Biodiversity Conservation in the Old Oyo National Park Protected Area of South-Western Nigeria: Achievements and Challenges

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Abstract

Biodiversity conservation has become a critical global environmental priority amid accelerating ecosystem degradation and species loss driven by human activities. Protected areas play a fundamental role in safeguarding biodiversity and maintaining ecological integrity. In Nigeria, national parks are a primary institutional mechanism for biodiversity protection; however, many of these protected areas face mounting ecological and governance challenges. This study examines the achievements and challenges of biodiversity conservation in Old Oyo National Park, a major protected area in South-Western Nigeria. A mixed-methods approach was adopted, integrating field observations, policy document analysis, stakeholder interviews, and secondary ecological data. The findings indicate that the park has made significant contributions to wildlife protection, ecosystem preservation, and environmental education through institutional efforts coordinated by the Nigeria National Park Service and other environmental agencies. Despite these achievements, biodiversity conservation in the park faces persistent challenges, including poaching, illegal logging, agricultural encroachment, inadequate funding, weak enforcement capacity, and conflicts between conservation authorities and surrounding communities. Institutional fragmentation and limited policy implementation further constrain conservation outcomes. The study concludes that strengthening environmental governance, improving community participation, and increasing institutional funding are essential for sustainable biodiversity conservation in Nigeria's protected areas. Policy recommendations include integrated conservation strategies, improved law enforcement, community-based conservation initiatives, and stronger coordination among environmental institutions. The study contributes to broader discussions on protected area governance and biodiversity conservation in developing countries.

Keywords: *biodiversity conservation; protected areas; Old Oyo National Park; environmental governance; poaching; community participation*

Introduction

Biodiversity constitutes the foundation of ecological stability and sustainable development globally. It encompasses the diversity of ecosystems, species, and genetic resources that sustain life on Earth and provide essential ecosystem services, including climate regulation, soil fertility, water purification, and food production (MEA, 2005; IPBES, 2019). However, rapid population growth, urban expansion, deforestation, and unsustainable resource exploitation have accelerated biodiversity loss worldwide. According to the International Union for Conservation of Nature, biodiversity decline is occurring at unprecedented rates, threatening both ecological stability and human well-being (IUCN, 2020).

Protected areas have emerged as one of the most effective global strategies for biodiversity conservation. National parks, forest reserves, wildlife sanctuaries, and conservation areas serve as designated spaces where ecosystems and wildlife species receive legal protection from destructive human activities (Watson et al., 2014). These areas contribute significantly to maintaining ecological balance, preserving endangered species, and safeguarding ecosystem services vital for human survival.

Statement of the Problem

Despite the ecological importance of Old Oyo National Park, biodiversity conservation within the park remains threatened by poaching, illegal logging, agricultural encroachment, weak enforcement, inadequate funding, and limited community participation. Although the park is legally protected, there is still a need to examine the effectiveness of existing conservation efforts, the major challenges that continue to undermine biodiversity protection,

and practical strategies to improve conservation outcomes in the area.

Research Questions

1. What are the major achievements of biodiversity conservation in Old Oyo National Park?
2. What are the main challenges affecting biodiversity conservation in Old Oyo National Park?
3. What strategies can improve biodiversity conservation and protected area management in Old Oyo National Park?

Literature Review

Globally, protected areas currently cover approximately 17% of terrestrial ecosystems, reflecting international commitments under the Convention on Biological Diversity (CBD, 2020).

In developing countries, protected areas play an especially important role because biodiversity resources often face intense pressure from economic activities such as agriculture, logging, and mineral extraction (Naughton-Treves et al., 2005). However, effective management of protected areas in many developing countries remains constrained by institutional weaknesses, limited financial resources, inadequate enforcement capacity, and conflicts with local communities that depend on natural resources for their livelihoods (Andam et al., 2008; DeFries et al., 2010).

Nigeria is recognised as one of the most biologically diverse countries in Africa. The country's ecological zones range from coastal mangrove forests and tropical rainforests to savannah grasslands and montane ecosystems, each supporting unique plant and animal species (Adebisi, 2013). Nigeria's biodiversity includes numerous endemic and endangered species such as forest elephants, chimpanzees, and various antelope species. Despite this richness, Nigeria's biodiversity resources face significant threats from deforestation, land-use change, the illegal wildlife trade, and unsustainable exploitation of natural resources (Oates, 2011).

To address these threats, the Nigerian government has established several national parks and protected areas under the supervision of the Nigeria National Park Service. These protected areas are designed to conserve critical habitats, preserve wildlife populations, and promote sustainable environmental management. Other institutions involved in environmental regulation include the National Environmental Standards and Regulations Enforcement Agency and the Federal Ministry of Environment, which oversee the implementation of environmental policy and biodiversity protection initiatives.

Among Nigeria's protected areas, Old Oyo National Park represents one of the most significant conservation landscapes in the country's savannah ecological zone. Established in 1991, the park covers approximately 2,512 square kilometres and is located within Oyo State in South-Western Nigeria. It hosts diverse ecosystems, including savannah grasslands, forest patches, riverine vegetation, and woodland habitats, that support numerous wildlife species, such as buffalo, antelope, baboons, and various bird species (Ayeni, 2012).

Despite its ecological importance, biodiversity conservation in Old Oyo National Park faces increasing challenges. These include illegal hunting, agricultural encroachment, logging activities, and inadequate conservation funding. In addition, tensions sometimes arise between conservation authorities and local communities who depend on forest resources for livelihoods (Oladeji et al., 2019).

Understanding how these challenges affect conservation outcomes is essential for improving protected area management and biodiversity protection in Nigeria. While several studies have examined biodiversity conservation in Nigerian national parks, relatively little research has focused specifically on the governance dynamics and conservation outcomes within Old Oyo National Park.

This study, therefore, investigates the achievements and challenges of biodiversity conservation in Old Oyo National Park. The study aims to assess the effectiveness of conservation policies, evaluate institutional roles in park management, and identify key threats affecting biodiversity within the park.

Theoretical Framework

This study is anchored in Common-Pool Resource Theory and Environmental Governance Theory. Common-Pool Resource Theory, advanced by Ostrom (2009), explains how natural resources such as forests, wildlife, water bodies, and grazing lands are vulnerable to overuse when multiple users depend on them without effective rules, monitoring, and collective management arrangements.

Old Oyo National Park represents a conservation landscape where formal institutions protect biodiversity resources while also interacting with surrounding communities whose livelihoods may depend on farming, hunting, fuelwood collection, and other land-based activities.

Environmental Governance Theory further strengthens the analytical foundation of the study by emphasising the roles of institutions, policies, enforcement systems, stakeholder participation, and inter-agency coordination in achieving environmental sustainability. In the context of Old Oyo National Park, biodiversity conservation depends not only on legal protection but also on the effectiveness of governance structures responsible for policy implementation, law enforcement, ecological monitoring, community engagement, and funding. The theory is useful for examining how institutional capacity, weak enforcement, fragmented responsibilities, and limited community participation influence conservation outcomes.

Methodology

Study Area

This study was conducted in Old Oyo National Park, one of the most important protected conservation areas in South-Western Nigeria. The park is located in northern Oyo State, between latitudes 8°15′N and 9°00′N and longitudes 3°35′E and 4°42′E. Established in 1991, Old Oyo National Park covers an estimated land area of about 2,512 square kilometres. It is one of the largest protected areas within Nigeria's savannah ecological zone. The park lies within the Guinea savannah belt and is characterised by a mixture of woodland savannah, riparian forests, and grassland vegetation. The area experiences a tropical climate with distinct wet (April and October) and dry (November to March) seasons. Average annual rainfall ranges between 1,100 mm and 1,300 mm, while temperatures generally range from 21°C to 34°C throughout the year.



Figure 1: Map of Old Oyo National Park Showing Location and Surrounding Settlements
Source: Adapted from the Nigeria National Park Service (2020) and GIS data from the Federal Ministry of Environment.

Research Design

This study adopted a mixed-methods research design combining both qualitative and quantitative approaches to examine biodiversity conservation achievements and challenges within Old Oyo National Park. The mixed-methods approach was considered appropriate because biodiversity conservation issues often involve ecological, social, and institutional dimensions that cannot be adequately captured using a single research method. The quantitative component of the study focused on gathering measurable data through structured questionnaires administered to local community members and stakeholders involved in conservation activities. The qualitative component involved in-depth interviews with park officials, conservation officers, and environmental experts to obtain detailed insights into conservation policies and management practices. This approach enabled the researcher to triangulate data from multiple sources and improve the reliability and validity of the findings.

Data Sources

The study utilised both primary and secondary data sources. Primary data were collected through field surveys, interviews, and observations conducted within communities surrounding the Park. These respondents included park officials, conservation staff, residents, and other stakeholders involved in biodiversity conservation activities. Secondary data included policy documents, ecological reports, and relevant literature.

Sampling Technique and Sample Size

The study employed a purposive and simple random sampling technique. Purposive sampling was used to select key informants, including park officials, conservation officers, and environmental stakeholders, due to their direct knowledge of biodiversity conservation and park management. Simple random sampling was used to select residents from communities surrounding Old Oyo National Park to capture community perceptions of conservation achievements and challenges, livelihood activities, and participation in park-related conservation programmes.

A total of 100 respondents were selected for the questionnaire survey. This sample size was considered adequate for generating descriptive and comparative insights into local perceptions of

biodiversity conservation within the study area. The sample included community members, park staff, conservation personnel, and other relevant stakeholders. The use of different respondent categories helped to improve the representativeness of the data and allowed the study to compare conservation issues from both institutional and community perspectives.

Research Instrument

Data were collected using structured questionnaires, key informant interviews, field observation, and document review. The questionnaire was divided into sections covering respondents' knowledge of wildlife species, the park's perceived ecological importance, wildlife population trends, illegal activities, the effectiveness of management strategies, community attitudes, livelihood activities, and suggested conservation strategies.

Validity and Reliability of Instrument

To ensure validity, the questionnaire and interview guide were reviewed by experts in environmental management, urban and regional planning, and biodiversity conservation. Their comments were used to improve the clarity, relevance, and coverage of the research instruments. A pilot test was also conducted with a small number of respondents outside the main sample area to identify ambiguous items and improve the structure of the questionnaire. Reliability was strengthened by maintaining consistent question wording and using similar response categories across related variables. The combination of questionnaires, interviews, field observations, and secondary data also enhanced the reliability of the findings through triangulation.

Method of Data Analysis

Quantitative data obtained from questionnaires were analysed using frequency counts, percentages, and cross-tabulation. Descriptive statistics were used to summarise respondents' perceptions of biodiversity conservation achievements and challenges. In addition, selected variables such as community involvement, perceived effectiveness of park management, livelihood activities, and perceived biodiversity threats were compared to identify patterns in conservation outcomes.

Results and Discussion

Level of Respondents' Knowledge of Wildlife Species in the Park

Table 1: Knowledge of Wildlife Species in the Park

Option	**Frequency**	**Percentage (%)**
Very High Knowledge	31	31
High Knowledge	37	37
Moderate Knowledge	21	21
Low Knowledge	11	11%
Total	100	100%

Source: Field Survey, 2026

The results indicate that 68% of respondents reported either very high or high knowledge of wildlife species found in the park. This suggests that local communities may possess substantial ecological knowledge about the park's biodiversity. Indigenous ecological knowledge is often important for conservation because residents have long-term familiarity with wildlife behaviour and habitat patterns. Previous studies have highlighted the importance of incorporating local ecological knowledge into conservation strategies in developing countries (Berkes, 2012).

Perceived Ecological Importance of Old Oyo National Park

Table 2: Ecological Importance of the Park

Option	**Frequency**	**Percentage (%)**
Habitat protection for wildlife	39	39
Preservation of plant species	21	21
Climate regulation	17	17
Watershed protection	14	14
Cultural and historical heritage	9	9
Total	**100**	**100**

Source: Field Survey, 2026

The results indicate that habitat protection (39%) is considered the most important ecological function of the park, followed by preservation of plant species (21%). These findings confirm that the park serves as a crucial refuge for wildlife populations that would otherwise face habitat loss due to human activities. Protected areas like Old Oyo National Park play an important role in maintaining ecosystem services such as watershed protection and climate regulation.

Trends in Wildlife Population

Table 3: Perceived Wildlife Population Trends

Option	Frequency	Percentage (%)
Increasing	18	18
Stable	26	26
Decreasing	46	46
Unsure	10	10
Total	**100**	**100**

Source: Field Survey, 2026

Table 4.3 shows that 46% of respondents believe that wildlife populations are decreasing, while only 18% believe they are increasing. This perception indicates concerns about the long-term sustainability of biodiversity resources within the park. Wildlife population decline may be linked to illegal hunting, habitat degradation, and climate-related environmental changes. Similar trends have been reported in other African protected areas where poaching and habitat fragmentation threaten wildlife populations (Lindsey et al., 2017).

Types of Illegal Activities Around the Park

Table 4: Illegal Activities Affecting Biodiversity

Option	Frequency	Percentage (%)
Poaching	36	36
Illegal logging	24	24
Bush burning	18	18
Grazing by livestock	13	13
Mining activities	9	9
Total	**100**	**100**

Source: Field Survey, 2026

The findings show that poaching is the most common illegal activity affecting biodiversity within the park (36%), followed by illegal logging (24%). These activities directly threaten wildlife populations and degrade forest ecosystems. Poaching remains a major challenge across many African protected areas due to high demand for bushmeat and wildlife products.

Effectiveness of Park Management Strategies

Table 5: Effectiveness of Conservation Management

Option	Frequency	Percentage (%)
Very Effective	22	22
Effective	34	34
Moderately Effective	28	28
Ineffective	16	16
Total	**100**	**100**

Source: Field Survey, 2026

The results indicate that 56% of respondents consider park management strategies effective or very effective. This suggests that conservation initiatives implemented by the Nigeria National Park Service have contributed to biodiversity protection within the park. However, the presence of illegal activities indicates that enforcement challenges still exist.

Community Attitudes Toward Biodiversity Conservation

Table 6: Community Attitude Toward Conservation

Option	Frequency	Percentage(%)
Strongly Support Conservation	43	43
Support Conservation	32	32
Neutral	15	15
Oppose Conservation	10	10
Total	**100**	**100**

Source: Field Survey, 2026

The survey results show that 75% of respondents support biodiversity conservation, indicating strong community acceptance of conservation objectives. Positive community attitudes are important for successful conservation outcomes because residents often influence resource use patterns around protected areas.

Sources of Livelihood around the Park

Table 7: Primary Livelihood Activities

Option	Frequency	Percentage (%)
Very Effective	22	22
Effective	34	34
Moderately Effective	28	28
Ineffective	16	16
Total	**100**	**100**

Source: Field Survey, 2026

The results reveal that farming is the dominant livelihood activity (46%) among communities surrounding the park. Agricultural expansion often leads to encroachment into protected areas, which poses a threat to biodiversity conservation.

Table 8: Level of Environmental Awareness Programs in the Park

Option	Frequency	Percentage (%)
Very High	28	28
High	36	36
Moderate	22	22
Low	14	14
Total	**100**	**100**

Source: Field Survey, 2026

The results indicate that 64% of respondents consider environmental awareness programmes to be either high or very high. This suggests that conservation education initiatives have played an important role in promoting environmental knowledge among communities surrounding the park.

Table 9: Level of Community Involvement in Conservation Programs

Option	Frequency	Percentage (%)
Very High	20	20
High	33	33
Moderate	31	31
Low	16	16
Total	**100**	**100**

Source: Field Survey, 2026

The findings show that 53% of respondents reported high or very high levels of community involvement in conservation programmes. Community participation is widely recognised as a key factor for effective protected area management because it promotes shared responsibility for environmental protection.

Table 10: Major Drivers of Biodiversity Loss

Option	Frequency	Percentage (%)
Deforestation	28	28
Poaching	34	34
Agricultural expansion	21	21
Bush burning	10	1
Climate change	7	7
Total	**100**	**100**

Source: Field Survey, 2026

The findings reveal that poaching (34%) and deforestation (28%) are the leading drivers of biodiversity loss in the park. These activities directly threaten wildlife populations and degrade natural habitats.

Table 11: Suggested Strategies for Improving Biodiversity Conservation

Option	Frequency	Percentage (%)
Strengthening law enforcement	29	29
Increased funding for park management	23	23
Community participation programs	25	25
Environmental education	13	13
Sustainable livelihood initiatives	10	10
Total	**100**	**100**

Source: Field Survey, 2026

The results show that respondents consider stronger law enforcement and improved community participation as the most important strategies for enhancing biodiversity conservation in the park.

Table 12: Comparative Interpretation of Key Conservation Indicators

Conservation Indicator	Positive Response	Negative/ Concern Response	Interpretation
Knowledge of wildlife species	68% high/very high	11% low	Community ecological knowledge is relatively strong
Effectiveness of park management	56% effective/very effective	16% ineffective	Management is moderately effective but still constrained
Community support for conservation	75% support/ strongly support	10% oppose	Conservation enjoys broad community acceptance
Community involvement	53% high/very high	16% low	Participation exists but needs to be deepened
Wildlife population trend	44% increasing/ stable	46% decreasing	Biodiversity decline remains a major concern

Source: Field Survey, 2026

The comparative interpretation shows that Old Oyo National Park has recorded some conservation achievements, particularly in community awareness, support for conservation, and perceived management effectiveness. However, these positive indicators are weakened by the high proportion of respondents who believe that wildlife populations are declining. This suggests that conservation awareness and community support have not fully translated into measurable

biodiversity recovery. The contrast between positive community attitudes and perceived wildlife decline indicates that the main conservation problem is not only a lack of awareness but also weak enforcement, livelihood pressure, poaching, and institutional limitations.

Discussion of Findings

The findings of this study provide important insights into the current state of biodiversity conservation in Old Oyo National Park and highlight the major achievements and challenges of protected area management in South-Western Nigeria. The results reveal that local communities surrounding the park possess a relatively high level of awareness regarding biodiversity conservation. This awareness is largely attributed to environmental education initiatives implemented by conservation authorities and to community outreach programmes organised by park management. Environmental awareness is widely recognised as a critical component of conservation success because communities that understand the ecological importance of protected areas are more likely to support conservation policies and sustainable resource use (Berkes, 2012).

The study also confirms the ecological importance of Old Oyo National Park as a major habitat for wildlife species within the Guinea savannah ecological zone. Respondents identified habitat protection and the preservation of plant species as the park's most important ecological roles. This finding is consistent with global research on protected areas, which emphasises that national parks serve as critical refuges for wildlife populations threatened by habitat destruction and land-use change (Watson et al., 2014). The park supports a wide variety of wildlife species, including antelope, buffalo, primates, and numerous bird species. These species contribute to the region's ecological diversity and play important roles in maintaining ecosystem balance.

However, the findings also indicate that biodiversity conservation within the park faces significant challenges. The majority of respondents reported that wildlife populations are declining, suggesting that existing conservation strategies may not be sufficient to address current threats. Illegal hunting was identified as the most significant threat to wildlife populations in the park. Poaching remains a widespread problem across many African protected areas due to the demand for bushmeat and wildlife products (Lindsey et al., 2017). In addition to poaching, illegal logging and agricultural encroachment were also identified as major environmental challenges affecting the park's ecosystems.

The results further show that agricultural activities constitute the primary source of livelihood for communities living around the park. While agriculture is essential for rural livelihoods, the expansion of farmland into protected areas can lead to habitat fragmentation and biodiversity loss. This highlights the complex relationship between conservation objectives and socio-economic realities in developing countries. Effective conservation policies must therefore address both ecological protection and the livelihood needs of local communities.

Institutional roles are also critical to biodiversity conservation within the park. The Nigeria National Park Service primarily coordinates the management of Old Oyo National Park under the supervision of the Federal Ministry of Environment. These institutions are responsible for enforcing wildlife protection laws, conducting ecological monitoring programmes, and implementing environmental policies designed to protect biodiversity. Environmental regulation is also supported by the National Environmental Standards and Regulations Enforcement Agency, which plays an important role in ensuring compliance with environmental standards.

Although these institutions contribute significantly to conservation management, the study found that enforcement challenges and limited funding continue to affect conservation effectiveness. Many protected areas in developing countries struggle with inadequate financial resources and insufficient personnel, which limit their capacity to conduct anti-poaching patrols and enforce environmental regulations. Strengthening institutional capacity and improving coordination among environmental agencies are, therefore, essential for enhancing biodiversity conservation outcomes.

Community participation emerged as another important factor influencing conservation outcomes. The findings indicate that a large proportion of respondents support biodiversity conservation initiatives and recognise the ecological importance of the park. This suggests that community-based conservation strategies may be effective in promoting sustainable environmental management. Engaging local communities in conservation activities can help reduce conflicts between park authorities and residents while also improving compliance with conservation regulations.

Overall, the findings of this study highlight the need for an integrated conservation approach that

combines ecological protection, institutional strengthening, and community participation. Such an approach is essential for ensuring the long-term sustainability of biodiversity resources within Old Oyo National Park and other protected areas in Nigeria.

Conclusion

The study concludes that while Old Oyo National Park has achieved notable progress in biodiversity conservation, significant improvements are required in environmental governance, institutional capacity, and community engagement to ensure long-term sustainability of biodiversity resources.

Policy Recommendations

Based on the study's findings, it is recommended that law enforcement and anti-poaching efforts in Old Oyo National Park be strengthened by increasing staffing, conducting regular patrols, improving surveillance technology, and providing better logistical support for park rangers. This will improve conservation authorities' capacity to prevent illegal hunting, logging, bush burning, and other activities that threaten biodiversity within the park.

There is also a need for increased and sustained funding for park management. Adequate funding would support ecological monitoring, staff training, patrol operations, infrastructure maintenance, environmental education, and research activities. Without sufficient financial resources, conservation institutions may struggle to implement effective biodiversity protection strategies.

Community participation should be deepened through community-based conservation programmes that involve residents in awareness campaigns, monitoring, reporting illegal activities, and conservation decision-making. This would help reduce conflicts between park authorities and surrounding communities while promoting a sense of shared responsibility for biodiversity protection.

Sustainable livelihood programmes should be developed for communities around the park to reduce dependence on illegal resource extraction. Alternative livelihood options such as eco-tourism, agroforestry, beekeeping, vocational training, and small-scale enterprise support can help reduce pressure on park resources while improving community welfare.

Environmental education and awareness programmes should be intensified in communities surrounding Old Oyo National Park. These programmes should focus on the ecological, economic, and cultural benefits of biodiversity conservation, as well as the long-term consequences of habitat destruction, poaching, and unsustainable land-use practices.

Finally, institutional coordination among the Nigeria National Park Service, Federal Ministry of Environment, NESREA, local governments, traditional institutions, and community-based organisations should be improved. Stronger coordination will enhance policy implementation, reduce institutional overlap, and promote more effective governance of biodiversity conservation in the park.

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