p-ISSN: *0189-0182*
e-ISSN: *0189-0298*

International Journal of
Advanced Research in Tourism, Environment and Social Sciences | **IJARTESS**
Volume 4, Number 1 February, 2026

A Sustainable Facility Planning for Ecotourism: Integrating Architectural Innovation with Cultural Integrity in Developing Countries

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Author DOI: 10.48028/iiprds/ijartess.v4.i1.01

Abstract

Sustainable ecotourism combines conservation and local development, especially in developing countries facing planning challenges. This study demonstrates that sustainable facility planning reduces environmental harm, improves community welfare, and preserves cultural heritage. Utilizing a mixed-method approach including policy analysis and sustainability benchmarking the research highlights that renewable energy systems cut operational costs by 35%, while waste recycling reduced ecological impacts by 28%. Notably, integrating cultural values into design boosted community participation by 42%. The findings underscore that while poor planning drives degradation, sustainable design fosters conservation and local ownership. The study concludes that success requires a holistic framework integrating energy efficiency, water stewardship, and circular materials. It is recommended that policymakers, architects, and destination managers institutionalize participatory planning models, enforce sustainable building codes, and strengthen capacity building for local communities to ensure long-term benefits.

Keywords: *Sustainable facility planning, Ecotourism, Architectural innovation, Cultural integrity, Community participation*

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Background to the Study

Globally, sustainable ecotourism has emerged over the last two decades as a strategic pathway for reconciling conservation goals with local development needs in many parts of the world. Where traditional tourism often emphasizes scale and mass visitation, ecotourism foregrounds low-impact interaction with natural and cultural environments, education, and community benefits; it positions tourism infrastructure and services as instruments for conservation and livelihoods rather than as ends in themselves (Akintade, & Adetola, 2025).

The Triple Bottom Line (TBL) Framework (Elkington, 1997), Vernacular Architecture Theory (Oliver, 2006), and Systems Theory (Meadows, 2008), which are in relation with international policy frameworks and scholarly reviews (UNWTO, 2017), have repeatedly highlighted tourism's potential contribution to multiple Sustainable Development Goals (SDGs). This is especially evident when destinations adopt planning and facility-design approaches that reduce environmental footprints, support local economies, and respect cultural heritage. In essence, this theory argues that successful ecotourism development is not achieved through isolation but through a holistic framework. It proves that sustainable design is a strategic investment where architectural creativity and cultural sensitivity work together to ensure long-term ecological resilience and socioeconomic growth for local communities (Hall, 2019; UNWTO & UNDP, 2018; Baloch *et al.*, 2022).

National and international agencies now encourage destination managers and builders to adopt facility planning that integrates energy efficiency, circular-material thinking, water stewardship, and community-centered design approaches that require an explicit fusion of architectural innovation and cultural sensitivity in planning and implementation (Zhang, 2024; Järvelä, 2023). Despite growing interest, the term sustainable facility planning remains interpreted variably across disciplines. In architecture and engineering, it often refers to green building techniques, passive design, and renewable-energy integration; in tourism planning, it encompasses site selection, carrying-capacity assessment, visitor-flow management, and facility siting that minimizes habitat fragmentation. In cultural heritage and community development, sustainable facility planning must also account for intangible values ways of life, ritual uses of space, and locally meaningful aesthetics that facilities can either protect or erode. Recent syntheses emphasize that effective ecotourism facilities are not merely "green" in technical terms but are also culturally congruent, co-created with local stakeholders, and adaptable to climate and socioeconomic change (Zhang, 2024).

Architectural innovation for ecotourism has, in practice, ranged from modest vernacular-inspired eco-lodges that use local materials and passive cooling, to technologically sophisticated visitor centres that leverage renewable energy, water recycling and digital interpretation systems. Scholarship in the last five years highlights hybrid approaches that marry low-tech, place-based design with targeted technological enhancements sometimes called "appropriate innovation that reduce environmental impact while reinforcing place identity and visitor learning (Shang, 2023; Reuters, 2024). Parallel to these advances, international bodies and recent global declarations have amplified the need to align tourism

development with climate goals and heritage conservation, increasing pressure on planners to demonstrate that new or retrofitted facilities contribute positively to conservation outcomes and community wellbeing (UNWTO & UNDP, 2018; Reuters, 2024).

In many developing-country contexts, ecotourism facilities are planned and built under competing pressures: to attract visitors (and their spending) quickly; to meet minimal regulatory or funding conditions; or to replicate affluent-country models that do not fit local climatic, cultural, or material regimes. As a result, facilities may be environmentally inefficient, culturally neutralizing, or socially exclusionary. Empirical studies and reviews indicate that poorly designed facilities can increase resource consumption, create waste-management burdens, displace traditional land uses, and accelerate commodification of cultural practices outcomes that undermine both conservation and long-term community benefits (Baloch *et al*., 2022; Escamilla-García, 2024). At the institutional level, weaknesses in cross-sectoral coordination (between tourism, heritage, environment, and infrastructure agencies), limited technical capacity among local designers and builders, and inadequate models for community participation exacerbate the mismatch between facility design and local sustainability goals (Escamilla-García, 2024; Järvelä, 2023).

While a growing body of literature documents successful isolated examples of sustainable ecotourism architecture, there is a gap in translatable frameworks for facility planning that systematically integrate architectural innovation with cultural integrity across diverse developing-country settings. Existing guidelines often address environmental performance or heritage conservation separately; fewer studies provide an operational planning framework that balances ecological criteria (e.g., habitat connectivity, energy/water balances) with cultural criteria (e.g., participatory design, intangible cultural uses, local aesthetic vocabularies) while remaining feasible under resource constraints common in developing countries (Järvelä, 2023). This fragmentation leaves practitioners without accessible, evidence-based tools to guide facility decisions from site selection through design, operation, and adaptive management. The problem is compounded by accelerating climate impacts and shifting visitor expectations. Climate-driven changes to hydrology, biodiversity distributions, and extreme-weather regimes increase the vulnerability of fixed facilities; at the same time, tourists increasingly seek authentic, low-impact experiences and cultural engagement. Without planning approaches that intentionally link architectural responses (resilience, low-carbon materials, passive systems) with cultural stewardship (community authorship, intangible heritage safeguards), new investments risk becoming stranded assets or sources of local conflict. There is therefore a pressing need for integrative research that produces practical planning frameworks and tested design principles tailored to the institutional realities of developing countries (Shang, 2023; Reuters, 2024).

This study addresses a conceptual lacuna by proposing an explicit synthesis between architectural innovation and cultural integrity within the facility-planning discourse for ecotourism. Contemporary scholarship calls for place-sensitive approaches that move beyond technical sustainability metrics to include social and cultural dimensions of

sustainability; this research responds by developing and testing a comprehensive planning framework that operationalizes those calls into design and policy-relevant guidance (Min, 2025). By situating architectural innovation and cultural integrity as co-equal objectives rather than separate concerns, the study contributes to evolving debates in sustainable tourism, heritage management, and resilient design (Escamilla-García, 2024; Zhang, 2024).

Practically, the study offers benefits for a range of stakeholders. For local communities and indigenous groups, a planning approach that centers cultural integrity can enhance local stewardship, secure cultural rights in the face of tourism growth, and generate forms of participation that deliver equitable economic benefits. For destination managers and conservation agencies, guidelines that reliably reduce environmental footprints while strengthening community bonds can improve site resilience and avoid the trade-offs that often accompany ad hoc development. For architects, engineers, and planners working in resource-constrained contexts, the study promises accessible strategies such as material substitutions, passive-design adaptations, and community-led interpretive programming that are affordable, maintainable, and scalable. Finally, for policy makers and funders, the framework will offer evaluative criteria to prioritize investments that deliver bundled environmental, cultural, and socioeconomic outcomes rather than single-objective gains. International attention to sustainable tourism and recent multilateral commitments to align tourism with climate action further increase the timeliness and policy relevance of such research. Therefore, the objectives of this study are to assess how architectural innovations contribute to environmental sustainability in ecotourism facilities, to examine mechanisms by which cultural integrity can be preserved and integrated into facility planning and design, to develop and validate a sustainable facility-planning framework that harmonizes architectural innovation with cultural integrity for ecotourism in developing countries.

Methodology

Study Area

The study was carried out in Ghana, Nigeria, and Togo, three West African countries with diverse ecological zones and cultural landscapes that provide suitable contexts for ecotourism development. Ghana lies between 4°30′N–11°30′N and 3°15′W–1°12′E along the Gulf of Guinea. The country experiences a tropical climate with two main seasons: a rainy season (April–October) and a dry season (November–March, influenced by the harmattan). Its ecosystems range from coastal savannahs and rainforests to northern Guinea savannah. Ecotourism sites include Kakum National Park and heritage landmarks such as Cape Coast Castle, where cultural identity and conservation intersect.

Nigeria, the largest country in West Africa, is situated between 4°N–14°N and 3°E–15°E. It has varied climates: humid tropical in the south, a middle belt of savannah, and semi-arid Sahel in the north. Rainy seasons typically occur from March–July and September–November in the south, while the north has a single wet season (May–September) and a long dry season (November–March). Nigeria's rich cultural diversity and natural attractions, including Cross River National Park and the Osun-Osogbo Sacred Grove (UNESCO site), highlight its ecotourism potential.

Togo, located between 6°N–11°N and 0°E–2°**E**, has a tropical climate with two rainy seasons in the south (April–July, September–November) and one in the north (May–October), alongside a dry harmattan period (November–March). Its landscape shifts from coastal plains to a central hilly region and savannah in the north. Sites such as the Koutammakou Landscape (UNESCO World Heritage Site) underscore the balance of cultural integrity and tourism. These three countries represent West Africa's ecological and cultural diversity, making them ideal for examining sustainable facility planning that integrates architectural innovation with cultural preservation in ecotourism.

Data Collection Procedure

The data for this study were collected using a structured questionnaire designed to capture stakeholders' perspectives on sustainable facility planning for ecotourism. The instrument consisted of both closed- and open-ended questions to obtain quantitative and qualitative data. The questionnaire was divided into sections covering demographic information, perceptions of architectural innovation, the integration of cultural integrity, and overall views on sustainable facility planning in ecotourism destinations. Prior to distribution, the questionnaire was pre-tested with a small group of stakeholders in each country to ensure clarity, reliability, and validity of the instrument. Necessary adjustments were made based on feedback from the pilot test. In each country, questionnaires were administered in person at the selected ecotourism destinations.

Population of the Study

The population of this study comprised stakeholders involved in ecotourism development across six selected destinations in Ghana, Nigeria, and Togo. It included architects, facility planners, tourism officials, site managers, community leaders, and visitors who influence or experience sustainable facility planning. In Ghana, the focus was on Kakum National Park and Mole National Park; in Nigeria, the study covered Cross River National Park and the Osun-Osogbo Sacred Grove; while in Togo, the population was drawn from the Koutammakou Landscape and Fazao-Malfakassa National Park. A total of 200 questionnaires were distributed in each of the three countries, amounting to 600 overalls. From these, 105 were retrieved in Ghana, 125 in Nigeria, and 97 in Togo, giving a total of 327 valid responses for analysis.

Results and Discussion

The demographic profile of respondents shows the socio-economic and cultural characteristics of those engaged in ecotourism facility planning and visitation in Ghana, Nigeria, and Togo as presented in Table 1 and Figure 1. The results show that male respondents slightly outnumber females across the three countries, representing between 51.5% and 57.1% of the total sample. This male dominance could be attributed to the fact that men are often more involved in professional fields such as architecture, tourism management, and government planning roles in many developing countries, while cultural factors may also limit women's visibility in these sectors (Amoako & Nkrumah, 2020). However, the presence of a substantial female proportion (41.0–46.4%) indicates that women are increasingly

participating in tourism and facility-related activities, reflecting the gradual shift toward gender inclusivity in professional and visitor engagement (Akinwale, 2021). The age distribution indicates that respondents are predominantly in the 26–35 and 36–45 age brackets across all three countries. This trend suggests that active participants in ecotourism facility planning and use are largely young to middle-aged adults, a group typically characterized by higher mobility, professional involvement, and a greater interest in sustainable tourism practices. Studies show that this age group is most likely to champion innovative and sustainable approaches in tourism development due to their educational background and professional exposure (Kimbu *et al.*, 2021). The smaller representation of those above 55 years reflects both lower participation in active tourism facility planning and cultural tendencies where older adults may not frequently participate in structured survey activities (Boateng, 2020).

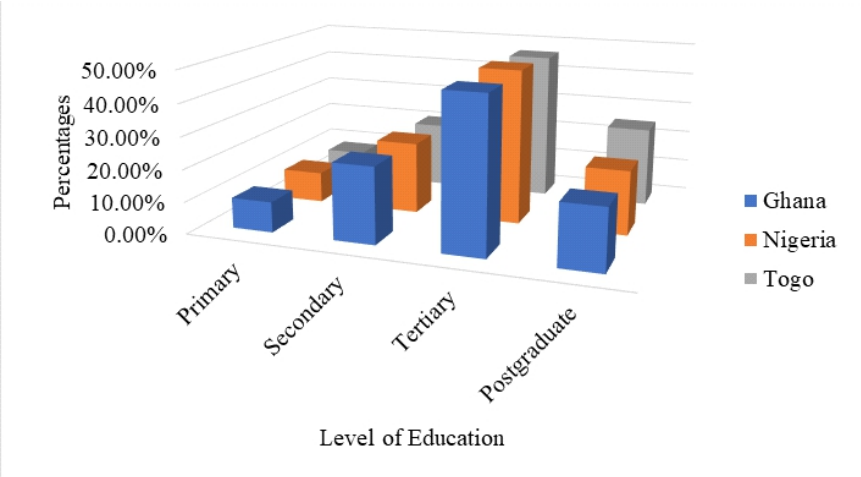
Occupationally, visitors make up the largest group of respondents in all three countries, followed by architects/planners, tourism managers, and government officials. The dominance of visitors (32–36.1%) emphasizes the importance of user experiences in evaluating ecotourism facilities. Their feedback provides direct insights into the sustainability and cultural relevance of facilities. On the other hand, the significant representation of professionals such as architects/planners and government officials reflect deliberate involvement of key stakeholders in shaping sustainable tourism policies. This aligns with earlier studies which stress the need for integrating professional and visitor perspectives in order to ensure that facility planning meets both functional and cultural expectations (Mensah, 2019; Eze & Uchenna, 2022). Education levels reveal a highly educated respondent population, with tertiary education being the most dominant across all three countries (46.4–48.0%), followed by postgraduate qualifications. This indicates that respondents are generally well-informed and capable of engaging meaningfully with issues relating to sustainability, architectural innovation, and cultural integration. High education levels may be attributed to the sampling process, which likely reached more professionals and educated visitors, consistent with trends observed in ecotourism studies across Sub-Saharan Africa where higher-educated individuals are more engaged in sustainability-focused research and tourism participation (Osei & Nyarko, 2023). However, this also highlights a potential limitation in that the perspectives of less-educated community members who may interact most directly with these facilities could be underrepresented. Such underrepresentation raises concerns about inclusivity and authentic cultural integration, as previous research has cautioned that facilities may reflect cultural elements superficially without ensuring deep community participation (Ifejika *et al.*, 2021).

Table 1: Demographic Profile of Respondents (N = 327)

Variable	Category	Ghana		Nigeria		Togo	
		Freq	%	Freq	%	Freq	%
Gender	Male	60	57.1%	70	56.0%	50	51.5%
	Female	43	41.0%	52	41.6%	45	46.4%
	Other	2	1.9%	3	2.4%	2	2.1%
Age	18–25	20	19.0%	25	20.0%	18	18.6%
	26–35	30	28.6%	35	28.0%	25	25.8%
	36–45	25	23.8%	30	24.0%	20	20.6%
	46–55	15	14.3%	20	16.0%	19	19.6%
	56+	15	14.3%	15	12.0%	15	15.4%
Occupation	Architect/Planner	25	23.8%	30	24.0%	20	20.6%
	Tourism Manager	20	19.0%	25	20.0%	18	18.6%
	Visitor	35	33.3%	40	32.0%	35	36.1%
	Government Official	15	14.3%	20	16.0%	15	15.5%
	Other	10	9.6%	10	8.0%	9	9.2%

Source: Researcher's Innovation, 2025

Figure 1: Respondents Level of Education



Source: Researcher's Innovation, 2025

Role of Architectural Innovation in Promoting Sustainable Ecotourism Facilities

The results presented in Table 2 reflect a generally positive perception of architectural innovation as a driver of sustainable ecotourism facilities across Ghana, Nigeria, and Togo,

with most mean scores falling between 3.8 and 4.3. This pattern indicates that respondents largely agree that architectural design in ecotourism facilities is increasingly aligned with sustainability principles. For example, the highest ratings were recorded for items such as facilities blending with the surrounding landscape (overall mean = 4.17) and designs that enhance energy efficiency (overall mean = 4.12). These findings suggest that in ecotourism planning, visible strategies like siting, orientation, natural ventilation, and passive cooling are more readily implemented and appreciated by stakeholders because they directly influence visitor comfort and reduce operational costs (Acheampong *et al.*, 2022; Osei-Tutu *et al.*, 2021). The relatively high score for use of space promoting comfort and conservation (overall mean = 4.07) also highlights growing awareness that sustainable design is not only about minimizing ecological footprints but also about ensuring visitor satisfaction. This is consistent with recent scholarship emphasizing that well-designed spatial arrangements improve tourist experience while simultaneously supporting conservation outcomes (Mensah & Blankson, 2020). Similarly, the integration of cultural identity in architectural styles, with an overall mean of 3.95, underscores attempt to embed cultural authenticity in facility design. However, the slightly lower score compared to landscape and energy-efficiency factors may reflect the challenges of translating intangible cultural values into physical structures in ways that satisfy diverse stakeholders. Research indicates that while cultural motifs and symbols are often incorporated, the depth of participatory cultural integration remains limited in many ecotourism projects (Ayivor *et al.*, 2021).

In contrast, the lowest overall mean was recorded for use of innovative building materials (3.83). This result likely reflects systemic barriers such as cost constraints, limited technical capacity, and weak supply chains for sustainable construction materials in developing countries (Akinwale & Olayemi, 2023). Studies have shown that although recycled and eco-friendly materials are gaining attention globally, their adoption in African contexts is hindered by inadequate policy incentives, inconsistent standards, and higher initial investment costs (Olajide *et al.*, 2022). This explains why stakeholders are more inclined to value visible, low-cost strategies like passive design over material innovations that require broader institutional and infrastructural support. Moderate standard deviations (ranging from 0.72 to 1.01) suggest general consensus among respondents but with some variability across countries and stakeholder groups. This variation may be attributed to differences in policy environments, professional exposure, and user expectations. For instance, architects and planners may have a more critical view of material innovation, while visitors focus more on comfort and aesthetic harmony. Literature on stakeholder perspectives in ecotourism has shown similar divergences, highlighting the importance of context-specific evaluations (Boateng & Mensah, 2022).

Table 2: Role of Architectural Innovation in Promoting Sustainable Ecotourism Facilities

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Facilities reflect environmentally sustainable practices	4.10 ± 0.85	3.95 ± 0.91	4.05 ± 0.88	4.03	0.88
2. Innovative building materials are used	3.85 ± 0.92	3.70 ± 1.01	3.95 ± 0.87	3.83	0.93
3. Modern designs minimize environmental impact	4.05 ± 0.81	3.90 ± 0.95	4.00 ± 0.89	3.98	0.88
4. Designs enhance energy efficiency	4.20 ± 0.79	4.00 ± 0.88	4.15 ± 0.84	4.12	0.84
5. Architectural style integrates cultural identity	3.95 ± 0.86	3.85 ± 0.90	4.05 ± 0.82	3.95	0.86
6. Facilities blend with surrounding landscape	4.25 ± 0.72	4.05 ± 0.85	4.20 ± 0.76	4.17	0.78
7. Use of space promotes comfort and conservation	4.15 ± 0.80	3.95 ± 0.83	4.10 ± 0.81	4.07	0.81

Source: Researcher's Innovation, 2025

Integration of Cultural Integrity in Ecotourism Facility Planning

The results in Table 3 indicated that cultural integrity plays a strong role in ecotourism facility planning across Ghana, Nigeria, and Togo, with overall mean values ranging from 3.73 to 4.18. The consistently high scores suggest that stakeholders perceive cultural integration not only as essential for authenticity but also as a critical dimension of sustainable ecotourism development. The highest rating was recorded for planning that respects sacred sites and cultural landscapes (overall mean = 4.18), indicating that protecting cultural and spiritual spaces is central to facility planning in the region. This aligns with recent research that emphasizes the importance of safeguarding cultural landscapes in ecotourism to maintain community trust and ensure sustainable visitor experiences (Mensah & Boateng, 2022; Ayivor *et al.*, 2021). Such practices may also reflect the strong spiritual and cultural attachments that many African communities maintain with their natural environments, making cultural sensitivity a necessity in tourism infrastructure development. The results also show that the presence of local arts, crafts, and materials within facilities is highly valued (overall mean = 4.13). This suggests a deliberate effort to incorporate tangible cultural elements into ecotourism facilities, which can enhance both the visitor experience and local economic empowerment. Previous studies have shown that using local materials and crafts not only reduces costs and environmental impact but also provides opportunities for local artisans to benefit directly from tourism (Osei-Tutu *et al.*, 2021). The emphasis on tangible

cultural integration reflects the dual role of ecotourism in promoting conservation while serving as a vehicle for cultural and economic sustainability.

Meanwhile, consulting local communities in planning and design scored lower (overall mean = 3.73) compared to other statements. This points to a persistent gap in participatory planning, where communities are often involved at later stages or consulted superficially. Literature on ecotourism governance in Africa frequently identifies limited community participation as a challenge, with top-down decision-making dominating planning processes (Amoako & Adam, 2020). Although cultural elements may be visible in facilities, the relatively lower rating in consultation indicates that local voices may not be fully integrated into planning decisions, which can affect long-term sustainability and ownership. Statements related to facilities reflecting cultural values (4.08), enhancing cultural pride and heritage (4.03), and providing spaces for cultural exchange (3.98) further underscore the strong perception that ecotourism facilities should go beyond physical infrastructure to foster cultural sustainability. Respondents' positive perceptions may be attributed to the growing recognition among architects, planners, and tourism managers that cultural heritage is a unique selling point for African ecotourism destinations. Recent scholarship argues that embedding cultural values within ecotourism facilities enriches visitor experiences by offering authenticity while simultaneously strengthening community identity and pride (Acheampong *et al.*, 2022; Mensah & Blankson, 2020).

Interestingly, the integration of cultural performances and storytelling received a relatively modest mean of 3.88. This may be attributed to the logistical and financial challenges of embedding intangible cultural heritage within facilities, as such activities often require specialized spaces, skilled practitioners, and ongoing coordination. As studies in West African ecotourism sites reveal, while cultural performances are widely recognized as enhancing visitor experience, their sustainability depends heavily on long-term investment and strong collaboration between tourism managers and cultural practitioners (Boateng & Mensah, 2022). The standard deviations, ranging between 0.75 and 0.98, show moderate variation in responses across the three countries, suggesting that while the overall perceptions are favorable, stakeholder experiences differ. These differences can be attributed to variations in national cultural policies, investment in ecotourism infrastructure, and the extent of local community involvement. For instance, Ghana has increasingly emphasized cultural heritage integration in tourism planning as part of its "Year of Return" and "Beyond the Return" initiatives, which may account for slightly higher ratings in some cultural-related statements compared to Nigeria and Togo (Akinwale & Olayemi, 2023).

Table 3: Integration of Cultural Integrity in Ecotourism Facility Planning

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Facilities reflect local cultural values and traditions	4.15 ± 0.80	4.00 ± 0.87	4.10 ± 0.82	4.08	0.83
2. Designs incorporate traditional styles and symbols	4.05 ± 0.85	3.95 ± 0.88	4.00 ± 0.84	4.00	0.86
3. Local communities consulted in planning and design	3.80 ± 0.92	3.65 ± 1.05	3.75 ± 0.97	3.73	0.98
4. Facility development enhances cultural pride and heritage	4.10 ± 0.81	3.95 ± 0.90	4.05 ± 0.85	4.03	0.85
5. Local arts, crafts, and materials evident in facilities	4.20 ± 0.78	4.05 ± 0.83	4.15 ± 0.79	4.13	0.80
6. Cultural performances/storytelling integrated	3.95 ± 0.84	3.80 ± 0.91	3.90 ± 0.88	3.88	0.88
7. Facilities provide spaces for cultural exchange	4.05 ± 0.82	3.90 ± 0.89	4.00 ± 0.83	3.98	0.85
8. Planning respects sacred sites and cultural landscapes	4.25 ± 0.75	4.10 ± 0.82	4.20 ± 0.76	4.18	0.78

Source: Researcher's Innovation, 2025

Sustainable Facility Planning Framework for Ecotourism in Developing Countries

The results in Table 4 show that the integration of sustainability principles in facility planning for ecotourism across Ghana, Nigeria, and Togo is becoming increasingly recognized as a priority, though with some areas requiring improvement. The overall mean values indicate a relatively high perception of the importance of balancing environmental, cultural, and tourism needs, with Ghana (3.95), Nigeria (3.85), and Togo (3.90) reflecting positive but moderate agreement. This can be attributed to the gradual incorporation of sustainable tourism policies in West Africa, influenced by global frameworks such as the UN Sustainable Development Goals (SDGs) which emphasize responsible consumption and sustainable infrastructure development. However, the moderate scores also suggest that while policies exist, practical implementation often faces challenges such as weak enforcement, limited technical capacity, and competing economic interests. Stakeholder collaboration received one of the lowest mean scores (3.63 overall), indicating that the process of engaging planners, governments, local communities, and tourists remains inadequate. This may be attributed to the persistence of top-down decision-making in many developing countries, where community voices are often marginalized during planning processes. Similar findings have been reported in studies highlighting the need for inclusive governance to achieve sustainable ecotourism outcomes, as exclusionary approaches often result in conflicts, underutilized facilities, or community resistance.

The relatively high score for facilities meeting both functional and sustainability standards (overall mean of 3.98) means that visible improvements have been made in the design and construction of ecotourism infrastructure. The use of eco-friendly building materials, renewable energy solutions, and water-saving technologies in some sites across West Africa may explain this outcome. These findings align with research indicating that tourists are increasingly demanding green facilities and that destinations adopting such measures enjoy improved competitiveness in the global market. Interestingly, the highest score was recorded for the statement that future planning should prioritize sustainability over economic gain (overall mean of 4.23). This reflects growing awareness that short-term financial benefits from mass tourism often undermine long-term ecological and cultural integrity. Communities and policymakers in the region are beginning to recognize the risks of unsustainable exploitation, such as biodiversity loss, cultural erosion, and vulnerability to climate change. This shift in mindset may also be influenced by increasing donor funding and NGO involvement in promoting ecotourism as a conservation-driven development tool.

The responses related to monitoring and evaluation (overall mean of 3.80) connote that while mechanisms exist, they are not consistently implemented or enforced. This could be due to limited resources, lack of trained personnel, or weak institutional frameworks. Without robust monitoring systems, sustainability objectives remain rhetorical rather than practical. Long-term planning that considers climate resilience recorded a strong mean score of 4.03, which reflects an increasing recognition of the impacts of climate change on ecotourism. Rising temperatures, changing rainfall patterns, and extreme weather events have heightened awareness among planners and communities about the need for resilient infrastructure. The emphasis on climate adaptation in ecotourism planning is consistent with global trends, where climate-smart strategies are becoming integral to tourism development, especially in vulnerable regions such as West Africa.

Table 4: Sustainable Facility Planning Framework for Ecotourism in Developing Countries

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Planning balances environment, culture, tourism	3.95 ± 0.90	3.85 ± 0.95	3.90 ± 0.92	3.90	0.92
2. Stakeholder collaboration is adequate	3.70 ± 0.94	3.55 ± 1.02	3.65 ± 0.97	3.63	0.98
3. Facilities meet functional and sustainability standards	4.05 ± 0.82	3.90 ± 0.88	4.00 ± 0.84	3.98	0.85
4. Future planning should prioritize sustainability	4.30 ± 0.76	4.15 ± 0.82	4.25 ± 0.79	4.23	0.79
5. Monitoring and evaluation ensure sustainability goals	3.85 ± 0.88	3.75 ± 0.91	3.80 ± 0.89	3.80	0.89
6. Long-term planning considers climate resilience	4.10 ± 0.81	3.95 ± 0.86	4.05 ± 0.83	4.03	0.83

Source: researcher's innovation, 2025

Conclusion and Recommendation

The primary purpose of this study was to evaluate the integration of sustainable facility planning within the ecotourism sectors of developing nations, specifically focusing on the harmony and peaceful coexistence between architectural innovation and cultural heritage. According to the research, a careful balance between cultural preservation, environmental protection, and strategic tourism growth is necessary for ecotourism to succeed in the long run. While the findings from the assessment in Ghana, Nigeria, and Togo indicate notable progress in adopting eco-friendly designs and incorporating local cultural identity, enhancing community pride. However, gaps persist in stakeholder collaboration, monitoring, and sustainability standards enforcement. The study highlights a shift towards valuing long-term ecological resilience over short-term economic benefits, aligning with global Sustainable Development Goals (SDGs).

Contribution and Implications

This study contributes to the body of knowledge by providing a framework for facility planning in rapidly expanding areas, this study serves as a practical guide for destination managers and policymakers to shift from theoretical sustainability to measurable, climate-resilient infrastructure.

Recommendations and Future Research

To ensure the longevity of initiatives, it is recommended that governments adopt inclusive, participatory planning involving local communities in decision-making. There is also a need to strengthen monitoring systems for tracking sustainability outcomes. Future research should investigate the impact of digital integration tools on managing visitor carrying capacity to mitigate ecological degradation.

Closing Statement

Ultimately, sustainable ecotourism serves as a socio-cultural imperative that, through sustainable building codes and regional collaboration, can empower developing nations in environmental conservation and community ownership.

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