



## Assessing Nigeria's Efforts in Biodiversity Conservation

Justice Victor William\*

Department of Geography and Natural Resources Management, University of Uyo, Akwa Ibom State, Nigeria, <https://orcid.org/0000-0003-2326-3535>

\*Email: [ittrueitswilliams@gmail.com](mailto:ittrueitswilliams@gmail.com)

Received: 03 October 2024 / Revised: 19 December 2024/ Accepted: 23 December 2024 / Published online: 02 March 2025.

**How to cite:** William, J. V., (2025). Assessing Nigeria's Efforts in Biodiversity Conservation, Scientific Reports in Life Sciences 6(1), 85-98. DOI: <https://doi.org/10.5281/zenodo.14950275>

### Abstract

This paper titled, 'Assessing Nigeria's Efforts in Biodiversity Conservation', categorically reviews the initiatives of Nigeria in conserving its biodiversity over the past years. This paper aims to examine the conservation strategies, policies, and frameworks that have been instituted towards the conservation of biodiversity in the country to determine their effectiveness in achieving conservation objectives and also proffer feasible recommendations for enhancing these conservation efforts. To achieve the aim of this research, the study adopted the desk research design. Thus, using secondary data, the paper explores biodiversity conservation in Nigeria in all its dimensions. To that extent, it reviewed existing research works and other secondary data sources such as news reports, government releases, journals, and academic books to reveal that even though biodiversity conservation in Nigeria is a tremendous success, it is still being significantly impacted by some challenges. These conservation challenges highlighted within the study include environmental, socioeconomic, institutional, and even political obstacles. Therefore, the study recommends that to address these difficulties and enhance the biodiversity conservation efforts and outcomes within Nigeria, greater community participation in conservation initiatives should be encouraged, sustainable funding for conservation should be ensured and the capacity of Nigeria's institutional frameworks should be strengthened.

**Keywords:** Biodiversity, Conservation, Ecosystems, Species

## **Introduction**

Globally, biodiversity is regarded as the variety of life on earth. It is based on this description that Singh (2024) asserts that biodiversity includes the variations among and between species in various ecosystems. For a fact, biodiversity makes possible the existence of different species of flora and fauna across the globe and the adaptability of these species within different ecological conditions (Gasu et al., 2021; Singh, 2024). Such healthy ecosystems all contribute to the overall well-being of the earth's systems, especially because they contribute to the regulation of these systems. According to Rands et al. (2010), the conservation of biodiversity [or the conservation of the varieties of flora and fauna species] is very necessary to protect it. This is because anthropogenic activities of different forms and kinds have led to the endangerment or extinction of several species over the past years. As the rate of urbanism and development continues to increase, the propensity for mass pollution, deforestation, and climate change heightens, thus, increasing the risk of ecosystem deterioration. To tackle biodiversity loss in a global context, several concerted efforts have been instigated. For instance, the United Nations Sustainable Development Goals (SDGs) have been adopted as a conservation agenda not just to help countries protect their biodiversity, but to restore it while at the same time ensuring development in livelihood and economy (Olawuyi & Olusegun, 2018). The Convention on Biological Diversity (CBD) has also played its part in preventing the escalation of the biodiversity crisis (Olorunnipa et al., 2024). In Nigeria, observations have been made of great biodiversity (William & Ebong, 2021). According to Aju & Ezeibekwe (2010), the country is a biodiversity hotspot that boasts lush rainforests in its southern regions, unique savannahs in the north, and even species-rich wetlands. These ecosystems support unique biodiversity, including both endangered and endemic species, which are also significant in the global biodiversity sphere. To protect this biodiversity, Nigeria has also instigated several intentional efforts. This review therefore aims to comprehensively evaluate the biodiversity conservation efforts of Nigeria, as it assesses policy frameworks, implementation strides, and challenges to determine their effectiveness and propose feasible recommendations for enhanced efforts.

## **Material and methods**

This review adopted a desk research design. Thus, the paper was compiled with the use of secondary data and secondary research methods. These secondary research methods included a review of existing literature and an in-depth analysis of existing data in articles and other research papers. To collect secondary data for the review, secondary data sources such as

academic books, academic journals, research papers, conservation intervention reports and publications, government releases and news reports, conservation organization memorandums, and other articles were consulted. The data analysis technique for the secondary data in this review involved the collection of data, the review of literature, and the making of inferences from such reviews as used by Prasert (2024).

### **Biodiversity conservation within the historical context**

In the history of Nigeria's environmental stewardship, the conservation of biodiversity can be categorically appraised as taking place within the pre-colonial, colonial, and even post-colonial periods. The pre-colonial period in the history of Nigeria was a period characterized by the existence of homogenous and indigenous communities and knowledge (Adjeketa et al., 2024). According to Adjeketa et al. (2024), these communities throughout the territory later called Nigeria adopted the use of traditional methods to ensure that they preserved and protected biodiversity within their environments and their environments themselves. These traditional methods had deep spiritual and cultural undertones, thus, many scholars like Sinthumule (2023) argue that the aim of these strides was not necessarily to conserve biodiversity but to appease deities and serve ritualistic purposes. Whatever the case, these methods which included the existence of sacred groves, abominations taboos, and even certain agricultural practices were pivotal to ensuring that biodiversity was conserved. Certain forests or groves and all that were in them were dedicated to the spiritual deities, viewed as sacred and not exploited by the villagers (Adeyanju et al., 2022). This way, both floristic and faunal species within these groves were left untouched and allowed to flourish in their natural ecosystems. In his paper, Udeagha et al. (2013) reports that in a certain community called Asanting Ibiono in the southern part of the country, this practice of sacred groves has been preserved down to this day (William, 2024). The existence of taboos or abominations was also an effective biodiversity conservation practice within this era. In certain communities, it was abominable for the dwellers to fish in some rivers on particular days, catch certain kinds of fish, or even hunt specific animals during some seasons. Such rivers and their ecosystems were thus able to thrive and maintain stable equilibrium without interference. Phil-Eze (2010) reports that agricultural practices such as bush fallowing were greatly practiced during this time and were quite effective in allowing the land to be regenerated with its ecological niche restored. These conservation methods were highly effective at that time especially because they were community-driven and fostered by the people's spiritual heritage. However, during the colonial era, conservation was redirected and its methods were changed by the enactment of foreign policies and laws that categorically bordered on the establishment of parks, game reserves, and other protected areas as Ado (2022)

explains. The Yankari Game Reserve in Bauchi state and the Old Oyo National Park in Oyo state were both established during this time by the colonizers as they sought to impose new knowledge and policies of conservation on the country (Mohammed, 2022). The advent of new conservation patterns and the steady erosion of traditional methods was effective in conserving large ecological areas, even though it masterminded the disregard of indigenous knowledge and the displacement of indigenous communities. At this time of the post-colonial era, major reforms and initiatives have overtaken the species conservation vehicle of the country. These reforms led to the introduction of important policy changes that were in line with international conservation goals and objectives (Ado, 2022). Audu & Ayuba (2016) assert that an important policy change was the inclusion of indigenous knowledge in official conservation plans. With this strategy, local communities were to once again have a key role in managing their natural resources which was quite a feasible move. This creation of community-based conservation programs was a crucial step since it enabled indigenous communities to participate in conservation efforts and gain from the resources (Etemire & Sobere, 2020). Governments in succession also started incorporating biodiversity conservation into national development agenda and enacting environmental protection legislation, which led to the establishment of new protected areas and encouraged sustainable forestry and agricultural practices. Notwithstanding these endeavors, challenges to biodiversity conservation persist, such as the depletion of habitats, the effects of climate change, and insufficient financial support for conservation initiatives (Olawuyi & Olusegun, 2018; Raimi et al., 2022).

### **Legislative framework for biodiversity conservation**

For certainty, it is worthwhile to emphasize that the conservation initiatives for biodiversity in Nigeria are anchored on certain frameworks propelled by legality. These frameworks are considered as both statutory and strategic plans for the successful undertaking of conservation objectives within different parts of the country.

#### **The National Biodiversity Strategy and Action Plan (NBSAP)**

The NBSAP is one such framework. According to the Federal Ministry of Environment (2015), 14 targets of the NBSAP were set by the government to be achieved by 2020. A few of these targets included;

- Target 2: Programme for the valuation of biodiversity and payments for ecosystem services are mainstreamed into the national budget.
- Target 3: National ecosystem-based spatial planning processes are adopted.
- Target 11: Nagoya protocol is implemented.

- Target 12: Community participation in project design and management of key ecosystems.

**Implementation and Effectiveness Status:** The adoption and implementation of the NBSAP have been encountered with mixed outcomes. Of course, there has been remarkable success in the area of creating awareness and integrating national policies and community participation for biodiversity conservation on a grand scale using the framework (Etemire & Sobere, 2020). However, certain challenges cannot be overlooked or ignored, and one such challenge concerns the inadequacy of funding as well as weak institutional powers for the enforcement of policies and regulations established through the NBSAP (Olawuyi & Olusegun, 2018).

### **Protected Areas and Wildlife Laws**

The National Parks Service Act (1991) is one legal framework that was enacted for the conservation of wildlife and their ecosystems through protected areas. In fact, this Act was enacted to establish the national park service, creating a vast network of protected areas in the country to conserve wildlife and also instigate sustainable tourism (Adewale & Alarape, 2020). The Wildlife Conservation Act (1985) is another significant framework. This framework addresses the protection of wildlife species within the country together with their natural habitats (Oruonye & Ahmed, 2020). According to the Food and Agriculture Organisation (2015), this Act provided the basis for the existence of wildlife sanctuaries and reserves in Nigeria. Today, such sanctuaries and reserves established under different Acts and ordinances like the Yankari Game Reserve in Bauchi state and the Idanre Hills Forest Reserve have served as a safe ecological hub for wildlife species (Mohammed, 2022; Adegoroye et al., 2024).

**Implementation and Effectiveness Status:** The various protected areas and wildlife laws including the ones reviewed above have proven to be quite effective to a great extent according to Adegoroye et al. (2024). This is especially true in the area of community participation in wildlife conservation within rural areas. However, Ukpoju et al. (2023) assert that Nigeria still deals with enforcement challenges, particularly due to a lack of strong institutional capacity and inadequacy of funding. Thus, activities like poaching and forest exploitation have continued to threaten the efficacy of these frameworks. Moreover, there is a greater need for the furtherance of community participation in wildlife management to ensure the inclusion of local communities in Nigeria's biodiversity conservation.

### **Institutional framework for biodiversity conservation**

The institutional frameworks for the conservation of biodiversity in Nigeria can generally be appraised under three groups. These frameworks include traditional and communal institutions, government agencies, and even non-governmental organizations.

### **Local Communities and Traditional Institutions**

It is worth mentioning that traditional Institutions have throughout history played a crucial role in effectively overseeing natural resources. This institutional framework, though frequently based on native knowledge systems has utilized reverence for customs and spiritual values to instill the need for conservation among indigenes of local communities (Sambe et al., 2021). An intriguing fact is that even though many rural communities rely on their environment for survival, traditional Institutions have created sustainable methods to protect biodiversity as many scholars explain. In most rural communities within Nigeria, forests managed by local communities have been protected by traditional institutions like the masquerade cults, age groups, and even clan elders. According to Phil-Eze (2010), the existence of these institutions has helped to effectively reduce deforestation, enhance forest health, and even promote biodiversity. For instance, sacred groves in some communities are deemed sacred because they serve as age-long strongholds for the spirituality of masquerade societies. However, Ozuruoke et al. (2021) posit that despite these successes, conflicts may be instigated when the needs of a community collide with conservation strides.

### **Government Agencies**

Foremost in this group is the Federal Ministry of Environment at the federal government level of Nigeria. This ministry as the name implies is a national agency that is dedicated to the environment or wildlife. Therefore, one of its departments, the Department of Forestry and Wildlife, typically oversees the development of biodiversity strategies and laws across the country. In addition, the institution is concerned with the administration of protected areas like national parks within the country (Isife, 2012). In Nigeria, the National Environmental Standards and Regulations Enforcement Agency (NESREA) works in close collaboration with the Federal Ministry of Environment to enforce or implement environmental regulations while striving for sustainable management of natural resources (NESREA, n.d). Several obstacles remain in the face of government involvement, one of which majorly revolves around poor coordination throughout governmental tiers and corruption which has resulted in dispersed and ineffective conservation efforts throughout the country (Altiparmak, 2022).

### **Non-Governmental Organisations (NGOs)**

The NGOs are another institutional framework for biodiversity conservation in Nigeria. These NGOs which include local and international organizations like Green Alliance Nigeria, World Wildlife Fund (WWF) Nigeria, and even Wildlife Conservation Society (WCS) Nigeria have made notable contributions towards the conservation of biodiversity in Nigeria (Abdulaziz, 2017). According to Abdulaziz (2017), they play a vital role in advocating for more robust environmental policies and initiatives, researching more feasible approaches for sustainable conservation, independently executing local or international conservation projects, and initiating public sensitization programs across rural and urban societies. It will not be presumptuous to say that this institutional framework often fills the chasm of inefficiency that government agencies create. On a grandiose scale, international NGOs Conservation International have frequently brought significant financial resources, technical expertise, and global visibility to biodiversity conservation efforts as they collaborate with the government and local communities to secure the health of ecosystems, protect endangered species, bolster sustainable land-use practices and overall expand nature-positive economies (Conservation International, n.d). Notwithstanding their enormous contributions, NGOs, like other institutional frameworks, are faced with several challenges. These NGOs have little or no control over national policy, thus, they can run into problems with local communities or government organizations like what happened between the Nigerian Conservation Foundation (NCF) and the Cross River State government over the superhighway project in 2017 (The Nation, 2017). Furthermore, there may be instances where international NGOs place global conservation goals on a higher pedestal than local conservation needs, thus, instigating disagreements among stakeholders.

### **Assessment of current conservation efforts in Nigeria**

#### **Habitat Restoration and Management**

Nigeria's habitat restoration initiatives are greatly intensifying and receiving more attention especially because of the nation's severe biodiversity loss which has been instigated by certain factors such as deforestation, extreme agricultural practices, and even uncontrolled urbanism. As a result of this situation, several projects have been established by institutional frameworks like the Nigerian Conservation Foundation (NCF) and others to rehabilitate ecosystems through the reforestation of the Niger Delta, restoration of the mangrove, and even replanting native species on damaged areas (Anwadike, 2020; Izah et al., 2023). According to reports by Sam et al. (2023), there has been significant progress, particularly in the mangrove restoration which has been met with community participation in some regions in Nigeria. However, the potential of restoration goals is largely untapped due to the challenges of funding and weak enforcement

of conservation laws and bylaws (Altiparmak, 2022). Also, habitat restoration efforts have been further hampered by issues of land modification, illegal logging, and even oil spills in oil-rich regions like Bayelsa, Rivers, and Akwa Ibom states (Izah et al., 2023). To record greater success on the collaborative projects that government and non-governmental organizations (NGOs) are working together on, there needs to be stricter enforcement of policies.

### **Protected Areas and National Parks**

Nigeria has successfully established quite several national parks and protected areas with the very objective of ensuring that ecological systems and faunal and floristic species are all preserved (Digun-Aweto et al., 2022). These parks include Yankari Game Reserve, Gashaka-Gumti National Park, Kamuku National Park, and Cross River National Park (Mohammed, 2022; Israel & Olujide, 2023). As biodiversity hotspots, these areas have protected much of the nation's landmass and the biodiversity within these areas. Digun-Aweto et al. (2022) even emphasize the effectiveness of this effort by reporting that endangered species like the Cross River gorilla have been better protected largely due to the efforts of the Cross River National Park which has worked closely with other agencies to reduce poaching and illegal logging, promote ecotourism and kick against anti-conservation strides within the state. Even with these positive outcomes, conservation efforts through protected areas and national parks are still inhibited by several challenges which include weak regulations enforcement, inadequate funding, poaching encroachment, and inadequate infrastructure as Altiparmak (2022); and Israel & Olujide (2023) observe. Moreover, communities that surround these parks most times lack the motivation to also support their conservation initiatives (Ogwu et al., 2022).

### **Species-Specific Conservation Programs**

There have been several conservation programs that have been targeted at protecting endangered species in Nigeria. These programs have been propagated by organizations like the Nigerian Conservation Foundation (NCF), the Wildlife Conservation Society (WCS), and even the IUCN in Nigeria. For example, the 'Species in Peril Programme' was established by the NCF to stop the further degradation of species habitat and ensure the sustainability of these species (NCF Nigeria, n.d). Like this program, other programs have also successfully placed their focus on community involvement, species habitat protection, and anti-poaching strides. However, amidst the overwhelming success recorded, these species-specific programs are slowed down by certain challenges. Digun-Aweto et al. (2022) identify these challenges to include lack of adequate funding and the absence of a task force to enforce compliance with conservation regulations. In addition, some communities do not comply with the requirements



of some conservation programs, especially if they offer no monetary benefits (Ogwu et al., 2022).

### **Challenges of biodiversity conservation in Nigeria**

#### **Environmental Challenges**

Aju & Ezeibekwe (2010) observe that certain environmental challenges exert a pulling impact on Nigeria's efforts to conserve its biodiversity. These issues of course include but are not limited to pollution, climate change, and even deforestation instigated by indices of urbanism and infrastructural development (Olalekan et al., 2019; William & Ebong, 2021). Deforestation which occurs in forested areas of the country is caused by logging for development and increased agricultural activities in rural areas which has led to the clearing of forests for farmlands and habitat fragmentation (Audu & Ayuba, 2016; Imarhiagbe et al., 2020). According to Audu & Ayuba (2016), the high rate of deforestation has instigated wildlife habitat loss and fragmentation across Nigeria, especially in the savannah and Niger Delta regions. The factor of climate change further worsens the situation and has contributed to unpredictable weather patterns such as changes in rainfall patterns and an increase in desertification in northern areas that trigger an imbalance in the ecological order of ecosystems (Olalekan et al., 2019). Pollution, whether by oil spill or industrial waste, is also significant in negatively impacting both marine and terrestrial biodiversity in the Niger Delta, thus seriously degrading ecosystems.

#### **Socio-Economic Challenges**

Acting closely with environmental challenges to impede biodiversity conservation efforts is the socio-economic challenge. According to Imarhiagbe et al. (2020), urbanization, land use conflicts, and poverty are seriously inhibiting biodiversity conservation efforts in Nigeria. As Anwadike (2020) expounds, due to poverty, people rely too much on natural resources for their livelihoods and unsustainably explore these resources for subsistence purposes. Poverty also encourages other unsustainable activities like slash-and-burn agriculture, illicit logging, and even hunting (Anwadike, 2020). Also, due to the expansion of farming and grazing activities into protected areas, there has been the emergence of land use conflicts, especially between pastoralists and farmers, and between pastoralists and the management of protected areas. Urbanization in Nigeria is also uncovering forested areas rapidly. This has resulted in the conversion of natural habitats into commercial and residential areas, rather than integrating built areas with natural habitats. This has decreased the amount of land available for wildlife (Ogwu et al., 2022).

#### **Political and Institutional Challenges**

A study by Altiparmak (2022) reveals that biodiversity conservation is challenged by factors about governance, corruption, and lack of implementation of environmental policies. In fact, within this political and institutional domain, Olalekan et al. (2019) agree that poor execution is still a significant barrier, even though the country has created protected areas and even enacted various conservation legislation and frameworks. In many regions within the country, illegal activities like poaching, logging, and land encroachment have continued unchecked due to the lack of enforcement of environmental laws and regulations (Ukpoju et al., 2023). The three tiers of government; national, state, and local governments also rarely coordinate their biodiversity conservation efforts properly due to the ineffective governance systems prevalent in the country (Altiparmak, 2022). Moreover, Ogunniyi & Azeta (2024) argue that long-term conservation investment and planning are hampered by the political instability in some areas within Nigeria.

### **Recommendations for enhancing Nigeria's conservation efforts**

#### **Community Engagement**

Given the status quo of biodiversity conservation in Nigeria, this study recommends among other things that community participation and involvement in biodiversity conservation initiatives in Nigeria should be encouraged and even motivated. This will enhance community support for conservation efforts instigated whether by government frameworks or by non-governmental organizations according to Ukpoju et al. (2023). Also, through this way, communities surrounding national parks and protected areas would be key participants in ensuring that the ecological integrity of these ecosystems is not compromised. However, sustainable empowerment should equally be considered for these communities to prevent them from exploiting natural resources.

#### **Institutional Strengthening**

It is also recommended that to enhance biodiversity conservation in Nigeria, the capacity of its institutional frameworks should be strengthened. Firstly, the government should improve its inter-agency coordination by ensuring that all those working in conservation agencies are adequately trained and retrained. This will help to enhance their expertise and expand their technical know-how for optimized strategisation. Secondly, there is a need for a conservation task force to be established across all states of Nigeria to ensure that conservation regulations are enforced. For better outcomes, this task force should integrate individuals from local communities, government agencies, and even non-governmental organizations. Lastly, the Nigerian government should invest in digital conservation tools such as forest mapping technology and satellite monitoring to aid all conservation efforts.

## **Funding and Resources**

The study finally recommends that sustainable funding must be secured for biodiversity conservation initiatives within Nigeria. This will help to ensure long-term success in biodiversity and wildlife conservation. To secure such funding, government conservation agencies must establish partnerships, particularly with the management of the country's national parks and international conservation organizations. This will help them to initiate ecotourism programs and generate revenue on a sustainable basis as a result. The factor of funding for biodiversity conservation should be included as part of Nigeria's budget planning. Thus, there should be an annual budgetary allocation for all conservation initiatives and efforts by all institutional frameworks within the country. Protocols should also be put in place to ensure that the allocated funds are utilized only for the purpose for which it was intended. When there are critical conservation projects on the ground, conservation organizations, whether governmental or non-governmental, can seek support through grants and sponsorship from the World Bank or the Global Environment Facility (GEF).

## **Conclusion**

The paper has essentially delved into the conservation efforts of biodiversity in Nigeria. From the pre-colonial era in Nigeria, the study highlights that conservation was based on the spirituality and traditional heritage of the villages that made up the territory now called Nigeria. However, during the colonial and post-colonial periods, conservation took a more structured approach as colonial influence instigated the establishment of legislation and sanctuaries for wildlife and biodiversity protection. Hence, conservation strides in Nigeria have now basically revolved around an integration of both scientific methods and community involvement. Thus, this integral framework has led to the preservation and establishment of protected areas, the restoration and management of wildlife habitats, and even species conservation programs. These conservation efforts have been appraised by the study as highly successful even though they are still inhibited by several challenges. The findings and recommendations within this study inform some implications for further studies. More studies should review the challenges to biodiversity conservation in Nigeria highlighted within this paper individually, intending to proffer more specialized and non-generic strategies for their resolution. Thus, this research emphasizes the importance of continued and more intentional efforts for biodiversity conservation in Nigeria.

## **DECLARATIONS**

### **Ethical Approval**

This declaration is not applicable.

## Funding

There was no funding from any external source whatsoever for this research work.

## Availability of Data and Materials

No structured datasets were quantified or analyzed in this research, however, both quantitative and qualitative data were collected from journal articles, books, and reports. These articles and books can all be accessed using Google Scholar, while reports can be retrieved from the databases of cited agencies.

## References

- Abdulaziz, H. (2017). Incorporating collaboration and motivation for effective management of protected areas in Nigeria (Doctoral dissertation). Faculty of Built Environment, Universiti Teknologi Malaysia.
- Adegoroye, A., Samuel, A., Oladosu, O., & Oloruntoba, E. (2024). Assessment of nature reserve park management for sustainable development: Insights from Idanre Hills in Ondo State Southwest, Nigeria. *International Journal of Advance Social Sciences and Education (IJASSE)*, 2(2), 109–128. <https://doi.org/10.59890/ijasse.v2i2.1531>
- Adewale, R. O., & Alarape, A. A. (2020). Appraisal of natural saltlicks management of Old Oyo National Park for wildlife and ecotourism: A baseline study. *NIU Journal of Humanities*, 5(3), 109–118.
- Adeyanju, S. O., Bulkan, J., Onyekwelu, J. C., St-Laurent, G., Kozak, R., Sunderland, T., & Stimm, B. (2022). Drivers of biodiversity conservation in sacred groves: A comparative study of three sacred groves in southwest Nigeria. *International Journal of the Commons*, 16(1), 94–107. <https://doi.org/10.5334/ijc.1143>
- Adjeketa, B., Shireku, A., & Obado, O. (2024). Indigenous festivals as a tool for forest preservation and cultural revival in Nigeria. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 16(1). <https://doi.org/10.21659/rupkatha.v16n1.07>
- Ado, A. S. (2022). An overview of British colonial forest conservation in Northern Nigeria. *Lapai Journal of Humanities*, 13(1), 144–162.
- Aju, P. C., & Ezeibekwe, I. O. (2010). Understanding and appreciating the need for biodiversity conservation in Nigeria. *Journal of Medicinal Plants Research*, 4(24), 2605–2608
- Altiparmak, S. O. (2022). An analysis of Nigeria's biodiversity governance: Policies, institutions and challenges. *Üsküdar Üniversitesi Sosyal Bilimler Dergisi*, 41–67.
- Anwadike, B. C. (2020). Biodiversity conservation in Nigeria: Perception, challenges and possible remedies. *Current Investigations in Agriculture and Current Research*, 8(4), 1109–1115.
- Audu, H., & Ayuba, G. M. (2016). Biodiversity conservation in Nigeria: Contemporary challenges for ecologists. *International Journal of Innovation and Applied Studies*, 18(1), 331.
- Digun-Aweto, O., Merwe, P., & Saayman, M. (2022). Tolerance factors in human-wildlife conflicts in protected areas: The case of Cross River National Park, Cross River State Nigeria. *GeoJournal*, 87(1), 349–361. <https://doi.org/10.1007/s10708-020-10254-9>
- Etemire, U., & Sobere, N. U. (2020). Improving public compliance with modern environmental laws in Nigeria: Looking to traditional African norms and practices. *Journal of Energy & Natural Resources Law*, 38(3), 305–327. <https://doi.org/10.1080/02646811.2020.1751970>
- Federal Ministry of Environment. (2015). National biodiversity strategy and action plan 2016-2020. <https://www.cbd.int/doc/world/ng/ng-nbsap>
- Food and Agriculture Organisation. (2015). Wildlife Conservation Act.

- <https://faolex.fao.org/docs/pdf/>
- Gasu, M. B., Gasu, G. N., & Ntemuse, U. E. (2021). A review of biodiversity loss and climate change: Policy measures and adaptation strategies in Nigeria. *Malaysian Journal of Tropical Geography (MJTG)*, 47(1&2), 100–122.
- Imarhiagbe, O., Egboduku, W. O., & Nwankwo, B. (2020). A review of the biodiversity conservation status of Nigeria. *Journal of Wildlife and Biodiversity*, 4(1), 73–83.
- Isife, C. T. (2012). Environmental problems in Nigeria: A review. *Sustainable Human Development Review*, 4(1&2), 1–6.
- Israel, O. O., & Olujide, O. (2023). Biodiversity conservation and rural development: Inseparable options for protected area management. A case study of four Nigerian National Parks. *Nature Conservation Research*, 8(1), 84–95.
- Izah, S. C., & Aigberua, A. O. (2023). Potential threats and possible conservation strategies of biodiversity in Niger Delta Region of Nigeria. In *Sustainable Utilisation and Conservation of Africa's Biological Resources and Environment* (pp. 151–176). [https://doi.org/10.1007/978-981-19-6974-4\\_6](https://doi.org/10.1007/978-981-19-6974-4_6)
- Mohammed, U. (2022). Ecotourism in Nigeria, challenges and prospects: A review. *Gadau Journal of Pure and Allied Sciences*, 1(1), 12–17. <https://doi.org/10.54117/gipas.v1i1.3>
- NCF Nigeria. (n.d.). Species in peril programme. <https://ncfnigeria.org/species/>
- NESREA. (n.d.). Laws and regulations. <https://www.nesrea.gov.ng/publications-downloads/laws-regulations/>
- Ogunniyi, D., & Azeta, A. (2024). Assessing biodiversity loss and the challenge of implementing nature conservation laws in Africa. *African Journal of Legal Studies*, 16(2), 79–105.
- Ogwu, M. C., Izah, S. C., & Iyiola, A. O. (2022). An overview of the potentials, threats, and conservation of biodiversity in Africa. In *Biodiversity in Africa: Potential, Threats, and Conservation* (pp. 3–20). [https://doi.org/10.1007/978-981-19-3326-4\\_1](https://doi.org/10.1007/978-981-19-3326-4_1)
- Olalekan, R. M., Omidiji, A. O., Williams, E. A., Christianah, M. B., & Modupe, O. (2019). The roles of all tiers of government and development partners in environmental conservation of natural resources: A case study in Nigeria. *MOJ Ecology & Environmental Sciences*, 4(3), 114–121. <https://doi.org/10.15406/mojes.2019.04.00142>
- Olawuyi, D. S., & Olusegun, O. O. (2018). Achieving the United Nations sustainable development goals on biological diversity in Nigeria: Current issues and future directions. *Global Journal of Comparative Law*, 7(1), 37–60. <https://doi.org/10.1163/2211906X-00701003>
- Olorunnipa, T. A., Adisa-Ibojo, O. I., & Adetoye, F. A. (2024). Convention on biological diversity and the Nagoya Protocol: Protection of traditional knowledge in Nigeria. *AGORA International Journal of Juridical Science*, 18, 75–81. <https://doi.org/10.15837/aijjs.v18i1.6744>
- Oruonye, E. D., & Ahmed, Y. M. (2020). The role of enforcement in environmental protection in Nigeria. *World Journal of Advanced Research and Reviews*, 7(1), 48–56. <https://doi.org/10.30574/wjarr.2020.7.1.0237>
- Ozuruoke, P. N., Wokekoro, E., & Ihuah, P. W. (2021). Challenges facing community participation in managing natural resources in Omoku, Nigeria. *MOJ Ecology & Environmental Sciences*, 6(3), 70–73.
- Prasert, S. (2024). Buddhist ethics and environmental conservation in Thailand. *Journal of Philosophy, Culture and Religion*, 7(2), 35–46. <https://doi.org/10.47604/jpcr.2606>
- Phil-Eze, P. O. (2010). The utilisation, threats, and conservation of biodiversity in Igboland, Nigeria. *A Survey of Igbo Nation*, 2(31), 849–872.
- Raimi, M. O., Saliu, A. O., Babatunde, A., Okon, O. G., Taiwo, P., Ahmed, A., Loto, O., Iyingiala, A., & Telu, M. (2022). The challenges and conservation strategies of biodiversity: The role of government and non-governmental organisations for action and results on the ground. In

- Biodiversity in Africa: Potentials, Threats, and Conservation (pp. 473–504).  
[https://doi.org/10.1007/978-981-19-3326-4\\_18](https://doi.org/10.1007/978-981-19-3326-4_18)
- Rands, M. R., Adams, W. M., Bennun, L., Butchart, S. H., Clements, A., Coomes, D., Entwistle, A., Hodge, I., Kapos, V., Scharlemann, J., Sutherland, W., & Vira, B. (2010). Biodiversity conservation: Challenges beyond 2010. *Science*, 329(5997), 1298–1303.  
<https://doi.org/10.1126/science.1189138>
- Sam, K., Zabbey, N., Gbaa, N. D., Ezurike, J., & Okoro, C. (2023). Towards a framework for mangrove restoration and conservation in Nigeria. *Regional Studies in Marine Science*, 65, 103154. <https://doi.org/10.1016/j.rsma.2023.103154>
- Sambe, L. N., Yager, G. O., Ver, P. N., & Ikape, M. O. (2021). Approaches and challenges of traditional institutions in conservation of biodiversity: Implications for sustainable management of natural resources in Nigeria. *Plants and Environment*, 3(1), 14–22.  
<https://doi.org/10.22271/2582-3744.2021.mar.14>
- Singh, V. (2024). Biodiversity: Concepts and values. In *Textbook of Environment and Ecology* (pp. 209–215). [https://doi.org/10.1007/978-981-99-8846-4\\_13](https://doi.org/10.1007/978-981-99-8846-4_13)
- Sinthumule, N. (2023). Traditional ecological knowledge and its role in biodiversity conservation: A systematic review. *Frontiers in Environmental Science*, 11, 1164900.  
<https://doi.org/10.3389/fenvs.2023.1164900>
- The Nation. (2017). Super-highway: Cross River hasn't met guidelines, says NCF.  
<https://thenationonlineng.net/super-highway-cross-river-hasnt-met-guidelines-says-ncf/amp/>
- Udeagha, A. U., Udofia, S. I., & Jacob, D. E. (2013). Cultural and socio-economic perspectives of the conservation of Asanting Ibiono Sacred Forests in Akwa Ibom State, Nigeria. *International Journal of Biodiversity and Conservation*, 5(11), 696–703.
- Ukpoju, E. A., Abatan, A., Obaedo, B. O., Balogun, O. D., & Adegbite, A. (2023). Assessing the effectiveness of biodiversity conservation strategies in Nigeria: A comprehensive review. *International Journal of Applied Research in Social Sciences*, 5(10), 577–598.
- William, J. V., & Ebong, M. S. (2024). Snake conservation and ecosystem engineering in Uyo Local Government Area of Akwa Ibom State, Southern Nigeria. *Journal of Global Ecology and Environment*, 12(4), 1–13.
- William, J. V. (2024). Communal and state-controlled approaches in biodiversity conservation in Akwa Ibom State: A comparative analysis. *Environment & Ecosystem Services (EES)*, 8(1), 60–65.