Eco-Tourism and Its Impact on Biodiversity Preservation in Nigeria: Insights from Developing Economies

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Abstract

This study assesses the effectiveness of eco-tourism initiatives in promoting biodiversity conservation in Cross River State, Nigeria, with a particular focus on the role of stakeholder engagement, infrastructure, and policy implementation. The objectives of the study were to evaluate the impact of eco-tourism initiatives on biodiversity preservation, investigate the role of stakeholders, and explore the consequences of poor infrastructure and weak policy on eco-tourism outcomes. A descriptive survey research design was adopted, involving a sample size of 392 respondents drawn from eco-tourism stakeholders using stratified and simple random sampling methods. Data were collected through structured questionnaires and analyzed using descriptive statistics and the Chi-Square Test of Independence. The study found that the most effective eco-tourism initiatives include visitor education and awareness programs (22.8%), followed closely by community-based conservation projects (22.5%), and wildlife sanctuary development (20.3%). Stakeholder analysis revealed that local community members (24.3%) played the most important role in eco-tourism success, followed by government agencies (22.3%). In terms of infrastructure and policy, the lack of adequate facilities was found to significantly reduce tourist visits (23.8%) and cause habitat damage (22.3%). Chi-square analysis showed a significant relationship between eco-tourism initiatives and biodiversity conservation, with a p-value of 0.0000000072. The study recommends improved infrastructure, stronger policy implementation, and enhanced collaboration between stakeholders to ensure the sustainability of eco-tourism and biodiversity conservation in the region.

Key words: Biodiversity, Conservation, Eco-tourism, Impact, Preservation.

Background to the study

Eco-tourism, also known as ecological tourism, refers to responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education. It emphasizes minimal environmental impact, cultural sensitivity, and active community participation. Eco-tourism fosters environmental awareness and biodiversity conservation while promoting sustainable livelihoods for host communities. According to Nwala and Gesiere (2024), eco-tourism plays a vital role in Nigeria's soft power diplomacy by showcasing the country's rich natural and cultural heritage to international visitors. This form of tourism contributes to national development by creating economic opportunities in rural areas and enhancing Nigeria's global image. Moreover, Akindele, Ekwemuka, Apeverga, Amusa, Olajuyigbe, Coker, and Kolawole-Daniels (2021) highlight that eco-tourism aligns with global biodiversity goals by raising awareness and encouraging active involvement in conservation efforts. Through eco-tourism, Nigeria can strike a balance between environmental protection and socio-economic growth.

Eco-tourism serves as a powerful tool for biodiversity preservation in developing economies, especially within Africa and Asia, where natural resources are abundant but conservation efforts are often underfunded. In Nigeria, eco-tourism initiatives such as those in Oke-Idanre Hills and the Lekki Conservation Centre have demonstrated that with proper planning, tourism can be harmonized with environmental preservation (Oladeji, Awolala, & Alabi, 2022; Ekpah, 2021). These destinations serve as case studies in how wildlife and natural landscapes can be protected while simultaneously contributing to

local economies. In Imo State, stakeholder engagement has also proven critical in leveraging nature-based tourism for biodiversity conservation, particularly in areas that are vulnerable to habitat loss (Osuagwu, 2022). Similar trends are observed in other African countries where corporate social responsibility programs have been integrated into eco-tourism, as seen in oil host communities in Nigeria, fostering youth empowerment and strengthening conservation awareness (Uduji & Okolo-Obasi, 2023).

Globally, both developed and developing nations recognize eco-tourism as a viable conservation strategy, but the approach varies significantly. In developed countries, strong environmental laws, advanced infrastructure, and well-established funding mechanisms make eco-tourism projects more efficient and less prone to environmental conflict. In contrast, developing economies must navigate the dual challenge of economic development and ecological preservation. Sri Lanka, for example, faces conflicts between conservation goals and the economic needs of communities dependent on natural resources; however, through policy reform and stakeholder dialogue, these challenges are being addressed (De Zoysa, 2022). In Africa, where poverty and unemployment often drive environmental exploitation, eco-tourism when aligned with sustainable tourism practices can transform conservation into a source of economic and social empowerment. The study by Okosodo and Sarada (2021) highlights how the monitoring of large mammal diversity in Nigeria's Idanre Forest Reserve offers a model for integrating wildlife conservation with sustainable tourism

Eco-tourism has emerged as a crucial strategy for biodiversity preservation in Nigeria, especially in regions rich in natural resources and endemic species. By promoting low-impact travel and encouraging conservation-oriented recreational activities, eco-tourism contributes directly to the protection of Nigeria's diverse ecosystems. For instance, the management of the Lekki Conservation Centre in Lagos has shown how eco-tourism initiatives can support biodiversity through proper resource management and public education (Onihunwa, Akande, Mohammed, & Joshua, 2023). Similarly, in Ondo State, sustainable practices at the Oke-Idanre Hills have helped maintain ecological integrity while drawing attention to the value of preserving unique natural habitats (Oladeji, Awolala, & Alabi, 2022). These examples underscore how eco-tourism, when well-managed, plays a vital role in reducing environmental degradation and fostering environmental stewardship among both tourists and local populations.

Moreover, eco-tourism in Nigeria has a transformative potential beyond environmental gains, it empowers communities, particularly youth, and fosters stakeholder collaboration essential for long-term conservation efforts. Uduji and Okolo-Obasi (2023) note that eco-tourism supported by corporate social responsibility programs in oil-producing areas not only enhances local livelihoods but also redirects attention toward preserving natural assets. In Imo State, Osuagwu (2022) emphasizes the significance of stakeholder engagement in developing nature-based tourism, which has proven instrumental in creating awareness, fostering conservation ethics, and ensuring inclusive biodiversity protection efforts. These studies collectively demonstrate that eco-tourism is not merely a recreational venture but a strategic tool for sustainable development and biodiversity conservation across Nigeria.

Statement of the problem

Globally, eco-tourism has gained recognition as a sustainable approach to promoting environmental conservation and economic development. However, in many developing economies, the implementation of eco-tourism is challenged by weak regulatory frameworks, insufficient infrastructure, and conflicting interests between economic growth and environmental preservation. For instance, in Sri Lanka, the development of eco-tourism has led to tensions between conservation goals and local livelihoods, highlighting the need for balanced and inclusive planning (De Zoysa, 2022). Additionally, the lack of strong institutional support and proper management in many parts of the Global South often leads to unsustainable

tourism practices that can degrade the very ecosystems they aim to protect (Oladeji, Awolala, & Alabi, 2022).

Eco-tourism holds great potential for biodiversity conservation and socio-economic transformation, yet it faces several structural and practical challenges. Despite being rich in biodiversity and natural attractions, many African countries struggle with poor infrastructure, limited funding, and inadequate community engagement, all of which hinder effective eco-tourism management. In Nigeria, for instance, eco-tourism initiatives in oil-producing communities have been criticized for prioritizing corporate interests over genuine conservation and community development (Uduji & Okolo-Obasi, 2023). Furthermore, studies from the Idanre Forest Reserve reveal that while the area holds significant eco-tourism and biodiversity potential, issues like habitat destruction and unsustainable resource use continue to threaten its ecological value (Okosodo & Sarada, 2021).

In Nigerian, the challenges facing eco-tourism are even more pronounced. Although sites like the Lekki Conservation Centre and Oke-Idanre Hills demonstrate the possibilities of nature-based tourism, they are often undermined by limited public awareness, insufficient policy implementation, and a lack of consistent stakeholder engagement (Ekpah, 2021; Osuagwu, 2022). The tension between local livelihood needs and biodiversity preservation further complicates eco-tourism efforts, especially in rural areas where communities depend heavily on the environment for survival. This study therefore seeks to investigate the complex dynamics of eco-tourism and its impact on biodiversity preservation in Nigeria, drawing insights from broader challenges in developing economies to offer context-sensitive and sustainable solutions.

Review of literature

Effectiveness of eco-tourism initiatives in promoting biodiversity preservation

Eco-tourism, when well-managed, serves as a powerful tool for biodiversity conservation by aligning tourism activities with ecological protection and sustainable development goals. In Sri Lanka, eco-tourism initiatives have been both praised and critiqued for their dual role in promoting conservation while attempting to meet socio-economic demands. De Zoysa (2022) noted that although the country has implemented several eco-tourism projects aimed at conserving biodiversity, conflicts often arise between conservation goals and the economic interests of local communities and tourism operators. These conflicts highlight the need for more inclusive planning and stakeholder engagement to ensure that eco-tourism actually supports rather than threatens biodiversity. Similarly, in Palampur, India, eco-tourism practices integrated within tea plantations have provided a unique conservation model. Kumar and Kumar (2024) observed that eco-tourism in this region not only enhances environmental awareness among visitors but also contributes directly to the protection of native flora and fauna through regulated tourism flows and habitat restoration efforts.

In Africa, the management and effectiveness of eco-tourism initiatives have been mixed due to varied political, economic, and environmental conditions. South Africa, for instance, has implemented successful eco-tourism programs through public-private partnerships that actively contribute to biodiversity conservation. According to Litheko (2022), these partnerships ensure funding, expertise, and sustainable development models that benefit both ecosystems and local communities. On the other hand, many eco-tourism projects in other African countries struggle with mismanagement and underfunding. In this context, eco-tourism must be carefully planned and managed to achieve its intended goals, ensuring that conservation is not sacrificed for short-term economic gains. In Nepal, where biodiversity-rich zones like the Annapurna and Chitwan regions are key eco-tourism destinations, Baral (2023) emphasized how tourism revenues have been reinvested into conservation activities such as anti-poaching patrols, environmental education, and sustainable infrastructure.

Globally, eco-tourism is also seen as a mechanism to mitigate environmental risks, particularly in climate-vulnerable regions. Gorbunov, Tatuev, and Taran (2024) argued that eco-tourism not only generates economic value but also encourages climate-conscious practices and infrastructure that support biodiversity resilience. In China's giant panda nature reserves, eco-tourism has played a vital role in protecting critical habitats. Zhou, Zheng, Zhang, Song, and Duan (2021) reported that well-regulated visitor activities, combined with educational programs and habitat funding, have enhanced ecological integrity while promoting global awareness of species conservation. However, the study cautioned that without strict visitor limits and environmental monitoring, even the best-intentioned eco-tourism can become a threat rather than a safeguard to biodiversity.

Legal frameworks and ethical branding also shape how effectively eco-tourism contributes to biodiversity preservation. Jeevishaa, Krithick, and Divya (2023) emphasized the importance of comprehensive legislation in holding tourism operators accountable for environmental impacts and ensuring responsible tourism practices. Meanwhile, Pandey and Dar (2025) highlighted the role of destination branding in shaping tourists' perceptions and behaviors, showing that well-branded eco-tourism destinations that communicate conservation values tend to attract more environmentally responsible visitors. Jin (2024) added that under a biodiversity-focused tourism strategy, eco-tourism can bridge the gap between environmental sustainability and economic development. In line with this, Zhichao and Yashu (2024) advocated for tourism models that emphasize green infrastructure, eco-friendly transportation, and community-driven conservation actions, underscoring the transformative potential of eco-tourism when guided by principled frameworks and long-term ecological thinking.

Role of stakeholder engagement, infrastructure, and policy implementation in the success or failure of eco-tourism as a biodiversity conservation tool

The effectiveness of eco-tourism in promoting biodiversity conservation is deeply rooted in the quality and depth of stakeholder engagement. Successful eco-tourism ventures often rely on inclusive participation by local communities, governmental bodies, NGOs, and the private sector. Samal and Dash (2024) emphasize that in the Chilika Wetland of India, proactive stakeholder engagement created a strong foundation for sustainable eco-tourism by integrating local knowledge, ensuring equitable benefits, and fostering a shared conservation ethic. Likewise, Salman, Jaafar, Mohamad, Ebekozien, and Rasul (2024) highlight that a multi-stakeholder approach in Asian ecotourism ensures transparency, accountability, and sustainability, as it distributes responsibility for biodiversity outcomes across all levels of governance. In contrast, the absence of community involvement often results in exploitative tourism models that degrade ecosystems and alienate local populations.

Infrastructure development is another key determinant in eco-tourism's success or failure as a conservation tool. When infrastructure is designed with sustainability in mind such as the use of eco-lodges, renewable energy systems, and waste management facilities, it supports biodiversity by minimizing the ecological footprint of tourism activities. In Palampur, India, Kumar and Kumar (2024) found that carefully planned infrastructure within tea plantation eco-tourism hubs not only preserved native species but also enhanced the visitor experience. On the other hand, unsustainable tourism infrastructure often causes irreversible damage to habitats and biodiversity. Muhamad, Ahmad, and Supriyadi (2025) note in the case of Yogyakarta's national strategic tourism area that local government policies were significantly influenced by the quality of existing infrastructure. Poor planning and weak policy enforcement allowed for overdevelopment and environmental degradation, undermining the goals of conservation-focused tourism.

Policy implementation and governance frameworks form the backbone of eco-tourism initiatives, influencing their ability to serve as viable conservation tools. In Sri Lanka, De Zoysa (2022) identified that policy conflicts, lack of regulatory clarity, and weak enforcement mechanisms often hinder eco-tourism's

contribution to biodiversity conservation. Similarly, Zoysa (2022) emphasized the gaps in forest-based eco-tourism governance in Sri Lanka, which have led to inconsistent outcomes in terms of both environmental protection and community welfare. A more coherent policy environment, with clear guidelines, institutional support, and legal frameworks, is necessary to ensure that eco-tourism is implemented in a manner that safeguards biodiversity. Jeevishaa, Krithick, and Divya (2023) stress the importance of legal instruments that enforce responsible tourism and biodiversity protection through licensing, zoning, and compliance monitoring.

The integration of community governance and land stewardship further enhances the sustainability of eco-tourism projects. In Tanzania's Enduimet Community Wildlife Management Area, Razzano (2024) documents how local communities, when given control over tourism-related decisions and revenue, were more motivated to conserve wildlife and habitat. This bottom-up governance approach also created a sense of ownership and cultural pride among indigenous people, reinforcing their role as stewards of biodiversity. In South Africa, public-private partnerships have similarly proven effective in harmonizing conservation with economic objectives. Litheko (2022) observed that when local communities, governments, and private investors collaborate effectively, they can develop tourism models that protect biodiversity while also delivering socio-economic benefits. Ultimately, the success of eco-tourism in preserving biodiversity depends on an integrated approach that aligns stakeholder interests, infrastructure sustainability, and robust policy enforcement.

Methodology

This study adopted a descriptive survey research design to explore the role of stakeholder engagement, infrastructure, and policy implementation in the success or failure of eco-tourism as a tool for biodiversity conservation in Nigeria. The research was centered around key national parks and reserves, including Gashaka-Gumti National Park, Okomu National Park, Yankari Game Reserve, Cross River National Park, Kamuku National Park, and Old Oyo National Park. These protected areas represent a cross-section of Nigeria's diverse ecosystems, ranging from montane forests and savannas to coastal rainforests (Litheko, 2022). The focus on these parks enabled the study to evaluate varying eco-tourism models, conservation strategies, and the level of involvement from local communities, government agencies, and private stakeholders. The study aimed to understand how different factors, including stakeholder collaboration and policy frameworks, influence the effectiveness of eco-tourism in preserving biodiversity.

To collect relevant data, a mixed-methods approach was employed, integrating both quantitative and qualitative techniques. A sample size of 400 respondents was determined using the Taro Yamane formula from a projected population of 20,000 eco-tourism stakeholders, ensuring statistical reliability at a 95% confidence level. A multi-stage sampling method was adopted: stratified sampling first grouped respondents into park officials, local community members, and tourists; thereafter, simple random sampling was used to select individuals within each group. Structured questionnaires were administered to gather measurable data, while in-depth interviews provided deeper insights into perceptions and experiences regarding eco-tourism and conservation. Data were analyzed using descriptive statistics such as frequencies and percentages, alongside inferential methods including chi-square tests, to assess relationships between eco-tourism activities and biodiversity conservation outcomes.

Findings and results

Table 1: Findings for Each Conservation Park

Conservation Park	Findings	Discussion

Gashaka-Gumti National Park	Eco-tourism practices have reduced poaching and improved species monitoring.	The study found that eco-tourism initiatives, like guided tours and community involvement, have led to a decline in poaching activities. This aligns with Ntoko, (2015), who highlighted that eco-tourism can provide financial resources for anti-poaching efforts and wildlife monitoring in Gashaka-Gumti.
Okomu National Park	Eco-tourism practices have contributed to the protection of endangered species like the white-throated monkey.	The park's eco-tourism programs, such as park entry fees and wildlife conservation education, have directly supported the protection of rare species. Adeyemi, & Lameed, (2015), similarly showed that eco-tourism activities in Okomu help raise funds for species protection and sustainable habitat management.
Yankari Game Reserve	Lack of infrastructure impedes the growth of eco-tourism in the park.	Inadequate visitor facilities were found to limit the park's tourism potential. Yakubu, Yusuf, & Yerima, (2024), also identified infrastructure challenges in Yankari, indicating the importance of proper facilities to attract tourists and generate income for conservation efforts.
Cross River National Park	Community involvement has increased anti-poaching patrols and reduced illegal logging.	The park's collaborative approach with local communities has resulted in more effective anti-poaching patrols and habitat protection. Madaki et al. (2024) support this, noting that local community engagement in Cross River National Park has enhanced biodiversity conservation efforts.
Kamuku National Park	Insufficient funding hinders the effectiveness of eco-tourism initiatives in park management.	The lack of financial resources was cited as a challenge to implementing eco-tourism programs, impacting ranger patrols and environmental education. Tiwari et al., (2024), also found that underfunding in Kamuku National Park limits its ability to fully realize the potential of eco-tourism.
Old Oyo National Park	Eco-tourism has successfully fostered awareness about biodiversity conservation but faces challenges with illegal activities.	The park's eco-tourism activities, such as guided tours, have raised awareness about conservation. However, illegal hunting and logging persist, a finding supported by Mbam et al. (2023), who also emphasized the need for better enforcement to reduce human-wildlife conflicts in Old Oyo.

Source: Authors fieldwork, 2025

Table 2: Key Findings and Challenges in Conservation Parks

Park	Key Findings	Challenges
Gashaka-Gumti National Park	Reduction in poaching and better wildlife monitoring through eco-tourism programs.	Poaching and habitat degradation remain due to insufficient funding and infrastructure for surveillance.
Okomu National Park	Successful protection of endangered species like the white-throated monkey through eco-tourism.	Limited infrastructure and the need for improved community participation in conservation practices.
Yankari Game Reserve	Inadequate infrastructure limits the park's tourism and conservation potential.	The lack of eco-friendly accommodations and amenities affects visitor experience and revenue generation.

Cross River National Park	Enhanced biodiversity protection through community collaboration and eco-tourism initiatives.	Difficulty in managing human-wildlife conflicts and encroachment into protected areas.
Kamuku National Park	Insufficient funding hinders effective park management and eco-tourism development.	Financial constraints limit anti-poaching activities and environmental education programs.
Old Oyo National Park	Eco-tourism helps raise awareness about biodiversity but is still challenged by illegal hunting and logging activities.	Enforcement of conservation laws remains a challenge due to resource limitations and illegal activities.

Source: Authors fieldwork, 2025

Effectiveness of eco-tourism initiatives in promoting biodiversity preservation

Table 3 provides knowledge of how different eco-tourism initiatives contribute to biodiversity conservation, based on respondents' opinions. Visitor education and awareness programs are the most favored, with 22.8% of respondents emphasizing the importance of educating tourists to promote conservation. Close behind, 22.5% of respondents highlight the significance of community-based conservation projects, showing a belief that local involvement is key to protecting natural resources. Wildlife sanctuary development also received strong support, with 20.3% of responses, reflecting the value placed on safeguarding species and their habitats. Nature trails and guided tours, which account for 18.8% of the responses, are seen as important for helping tourists connect with nature. Lastly, habitat restoration activities were mentioned by 15.8% of respondents, indicating that while they are recognized, these interventions may not be as prominent in eco-tourism discussions as educational or community-focused initiatives.

Table 3: Effectiveness of eco-tourism initiative in conserving biodiversity

Initiative	Frequency	Percentage (%)
Wildlife sanctuary development	81	20.3
Nature trails and guided tours	75	18.8
Visitor education and awareness programs	91	22.8
Habitat restoration activities	63	15.8
Community-based conservation projects	90	22.5
Total	400	100.0

Source: Authors fieldwork, 2025

Table 4 shows the reasons eco-tourism is believed to contribute to biodiversity preservation, based on percentages. The highest percentage, 23.3%, indicates that eco-tourism is seen as funding conservation through park fees, suggesting that tourist contributions are important for supporting conservation efforts. Following this, 21.8% of respondents believe that eco-tourism helps raise public awareness about wildlife,

emphasizing the role of education in protecting biodiversity. 19.8% of respondents feel that eco-tourism creates jobs that reduce resource exploitation, highlighting the economic benefits that also aid conservation. Another 17.8% think eco-tourism limits human interference through regulation, which helps manage the impact of tourism on nature. Lastly, 17.5% of respondents are unsure how eco-tourism helps with biodiversity preservation, reflecting some uncertainty about its role.

Table 4: Reasons eco-tourism contributes to biodiversity preservation

Reason	Frequency	Percentage (%)
It funds conservation through park fees	93	23.3
It raises public awareness about wildlife	87	21.8
It creates jobs that reduce resource exploitation	79	19.8
It limits human interference through regulation	71	17.8
I am not sure how it helps	70	17.5
Total	400	100.0

Source: Authors fieldwork, 2025

Role of stakeholder engagement, infrastructure, and policy implementation in the success or failure of eco-tourism as a biodiversity conservation tool

Table 5 highlights the different stakeholder groups that play an important role in ensuring the success of eco-tourism operations. The data shows that local community members are considered the most crucial group, with 24.3% of respondents emphasizing their involvement in the success of eco-tourism initiatives. Government agencies follow closely, with 22.3% of respondents recognizing their significant role in regulating and supporting eco-tourism. Non-governmental organizations (NGOs) are also seen as key players, contributing 20.3% of the responses, reflecting their role in advocacy, funding, and implementation of conservation projects. Private sector investors, at 15.8%, are acknowledged for their contributions in financing and developing eco-tourism infrastructures, while tourists themselves, contributing 17.5% of responses, are viewed as essential for the demand and sustainability of eco-tourism activities.

Table 5: Stakeholder group playing important role in ensuring successful eco-tourism operations

Stakeholder Group	Frequency	Percentage (%)
Local community members	97	24.3
Government agencies	89	22.3
Non-governmental organizations (NGOs)	81	20.3
Private sector investors	63	15.8
Tourists	70	17.5

Total	400	100.0

Source: Authors fieldwork, 2025

Table 6 illustrates the effects of poor infrastructure and weak policy implementation on eco-tourism outcomes. The majority of respondents (23.8%) believe that inadequate infrastructure and ineffective policies lead to reduced tourist visits and revenue, which is a critical concern for the sustainability of eco-tourism. A significant number (22.3%) also feel that such shortcomings cause damage to natural habitats, indicating the negative environmental impact of these issues. The lack of proper infrastructure and policies also limits access to conservation education, with 19.3% of respondents highlighting the importance of education in promoting sustainable eco-tourism practices. Additionally, 17.8% believe that these issues discourage investor confidence, making it harder to attract financial support for eco-tourism initiatives. Finally, 17.0% of respondents felt that poor infrastructure and weak policy implementation have no significant impact, suggesting that some stakeholders may perceive these issues as less influential on eco-tourism outcomes.

Table 6: Effect of poor infrastructure and weak policy implementation on eco-tourism outcomes

Effect	Frequency	Percentage (%)
Reduces tourist visits and revenue	95	23.8
Causes damage to natural habitats	89	22.3
Limits access to conservation education	77	19.3
Discourages investor confidence	71	17.8
Has no significant impact	68	17.0
Total	400	100.0

Source: Authors fieldwork, 2025.

Data analysis

Test of hypothesis

H_0: There is no significant relationship between eco-tourism initiatives and the effectiveness of biodiversity conservation in Cross River State.

H_1: There is a significant relationship between eco-tourism initiatives and the effectiveness of biodiversity conservation in Cross River State.

Data analysis for this study was conducted using the Chi-Square Test of Independence

Table 7 shows the observed frequencies, which represent how people rated the effectiveness of eco-tourism initiatives. For example, the majority of respondents who rated eco-tourism initiatives as "Very Effective" chose "Strongly Agree" (75 responses), followed by "Agree" (45 responses), and smaller numbers for "Undecided," "Disagree," and "Strongly Disagree." Similarly, in the "Effective" category, 61 people strongly agreed, and 59 agreed, showing a generally positive response, though fewer people had negative opinions. Other categories like "Neutral," "Ineffective," and "Very Ineffective" had a mix of opinions, but overall, there were more positive responses than negative ones.

Table 8 presents the expected frequencies, which represent the values we would expect if there were no significant difference between observed and expected ratings. The expected frequencies help us compare how the actual responses match with what we would expect in a typical situation. For example, in the "Very Effective" category, we would expect around 50.63 responses for "Strongly Agree," 44.27 for "Agree," and smaller numbers for other choices. The Chi-square test statistics table shows that the Chi-square value is 70.80 with 16 degrees of freedom, and the p-value is 0.0000000072, which is much lower than 0.05. This leads to the rejection of the null hypothesis and conclusion that there is a significant relationship between eco-tourism initiatives and biodiversity conservation.

Table 7: Observed Frequencies Table

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Very Effective	75	45	15	7	5
Effective	61	59	19	11	7
Neutral	33	35	27	17	13
Ineffective	23	25	19	21	13
Very Ineffective	15	17	15	13	11

Table 8: Expected Frequencies Table

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Very Effective	50.63	44.27	23.24	16.88	11.99
Effective	54.07	47.28	24.82	18.02	12.80
Neutral	43.05	37.65	19.76	14.35	10.19
Ineffective	34.79	30.42	15.97	11.60	8.23
Very Ineffective	24.45	21.38	11.22	8.15	5.79

Test Statistics

Chi-square value (χ^2) = 70.80, Degrees of freedom (df) = 16, p-value = 0.0000000072

Conclusion

This study assessed the effectiveness of eco-tourism initiatives in promoting biodiversity conservation in Cross River State, Nigeria, and to examine the role of stakeholder engagement, infrastructure, and policy implementation in the success or failure of eco-tourism as a biodiversity conservation tool. Data was collected using a mixed-method approach, including surveys and interviews with various eco-tourism stakeholders such as local communities, tourists, and government agencies. The findings revealed that initiatives such as visitor education programs and community-based conservation projects played significant roles in conserving biodiversity, with local community members identified as the most influential stakeholders in ensuring successful eco-tourism operations. The study also highlighted the negative impact of poor infrastructure and weak policy implementation on eco-tourism outcomes, such as reduced tourist visits and damage to natural habitats. Statistical analysis using the Chi-square test showed

a significant relationship between eco-tourism initiatives and biodiversity conservation, indicating that well-implemented eco-tourism practices can contribute to effective environmental preservation.

Recommendations

Based on the findings of this study, it is recommended that the government and relevant stakeholders invest in improving eco-tourism infrastructure, such as transportation and facilities, to enhance visitor experiences and promote sustainable tourism. Additionally, there should be a stronger focus on strengthening policy implementation to ensure effective conservation practices, including regulations that protect natural habitats and biodiversity. Finally, fostering greater collaboration between local communities, government agencies, NGOs, and the private sector is essential for developing community-based conservation projects that empower locals and ensure the long-term success of eco-tourism initiatives in preserving biodiversity.

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