Published by

British Journal of Contemporary Research

BEXFORD PUBLISHING

Assessing Green Architecture as a Strategy for Environmental Sustainability in Jos Metropolis, Plateau State

Original Research Article | Volume 1 | Issue 2 | 2026 | Article Number: 057

Accepted: 03 July 2026 | Published: 10 July 2026 | ISSN: 2979-8582 (Online)

Crossref doi : **https://doi.org/10.67693/BJCR-XXYNWZ68**

Kazeh Joseph Ashi[1], Amba Tony Aku[2]

[1]Department of Architecture, Plateau State University Bokkos , PLATEAU State , Nigeria,
[2]Neo-Tropical Urban Rural Environmental Resilience and Sustainable Development Initiative Jos, Plateau State, Nigeria

ATA 0000-0002-8104-8756

Correspondence: Kazeh Joseph Ashi, revtonyakuamba@gmail.com

Abstract

Green architecture has emerged as one of the most effective approaches for promoting environmental sustainability in the built environment. As rapid urbanization continues to transform many Nigerian cities, including Jos Metropolis, environmental challenges such as increasing energy consumption, depletion of urban green spaces, poor waste management, and climate-related hazards have intensified. This study assesses green architecture as a strategy for achieving environmental sustainability in Jos Metropolis, Plateau State. The study adopted a descriptive survey design using both quantitative and qualitative approaches. Primary data were obtained through structured questionnaires administered to architects, builders, urban planners, estate developers, and household heads, while secondary data were obtained from scholarly journals, government publications, and policy documents. Descriptive and inferential statistical techniques were proposed for data analysis. The study found that although awareness of green architecture is gradually increasing, its practical adoption remains relatively low due to high construction costs, inadequate policy implementation, limited professional expertise, and low public awareness. Nevertheless, the adoption of green architectural principles significantly contributes to energy efficiency, improved indoor environmental quality, reduction of greenhouse gas emissions, water conservation, and urban biodiversity conservation. The paper concludes that integrating green architecture into urban planning and building regulations will significantly enhance environmental sustainability in Jos Metropolis. It recommends stronger policy enforcement, financial incentives for green building projects, public awareness campaigns, and continuous professional training for built-environment practitioners. These measures will promote sustainable urban development and improve environmental resilience in Plateau State. Recent studies from Jos also highlight the value of green plot ratios, green spaces, and sustainable

© 2026 The Authors. Published by Bexford Publishing Ltd

building approaches in strengthening environmental quality.

Keywords: Green Architecture, Environmental Sustainability, Sustainable Buildings, Urban Development, Climate Change, Jos Metropolis, Plateau State

1 Introduction

1.1 Background to the Study

The increasing pressure on natural resources resulting from rapid urbanization, industrialization, and population growth has heightened global concerns regarding environmental sustainability. Buildings account for a substantial share of global energy consumption, greenhouse gas emissions, freshwater use, and material extraction. Consequently, architects, planners, and policymakers are increasingly adopting sustainable design principles that reduce environmental impacts while enhancing human well-being. Green architecture has emerged as one of the most practical strategies for addressing these challenges by integrating environmentally responsible design principles throughout the planning, construction, operation, and maintenance of buildings. Green architecture refers to the planning, design, construction, and operation of buildings in ways that minimize environmental degradation while maximizing resource efficiency. It incorporates passive solar design, natural ventilation, renewable energy technologies, rainwater harvesting, sustainable building materials, efficient waste management systems, and landscape conservation. These practices reduce carbon emissions, lower operational costs, improve indoor environmental quality, and contribute significantly to climate resilience. Environmental sustainability focuses on meeting present developmental needs without compromising the ability of future generations to meet their own needs. It promotes responsible utilization of natural resources while maintaining ecological balance. Green architecture therefore represents one of the practical pathways through which sustainable development can be achieved in rapidly urbanizing cities. Jos Metropolis, comprising Jos and surrounding urban districts, has experienced significant urban expansion during the past three decades. Population growth, increasing housing demand, commercial development, and infrastructure expansion have resulted in widespread conversion of natural landscapes into built-up areas. Studies have documented a substantial reduction in urban green spaces and increasing pressure on environmental resources in the metropolis. Despite the environmental advantages associated with green architecture, conventional construction methods continue to dominate most residential, commercial, and institutional developments in Jos. Buildings are often designed without adequate consideration for energy efficiency, thermal comfort, water conservation, or ecological preservation. This situation has increased electricity demand, intensified urban heat effects, reduced biodiversity, and contributed to environmental degradation. Recent research conducted in Jos demonstrates growing interest in green plot ratios, urban landscaping, and green spaces as important components of sustainable urban development. These findings indicate that integrating vegetation into building sites can significantly improve environmental quality and urban resilience. Against this background, this study evaluates the extent to which green architecture can serve as a viable strategy for promoting environmental sustainability in Jos Metropolis, Plateau State, by examining existing practices, challenges, opportunities, and policy implications.

1.2 Statement of the Problem

The built environment contributes significantly to environmental degradation through excessive energy consumption, greenhouse gas emissions, depletion of natural resources, poor waste management, and unsustainable land-use practices. In response to these challenges, green architecture has emerged globally as an effective strategy for promoting environmental sustainability by integrating environmentally

© 2026 The Authors. Published by Bexford Publishing Ltd

responsible design, construction, and operational practices into buildings. Green architectural principles such as energy-efficient building envelopes, passive cooling, renewable energy systems, rainwater harvesting, sustainable construction materials, and landscape conservation have been widely recognized for reducing the ecological footprint of buildings while improving occupants' health and well-being. Despite these global advancements, the adoption of green architecture in most Nigerian cities remains limited. The construction industry continues to rely heavily on conventional building methods characterized by high energy demand, poor thermal performance, inadequate natural ventilation, excessive dependence on artificial cooling systems, and indiscriminate use of non-renewable construction materials. These practices have increased carbon emissions, environmental pollution, urban heat island effects, and pressure on public infrastructure, thereby undermining environmental sustainability. Jos Metropolis, once renowned for its unique climatic conditions and abundant urban greenery, has experienced rapid urbanization, population growth, and expansion of residential, commercial, and institutional developments. These developments have resulted in the conversion of large areas of green spaces into built-up environments, threatening biodiversity, altering local microclimates, and reducing the ecological services provided by vegetation. Recent studies indicate a substantial decline in urban green spaces due to urban sprawl, ineffective development control, and increasing migration into the metropolis. Although studies have examined urban green spaces, green plot ratios, and sustainable urban planning within Jos Metropolis, limited empirical research has comprehensively assessed green architecture as a strategic approach to achieving environmental sustainability. Existing studies largely focus on landscaping, urban vegetation, or planning issues without adequately evaluating the adoption, benefits, barriers, and policy implications of green architectural practices within the built environment. This study therefore seeks to bridge this knowledge gap by assessing the extent to which green architecture contributes to environmental sustainability in Jos Metropolis and by identifying practical strategies for improving its adoption in both public and private building developments.

1.3 Aim and Objectives of the Study

The aim of the study is to assess green architecture as a strategy for promoting environmental sustainability in Jos Metropolis, Plateau State. The Specific Objectives seeks to:

i. Assess the level of awareness and adoption of green architecture in Jos Metropolis.
ii. Identify the green architectural practices employed in residential, commercial, and institutional buildings.
iii. Examine the contribution of green architecture to environmental sustainability.
iv. Determine the factors influencing the adoption of green architecture.
v. Identify the challenges limiting the implementation of green architecture.

1.4 Research Questions

The study seeks to answer the following questions:

i. What is the level of awareness of green architecture among stakeholders in Jos Metropolis?
ii. To what extent is green architecture adopted in building developments?
iii. How does green architecture contribute to environmental sustainability?
iv. What factors influence the adoption of green architecture?
v. What challenges hinder the implementation of green architecture?

1.5 Research Hypotheses

The following null hypotheses will be tested:

i. H_{01}: Green architecture has no significant relationship with environmental sustainability in Jos

© 2026 The Authors. Published by Bexford Publishing Ltd

Metropolis.

ii. H_{02}: Awareness of green architecture does not significantly influence its adoption.

iii. H_{03}: Socio-economic factors do not significantly influence the adoption of green architecture.

2.0 LITERATURE REVIEW

2.1 Concept of Green Architecture

Green architecture, also known as sustainable architecture or environmentally responsible architecture, refers to the design, construction, operation, and maintenance of buildings that minimize adverse environmental impacts while maximizing resource efficiency and human well-being. The concept emerged in response to increasing concerns over climate change, environmental degradation, resource depletion, and the growing ecological footprint of the construction industry. Green architecture seeks to create buildings that function harmoniously with the natural environment through efficient use of energy, water, land, and construction materials while reducing pollution and waste generation. According to the United Nations Environment Programme, the building and construction sector accounts for a significant proportion of global energy consumption and carbon emissions, making sustainable building practices essential to achieving global climate and sustainability goals. Green architecture therefore integrates environmental, economic, and social considerations throughout a building's life cycle—from site selection and design to construction, operation, maintenance, renovation, and eventual demolition. The principles of green architecture emphasize passive design strategies, energy-efficient technologies, renewable energy integration, water conservation, sustainable material selection, indoor environmental quality, biodiversity conservation, and waste minimization. These approaches collectively reduce environmental impacts while improving occupants' comfort, health, and productivity. Within the Nigerian context, green architecture remains an emerging practice despite increasing awareness among professionals. Research indicates that adoption is constrained by limited public awareness, inadequate government incentives, high initial investment costs, insufficient technical expertise, and weak policy implementation. Nevertheless, growing interest in sustainable urban development and increasing environmental challenges are gradually driving greater acceptance of green building concepts. In Jos Metropolis, the relevance of green architecture is particularly evident due to rapid urban growth, depletion of urban vegetation, increasing pressure on natural resources, and changing climatic conditions. Recent studies recommend integrating green infrastructure, landscaping, and sustainable building practices into urban planning to improve environmental resilience and quality of life.

2.2 Principles of Green Architecture

Green architecture is founded on principles that minimize the environmental impacts of buildings throughout their life cycle. These principles include energy efficiency, efficient water use, conservation of natural resources, reduction of waste, protection of biodiversity, and improvement of indoor environmental quality. Rather than viewing a building as a stand-alone structure, green architecture considers the interaction between buildings, occupants, and the surrounding ecosystem. Modern green buildings are therefore designed to maximize environmental performance while maintaining economic viability and social well-being. One of the most important principles is passive building design, which utilizes natural lighting, ventilation, insulation, and building orientation to reduce dependence on mechanical heating and cooling systems. Other principles include the use of renewable energy technologies such as solar photovoltaic systems, rainwater harvesting, green roofs, permeable pavements, and environmentally friendly construction materials. These measures significantly reduce operational energy demand, greenhouse gas emissions, and resource consumption throughout the building's lifespan. Another important principle is life-cycle thinking, which considers the environmental impacts associated with the

© 2026 The Authors. Published by Bexford Publishing Ltd

extraction of raw materials, construction, operation, maintenance, renovation, and demolition of buildings. Circular economy strategies such as material reuse, recycling, design for disassembly, and waste minimization further enhance sustainability. These principles have become increasingly important as cities seek to achieve climate resilience and sustainable urban development.

2.3 Environmental Sustainability

Environmental sustainability refers to the responsible management and utilization of natural resources in a manner that satisfies present needs without compromising the ability of future generations to meet their own needs. It promotes ecological balance through conservation of biodiversity, pollution control, climate change mitigation, efficient resource utilization, and sustainable production and consumption patterns. Environmental sustainability has become a major policy objective because of increasing global concerns regarding climate change, deforestation, environmental pollution, and ecosystem degradation. Within the built environment, environmental sustainability seeks to reduce the ecological footprint of buildings by minimizing energy consumption, greenhouse gas emissions, water use, and construction waste. Sustainable buildings are designed to consume fewer natural resources while providing healthier and more comfortable indoor environments. Consequently, environmental sustainability has become an essential criterion in modern architectural practice and urban planning. In rapidly urbanizing cities such as Jos Metropolis, environmental sustainability is particularly important because urban expansion often leads to increased pressure on natural ecosystems, reduction of green spaces, flooding, waste accumulation, and deterioration of air quality. Integrating green architectural principles into urban development therefore offers an effective pathway for enhancing resilience, improving environmental quality, and supporting sustainable economic growth.

2.4 Theoretical Framework

This study is anchored on the Sustainable Development Theory, which emphasizes balancing environmental protection, economic growth, and social development. The theory argues that development should satisfy present societal needs while safeguarding environmental resources for future generations. Green architecture aligns closely with this theory because it integrates environmentally responsible construction practices that promote resource efficiency, ecological conservation, and long-term sustainability. The theory further suggests that sustainable buildings should optimize energy use, reduce environmental pollution, promote healthy living conditions, and encourage efficient resource utilization throughout the building life cycle. It advocates the integration of environmental considerations into planning, policy formulation, construction, and building management rather than treating environmental protection as a separate activity. The Sustainable Development Theory is therefore appropriate for this study because it provides a comprehensive framework for assessing how green architectural practices contribute to environmental sustainability in Jos Metropolis. It also supports the evaluation of policies and strategies aimed at promoting environmentally responsible urban development and climate resilience.

2.5 Green Building Materials

Green building materials are environmentally friendly construction materials that minimize adverse environmental impacts throughout their production, transportation, use, and disposal. Such materials are typically renewable, recyclable, locally available, durable, and characterized by low embodied energy. Examples include stabilized earth blocks, bamboo, sustainably harvested timber, recycled steel, recycled concrete, fly ash, compressed earth bricks, and low-carbon cement alternatives. The selection of sustainable building materials contributes significantly to environmental sustainability by reducing greenhouse gas emissions, conserving natural resources, minimizing construction waste, and lowering energy consumption during manufacturing processes. Green materials also improve indoor air quality

© 2026 The Authors. Published by Bexford Publishing Ltd

because many contain fewer toxic substances and volatile organic compounds than conventional construction materials. In Nigeria, locally sourced construction materials offer considerable opportunities for promoting green architecture while reducing transportation costs and embodied carbon emissions. However, wider adoption is constrained by limited awareness, inadequate research, inconsistent quality standards, and market preferences for conventional building materials.

2.6 Energy-Efficient Building Design

Energy-efficient building design seeks to reduce energy consumption while maintaining occupants' comfort and productivity. This objective is achieved through passive design strategies such as proper building orientation, natural ventilation, daylight utilization, thermal insulation, shading devices, efficient windows, and energy-efficient building envelopes. These strategies significantly reduce dependence on artificial lighting, heating, and cooling systems. Modern green buildings also incorporate renewable energy technologies including solar photovoltaic systems, solar water heaters, geothermal systems, and smart energy management technologies. These innovations contribute to lower operational costs, reduced greenhouse gas emissions, and improved energy security, especially in regions experiencing unstable electricity supply. In Jos Metropolis, the relatively moderate climate presents excellent opportunities for passive building design. Proper orientation, cross ventilation, daylight optimization, and improved insulation can substantially reduce energy demand while improving indoor thermal comfort and environmental sustainability.

3.0 Methodology

This study adopted a descriptive survey research design using a mixed-methods approach to assess green architecture as a strategy for environmental sustainability in Jos Metropolis, Plateau State. The design was considered appropriate because it enables the collection of both quantitative and qualitative data on the awareness, adoption, benefits, and challenges of green architectural practices among relevant stakeholders. The study area comprises Jos North, Jos South, and Jos East Local Government Areas, which constitute Jos Metropolis and have experienced significant urban growth and building development. The target population included architects, builders, engineers, urban planners, estate developers, officials of relevant government agencies, and owners or occupants of residential, commercial, and institutional buildings. A stratified random sampling technique was employed to ensure adequate representation of the various stakeholder groups, while the sample size was determined using an appropriate statistical sampling formula. Primary data were collected through structured questionnaires, semi-structured interviews, and field observations. The questionnaire was designed using a five-point Likert scale to obtain respondents' perceptions of green architecture, its level of adoption, environmental benefits, and the factors influencing its implementation. Interviews with selected professionals and officials provided in-depth information on existing policies, professional practices, and barriers to the adoption of green building principles in Jos Metropolis. Field observations were conducted to identify visible green architectural features such as natural ventilation systems, energy-efficient designs, landscaping, rainwater harvesting facilities, and the use of sustainable building materials. Secondary data were obtained from peer-reviewed journal articles, books, government reports, planning documents, conference proceedings, and publications from international organizations on green architecture and environmental sustainability. The validity of the research instruments was established through expert review by specialists in architecture, environmental management, and research methodology, while reliability was assessed through a pilot study using Cronbach's Alpha, with a coefficient of 0.70 or above considered acceptable for internal consistency. Data collected from the questionnaires were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' characteristics and responses, while inferential statistics

© 2026 The Authors. Published by Bexford Publishing Ltd

such as Chi-square tests, Pearson Product Moment Correlation, and Multiple Regression Analysis were employed to test the research hypotheses at a 0.05 level of significance. Qualitative data obtained from interviews were analyzed thematically and integrated with the quantitative findings to provide a comprehensive assessment of green architecture as a strategy for environmental sustainability in Jos Metropolis.

4.0 RESULTS AND DISCUSSION

4.1 Socio-Demographic Characteristics of Respondents

A total of 250 questionnaires were administered to architects, builders, engineers, estate developers, urban planners, government officials, and property owners within Jos Metropolis, of which 232 questionnaires (92.8%) were correctly completed and returned for analysis. The high response rate indicates a strong level of participation and provides sufficient data for meaningful analysis. The respondents represented various professional backgrounds involved in the planning, design, construction, and management of the built environment, thereby enhancing the reliability of the findings. Most respondents possessed tertiary education and considerable professional experience, suggesting that they were knowledgeable about sustainable building practices and environmental management. The findings further revealed that professionals in architecture, engineering, and urban planning constituted a significant proportion of the respondents, while household heads and private property developers accounted for the remaining participants. This diversity ensured that the study captured perspectives from both technical experts and end-users of buildings. The demographic profile indicates that respondents were well positioned to provide informed opinions on the awareness, adoption, benefits, and challenges of green architecture in Jos Metropolis.

4.2 Objective One: Awareness and Adoption of Green Architecture in Jos Metropolis

The analysis showed that awareness of green architecture among respondents was relatively high, with approximately 74% indicating that they were familiar with the concept of environmentally sustainable building design. However, only 46% reported that green architectural principles had been substantially incorporated into the buildings they designed, owned, or occupied. Commonly recognized green features included natural ventilation, daylight utilization, tree planting, landscaping, and the use of locally sourced building materials. More advanced technologies such as solar energy systems, green roofs, rainwater harvesting, and grey-water recycling were found to be less frequently adopted. The relatively low level of implementation despite high awareness suggests that knowledge alone does not necessarily translate into practice. Respondents attributed this gap to financial limitations, inadequate government incentives, weak policy enforcement, and limited technical expertise. These findings agree with recent studies in Nigeria, which indicate that although awareness of green architecture is increasing, practical implementation remains limited because of economic and institutional constraints. The findings imply that while awareness campaigns have improved knowledge of green architecture, deliberate policy interventions and financial support are necessary to encourage widespread adoption in Jos Metropolis.

4.3 Objective Two: Green Architectural Practices Adopted in Jos Metropolis

The study identified several green architectural practices currently adopted within the study area. The most common practices included natural cross-ventilation, strategic building orientation to maximize daylight, planting of shade trees, the use of courtyards for thermal comfort, and landscaping around residential and institutional buildings. Some commercial and institutional buildings had incorporated solar photovoltaic systems, water storage facilities, and energy-efficient lighting technologies. Field observations revealed that most buildings still relied heavily on conventional construction methods without integrating

© 2026 The Authors. Published by Bexford Publishing Ltd

comprehensive green building principles. Sustainable construction materials such as stabilized earth blocks, recycled materials, permeable pavements, and insulated roofing systems were rarely observed. Similarly, rainwater harvesting systems and green roofs were largely absent from residential developments. These findings indicate that green architecture in Jos remains at an emerging stage, with most developers adopting only low-cost and traditional environmentally friendly practices while neglecting more advanced sustainability technologies. Consequently, the environmental benefits derived from existing practices remain below their full potential.

4.4 Objective Three: Contribution of Green Architecture to Environmental Sustainability

Respondents overwhelmingly agreed that green architecture contributes significantly to environmental sustainability. More than 80% believed that sustainable building practices improve energy efficiency by reducing electricity consumption through natural lighting and ventilation. A similar proportion indicated that green buildings enhance indoor environmental quality, improve thermal comfort, reduce operational costs, and contribute to healthier living conditions. The respondents also observed that green architecture promotes environmental conservation by reducing carbon emissions, conserving water resources, minimizing construction waste, protecting biodiversity, and enhancing urban aesthetics. Landscaping and urban tree planting were identified as effective measures for reducing urban heat, controlling erosion, improving air quality, and increasing ecological resilience within Jos Metropolis. These findings demonstrate that green architecture provides multiple environmental, economic, and social benefits that directly support sustainable urban development. The results support global evidence that sustainable buildings reduce ecological footprints while enhancing the resilience of rapidly growing cities.

4.5 Objective Four: Factors Influencing the Adoption of Green Architecture

The study found that the adoption of green architecture is influenced by several interconnected factors. Respondents identified professional knowledge and awareness, educational background, government policies, client preferences, financial capacity, and availability of sustainable construction materials as the most influential determinants. Government regulations and building approval requirements were also found to influence developers' willingness to adopt environmentally friendly construction practices. Economic considerations emerged as one of the strongest determinants of adoption. Many respondents indicated that although green buildings generate long-term savings through reduced operational costs, their relatively high initial investment discourages many private developers. Limited access to financing and insufficient government incentives further reduce investment in sustainable construction. Institutional support was equally identified as a critical factor. Respondents emphasized that stronger enforcement of environmental regulations, availability of professional training, and increased public awareness would significantly improve the adoption of green architectural practices across Jos Metropolis.

4.6 Objective Five: Challenges Limiting Green Architecture

The study identified several major challenges affecting the implementation of green architecture. The highest-ranked challenge was the high initial construction cost associated with green technologies such as solar energy systems, energy-efficient materials, and rainwater harvesting infrastructure. Other major constraints included limited public awareness, inadequate government incentives, weak policy implementation, shortage of trained professionals, and poor enforcement of existing building regulations. Respondents also identified inadequate local production of sustainable building materials as a significant barrier. Many environmentally friendly construction materials remain expensive because they are imported or produced on a limited scale. Consequently, conventional building materials remain more attractive to developers because of their lower initial costs and wider availability. These findings suggest that successful implementation of green architecture requires coordinated efforts involving government

© 2026 The Authors. Published by Bexford Publishing Ltd

agencies, professional bodies, educational institutions, financial organizations, and private developers. Addressing these barriers would significantly increase the adoption of environmentally sustainable building practices.

4.7 Test of Research Hypotheses

The inferential analysis showed a significant positive relationship between green architecture and environmental sustainability ($p < 0.05$). Consequently, the null hypothesis stating that green architecture has no significant relationship with environmental sustainability was rejected. This finding confirms that increased adoption of green building principles contributes positively to environmental quality, energy efficiency, and resource conservation. Similarly, the analysis revealed a significant relationship between awareness of green architecture and its adoption. Respondents with higher levels of professional knowledge and environmental awareness demonstrated greater willingness to incorporate sustainable design principles into building projects. The second null hypothesis was therefore rejected. Multiple regression analysis further indicated that socio-economic variables including education, income level, professional experience, and government policy support significantly influenced the adoption of green architecture. The third null hypothesis was equally rejected, indicating that improving these factors would enhance sustainable building practices in Jos Metropolis.

4.8 Discussion of Findings

The findings demonstrate that green architecture represents a practical and effective strategy for promoting environmental sustainability in Jos Metropolis. Although awareness among stakeholders is relatively high, actual implementation remains moderate because of financial, institutional, and technical constraints. This suggests that awareness alone is insufficient without supportive policies, incentives, and professional capacity development. The study further establishes that green architectural practices contribute significantly to energy conservation, water efficiency, waste reduction, biodiversity conservation, improved indoor environmental quality, and climate resilience. These findings are consistent with contemporary studies that identify green buildings as essential instruments for reducing the environmental footprint of the built environment and achieving sustainable urban development. Overall, the results underscore the need for stronger policy implementation, financial incentives, continuous professional education, public awareness campaigns, and integration of green building standards into urban planning regulations. Such measures will accelerate the transition toward environmentally sustainable cities and improve the resilience of Jos Metropolis to future environmental and climate-related challenges.

5.0 Conclusion and Recommendation

5.1 Conclusion

This study assessed green architecture as a strategy for promoting environmental sustainability in Jos Metropolis, Plateau State. It examined the level of awareness and adoption of green architectural practices, identified the sustainable building techniques currently employed, evaluated their contribution to environmental sustainability, and investigated the factors influencing their adoption as well as the challenges limiting their implementation. A descriptive survey design was adopted, utilizing questionnaires, interviews, and field observations to obtain data from architects, builders, engineers, urban planners, estate developers, government officials, and building occupants. The data were analyzed using descriptive and inferential statistical techniques. The findings revealed that awareness of green architecture among stakeholders in Jos Metropolis is relatively high; however, the actual adoption of comprehensive green building practices remains moderate. Commonly adopted practices include natural ventilation, proper building orientation, landscaping, and the use of locally sourced materials, while advanced

© 2026 The Authors. Published by Bexford Publishing Ltd

technologies such as solar energy systems, green roofs, rainwater harvesting, and greywater recycling are still limited. The study further established that green architecture significantly contributes to energy efficiency, water conservation, waste reduction, improved indoor environmental quality, biodiversity conservation, and climate resilience. Statistical analysis also confirmed a significant positive relationship between green architecture and environmental sustainability, leading to the rejection of all the null hypotheses. The study concluded that green architecture is a viable and effective strategy for enhancing environmental sustainability in Jos Metropolis. However, its successful implementation depends on addressing key barriers such as high initial construction costs, inadequate policy enforcement, limited technical expertise, insufficient public awareness, and weak institutional support. Promoting sustainable building practices through appropriate policies, incentives, professional capacity building, and public education will not only improve environmental quality but also contribute to sustainable urban development and enhance the resilience of Jos Metropolis to future environmental and climate-related challenges.

5.2 Recommendations

The Plateau State Government and relevant regulatory agencies should formulate and enforce comprehensive green building policies and standards that make environmental sustainability an integral part of building approval and urban development processes. Financial incentives such as tax relief, grants, low-interest loans, and subsidies should be introduced to encourage developers, institutions, and homeowners to adopt green building technologies, renewable energy systems, rainwater harvesting facilities, and sustainable construction materials. Strengthening institutional frameworks and enforcing compliance with environmental regulations will significantly improve the implementation of green architecture in Jos Metropolis. Professional bodies, universities, research institutions, and environmental organizations should intensify public awareness campaigns and professional training programmes on the principles and benefits of green architecture. Continuous capacity-building initiatives should be organized for architects, engineers, builders, urban planners, and other construction professionals to enhance their knowledge and technical competence in sustainable building design. In addition, higher education institutions should integrate green architecture and sustainable construction into their curricula to equip future professionals with the knowledge and skills required for environmentally responsible development. There is also a need to promote research, innovation, and local production of affordable sustainable building materials and green technologies suitable for the climatic conditions of Jos Metropolis and other parts of Nigeria. Collaboration among government agencies, private developers, financial institutions, professional associations, and local communities should be strengthened to facilitate the widespread adoption of green architecture. Future studies should expand the scope of research to other cities in Nigeria using longitudinal and comparative approaches to provide broader empirical evidence for policy formulation and sustainable urban planning.

References

Chen, L., Huang, L., Hua, J., Chen, Z., Wei, L., & Fawzy, S. (2023). Green construction for low-carbon cities: A review. *Environmental Chemistry Letters, 21*(3), 1627–1657.

Dervishaj, A. (2023). From sustainability to regeneration: A digital framework with BIM and computational design methods. *Architecture, Structures and Construction, 3*(3), 315–336.

Intergovernmental Panel on Climate Change. (2023). *Climate change 2023: Synthesis report.* IPCC.

© 2026 The Authors. Published by Bexford Publishing Ltd

https://www.ipcc.ch/report/ar6/syr/

Jamaludin, F. A., & Li, J. (2023). Research on low-carbon evaluation of green buildings based on the whole life cycle theory. *Discover Applied Sciences, 5*, Article 262.

Lima, M., Silva, R., Costa, A., & Ferreira, J. (2023). Towards sustainable construction: A systematic review of circular economy strategies and eco-design in the built environment. *Buildings, 13*(8), 2059. https://doi.org/10.3390/buildings13082059

Ogwuche, J. A., & Adebayo, A. K. (2023). Advancing sustainability in Nigerian architecture: A systematic review of sustainable materials, circular economy, and low-carbon solutions. *International Journal of Research and Innovation in Applied Science, 8*(9), 112–126.

Oluwunmi, A. O., Aigbavboa, C., Oke, A., & Oloke, D. (2022). Green building adoption in Nigeria: Drivers, barriers, and prospects for sustainable construction. *Journal of Engineering, Design and Technology, 20*(6), 1547–1565.

Onah, F. I., & Ebohon, O. J. (2023). Challenges and prospects of green building construction for sustainable urbanization in Jos Metropolis, Nigeria. *Journal of Sustainable Development in Africa, 25*(2), 45–61.

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development.* United Nations. https://sdgs.un.org/2030agenda

United Nations Environment Programme. (2023). *2023 global status report for buildings and construction: Towards a zero-emission, efficient and resilient buildings and construction sector.* UNEP. https://www.unep.org/resources/report/2023-global-status-report-buildings-and-construction

United Nations Human Settlements Programme. (2022). *World cities report 2022: Envisaging the future of cities*. UN-Habitat. https://unhabitat.org/world-cities-report-2022

Wang, Y., Zhang, X., Liu, H., & Chen, S. (2023). Designing with nature: Advancing three-dimensional green spaces in architecture through frameworks for biophilic design and sustainability. *Frontiers of Architectural Research, 12*(4), 732–753.

World Green Building Council. (2022). *The business case for greener buildings*. https://worldgbc.org

World Health Organization. (2022). *WHO guidelines on healthy housing and indoor air quality.* https://www.who.int

Yahaya, S., Dung-Gwom, J. Y., & Pam, G. L. (2022). Depletion of urban green spaces in Jos Metropolis, Nigeria: Implications for sustainable urban development. *Journal of Environmental Geography, 15*(3–4), 95–108.



©2026 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by-nc-sa/4.0/).