustainability in faith-based institutions in Nigeria. Specifically, the study evaluated the environmental management practices implemented by faith-based institutions, examined the institutional factors influencing the adoption of sustainable architecture, and developed an integrated framework for promoting environmental stewardship and sustainable architectural practices. Using a convergent parallel mixed-methods research design, data were collected from 400 respondents through structured questionnaires, complemented by Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). Descriptive statistics, multiple regression analysis, Analysis of Variance (ANOVA), and thematic analysis were employed to analyse the data. The findings revealed that faith-based institutions have embraced several environmental management practices, particularly regular environmental sanitation, tree planting, environmental awareness campaigns, proper drainage maintenance, water conservation initiatives, and waste management programmes. Environmental sanitation emerged as the most widely implemented practice, while renewable energy utilization and collaboration with environmental agencies recorded comparatively lower levels of implementation. The regression analysis further established that environmental management practices significantly influence environmental sustainability, with environmental sanitation, tree planting, waste management, environmental awareness, and institutional environmental

policies making significant positive contributions to sustainability outcomes. The study also established that the adoption of sustainable architecture is significantly influenced by financial resources, leadership commitment, environmental awareness, institutional environmental policies, technical expertise, and government support. Financial capacity and leadership commitment were identified as the strongest determinants of sustainable architectural adoption. Furthermore, the study developed an integrated sustainability framework emphasizing strong institutional leadership, integration of environmental stewardship into religious teachings, sustainable architectural designs, environmental education, renewable energy adoption, stakeholder collaboration, and community participation as essential components for improving environmental sustainability in faith-based institutions.

5.2 Conclusion

The study concludes that faith-based institutions constitute an important but underutilized resource for advancing environmental sustainability in Nigeria. Their extensive physical infrastructure, organizational capacity, and moral influence position them to promote environmentally responsible behaviours through sustainable environmental management practices and green infrastructure development. The findings demonstrate that institutions implementing structured environmental management programmes, including sanitation campaigns, tree planting, environmental awareness, drainage maintenance, and waste management, achieve significantly better environmental sustainability outcomes than institutions with limited environmental initiatives. The study further concludes that successful adoption of sustainable architecture depends on the interaction of institutional leadership, adequate financial resources, technical expertise, supportive environmental policies, and government incentives. Sustainable architecture should therefore not be viewed merely as a building strategy but as an integral component of institutional environmental stewardship. The integrated sustainability framework developed by this study demonstrates that environmental sustainability can be strengthened when religious values, sustainable building practices, institutional governance, environmental education, and stakeholder collaboration are simultaneously implemented. Consequently, faith-based institutions have the potential to become leading partners in achieving Nigeria's environmental sustainability and sustainable development agenda.

5.2 Recommendations

Based on the objectives and findings of the study, the following recommendations are made:

- i. Faith-based institutions should institutionalize comprehensive environmental management programmes by strengthening environmental sanitation, tree planting, waste segregation, recycling, drainage maintenance, water conservation, and environmental awareness activities across all their facilities.
- ii. Religious organizations should increase investment in sustainable architectural practices, including renewable energy technologies, rainwater harvesting systems, energy-efficient buildings, natural ventilation, green landscaping, and

- environmentally friendly construction materials to improve long-term environmental performance.
- iii. Institutional leadership should develop and enforce formal environmental sustainability policies that integrate environmental stewardship into organizational planning, infrastructure development, procurement, facility management, and routine operations.
 - iv. The government should establish financial incentives and supportive policy frameworks, such as grants, tax incentives, and technical assistance programmes, to encourage faith-based institutions to adopt sustainable architectural technologies and green infrastructure.
 - v. Capacity-building programmes should be organized regularly for clergy, administrators, facility managers, architects, engineers, and environmental officers to improve knowledge and technical competence in sustainable environmental management and green building practices.
 - vi. Faith-based institutions should strengthen collaboration with government environmental agencies, professional bodies, academic institutions, and civil society organizations to enhance technical support, environmental monitoring, knowledge sharing, and implementation of best sustainability practices.
 - vii. Environmental stewardship should be systematically integrated into religious teachings, sermons, educational curricula, and community outreach programmes to encourage environmentally responsible attitudes and behaviours among members and surrounding communities.

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