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Research article

EVALUATING THE CURRENT LEVEL OF DEVELOPMENT AND UTILISATION OF ECOTOURISM RESOURCES IN CROSS RIVER STATE, NIGERIA

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ABSTRACT
This study evaluates the current level of development and utilisation of major ecotourism resources in Cross River State, Nigeria. A cross-sectional survey design was adopted, and questionnaire data were collected from 400 respondents selected through a multi-stage sampling procedure across six ecotourism zones: Obanliku, Obudu, Boki, Etung, Akamkpa and Calabar Municipal. Descriptive statistics were used to identify major resources and assess their level of development and use. Findings show that respondents recognised mountains (97.3%), waterfalls (91.3%), biodiversity hotspots (86.3%), wildlife sanctuaries (82.0%), monoliths (78.0%), drill ranches (74.5%), forests (72.0%), local festivals (65.3%), hills (63.0%) and dams (50.3%) as major ecotourism resources. However, most attractions recorded low development and low utilisation, while dams, monoliths and local festivals showed substantial non-development. The study contributes empirical evidence on the gap between resource abundance and destination readiness in a rainforest tourism setting. It concludes that Cross River State's ecotourism assets can support sustainable rural development only where infrastructure, community participation, investment, destination management and conservation governance are strengthened.

KEYWORDS
Ecotourism; resource development; resource utilisation; sustainable tourism; community participation; Cross River State; destination management; Nigeria

Introduction

Ecotourism has become one of the most widely discussed strategies for aligning environmental conservation with community development. It is valued because it links travel to natural areas with conservation ethics, interpretation, local participation and livelihood improvement. In principle, ecotourism transforms forests, waterfalls, mountains, wildlife habitats, cultural landscapes and rural knowledge systems into development assets without destroying the ecological foundations on which those assets depend. This principle is especially important for developing destinations where local communities often live close to protected areas but have limited access to stable employment, infrastructure and formal tourism markets. Properly planned ecotourism can create employment, diversify household income, finance conservation, strengthen local identity and encourage public support for biodiversity protection (Baydeniz et al., 2024; Cossengue et al., 2025; Eneyo, 2018; Eneyo, 2024a). The global growth of nature-based tourism has also created a need to distinguish authentic ecotourism from general nature tourism. A destination may attract visitors because of scenery or wildlife and still fail to conserve ecosystems or improve local wellbeing. Torsney et al. (2025) therefore argue that ecotourism should be defined and governed through measurable sustainability outcomes rather than used as a promotional label. This position is important because poorly managed nature tourism can increase waste, noise, vegetation loss, wildlife disturbance, unplanned construction and social conflict. Ecotourism can only be considered

sustainable when visitor use is controlled, ecological thresholds are respected, revenues are accountable and host communities participate meaningfully in decision-making.

Nigeria possesses a wide range of resources suitable for ecotourism development. These include tropical rainforests, savannah landscapes, waterfalls, rivers, caves, wildlife habitats, mountains, monoliths, cultural festivals and protected areas. Cross River State occupies a distinctive place in this national geography because it contains some of the country's best-known rainforest and mountain attractions. Obudu Mountain Resort, Agbokim Waterfalls, Kwa Falls, Afi Mountain Wildlife Sanctuary, Oban Hills, the Okwangwo Division of Cross River National Park, the Ikom Monoliths and associated cultural landscapes provide a strong base for ecotourism development. These resources are not merely tourism attractions; they are socio-ecological assets that connect biodiversity, identity, livelihoods, heritage and territorial development (Ofem et al., 2021; Usang et al., 2023; Eneyo, et al., 2025; Eneyo & Essien, 2024; Eneyo et al., 2023). Despite this resource base, the development and utilisation of ecotourism assets in Cross River State remain uneven. Many sites are known by residents and potential visitors but lack the infrastructure, maintenance, interpretation, safety systems and marketing required for competitive destination performance. Poor access roads, inadequate accommodation around some sites, weak signage, insufficient power supply, limited waste management, low digital visibility and weak institutional coordination continue to restrict destination use. The result is a paradox of resource abundance and limited utilisation: the state is rich in attractions but many of those attractions are not sufficiently developed to generate sustained visitor flows, revenue, jobs and local enterprise opportunities.

The problem is not simply that attractions exist without facilities. It is that underdeveloped attractions weaken the ability of ecotourism to contribute to sustainable development. Where waterfalls, forests, monoliths or wildlife sanctuaries are poorly accessible, local communities may receive little benefit from their presence. Where tourism activity is seasonal or weakly managed, investment is discouraged and conservation financing remains limited. Where communities are not involved in planning and benefit-sharing, ecotourism may be perceived as an external project rather than a locally owned development pathway. These issues are consistent with wider African literature showing that ecotourism succeeds when infrastructure, participation, governance and benefit distribution operate together (Arowosafe et al., 2019; Ngongolo & Kyando, 2025; Eneyo, 2024b). The current study responds to this gap by evaluating the present level of development and utilisation of major ecotourism resources in Cross River State. It focuses on six ecotourism zones across the state and uses field survey data to identify resources perceived as major, assess their development status and examine their utilisation. The study is guided by three objectives: to identify the major ecotourism resources available in the study area; to assess the current level of development of those resources; and to examine the extent of their utilisation. The study is significant because it provides evidence that can assist government agencies, destination managers, conservation institutions, private investors and host communities in prioritising ecotourism planning and investment.

Literature review

Ecotourism is commonly defined as responsible travel to natural areas that conserves the environment, supports the wellbeing of local people and promotes interpretation or education. This definition places ecotourism at the intersection of environmental protection and livelihood development. Unlike mass tourism, ecotourism is expected to minimise ecological disturbance, strengthen conservation awareness and create incentives for communities to protect natural and cultural resources. The International Ecotourism Society (2023) emphasises responsible travel and local wellbeing, while recent scholarship adds that ecotourism must be assessed through governance, accountability and measurable sustainability outcomes (Cossengue et al., 2025; Torsney et al., 2025).

Ecotourism resources include natural and cultural assets that can attract visitors while supporting conservation and community benefit. Natural resources include forests, mountains, waterfalls, caves, wetlands,

wildlife habitats, biodiversity hotspots and scenic landscapes. Cultural resources include monoliths, festivals, crafts, indigenous practices, oral histories, sacred landscapes and local guide knowledge. In Cross River State, these categories overlap because forest landscapes are often embedded in community histories and cultural practices. The Ikom Monoliths, local festivals, indigenous crafts and community guiding systems therefore broaden ecotourism beyond wildlife viewing or scenic appreciation. Sustainable ecotourism planning should recognise both ecological and cultural dimensions of destination value. Resource development refers to the process of preparing an attraction for safe, meaningful and sustainable visitation. It includes access roads, trails, signage, interpretation centres, visitor facilities, sanitation, electricity, water supply, trained guides, security arrangements, conservation rules, emergency response and management systems. Development does not mean uncontrolled construction or commercial expansion. Rather, it means putting in place the minimum physical, institutional and interpretive conditions needed for visitors to experience the resource without degrading it. Corbos et al. (2024) show that tourism infrastructure can support regional development when it is integrated into sustainability planning and local economic linkages.

Resource utilisation refers to the degree to which available attractions are used by tourists, communities, operators and institutions for tourism, education, conservation and income generation. High utilisation may indicate active visitor demand, local enterprise participation and institutional visibility, but it must be interpreted carefully. Over-utilisation can damage fragile ecosystems if carrying capacity is ignored, while underutilisation can mean that valuable resources remain dormant and contribute little to development. The key issue is therefore sustainable utilisation: the use of resources at levels that generate benefits while maintaining ecological integrity and cultural dignity. This requires monitoring, visitor management and community participation. The literature on ecotourism and community development shows that host communities' benefit when they are not treated merely as labour suppliers but as planning partners and enterprise owners. Rajasenan et al. (2012) found that ecotourism initiatives in Kerala improved livelihoods where policy support and community-based arrangements were present. Ekowati and Nawarcono (2018) also reported that community-based tourism in Yogyakarta improved local income, homestay management, environmental cleanliness and collective organisation. These findings suggest that ecotourism outcomes depend strongly on institutional design. Attractions alone do not create inclusive benefits; participation structures, local ownership and skills development are necessary.

Studies from West Africa also highlight the need for benefits that are visible to communities near protected areas. Arowosafe et al. (2019) found that residents around Kainji Lake National Park and Mole National Park identified direct, indirect and service benefits, including boreholes, health services, cultural display, craft sales and employment. Their findings demonstrate that communities evaluate ecotourism through practical improvements in daily life. If communities near ecotourism resources do not see tangible benefits, conservation support may weaken. This is relevant to Cross River State, where many host communities live near forests, waterfalls and wildlife areas but may not receive sustained income or infrastructure from tourism. Infrastructure remains one of the strongest determinants of ecotourism performance. Poor roads, limited accommodation, weak telecommunications, insufficient signage, unreliable electricity and inadequate waste systems reduce visitor satisfaction and investor confidence. They also limit the ability of local businesses to connect with tourism demand. Usang et al. (2023) observed that investment in roads, airport facilities and transport systems is important for tourism-driven economic development in Calabar Municipal. For ecotourism destinations that are often located in rural or difficult terrain, accessibility is not only a convenience issue; it determines whether resources can be safely and consistently used.

Marketing and interpretation also shape resource utilisation. A waterfall, forest or cultural monument may be known locally but invisible to wider domestic and international markets if there is no coherent branding, digital presence, storytelling or tour packaging. Interpretation is particularly important because ecotourism is not just sightseeing. Visitors should understand the ecological importance of rainforests, the cultural significance of monoliths, the conservation value of wildlife sanctuaries and the responsibilities attached to visiting fragile

environments. Silva et al. (2023) argue that nature-based tourism can strengthen environmental awareness when destination experiences are deliberately designed to educate rather than merely entertain.

Governance is central to resource development and utilisation. Sustainable destination management requires coordination among tourism boards, conservation agencies, local governments, traditional institutions, private operators, universities, security agencies and community groups. Panagiotopoulou and Skoultsos (2025) emphasise that multi-stakeholder collaboration is necessary for sustainable destination management because no single actor controls all the resources, decisions and responsibilities involved. Where governance is fragmented, ecotourism sites may suffer from poor maintenance, weak revenue accountability, inconsistent policy implementation and limited community trust.

The study is anchored on Sustainable Tourism Theory and the Rural Livelihood Diversification perspective. Sustainable Tourism Theory emphasises the balance between environmental integrity, economic viability and social equity. It suggests that tourism development should not sacrifice ecological systems or marginalise host communities in pursuit of visitor numbers. The Rural Livelihood Diversification perspective explains how households reduce vulnerability by combining income sources such as farming, trading, guiding, crafts, transport, food services and accommodation. Ecotourism should therefore provide alternative and supplementary livelihood options, especially in rural areas where dependence on natural resources may be high. The Limits of Acceptable Change approach also provides a useful environmental lens. Rather than asking only how many visitors a site can receive, it asks what ecological and social conditions must be maintained. This approach is important for Cross River State because increased access to waterfalls, forests, wildlife areas and mountains can generate income but also create litter, erosion, disturbance and conflict if unmanaged. Development and utilisation should therefore be measured against indicators such as trail condition, waste volume, habitat integrity, visitor safety, community satisfaction and revenue distribution (Stankey et al., 1985).

Methodology

The study adopted a cross-sectional survey design. This design was appropriate because the research sought to obtain data from a defined population at a particular point in time in order to evaluate perceptions of ecotourism resource availability, development and utilisation. A cross-sectional design is useful when researchers need to describe current conditions and compare patterns across respondent categories without manipulating the variables under investigation (Takona, 2024). In this study, the design enabled the researchers to capture the present state of ecotourism resources across selected zones in Cross River State.

The study area was Cross River State, Nigeria. The state lies in the south-eastern part of the country and shares boundaries with Benue State to the north, Akwa Ibom State and the Atlantic Ocean to the south, Ebonyi and Anambra States to the west and Cameroon Republic to the east. It is ecologically important because of its rainforest vegetation, montane landscapes, wildlife habitats, rivers, waterfalls, cultural heritage and protected areas. The selected ecotourism zones were Obanliku, Obudu, Boki, Etung, Akamkpa and Calabar Municipal. These zones were selected because they contain or are connected to major attractions such as Obudu Mountain Resort, Afi Mountain, Agbokim Waterfalls, Kwa Falls, Oban forest landscapes, biodiversity hotspots, the Ikom Monoliths and related cultural resources. Figure 1 presents the map of Cross River State and the spatial context of the study area.

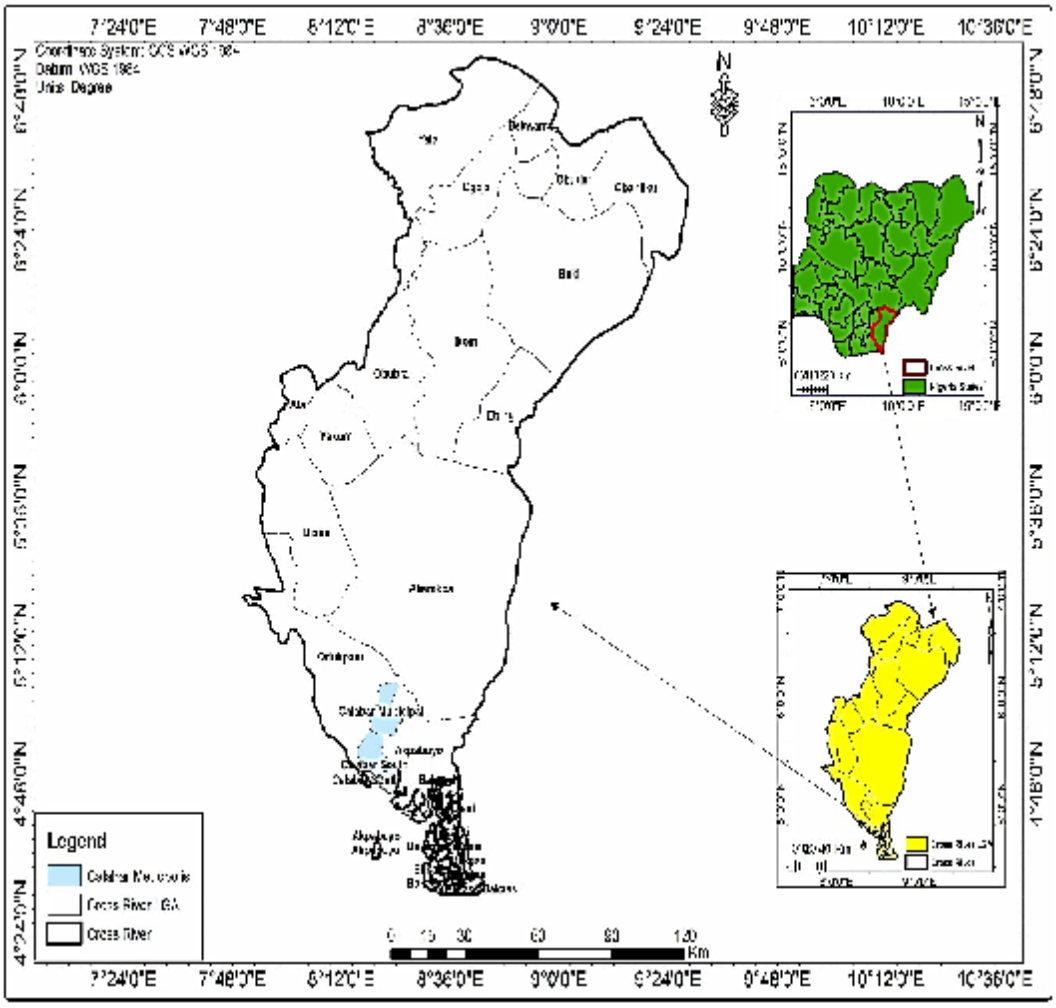

Figure 1. Map of Cross River State showing the geographical context of the selected ecotourism zones.
Source: Authors' field survey documentation, 2025.

The population comprised residents and individuals within host communities who were stakeholders, potential beneficiaries or participants in ecotourism-related activities. The study population was drawn from the six selected ecotourism zones. Based on the population projection used in the original survey frame, the selected communities had an estimated population of 133,109. The unit of analysis was the individual respondent, while the focus of analysis was the respondent's assessment of available ecotourism resources, their level of development and their extent of utilisation. A sample size of 400 respondents was used. The sample was obtained through a multi-stage sampling procedure. In the first stage, two local government areas were selected from each of the three senatorial districts, giving six local government areas. In the second stage, one ecotourism site was selected from each local government area. In the third stage, two communities or wards associated with the selected ecotourism sites were selected. In the fourth stage, respondents were selected from the communities. The Taro Yamane formula was used in determining the sample size for a known population, and the final sample of 400 was considered adequate for descriptive assessment of the selected ecotourism zones (Yamane, 1967).

Primary data were collected using a structured questionnaire. The questionnaire contained items on respondents' demographic characteristics, major ecotourism resources, level of development and level of utilisation. The resource inventory items included forests, hills, biodiversity hotspots, mountains, wildlife sanctuaries, waterfalls, drill ranches, dams, monoliths, indigenous cultural practices, traditional crafts, local festivals and local guides. Development was measured using three response categories: high level of

development, low level of development and no development. Utilisation was measured using high utilisation, low utilisation and no utilisation. This categorisation made it possible to identify both the availability and the practical readiness of major resources. Secondary data were drawn from published studies, policy-related materials and relevant literature on ecotourism, community development, resource utilisation and sustainable tourism. These sources provided conceptual and empirical support for interpreting the field findings. The use of both primary and secondary information strengthened the study by connecting local evidence with wider debates in ecotourism scholarship.

The research instrument was subjected to face and content validity procedures. Three experts from the Department of Hospitality and Tourism Management and the Department of Measurement and Evaluation, University of Calabar, reviewed the questionnaire for clarity, relevance and coverage. Their observations were incorporated into the final instrument. Reliability was assessed through a pilot study involving 30 respondents from ecotourism communities outside the selected study areas but with similar characteristics. The overall Cronbach's alpha coefficient was 0.84, exceeding the commonly accepted minimum threshold of 0.70. This indicates that the instrument was internally consistent and suitable for the study. Data were analysed using descriptive statistics, particularly frequencies and percentages. This analytical strategy was appropriate because the study objectives focused on identifying major resources and assessing current development and utilisation levels. Results are presented in tables and figures to make the evidence clear and comparable. Where appropriate, findings are interpreted in relation to sustainable tourism, rural livelihood diversification and resource governance. The emphasis is on explaining what the patterns mean for destination planning, community benefits and sustainable utilisation rather than merely reporting numerical values.

Ethical considerations were observed throughout the study. Permission was obtained from relevant local authorities and community leaders before data collection. Respondents were informed about the purpose of the research, the voluntary nature of participation, confidentiality of responses and their right to withdraw at any time. No personal identifiers were collected. The results are reported in aggregate form and used strictly for academic and policy-oriented purposes.

Results and discussion

The results are presented according to the objectives of the study. The section first describes the demographic profile of respondents, then identifies the major ecotourism resources recognised in the study area, and finally examines the current level of development and utilisation of those resources. Tables and figures are discussed directly in the text to ensure that the empirical evidence is linked to interpretation and policy relevance.

Table 1 presents the demographic distribution of respondents. The sample included 181 males (45.3%) and 219 females (54.7%), indicating that women were slightly more represented than men. The age distribution shows that the largest group was between 31 and 40 years (34.3%), followed by respondents aged 41 to 50 years (27.7%), respondents aged 51 years and above (24.7%) and those aged 18 to 30 years (13.3%). This age structure is useful because many respondents were mature enough to understand changes in ecotourism development within their communities while still being economically active. The marital status distribution in Table 1 shows that 208 respondents (52.0%) were single, 140 (35.0%) were married and 52 (13.0%) were divorced or separated. Educationally, 127 respondents (31.8%) had secondary education, 110 (27.5%) had primary education, 106 (26.5%) had no formal education and 57 (14.2%) had tertiary education. The relatively high proportion of respondents with primary or secondary education suggests that local knowledge of ecotourism resources is not confined to formally trained tourism professionals. It reflects community-level awareness of local attractions and their development status.

Table 1. Percentage distribution of respondents based on demographic variables.

Variable/category	Frequency	Percent (%)
SEX		
Male	181	45.3

Variable/category	Frequency	Percent (%)
Female	219	54.7
Total	400	100.0
AGE		
18-30	53	13.3
31-40	137	34.3
41-50	111	27.7
51 and above	99	24.7
Total	400	100.0
Marital status		
Single	208	52.0
Married	140	35.0
Divorced/separated	52	13.0
Total	400	100.0
Educational status		
No formal education	106	26.5
Primary education	110	27.5
Secondary education	127	31.8
Tertiary education (OND, HND, B.Sc, etc.)	57	14.2
Total	400	100.0

Source: Field survey data, 2025.

The profile in Table 1 is important because ecotourism development is experienced differently across gender, age, marital and educational groups. Women may participate through food vending, craft production, hospitality services, festivals and community organisation, while men may be more visible in guiding, transport, security and site maintenance. Youth and middle-aged respondents are also important because they are more likely to seek employment or enterprise opportunities from ecotourism. A sustainable ecotourism strategy must therefore be inclusive enough to reflect the diversity of community actors.

Table 2. Distribution of respondents based on major ecotourism resources.

Ecotourism resource	Frequency	Percent (%)
Forest (e.g., Obudu, Agbokim and Oban forests)	288	72.0*
Hills (Oban Hills)	252	63.0*
Biodiversity hotspots (plants and animals; Afi and Okwangwo biodiversity)	345	86.3*
Mountains (Obudu and Afi mountains)	389	97.3*
Wildlife sanctuary/conservation (Afi wildlife)	328	82.0*
Waterfalls (Agbokim and Kwa waterfalls)	365	91.3*
Drill ranch (e.g., Afi ranch)	298	74.5*
Dam (Obudu Dam)	201	50.3*
Monoliths (Ikom)	312	78.0*
Indigenous cultural practices	163	40.8
Traditional crafts	176	44.5
Local festivals	261	65.3*
Local guides	182	45.5

*Note. Multiple responses were allowed; 1-49% = minor resources, while 50% and above = *major resources.*

Source: Field survey data, 2025.

Table 2 shows that Cross River State possesses a broad and recognisable ecotourism resource base. Mountains were the most frequently identified resource, with 389 respondents (97.3%) recognising Obudu and Afi mountains as major attractions. Waterfalls followed with 365 respondents (91.3%), while biodiversity hotspots such as Afi and Okwangwo were identified by 345 respondents (86.3%). Wildlife sanctuary and conservation resources were recognised by 328 respondents (82.0%), and the Ikom Monoliths were identified by 312 respondents (78.0%). These figures confirm that the state's ecotourism identity is strongly anchored in both natural and cultural resources. The evidence in Table 2 also shows that forests (72.0%), drill ranches (74.5%), local festivals (65.3%), hills (63.0%) and dams (50.3%) were identified as major resources. However, indigenous cultural practices (40.8%), traditional crafts (44.5%) and local guides (45.5%) fell below the 50% threshold used in the study to classify major resources. This pattern suggests that respondents recognise physical landscapes more readily than human and cultural service components. Yet guides, crafts and indigenous knowledge are

essential to ecotourism interpretation and community benefit. Their lower recognition points to a need for stronger cultural packaging, guide training and community-based enterprise development.

Figure 2 visually summarises the resource recognition pattern. It shows that mountains, waterfalls, biodiversity hotspots, wildlife sanctuaries and monoliths stand out as the most visible components of the state's ecotourism portfolio. The figure reinforces the finding that Cross River State has a strong resource foundation for ecotourism. However, recognition alone is not the same as development or utilisation. A resource may be widely known and still remain difficult to access, poorly serviced, weakly marketed or underused. This distinction is examined in Tables 3a and 3b.

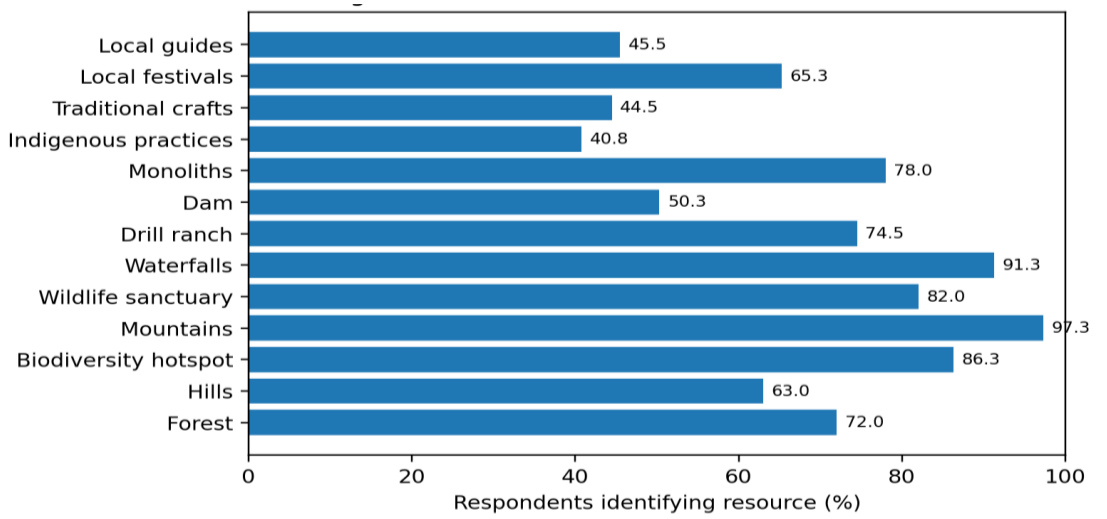

Figure 2. Recognition of ecotourism resources in Cross River State.

Source: Field survey data, 2025.

The implication of Table 2 and Figure 2 is that Cross River State does not suffer from a lack of ecotourism assets. Rather, the main problem is the conversion of these assets into sustainable, visitor-ready and community-benefiting products. This finding aligns with Torsney et al. (2025), who caution that nature-based attractions should not automatically be described as successful ecotourism. They must be supported by management systems, interpretation, conservation standards and local benefit mechanisms. In Cross River State, the resource base is broad, but the development system remains incomplete.

Table 3a. Current level of development of major ecotourism resources.

Major ecotourism resource	High development Frequency	High development %	Low development Frequency	Low development %	No development Frequency	No development %
Forest (e.g., Obudu, Agbokim and Oban forests)	-	-	250	62.5	150	37.5
Hills (Oban Hills)	110	27.5	200	50.0	90	22.5
Biodiversity hotspots (Afi and Okwangwo biodiversity)	140	35.0	201	50.3	59	14.8
Mountains (e.g., Obudu Mountain Resort)	40	10.0	315	78.7	45	11.3
Wildlife sanctuary/conservation (e.g., Afi wildlife)	42	10.5	239	59.8	119	29.7
Waterfalls (e.g., Agbokim and Kwa Falls)	50	12.5	283	70.8	67	16.8
Drill ranch (e.g., Afi ranch)	98	24.5	241	60.3	61	15.2
Dam (Obudu Dam)	-	-	131	32.7	269	67.3
Monoliths (e.g., Ikom)	88	22.0	92	23.0	220	55.0
Local festivals	-	-	189	47.3	211	52.7

Source: Field survey data, 2025.

Table 3a presents the current level of development of major ecotourism resources. The results show that most resources were rated as having a low level of development rather than a high level of development. Mountains,

including Obudu Mountain Resort, recorded 315 respondents (78.7%) reporting low development, while only 40 respondents (10.0%) reported high development. Waterfalls such as Agbokim and Kwa Falls recorded 283 respondents (70.8%) reporting low development, while forests recorded 250 respondents (62.5%) reporting low development. Drill ranches, wildlife sanctuaries, biodiversity hotspots and hills also recorded substantial low-development responses. The most concerning results in Table 3a relate to resources classified as having no development. Obudu Dam recorded 269 respondents (67.3%) reporting no development, monoliths recorded 220 respondents (55.0%), and local festivals recorded 211 respondents (52.7%). These findings suggest that some resources are recognised as important but lack sufficient tourism development structures. The case of the Ikom Monoliths is particularly significant because monoliths are distinctive cultural heritage assets with potential for interpretation, research tourism and cultural education. Their reported non-development implies missed opportunities for heritage-based ecotourism and local enterprise.

The development pattern reveals a strategic gap. The resources most capable of giving Cross River State a unique ecotourism identity are not necessarily the most developed. Mountains, waterfalls, forests, biodiversity hotspots and wildlife sanctuaries all depend on access, visitor management, signage, conservation monitoring and safety systems. If these are weak, the visitor experience is diminished and the ecological resource may remain vulnerable. Development must therefore be understood not as physical expansion alone but as the creation of responsible destination systems. This supports Corbos et al. (2024), who emphasise that infrastructure contributes to sustainability only when it is planned as part of regional and environmental development.

Table 3b. Current level of utilisation of major ecotourism resources.

Major ecotourism resource	High utilisation Frequency	High utilisation %	Low utilisation Frequency	Low utilisation %	No utilisation Frequency	No utilisation %
Forest (e.g., Obudu, Agbokim and Oban forests)	-	-	213	53.3	187	46.7
Hills	68	17.0	190	47.5	142	35.5
Biodiversity hotspots (Afi and Okwangwo biodiversity)	-	-	298	74.5	102	25.5
Mountains (e.g., Obudu Mountain Resort)	29	7.3	326	81.5	45	11.2
Wildlife sanctuary/conservation (e.g., Afi wildlife)	-	-	313	78.3	87	21.7
Waterfalls (e.g., Agbokim and Kwa Falls)	-	-	179	44.8	221	55.2
Drill ranch (e.g., Afi ranch)	54	13.5	274	68.5	72	18.0
Dam (Obudu Dam)	-	-	96	24.0	304	76.0
Monoliths (e.g., Ikom)	-	-	320	80.0	80	20.0
Local festivals	115	28.7	236	59.0	49	12.3

Source: Field survey data, 2025.

Table 3b presents the utilisation status of the same resources. The results show that high utilisation was generally low. Mountains recorded only 29 respondents (7.3%) reporting high utilisation, while 326 respondents (81.5%) reported low utilisation. Wildlife sanctuaries recorded no high utilisation response, with 313 respondents (78.3%) reporting low utilisation. Biodiversity hotspots also recorded no high utilisation response, with 298 respondents (74.5%) reporting low utilisation. Monoliths recorded 320 respondents (80.0%) reporting low utilisation, while local festivals recorded 236 respondents (59.0%) reporting low utilisation and 115 respondents (28.7%) reporting high utilisation. The results also show cases of non-utilisation. Dams recorded 304 respondents (76.0%) reporting no utilisation, while waterfalls recorded 221 respondents (55.2%) reporting no utilisation. These findings are striking because waterfalls were among the most widely recognised resources in Table 2. The contrast between high recognition and low or no utilisation demonstrates that resource popularity does not guarantee practical use. Accessibility, safety, marketing, visitor facilities, site maintenance and tour packaging may be preventing these resources from generating sustained tourism activity. Figure 3 compares high development and high utilisation levels across selected resources. The figure shows that high development is generally limited and high utilisation is even weaker for many resources. Hills, biodiversity hotspots, drill ranches, monoliths and festivals show some level of development or use, but the broader pattern remains one of low performance. This finding supports the argument that Cross River State's ecotourism sector requires strategic

upgrading rather than mere promotion. Promotional campaigns may attract attention, but without development and utilisation systems, they may produce visitor disappointment and weak community benefits.

The combined evidence from Tables 3a, 3b and Figure 3 indicates that the principal challenge is not resource absence but resource readiness. Many attractions require basic infrastructure, environmental safeguards, trained personnel, interpretation, visitor safety arrangements, local enterprise linkages and consistent marketing. Sustainable utilisation also requires that communities participate in managing and benefiting from the resources. Where utilisation is low, revenue generation remains weak; where revenue is weak, reinvestment in conservation and infrastructure becomes difficult. This cycle can keep attractions in a state of underdevelopment.

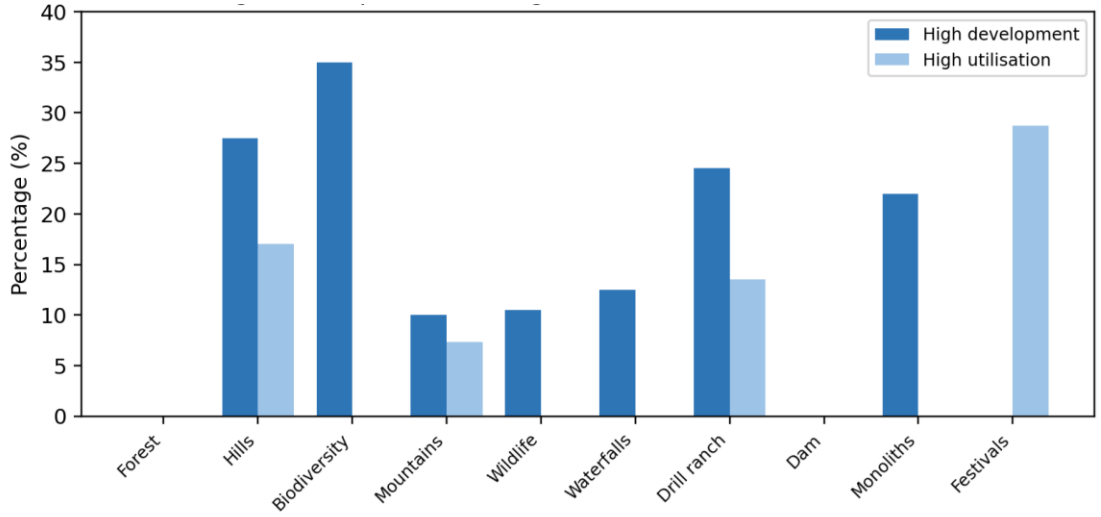

Figure 3. Comparison of high development and high utilisation levels across selected resources.
Source: Field survey data, 2025.

These findings are consistent with earlier Nigerian studies showing that ecotourism potential often exceeds actual destination performance. Ngokah (2013), for example, found that Cross River National Park had very low overall capacity utilisation even though some specific attractions, such as rainforest experiences, were highly used by those who visited. The present study confirms a similar pattern at the broader state level. Some resources are visible and valued, but the system for transforming them into sustainable destination products remains weak. This calls for evidence-based prioritisation of investment.

The findings also have livelihood implications. Ecotourism is expected to support rural livelihood diversification through guiding, accommodation, food services, transport, craft sales, cultural performances and conservation employment. However, low development and low utilisation reduce the scale of these opportunities. If sites receive few visitors or lack facilities, local businesses cannot depend on tourism as a stable income source. This may explain why ecotourism may sometimes appear to have limited or even negative livelihood effects in poorly developed destinations. The issue is not that ecotourism lacks potential; rather, the enabling conditions for benefit generation are inadequate. The negative livelihood interpretation reported in the original analysis can therefore be understood as a development-stage problem. When protected areas restrict access to farming, hunting, fishing or forest products without providing adequate alternative income, communities may experience conservation and ecotourism as constraints rather than opportunities. When benefits are captured by external operators or state agencies, local residents may become spectators rather than beneficiaries. Similar concerns appear in the wider literature on protected-area tourism, where benefit-sharing and community participation are necessary for long-term conservation support (Arowosafe et al., 2019; Ngongolo & Kyando, 2025).

Revenue generation is also closely tied to development and utilisation. The more accessible, safe, interpreted and well-managed a site is, the more likely it is to attract visitors and generate revenue. That revenue

can then support infrastructure maintenance, conservation education, employment, community projects and state internally generated revenue. However, revenue generation should not be treated as the only goal. If tourism revenue is pursued without conservation safeguards, the resource base may be degraded. If revenue is generated without transparent benefit-sharing, local support may weaken. Sustainable ecotourism therefore requires a circular system in which resource protection, visitor satisfaction, revenue, reinvestment and community benefit reinforce one another.

The results further suggest that cultural resources require greater policy attention. Monoliths, festivals, indigenous cultural practices, crafts and local guides are central to the uniqueness of Cross River State's ecotourism identity. Yet several of these resources recorded low recognition, no development or low utilisation. Cultural components often require less heavy infrastructure than some natural attractions, but they require documentation, interpretation, ethical presentation, local ownership and market access. Developing cultural routes, craft clusters, trained local guides and festival calendars could strengthen both utilisation and community income. From a conservation perspective, low utilisation can be both a risk and an opportunity. It is a risk because underutilised resources may not generate enough revenue or public interest to support conservation. Communities may then turn to extractive uses such as logging, hunting or uncontrolled land conversion. It is also an opportunity because low utilisation means that the state can still plan before destinations become overcrowded. Carrying-capacity principles, waste systems, visitor codes, zoning and monitoring can be built into destination development early. This is where the Limits of Acceptable Change approach becomes useful for Cross River State (Stankey et al., 1985).

Overall, the results show that Cross River State has a strong ecotourism resource base but a weak conversion system. Mountains, waterfalls, forests, wildlife sanctuaries, biodiversity hotspots and monoliths are widely recognised, but most are not developed or utilised at levels that can sustain tourism growth and rural development. The findings support the central argument of this article: ecotourism potential becomes sustainable development only when resources are properly developed, responsibly utilised, locally owned and institutionally governed.

Implications/conclusion

The study evaluated the current level of development and utilisation of major ecotourism resources in Cross River State, Nigeria. The findings show that the state is richly endowed with diverse ecotourism resources, including mountains, waterfalls, forests, biodiversity hotspots, wildlife sanctuaries, drill ranches, dams, monoliths, local festivals, indigenous cultural practices, traditional crafts and local guide knowledge. Respondents identified mountains, waterfalls, biodiversity hotspots, wildlife sanctuaries and monoliths as particularly important resources. This confirms that Cross River State has a strong foundation for ecotourism development and sustainable destination positioning.

However, the study also found that most of these resources are poorly developed and underutilised. Mountains, waterfalls, forests, drill ranches, wildlife sanctuaries, biodiversity hotspots and hills recorded high levels of low development, while dams, monoliths and local festivals recorded substantial non-development. Utilisation was also weak, with mountains, monoliths, wildlife sanctuaries, biodiversity hotspots, drill ranches, local festivals and forests recording low utilisation, and dams and waterfalls recording high non-utilisation. These patterns show that the state faces a strategic gap between resource abundance and destination readiness.

The policy implication is that Cross River State should move from general tourism promotion to targeted ecotourism development planning. Government and private stakeholders should invest in sustainable infrastructure such as access roads, trails, signage, visitor centres, sanitation, electricity, communication systems, waste management and safety facilities. Such infrastructure should be designed to protect fragile environments rather than open them to uncontrolled pressure. Priority should be given to high-recognition resources that

remain poorly developed or underutilised, especially waterfalls, monoliths, biodiversity hotspots, wildlife sanctuaries and community cultural assets.

Community participation should also be strengthened. Host communities should be involved in planning, guiding, interpretation, revenue-sharing, conservation monitoring and enterprise development. Local guide associations, craft cooperatives, community tourism committees and festival management groups can help convert community knowledge into income and stewardship. Training in hospitality, interpretation, digital marketing, safety, small business management and conservation education would improve the ability of residents to benefit from ecotourism. Without such participation, tourism benefits may remain concentrated among external operators and public agencies.

The study also recommends stronger destination governance and monitoring. Tourism agencies, conservation authorities, local governments, traditional institutions, universities, private operators and community organisations should collaborate on site-specific management plans. These plans should define development priorities, visitor rules, conservation indicators, carrying-capacity thresholds, revenue-use arrangements and community roles. Regular monitoring of visitor numbers, trail conditions, waste, biodiversity indicators, revenue and community satisfaction would provide evidence for adaptive management.

Although the study provides useful evidence, it has limitations. The cross-sectional design captured perceptions at one point in time and could not measure changes over a long period. The study also relied mainly on questionnaire responses, which may reflect subjective assessment. Future research should adopt longitudinal and mixed-method designs that combine surveys with interviews, focus group discussions, visitor records, geographic information systems, biodiversity monitoring and household income analysis. Comparative studies across Nigerian states and African rainforest destinations would also help identify best practices for sustainable ecotourism development.

In conclusion, Cross River State's ecotourism resources possess strong potential for revenue generation, employment creation, conservation education and sustainable rural development. Yet this potential will remain under-realised unless development and utilisation gaps are addressed. The future of ecotourism in the state depends on strategic investment, community ownership, conservation safeguards, accountable governance and evidence-based destination management. Properly implemented, ecotourism can become a practical pathway for linking environmental protection with inclusive development in Cross River State.

Declarations

Ethics approval and consent to participate: Ethical approval was obtained from the relevant academic and community authorities before data collection. Respondents participated voluntarily, and informed consent was obtained before questionnaire administration.

Consent for publication: All authors approved the manuscript for journal submission and publication.

Availability of data and materials: The datasets generated and analysed during the study are available from the corresponding author on reasonable request.

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