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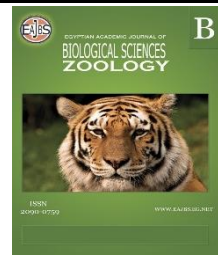


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Conservation Awareness Strategies and Threats Affecting Sha-Sha Forest Reserve Management, Osun State, Nigeria

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Nigeria's protected areas, the most bio-diverse environments in the country's development are under threat from various pressures; land encroachment, illegal poaching, excessive deforestation, and inadequate funds for the management and enforcement of laws. The study investigated the level of awareness and threats to the Sha-Sha Forest Reserve (SFR) biodiversity conservation. Random sampling methods were employed to obtain information through the administration of one hundred and twenty (120) structured questionnaire surveys, a selective focal point interview, and field observation. Likert-type measure methods were employed to determine the level of disagreement and agreement responses on perceptions besides attitudes of local people towards effective conservation awareness (moderation methods), and management approaches on wildlife conservation by the residents. Data were examined through descriptive and inferential statistics. Descriptive outcomes reveal that most respondents are middle-aged, married, educated, male, and Islamic faithful, with large household sizes. Respondents were aware of ownership, threats, challenges, and potential future use of SFR, but observed weak conservation education and participation in conservation strategies among the respondents. Correlation analysis results revealed a weak significant relationship between age and marital status, negative and apparent threats to effective conservation, while a positive correlation is established in educational status and apparent threats to effective conservation. Also, there is a weak correlation between educational status and apparent participation by the community in forest conservation; while a positive significant association is shown between age and the seeming contribution of the public in forest management of the reserve. The study concluded that there is instability or unproductive conservation awareness among the inhabitants of the forest reserve, thus a sustainable empowerment program should be recommended to all stakeholders to boost people's livelihoods around the forest reserve for effective conservation.

INTRODUCTION

Protected areas (PAs) are a pertinent tool in biodiversity conservation which amount to about 15% of the earth's landmass (UNEP-WCMC and IUCN, 2016). A significant portion of its terrestrial (at least 1,000 hectares) was selected for national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed primarily for sustainable use by national authorities as scientific reserves with partial public access. It was stated that terrestrial protected areas in Nigeria cover 13.93% of the country's land area (WBD, 2023). Conservation awareness involves disseminating information and data on the sustainable use of wildlife resources, and assessing such information or facts on wildlife for humanity and the environment (Olalekan *et al.*, 2019). The inspiration and skill of individuals to participate in the conservation of biodiversity awareness program depend majorly on the level of the individual's awareness and effective understanding (Sterling *et al.*, 2017). Aside from formal education and training, conservation awareness should cover enlighten the public through media stations and showing films on wildlife documentaries alongside depicting the role of indigenous knowledge of elderly people to the young ones (Okeke *et al.*, 2022). Most Nigerians depend solitary on sustainable biodiversity which plays a vital role in their maintenance and existence (Olalekan *et al.*, 2019). This ecosystem service provides essential needs regulating climate change, raw materials for food and medicine, aesthetic values, and cultural services, for humankind. A biodiversity study revealed that 90% of rural inhabitants in Nigeria solely rely on forest resources for their living and survival, while a greater percentage (70%) population of the residents rely on fuel wood for energy needs (Akindele *et al.*, 2021). Protected areas of 4-7% of land mass harbor 60% of all known species due to richness and unique biodiversity (Jacobson, *et al.*, 2019, Rajpar, 2018). Nowadays, most of the specific threats are due to anthropogenic activities by man through over-exploitation, habitat loss, land degradation, fragmentation, isolations, and conversion of land for agricultural activity and other domestic uses (Siyum, 2020). Though, their being has been negotiated by many unified human anthropogenic pressures that have strengthened over the years. The increased human growth and their aspiration need for the ecosystem swift changes in different threats to wildlife habitat loss, degradation, and untenable hunting. This led to the decline of wildlife, habitat destruction ecosystem devastation of biodiversity in most tropical forests (Jamhuri, *et al.*, 2018; Laurance, *et al.*, 2014). Threats in most African tropical forests to be precise involved national and international consideration over the years resulting in the establishment of many protected areas for the preservation and conservation effort towards the protection of fauna and flora resources for the benefit survival of the neighboring communities (Ajayi, *et al.*, 2018). African countries protected areas still faced a lot of threats and anthropogenic pressures due to human population growth despite regulation on protection status (Ralimanana, *et al.*, 2022). This has an impact on many notable species, which retard their physiological and growth reproduction (Chichorro *et al.*, 2019). Therefore, wildlife is in decline as humans continue to clear forests, consume beyond the limits of the planet, and pollute on an industrial scale (Patrick *et al.*, 2022), and resident extinctions become progressively common in the protected areas to wild animals such as colobus monkeys (Freedman, 2020). This has made most gazette-protected areas to be seen as "paper parks" with little conservation efforts (Tranquilli *et al.*, 2014).

Most of the protected areas are not sufficiently financed appropriately by their national governments since they are not painstaking to be thriftily feasible reserves (World Bank Report 2021). Consequently, rely upon the counterpart funds for their operational activity. Nonetheless, the budget bill on Protected Areas is inappropriate for most effective protection activities (Wilson and Primack, 2021). The administration management, the impact of threat level, and wildlife status in our protected areas in Africa have been

gradually measured over the years (Lindsey, *et al.*, 2020). This evaluation is pertinent to bonding the hole among policymakers, backing bodies, and conservation practitioners (Dubois *et al.*, 2020). Though, threats to protected areas in Africa are problematic to measure owing to unfortunate or non-existent data that characterized incomplete situation studies. The implication of different threats and their impact in relation to conservation activities in protected areas have been rarely inspected on a broad scale in tropical rainforest Africa.

MATERIALS AND METHODS

Field Description of The Study Area:

The study site is the Shasha Forest Reserve (SFR) (Figs. 1a and 1b). It is on latitude of 7° 4' 60 N and longitude of 4° 30' 0 E. at an altitude of 146 meters above sea level. The reserve is located in Ife Southwestern part of Osun state, Nigeria. The forest reserve is located in a humid tropical climate zone. The wet season is from April to November and the dry season period is from December to March. The average annual rainfall is 2500 mm at the coast, while is about 1220 mm in the north. The mean minimum temperature is about 22.49°C, while the mean maximum temperature is about 31.24°C, of which the average temperature is 26.6°C. The soil type of the site is deep clay soils, observation shows the devastation of forest land for settlement, poaching, and decline of wildlife population decline (Figs. 1a and 1b).

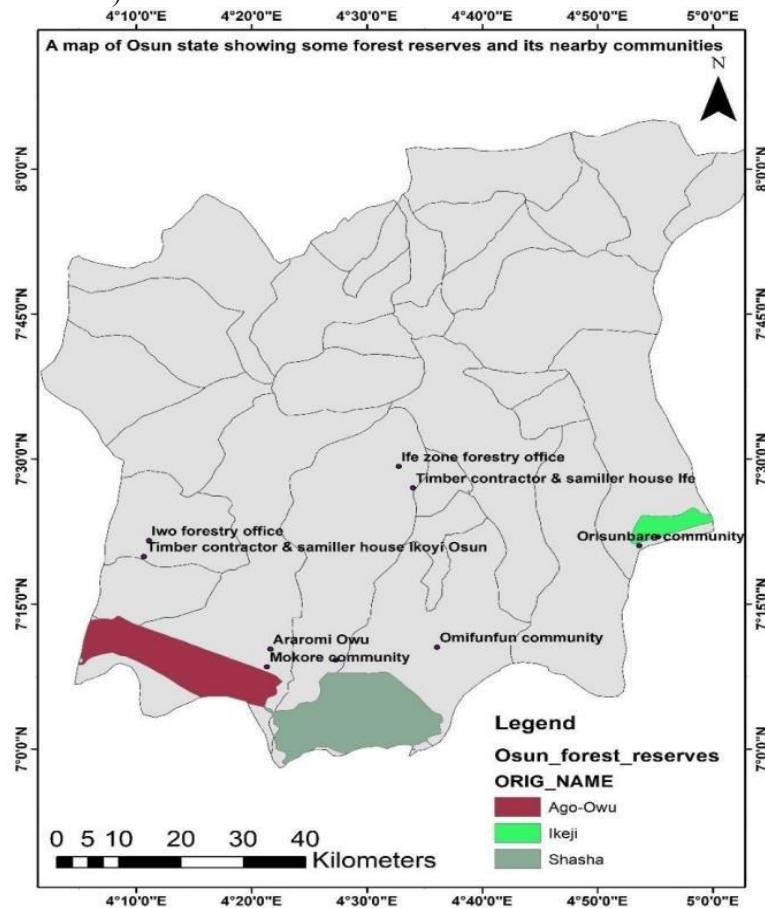


Fig. 1a: Map of Osun State showing some forest reserves and its nearby communities

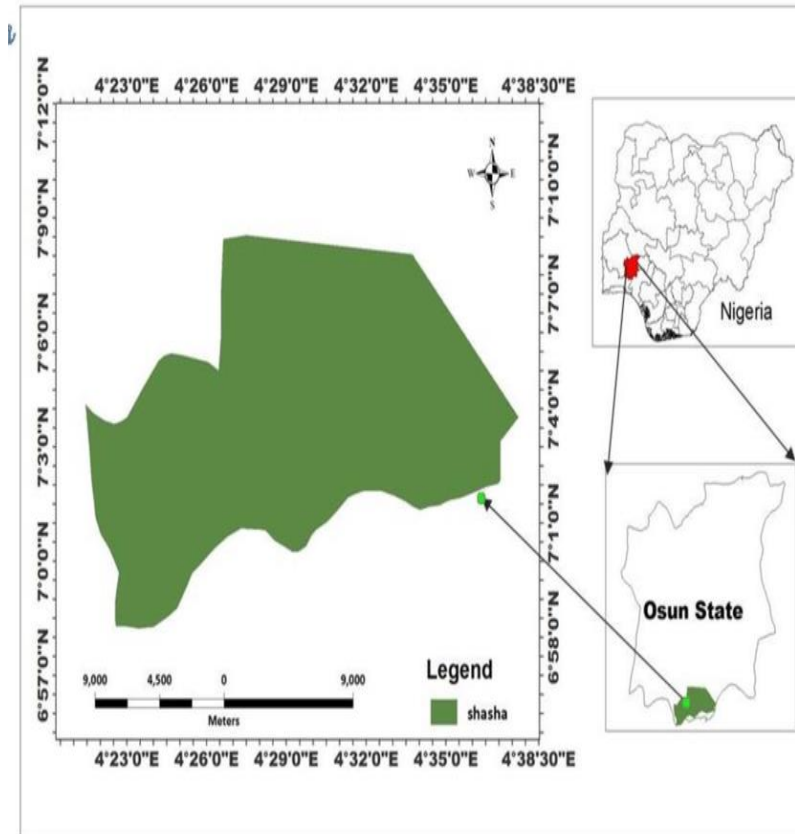


Fig. 1b: Map of Shasha Forest Reserve, Osun State, Nigeria.

Data Collection:

After a reconnaissance survey of the surrounding buffer zone of the Sha-sha Forest Reserve. The survey was conducted to get familiar with the site and collection of primary data through questionnaire administration. Selection criteria were based upon information regarding people's awareness of the reserve, identifying a measure of "conservation awareness" from an up-to-date and key informant around the villages in the buffer zone of the six villages were selected from the buffer zone community. Sampling was purposive with a sampling intensity of 5% (Palinkas, *et al.*, 2015). Structured interviews and focal group interviews were employed to collect information on respondents' characteristics and their perception of wildlife conservation awareness. One hundred and twenty respondents were sampled from the study site. A Likert scale method was used to determine the level of perceptions and attitudes of local people towards effective conservation awareness (mitigation approaches).

Data Analysis:

The data obtained will be subjected to descriptive (mean, frequencies, and percentages) and inferential (correlation analysis) statistics.

RESULTS

Socio-Economic Characteristics of Respondents:

The finding reveals majority (73.2%) of the respondents were male, while (26.8%) of them were female (Table 1). The majority of respondents (54.5%) were Muslims, while 45.5% worshiped in Christianity faith. It is further observed that the majority (78.33%) of the respondents at the buffer zone of the forest reserve are in the class age range of 21–50 years, showing that they are productive. The majority (36.7%) of respondents around the

forest reserve's boundary zone were; farmers, hunters (20.8%), and others 8.3%. Furthermore, most (75.8%) of respondents were married while (24.2%) of them are single. Finally, the majority (82%) of the respondents had access to formal education while others are equally represented.

Table1: Socio-economic distribution of the respondents

Characteristics (n=120)	Frequency	Proportion (%)
Gender		
Male	88	73.3
Female	32	26.7
Total	120	100
Religion		
Christianity	54	45.2
Islam	65	54.2
Traditional	1	0.8
Total	120	100
Age (years)		
10-20	7	1.07
21-30	20	15.08
31-40	48	40.0
41-50	26	21.7
>50	19	15.8
Mean age=44 years		
Total	120	100
Household size		
1-5	41	
6-10	59	43.03
11-15	5	45.08
>15	15	10.00
Total	120	100
Marital status		
Single	22	18.3
Married	91	75.8
Divorced	6	5.0
Widowed	1	0.8
Total	120	100
Education level		
No education	2	1.7
Primary education	20	16.7
Secondary education	53	44.2
Higher education	45	37.5
Total	120	100
Occupation		
Farming	44	36.7
Hunting	25	20.8
Cattle rearing	10	8.3
Trading	15	12.5
Civil servant	15	12.5
Others	11	9.2
Total	120	100

Source: Field Survey, 2022.

Observation of the Identified Threats on The Reserve:

The result of the respondent’s observation of various threats on the reserve was investigated during the study (Table 2). The identified threats inside and around the buffer zone of the forest reserve and village communities dwelling at the corridor were used to determine the level of disturbance on the biodiversity resources of the forest reserve.

Table 2: List of identified threats affecting the Forest Reserve.

S/N	Straight Threats	Description
1	Subsistence hunting	The unlawful killing of wild animals by residents in the reserve for a protein source
	Commercial hunting	Unlawful killing and seizing of wild animals by residents in or out of the reserve for commercial
Unintended Threats		
2	Agriculture Activity	Unlawful alteration of forest land in the reserve for agriculture
3	Ailment outbreaks	Existence of outbreaks of ailment on wild animals' population in reserve herders
4.	Fire outbreaks	Illegitimate use of fire for pasture grazing of cattle/enabling agricultural activity
5.	Wood collections	Illegitimate collections of forest wood in the reserve area, use of firewood and charcoal making
6.	Road Infrastructure	Road construction for vehicles used in the reserve.
7.	Logging activity	Prohibited tree felling, onsite slashing and production of timber in reserve.
8.	Mining	Banned mining of natural resources in the reserve.
9.	Enclave inside	Existence of enclave/hamlets in the reserve.
10.	Enclave outside	Existence of hamlets at a boundary zone of 5 -10km to the border of the reserve.
11.	Community conflicts	Community conflicts/unrest action

Source: Field survey, 2022

Perception of Forest Reserve Ownership and Acceptance:

The results of respondents' perception of ownership and control of the forest reserve, acceptance of the reserve, and the role played towards the protection of the forest reserve are presented in Table 3. The Table reveals that most (91.70%) of the respondents were aware that the reserve is government owned and controlled, while a few (8.30%) were of the opinion that the forest reserve is under community ownership. Most (95.80%) of the respondents accepted the reserve to be located in their community. Also, most (91.7%) of respondents are willing to help in protecting the reserve by reporting offenders to the forest reserve authority.

Table 3. Distribution of respondent's perception of the ownership of the forest reserve.

Variables	Frequency	Percentages (%)
Ownership of the reserve		
Community	10	8.3
Government	110	91.7
Total	120	100
Acceptance of the reserve		
Yes	115	95.8
No	05	4.2
Total	120	100
Role play toward the protection of the forest reserve		
Report offenders to the forest reserve authority	110	91.7
Reduced trespassing to the forest reserve	08	6.7
Reduced logging activity	02	2.3
Total	120	100

Source: Field Survey, 2022.

Perceived Challenges Encountered from Forest Reserve and Distance of Habitation:

The perceived challenges posed by the forest reserve to the respondents and their distance of habitation from the forest reserve are presented in Table 4. The Table reveals that the majority (67.50%) of the respondents agreed that the major challenge was their inaccessibility to the resources from the forest reserve, while others (30.80%) are of the opinion that marauding animals from the forest reserve to their farmland is a major challenge. The Table further reveals that most (80.80%) of the respondents had the distance of their residence from the forest rest in the range of 3-5 kilometres.

Table 4. Distribution of respondents according to perceived challenges encountered from forest reserve and distance of habitation.

Variables	Frequency	Percentages (%)
Perceived challenges		
Inaccessible to the forest resources	81	67.5
Destruction of crops by Marauding animals	37	30.8
Deforestation	1	0.8
No Challenges	1	0.8
Total	120	100
Distance of residence from the forest reserve boundary		
5 Kilometre	55	45.8
3- 4 Kilometre	42	35.0
1-2 Kilometre	23	19.2
Total	120	100

Source: Field Survey, 2022.

Respondents’ Perception of the forest reserve’s future utilisation:

The perceptions of the respondents on the future utilization of the forest reserve are presented in Table 5. The majority (74.20%) of respondents are of the opinion that the forest has a future potential to develop into a tourist centre and (54.20%) of them were on employment generation.

Table 5. Distribution of respondents’ perception of the forest reserve's future utilisation.

Variables	Frequency	Percentages (%)
Tourism		
Yes	89	74.2
No	31	25.8
Total	120	100
Employment		
Yes	65	54.2
No	55	45.8
Total	120	100
Timber, poles and fuel wood		
Yes	30	25
No	90	75
Total	120	100
Water, food plant		
Yes	25	20.8
No	95	79.2
Total	120	100
Charcoal		
Yes	15	12.5
No	105	87.5
Total	120	100
Medicinal value		
Yes	27	22.5
No	93	77.5
Total	120	100
Cultural value		
Yes	27	22.5
No	93	77.5
Total	120	100
Community project		
Yes	26	21.7
No	94	78.3
Total	120	100
Carbon sequestration		
Yes	22	18.3
No	98	81.7
Total	120	100

Source: Field survey, 2022

Perceived Major Threats To Forest Reserve:

Respondents perceived major threats to the forest reserve are shown in Table 6. The table reveals that the most (81.70%) perceived threat to the forest reserve is illegal logging activities which are fast depleting the forest resources. This is followed by the encroachment of farmlands (10%) into the reserve area.

Table 6. Distribution of respondents perceived major threats to forest reserve.

Variables	Frequency	Percentage
Grazing	3	2.5
Logging of wood	98	81.7
Farming	12	10.0
Hunting	7	5.8
Total respondents	120	100

Source: Field survey, 2022

Relationship Between Selected Socio-Economic Characteristics and Perception of Major Threats Against Effective Conservation:

The results of correlation analysis to establish the relationship between selected socio-economic characteristics and perception of major threats against effective conservation is presented in Table 7. The Table reveals a weak association between the age and marital status of the respondents and their perception of major threats against effective conservation. However, a substantial association exists between educational status and perception of major threats against effective conservation.

Table 7: Correlation matrix showing the relationship between selected socio-economic characteristics and perception of major threats against effective conservation.

Variable	Coefficient	P value	Decision
Gender	0.174	0.056	NS
Age	-0.256*	0.005	S
Marital status	-0.235*	0.009	S
Educational level	0.278*	0.002	S
Household size	0.108	0.236	NS
Monthly income	-0.148	0.103	NS

Source: Field Survey, 2022. * Significant at $p < 0.01$.

Correlation of Selected Demographic Attributes with Challenges Hindering Community Contribution to the Conservation of the Forest Reserve:

The results of correlation analysis found a relationship between selected socio-economic characteristics and challenges hindering conservation awareness of the reserve (Table 8). The correlation shows no significant coefficient in marital status as well as gender and household sizes while significant coefficient associations were found in age and education level of respondents.

Table:8. Correlation of selected Demographic attributes with challenges hindering community contribution to the conservation of the forest reserve.

Variable	Coefficient	P value	Decision
Gender	-0.07	0.445	NS
Age	0.235**	0.009	S
Marital status	-0.035	0.704	NS
Educational level	-0.322**	0.00	S
Household size	-0.028	0.758	NS
Monthly income	-0.114	0.213	NS

Source: Field survey, 2022 **Significant at $p < 0.01$ * Significant at $p < 0.05$

DISCUSSION

This finding investigated the absurdity of environmental conservation at the boundary communities of the reserve. Results reveal the majority of respondents are middle-aged, married, educated, male Islamic faithful, with large household sizes. Respondents were aware of threats, challenges, and potential future use of SFR, but there is close consciousness and participation in conservation strategies among the respondents. The majority of the respondents (36.7%) who lived in the forest reserve's boundary zone were farmers, followed by hunters (20.8%), while the least percentage was 8.3% and others were equally represented. This observation shows equal consciousness and understanding by the respondent's residence in the study area were not impressive. The poor attitude of the communities towards the management of the reserve and their concern over a government initiative to have the forest reserve for future purposes in the study area are not encouraging. Many illegal and nefarious activities took place within the reserve due to the reserve's nonchalant attitude and ignorance of forest conservation management. This observation was made during the study site with a high percentage of logging activities. It was believed that communities' support programs on forest management will promote large-scale development in the reserve (Shomkegh, *et.al.*, 2017). Also, a recently conducted study by scientists reveals high forest integrity protection across the tropics through those conserved by indigenous people. (Jocelyne, *et. al.*, 2022). Likewise, evidence has shown that about 3% of tropical forest loss was recorded between 2000–2005 through UNEP World Conservation Monitoring Centre, while significantly less percentage of hunting pressure has constituted a great threat to wildlife in the reserve, which resulted in habitat loss, land degradation and competition for land use (Campbell *et al.*, 2011). Though, observations show efforts on the conservation of protected areas and interplay of natural resources management, land use strategies, and how best local communities can be positively integrated. The study looked into the fact that conservation awareness of the value attached to SFR management was not encouraged, causing it to encounter a variety of illegal and nefarious activities from those living along the buffer zone. The findings show the major threats facing the SFR, including a lack of conservation education from the authority to the communities dwelling around the reserve boundary. For the successful actualization of conservation development in SFR, constant sensitization and advocacy campaigns on conservation education should be a specific focus of discussion for the people in its corridor. Establishing forestry/conservation clubs within the support zone communities and integrating the opinion and active leader participation in forest management will go a long way in achieving an agreement for effective conservation protective measures. Prominently, programs must synchronize civil organizations, and governmental organizations to raise priority alertness forest through a sound awareness general on Forest Division, for strong goals development. The study concluded that there is instability or unproductive conservation awareness among the inhabitants of the forest reserve, thus a sustainable empowerment program should be recommended to all stakeholders to boost people's livelihoods around the forest reserve for effective conservation.

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Conflict of Interest:

The authors declared that there is no conflict of interest.

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