Assessment of Wildlife Conservation in Ngel Nyaki Forest Reserved in Sardauna Local Government Area, Taraba State

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The global concern over wildlife conservation highlights the need for continuous education and community involvement, particularly in Nigeria, to address challenges in perception and ensure sustainable practices. The study assessed the wildlife conservation in the Ngel-Nyaki forest reserve, Sardauna Local Government Area of Taraba State. Descriptive research design and a random sampling technique were used to select 400 people in Yelwa community and Ngel forest reserved workers from a population of 327,000. The data were collected using structured questionnaire and were analysed using mean score with a benchmark of 2.50. The results from the analysis revealed that the people of Ngel-Nyaki community are aware of wildlife conservation. However, there are no efforts made by the government towards the conservation of wildlife in Ngel Nyaki forest reserve. More so, analysis from the study also shows that deforestation, indiscriminate hunting of wild animals, and climate change are the major factors affecting wildlife conservation in Ngel Nyaki forest reserve. The study recommended government involvements towards the conservation of wildlife in Ngel-Nyaki forest reserve and the prohibition of deforestation, and indiscriminate hunting of wild animals in the forest reserved.

Keywords: Awareness, forest reserve, government efforts, stakeholders, wildlife conservation.

Introduction

Wildlife conservation play a significant role in maintaining ecological balance, preserving biodiversity, supporting human well-being, and ensuring the long-term sustainability of our planet by protecting and preserving threatened and endangered species, habitats, and ecosystems. According to Akande *et al*. (2019), wildlife conservation refers to the practice of protecting and preserving plant and animal species and their habitats. It involves the dissemination and gathering of information and knowledge on the sustainable use of wildlife resources, as well as the ability to evaluate such information. Jacobson *et al*. (2015) and Akande *et al*. (2019) stated that conservation aims to provide scholars with an opportunity to develop an awareness of wildlife and their environment, knowledge of and experience with the issues surrounding the sustainable use of wildlife, a set of values and positive attitudes, and the skills necessary to recognize and address wildlife-related issues. It also aims to instil in them the drive and capacity to participate in conservation efforts.

Changing people's attitudes requires both formal and non-formal education. This statement underscores the significance of education in achieving sustainable development and highlights the need to incorporate both formal and non-formal aspects into the curriculum. Therefore, "environmental education, including conservation education, should not only include formal education and training but also public awareness campaigns (such as posters and media), school environmental clubs, and the transfer of indigenous knowledge (Wals & Benavot, 2017).

Rae *et al*. (2022) asserted that the world is grappling with a crisis of biodiversity. To address this issue, schools, teachers, and parents are being urged to equip students with the knowledge and skills they need to tackle real-world challenges in their efforts to sustainably manage the biosphere and integrate biodiversity conservation with other societal goals." Mekonen *et al*. (2017) and Fuller *et al*. (2020) affirmed that one of the challenges facing wildlife conservation is changing people's perception of wildlife. Communities that have lived with wildlife for generations have a wealth of knowledge about the animals around them. Some have hunted them for food since time immemorial and cannot comprehend why hunting is illegal (Fuller *et al*., 2020). Their traditional and indigenous knowledge is very valuable for modern wildlife management. Despite the presence of National

Parks, there are still communities living nearby who lack knowledge about wildlife, National Parks, and nature conservation (Abukari & Mwalyosi, 2020). To address this issue, it is necessary to continuously educate people about wildlife. By working together with children from these communities and other stakeholders, we can achieve adequate conservation information and knowledge. In Nigeria, wildlife conservation is taught in schools, particularly in biology, ecology, geography, and history (Akande *et al*., 2019).

Raimi *et al*. (2019) stated that Nigeria is experiencing a significant loss of wildlife due to changes in their natural habitats. According to Friends of the Earth, an environmental organization, Nigeria is one of the areas where tropical rainforest is being lost at a rate of over 402,000 hectares each year (Saka *et al*., 2016). This poses a serious threat to Nigeria's tropical rainforest wildlife heritage. Habitat destruction is the most dangerous cause of wildlife loss (Wassie, 2020). According to Puc-Alcocer *et al*. (2019), the world is losing more than 20 hectares of tropical rainforest every day, and significantly degrading another 20 hectares every day on top of that. If this devastation continues at the current rate, most of the forest will become wasteland by 2050. Conservation refers to the management of human use of the biosphere to ensure that it yields the greatest sustainable benefit to present generations while maintaining the potential to meet the needs and aspirations of future generations (Verma, 2019).. It involves the protection of plants, animals, and natural areas from the damaging effects of human activity, as well as the careful use of natural substances to make them available for longer (Verma, 2019). The modern concept of conservation is essentially a combination of two ancient principles: the need to plan resource management based on accurate inventory and the need to take protective measures to prevent resources from becoming exhausted (Suratman, 2022). Ramos (2018) stated that wildlife management is the practice of applying ecological knowledge to populations of vertebrate animals and their plant and animal associates in a way that balances the needs of these populations with those of people. This definition emphasizes the human component of wildlife management. There are several approaches to managing wildlife, including preservation, conservation, and management (Dubois *et al*., 2017).

According to the International Union for the Conservation of Nature and Natural Resources (IUCN) and the World Conservation Monitoring Centre (WCMC), there is a global list of endangered and vulnerable animal species called the Red List. This list evaluates the status of animal species worldwide and identifies threats to their survival (Juffe-Bignoli *et al*., 2018). Conservation International and World Wildlife Fund, among other non-governmental organizations, conduct periodic rapid assessments of wildlife species in addition to other biodiversity databases (Darwall *et al*., 2015).

The specific problem this study aims to address is the need for improved wildlife conservation efforts, particularly through changing public perceptions, enhancing education, and fostering community involvement to ensure sustainable practices and better understanding of wildlife and conservation laws. The main purpose of this research is to evaluate the conservation of wildlife in Ngel-Nyaki area of Taraba state. The specific objectives of this study are; to determine the level of awareness of conserving wildlife in Ngel-Nyakiarea, to ascertain the effort of government and private sectors towards the conservation of wildlife in Ngel-Nyaki area and to identify some of the factors affecting wildlife conservation and seek measure of improving wildlife conservation in area of Taraba State.

Literature Review

Okeke *et al*. (2022) conducted a study to assess wildlife conservation awareness among senior secondary school students in Owerri West Local Government Area, Imo State, Nigeria. They surveyed students from three schools—ISS, EMSS, and NSS—using 90 structured questionnaires. The results revealed that most respondents (73.3%) were between 13 and 16 years old, with a higher percentage of females (57.8%) than males (42.2%). Students from SSI made up 37.8% of the sample, while SS2 and SS3 students accounted for 31.1% each. Notably, over 70% of respondents were unaware of wildlife conservation, and fewer than 30% were aware, though none actively practiced conservation. Kwaga *et al*. (2014) explored the awareness and perception of local communities regarding wildlife conservation in Obi Local Government Area, Benue State. They aimed to propose suitable conservation options by surveying six out of twelve wards, administering 180 questionnaires. Their findings revealed that 52% of respondents associated wildlife conservation with game reserves, while some recognized poaching as a major threat.

Odebiyi *et al*. (2015) examined the attitudes of communities surrounding Gashaka-Gumti National Park toward conservation, as well as the factors influencing these attitudes. Using structured questionnaires, they gathered data on demographic characteristics, perceived benefits and challenges, and community responses to conservation efforts. The study found that 79.3% of respondents had a positive attitude toward conservation, likely due to economic benefits such as infrastructure development, employment opportunities, and improved local economy from tourism. Challenges included crop

destruction by wild animals and limited access to fodder for livestock. Additionally, 78.9% of respondents were willing to participate in community-based project planning, and 100% supported the park's continued existence. Statistical analysis indicated that gender, occupation, education level, perceived benefits, and proximity to the park were significant factors influencing conservation attitudes. Mgonja and Uswege (2022) examined community attitudes toward wildlife tourism and conservation interventions in Wildlife Management Areas (WMAs), using Ikona and Makao WMAs as case studies. Their cross-sectional study, conducted between October and November 2018, involved 559 randomly sampled respondents who were interviewed using a semi-structured questionnaire. The findings indicated that Social Economic Status (SES) significantly influenced respondents' attitudes, while gender and origin had a marginal impact. Although most respondents accepted WMAs in their villages, they expressed dissatisfaction with the benefits received. Crop damage and livestock depredation were identified as major concerns affecting attitudes toward WMAs.

Akande *et al*. (2019) investigated wildlife conservation awareness and practices among secondary school students near Kainji Lake National Park. Using pre-tested structured questionnaires, they surveyed six selected schools, with a sample size of 100 respondents. The findings showed that 74% of respondents were male, with the 15-20 age group being the most represented (43%). 63% were aware of wildlife conservation, yet 66% had never visited Kainji Lake National Park. 50% learned about wildlife through direct communication, while 63% were willing and 80% ready to support conservation efforts. However, the study highlighted that awareness remains insufficient in many schools within the communities. Other recent studies in wildlife conservation awareness and practices include Christine *et al.* (2021) examined traditional conservation knowledge among Maasai communities in Kenya. Additionally, Rahul (2024) explored the role of zoological education in promoting conservation awareness, particularly in India. Shawon *et al*. (2025) analysed public knowledge, perception, and practices of wildlife conservation in Bangladesh.

Materials and Methods

Study area

Ngel-Nyaki Forest Reserve is located on the western escarpment of the Mambilla Plateau in Taraba state, Nigeria. The reserve covers an area of about 46 km², with about 7.2 km² of sub-montane to midaltitude forest. The reserve is situated between latitudes 7° 5'N and longitude 11° 5'E at an altitude of 1,400m – 1,600m above sea level (Figure 1). The Ngel Nyaki Forest Reserve is a 46 km² forest reserve located on the Mambilla Plateau in North East Nigeria, covering the Sardauna Local Government Area of Taraba State (Borokini *et al*., 2012).. Nigeria's highest plateau, the Mambilla Plateau, is located 1,524 meters (5,000 feet) above sea level on average. Tropical Montane Forest Biodiversity in Nigeria–case study of Ngel Nyaki Forest Reserve, Mambilla Plateau. Certain hills are far taller than others; for example, Nigeria's highest mountain, Chappal Waddi, rises to a height of 2,419 meters (7,936 feet). The climate in the region is semi-temperate. The Mambilla Plateau has roughly fifteen forest fringes, the most diversified of which is Ngel-Nyaki Forest Reserve (Salako *et al*., 2016). Other surrounding woods are Leinde Fadali, Sarkaka, NdumYaji, and Ngel-Nyaki Forest Reserve. The Ngel-Nyaki Forest Reserve consists of three forest fragments and a major forest divided by hills covered in alpine grasslands. Under the Gashaka Mambilla Native Authority Forest Reserve Order of April 24, 1969, it was gazetted as a Local Authority Forest Reserve (Borokini *et al*., 2012).

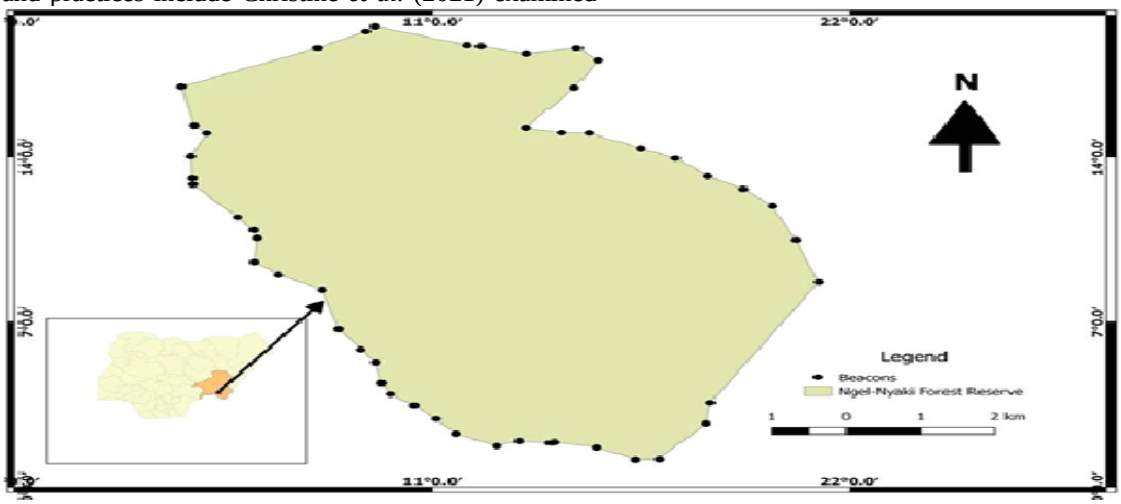

Figure1: Map of the study area (Authors field work 2023)

Methods

This study employed a descriptive survey research design, which is a non-experimental approach focused on determining and reporting the characteristics of a subject or phenomenon (Firdaus, Zulfadilla, & Caniago, 2021). The researchers selected this design because it integrates both quantitative and qualitative data, allowing for a comprehensive analysis of the research problem.

Data were gathered exclusively from primary sources to ensure first hand and relevant information. The primary data collection method was a structured questionnaire designed to capture essential insights while maintaining consistency, reliability, and clarity. To ensure validity, the questionnaire was reviewed by experts in Geography, who assessed its accuracy, consistency, and content validity (Emaikwu, 2006). Reliability was established using the Kuder-Richardson method (KR-21), yielding an internal consistency estimate of 0.78, indicating strong reliability (Mishel, 1998).

The study focused on Sardauna Local Government Area, with an estimated population of 327,000. A sample size of 400 was determined using Taro Yamane's (1967) formula. The sample was distributed as follows: A total of 280 questionnaires in Ngel-Nyaki community (Yelwa) and 120 questionnaires to staff of the Nigerian Montane Forest Project

Data were analysed using SPSS (version 16.1.0), employing descriptive statistics to present frequencies, percentages, and mean values. The research questions were assessed using a 4-point Likert scale, which is structured as follows: Strongly Agree (SA) – 4 points, Agree (A) – 3 points, Disagree (D) – 2 points, and Strongly Disagree (SD) – 1 point. The 4-point Likert scale was chosen to eliminate the neutral option, thereby encouraging respondents to take a definitive stance on each item. Studies suggest that even-numbered Likert scales reduce central tendency bias, leading to more accurate and decisive responses (Kusmaryono *et al*., 2022; Warmbrod, 2014; Chang, 1994). Additionally, research indicates that 4-point and 6-point scales maintain strong reliability and validity, making them effective for measuring attitudes and perceptions (Chang, 1994). The data collected were analysed using mean score with a benchmark of 2.50 to estimate the variables of the study. Variables with a mean score of less than the benchmark (2.50) were disagreed while those with a mean score above the benchmark (2.50) were agreed.

Results and Discussion

This section presents results of the data analysis and discussion of findings based on the data collected for the study. The presentation follows the sequence of the research questions that guided the study

Demography of respondents

From the demographic characteristics of the respondents from Ngel Nyaki community shown in Table 1, that most of the respondents were male (66.4%) which were the age bracket of 40-49 (36.4%) followed by those within the age bracket of 30-39 (26.1%) as earlier reported by Mutanga *et al*. (2015). The major occupation of the respondents is farming (43.2%), followed by trading (27.90%). Majority of the respondents had secondary educational as their highest qualification (41.1%) followed by primary school leavers (20.5%). Most of the respondents were married (37.1%) and followed by those who were single (34.6%). The demographic characteristics of the respondents' from Ngel Nyaki forest reserve showed that most 71.5% of the staff were male who were within the age bracket of 40-49 (46.75%) followed by those who were within 30-39 (16.7%). Their highest qualification was tertiary education (65.8%) and they were married (55.0%) followed by those who were single (34.2%). Most of the workers (79.2%) were directly employed by management of the forest reserve as earlier reported by Adamu *et al*. (2015) and Shehu (2018)

Table 1: Demographic Characteristics of the Respondents

Demography	Categories	Ngel-Nyaki CommunityFrequency (%)	Staff of Forest Reserve Frequency (%)
Gender	Male	186 (66.4)	87 (72.5)
	Female	95 (33.9)	33 (27.5)
	Total	**280 (100)**	**120 (100)**
Age	>20	37 (13.2)	2 (1.7)
	20-29	36 (12.9)	14 (11.7)
	30-39	73 (26.1)	20 (16.7)
	40-49	102 (36.4)	56 (46.7)
	50-59	28 (10.0)	19 (15.8)
	60 and above	4 (1.4)	9 (7.5)
	Total	**280 (100)**	**120 (100)**
Major Occupation	Civil servants	33 (11.8)	-
	Self-employed	48 (17.1)	4 (3.3)
	Farming	121 (43.2)	10 (8.3)
	Trading	78 (27.9)	11 (9.2)
	Employed	-	95 (79.2)
	Total	**280 (100)**	**120 (100)**
Level of Education	No formal	21 (7.5)	6 (5)
	Primary	62 (22.1)	9 (7.5)
	Secondary	115 (41.1)	18 (15)
	Tertiary	44 (15.7)	79 (65.8)
	Adult education	16 (5.7)	1 (0.8)
	Arabic education	22 (7.9)	7 (5.8)
	Total	**280 (100)**	**120 (100)**

Awareness of wildlife conservation by Ngel Nyaki community

Table 2 has cluster mean as 2.78 and 3.18 for community and staff respondents respectively. Since the cluster mean of both groups is above the benchmark of 2.50, it means that the people of Ngel-Nyaki community and staff of Ngel Nyaki forest reserve are aware of wildlife conservation. This agrees with the findings of Saka *et al*. (2016) and Tugume *et al*. (2016) who reported that most of the communities around forest reserves and the workers in the reserves are already aware of wildlife conservation.

Table 2: Responses on the Awareness of Wildlife Conservation

Indicators	Community Mean	Staff Mean	Group Mean	Decision
I am aware of wildlife conservation.	2.97	3.73	3.35	Agree
I protest the consistent killing of wildlife	2.94	3.88	3.41	Agree
It is good to preserve wildlife in our community	3.38	3.93	3.66	Agree
I am not aware of wildlife conservation.	1.83	1.19	1.51	Disagree
Cluster Mean	**2.78**	**3.18**	**2.98**	**Agree**

Efforts made by the Government towards the conservation of wildlife in Ngel Nyaki forest reserve

Table 3 has the cluster mean score as 2.34 and 2.46 for community and staff respondents respectively. Since the cluster mean of both groups is below the benchmark of 2.50, it means both the people of Ngel Nyaki community and staff of Ngel Nyaki forest reserve agree that there are no efforts made by the government towards the conservation of wildlife in Ngel Nyaki forest reserve. This is in line with the findings of Fuller *et al.* (2020) and Noe and Kangalawe (2015), they reported that the efforts made government towards wildlife conservation is not sufficient enough to handle the challenges facing wildlife.

Table 3: Responses on Government Efforts Toward Wildlife Conservation

Indicators	Community Mean	Staff Mean	Group Mean	Decision
There are campaigns on wildlife conservation in Ngel Nyaki forest reserve in our community sponsored by the government.	1.58	1.17	1.38	Disagree
There are forest guards in Ngel Nyaki to safeguard wildlife.	1.59	1.43	1.51	Disagree
There is no awareness by the government on conservation of wildlife in Ngel Nyaki.	3.04	3.75	3.40	Agree
There are no efforts made by the government toward the conservation of wildlife in Ngel Nyaki.	3.16	3.5	3.33	Agree
Cluster Mean	**2.34**	**2.46**	**2.40**	**Disagree**

Efforts made by the private organizations towards the conservation of wildlife in Ngel Nyaki forest reserve

Table 4 has the cluster mean score as 2.91 and 3.06 for community and staff respondents respectively. Since the cluster mean is above the benchmark of 2.50, it means that there are campaigns on wildlife conservation sponsored by private organization in Ngel Nyaki community. This signifies that private organizations are making serious efforts towards conservation of wildlife in Ngel Nyaki community as agree by both the people of the community and staff of the forest reserve. This agrees with the earlier report of Wals and Benavot, (2017) and Shields *et al*. (2017). They reported that most campaigns on wildlife conservation are sponsored by private organizations and not the government.

Table 4: Responses on Private Organizations' Efforts Toward Wildlife Conservation

Indicators	Community Mean	Staff Mean	Group Mean	Decision
There are campaigns on wildlife conservation sponsored by private organizations in Ngel Nyaki.	3.29	3.73	3.51	Agree
There are private forest guards employed by private organizations to safeguard wildlife.	3.18	3.55	3.37	Agree
Private organizations are not making any efforts in wildlife conservation in Ngel Nyaki.	1.81	1.34	1.58	Disagree
Private organizations usually lead campaigns on the dysfunction of wildlife in Ngel Nyaki forest reserve.	3.34	3.62	3.48	Agree
Cluster Mean	**2.91**	**3.06**	**2.99**	**Agree**

Factors affecting wildlife conservation in Ngel Nyaki area

Tables 5 has the cluster mean scores as 2.95 and 3.11 for community and staff respondents respectively. Since the cluster mean of both groups is above the benchmark of 2.50, it means that there are certain factors affecting wildlife conservation in NgelNyaki community and the forest reserve. The earlier reports of Izah and Seiyaboh, (2018), Adamu *et al*. (2015) and Ahmed *et al*. (2022) on the factors affecting wildlife conservation agree with these findings.

Table 5: Factors Affecting Wildlife Conservation

Items	Community Mean	Staff Mean	Group Mean	Decision
Deforestation affects wildlife conservation in Ngel-Nyaki forest.	3.18	3.93	3.56	Agree
Bush burning does not affect wildlife conservation in Ngel-Nyaki forest.	2.08	1.37	1.73	Disagree
Indiscriminate hunting of wild animals affects wildlife conservation.	3.49	3.48	3.49	Agree
Climate change affects wildlife conservation.	3.04	3.65	3.35	Agree
Cluster Mean	**2.95**	**3.11**	**3.03**	**Agree**

Conclusion

Based on the findings of this study, the researcher concluded there are no much efforts made by the government towards the conservation of wildlife in Ngel Nyaki forest reserve. The people of Ngel-Nyaki community are aware of the need for wildlife conservation in the area. There are campaigns on wildlife conservation sponsored by private organization in Ngel Nyaki community which signifies that private organizations are making serious efforts towards conservation of wildlife in Ngel Nyaki forest reserve. Deforestation, indiscriminate hunting of wild animals, and climate change are the major factors affecting wildlife conservation in in Ngel Nyaki forest reserve. On the basis of the findings, the study recommends the following: Deforestation, and indiscriminate hunting of wild animals, may be avoided and if possible banned in forest reserved areas. Both Federal and State Governments may double their efforts towards the conservation of wildlife in Ngel-Nyaki forest reserve. Advocate for policies that address climate change's impact on biodiversity in Ngel-Nyaki forest reserve. These findings provide key insights into both theoretical understanding and practical applications of wildlife conservation efforts in the Ngel-Nyaki community and its forest reserve staff. The study reinforces theories on community-based conservation, emphasizing the vital role of local perceptions and engagement in successful wildlife protection. It provides empirical evidence supporting the environmental awareness theory, which suggests that greater awareness fosters conservation behaviours. The discrepancy in awareness between the community and the forest reserve staff highlights the need for tailored conservation education approaches. It also touches on governance theory in conservation, as findings indicate a limited governmental role, suggesting a gap between policy intent and implementation effectiveness in protected areas. The study underscores the need for enhanced government engagement in conservation awareness programmes, ensuring policies translate into effective actions. Private organizations' involvement appears to be more significant than government efforts. Strengthening partnerships between conservation NGOs and government agencies could improve conservation outcomes. There is a need for more effective outreach campaigns in the community regarding the negative effects of deforestation, bush burning, and poaching. Addressing climate change impacts on wildlife conservation may require localized adaptation strategies, such as afforestation initiatives and better habitat management practices. While the study provides a robust comparison, the sample size may not be fully representative of all stakeholders involved in wildlife conservation, such as local policymakers and researchers. The findings rely on self-reported perceptions, which may be subject to personal biases or misinterpretations of conservation efforts. Future studies could integrate observational and ecological data.

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