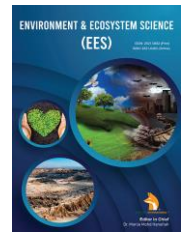




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RESEARCH ARTICLE

COMMUNAL AND STATE CONTROLLED APPROACHES IN BIODIVERSITY CONSERVATION IN AKWA IBOM STATE: A COMPARATIVE ANALYSIS

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ABSTRACT

This research paper is a comparative analysis of the communal and state-controlled approaches in biodiversity conservation within Akwa Ibom State. To achieve its aim, the study utilised both primary data obtained from a structured survey and secondary data from secondary sources. For the survey, a questionnaire was prepared and administered to a total of 300 respondents within both urban and rural communities of the study area. There was also a focus group discussion of 15 individuals to enhance the quality of the primary data gotten. Descriptive statistics, deductive and inductive reasoning were used to analyse the survey responses and the data drawn from other sources. The findings revealed that while communal and state-controlled biodiversity conservation approaches were quite ideal in protecting the region's biodiversity, it would be more beneficial and cost-effective for Akwa Ibom State to adopt and invest primarily in the communal approach of biodiversity conservation.

Keywords

Communal, State-Controlled, Biodiversity, Biodiversity Conservation

1. INTRODUCTION

Globally, it is becoming an interesting phenomenon that more and more wildlife species are facing the threat of extinction. In fact, a study asserts with dogmatism that the emergence of certain anthropogenic unethical practices due to the indices of development is one of the causal factors of this ecological imbalance (Liu et al., 2023). As a primary causal factor, construction is appraised by researchers to be one of the leading instigators of wildlife habitat degradation, loss or fragmentation (Haq et al., 2023). In fact, in most developing regions of the world, large-scale construction of residential estates, factories and other facilities leads to the destruction of large acres of natural vegetation, and consequent displacement or loss of certain wildlife species (Liu et al., 2023). It is only in some developed countries that researchers have observed the adoption of green construction, which is the incorporation of a built environment with the natural environment to protect natural habitats, prevent ecological imbalance and protect local biodiversity (Shi et al., 2013; Haq et al., 2023). This has been considered an ideal approach towards the conservation of wildlife by both the government, private entities and communities within these countries (Shi et al., 2013). The negative effects of anthropogenic activities on biodiversity conservation and protection is also evident in the Southern Nigerian environment. The region of Southern Nigeria is undoubtedly an ecological hub of rich biodiversity with great environmental significance to the entire country (William and Ebong, 2021). The rich biodiversity includes the lush and thick rainforest in parts of Akwa Ibom and Cross River states, the swamp flora species in the lowlands of Delta, Bayelsa, Edo and Rivers states, the unique highland species and even the marine life forms of the Niger Delta (Izah et al., 2018; Sam et al., 2023). In fact, within this region, iconic species such as the Niger Delta red colobus monkey, the Cross River gorilla, and even certain

threatened species of pangolins have relished and flourished. This flourishing fauna and flora species is basically due to the ecologically conducive tropical climate, the drainage system and the humus soil structure within the region (Ambe and Obeten, 2020). However, it is best to agree with the observation by Sam et al. (2023), that this ecological jewel is ferociously threatened by the burgeoning heterogeneous populations and urbanism which exert tremendous pressure on the ecological system. Even in rural colonies within this region, the expansion of the homogenous populations due to certain indices have also led to agricultural expansion, with pressure exerted on wild groves, turning them to arable land, straining the environment and disrupting the delicate ecological order (Anwadike, 2020). Due to this bizarre situation, several approaches and strategies for conserving biodiversity have become essential instruments for conservation and sustainable development within this region and in fact, in the entire country of Nigeria (Ambe and Obeten, 2020). To a great extent, both communal instigated efforts, and government strides and regulations have emerged as communal and state-controlled biodiversity conservation approaches in concerted response to these wildlife challenges (Anwadike, 2020; William and Ebong, 2021). In this direction, this research paper aims to delve with accuracy into the complex and detailed web of communal and state controlled biodiversity conservation approaches within the realm of Akwa Ibom State. This research stride is to help determine which is a more ideal and effective biodiversity conservation approach for the region, and to achieve this research aim, the study adopts a comparative analysis of the approaches, patterns, strides and outcomes of both conservation approaches. Moreover, the study also establishes a framework for the roles of government and communities in ensuring that all is going smoothly with regards to the successful outcomes of these biodiversity conservation approaches.

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1.1 Research location

The location for this research is the southern part of Nigerian, or Southern Nigeria, particularly Akwa Ibom State. The state of Akwa Ibom is located in the south southern part of Nigeria and is positioned between Cross River State in the East, and Rivers State in the West (Adaobi, 2022). In the South, the country is bordered by the Atlantic Ocean shoreline, and in the North by Abia State (Adaobi, 2022). Akwa Ibom State has a latitude of 4.9057° North and a longitude of 7.8537° East (Akpan and Ukut, 2022).

2. MATERIAL AND METHOD

For this study, the exploratory research design was adopted and both primary and secondary data were utilised. The sample size for this study

was a total of 300 respondents, while the sampling technique adopted for this study was the simple random sampling technique. For this research, a survey was used to collect primary data from sampled respondents. The questionnaire for the survey was developed in English language, however, to enhance the respondents' comprehension of the questions and thus improve accuracy of their responses, it was translated to Ibibio, the native language of the study area. In addition, a focus group of 15 individuals, basically at the communal level was formed for discussions relating to the variables of study. These 15 individuals were also part of the survey and their submissions during the focus group discussions aided the researcher's observation. Lastly, unstructured observations were made on the wildlife management strides of both the state governments and various communities in the study within a 6 month long period.

Table 1: Summary of Datasets and Data Collection		
Data Sets	Data Collection Method	Type of Data
The status quo of both communal and state controlled wildlife management in Akwa Ibom State	Survey/Focus Group Discussions/Observations	Primary
Impact of communal and state controlled wildlife management on species protection in the area	Survey/Focus Group Discussions	
Impact of communal and state controlled wildlife management on habitat preservation in the region	Survey/Focus Group Discussions	
Extent of Biodiversity Preservation achieved in the study area	Survey/Focus Group Discussions	
Status quo on Human-wildlife conflicts in the region	Survey/Focus Group Discussions/Observations	
Quality of ecosystem services garnered	Survey/Focus Group Discussions	
Appropriate wildlife management approach for Southern Nigeria	Survey/Focus Group Discussions	
Cost benefit analysis of both communal and state controlled wildlife management systems	Research Papers	Secondary
Wildlife management expenses for both communal and state controlled	Research Papers	

3. RESULTS

Table 2: Demographic Characteristics of Study Respondents				
Variables		No. Of Respondents	Percentage	Total Respondents
Gender	Male	120	40%	300 (100%)
	Female	180	60%	
Respondents' Age	18 - 30 years	120	40%	300 (100%)
	31 - 45 years	80	26.7%	
	45 years & above	100	33.3%	
Occupation	Primary Occupation	130	43.3%	300 (100%)
	Secondary Occupation	120	40%	
	Tertiary Occupation	50	16.7%	
Area of Residence	Urban	90	30%	300 (100%)
	Rural	210	70%	

3.1 Status quo of communal and state-controlled wildlife management in study area



Figure 1: Sacred Grove in Akwa Ibom State (Asanting Ibiono Community): An Evidence of Communal Wildlife Management Effort

Source: (Udeagha et al., 2013)



Figure 2: Protected Forest in Akwa Ibom State (Usaka Annang Community): An Evidence of State Controlled Wildlife Management Effort

Source: (Udoma-Michaels and Akinola, 2022)

These figures (figure 1 and figure 2) above show both the protected forest and the sacred grove in different communities within Akwa Ibom State, the study area. While the sacred grove is an evidence of communal wildlife

management effort policed by traditional frameworks and practices of the community, the protected forest is evidence of state-controlled wildlife management effort regulated by the ministry of environment's task force.

Table 3: Extract of Survey Responses

S/N	Items	Agree	Indecisive	Disagree
1.	Do you agree that communal and state controlled wildlife management in Akwa Ibom State are equally ideal?	192 (64%)	21 (7%)	87 (29%)

From table 3 above, results presented indicate that 192 participants, which represents about 64% of the total respondents, agree that both the communal and state-controlled wildlife management approaches in the

study area were equally ideal. While about 7% of the total population was indecisive about this, some 87 (29%) of these respondents disagreed with this.

3.2 Comparative impact of communal and state-controlled wildlife management on wildlife conservation efforts in study area

Table 4: Extract of Survey Responses

S/N	Items	Agree	Indecisive	Disagree
1.	Communal wildlife management preserves the natural wildlife habitats in the region of Akwa Ibom State better than state-controlled wildlife management.	180 (60%)	6 (2%)	114 (38%)
2.	Do you think that there is greater biodiversity in rural areas than there is in urban areas protected by state-controlled wildlife management?	246 (82%)	0 (0%)	54 (18%)
3.	Does this indicate that communal wildlife management achieves better vegetation health and biodiversity preservation than state-controlled wildlife management?	165 (55%)	15 (5%)	120 (40%)
4.	State controlled wildlife management better enhances the quality of ecosystem services and ecological niche than communal wildlife management.	99 (33%)	81 (27%)	120 (40%)
5.	It seems that state-controlled wildlife management has better reduced human wildlife conflicts in the region of Akwa Ibom State.	117 (39%)	102 (34%)	81 (27%)

From table 4 above, the results presented indicate that about 180 respondents, representing 60% of the total respondents, agree that communal wildlife management better preserves the natural wildlife habitats in the region of Akwa Ibom State than the state-controlled wildlife management. However, about 114 respondents disagreed with this assertion, while another 6 (2%) respondents were indecisive. Out of the total 300 respondents, more than half, about 55% (165), agreed that communal wildlife management achieves better vegetation index and biodiversity preservation than state-controlled wildlife management. Of

course, the remaining 45% either disagreed with the assertion, or were indecisive. When asked whether state-controlled wildlife management better enhances the quality of ecosystem services and ecological niche than communal wildlife management, some 120 respondents representing about 40% of the total respondents disagreed, while 81 respondents were indecisive. Lastly, a greater percentage of respondents (39%) agreed with the notion that state controlled wildlife management has better reduced human wildlife conflicts in the region of Akwa Ibom State.

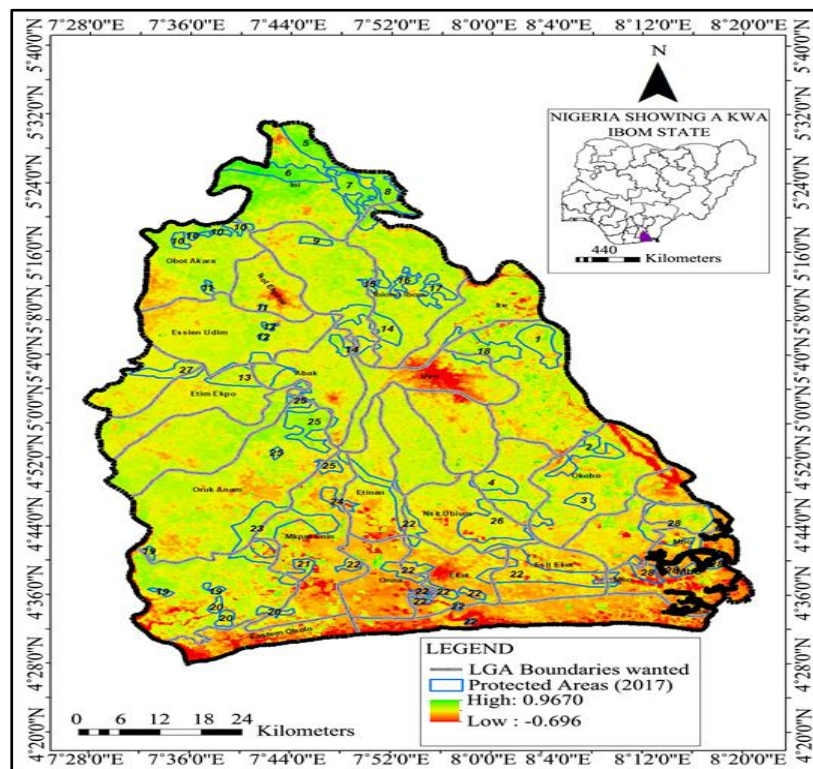


Figure 3: Vegetation Index Analysis for Protected Areas in Akwa Ibom State

Source: Udoma-Michaels and Akinola, 2022

The figure above is a map that shows an analysis of the vegetation health in state controlled protected forests of Akwa Ibom State from 2000 to 2021. The map is of course a Normalised Difference Vegetation Index (NDVI) map, which was compiled using the innovation of Moderate

Resolution Imaging Spectroradiometer (MODIS) aboard Terra and Aqua satellites. From the map, a high vegetation index figure can be noted in most forests.

Plant Species	Relative frequency (%)	Relative density (%)	Relative dominance (%)	IVI
<i>Aframomum daniellii</i>	3.51	10.34	-	13.85
<i>Azela bipindensis</i>	3.51	4.13	-	7.64
<i>Albizia zygia</i>	1.75	0.25	7.68	9.68
<i>Alchornea cordifolia</i>	1.75	5.27	-	7.02
<i>Allanblanksia floribunda</i>	0.88	0.25	2.19	3.32
<i>Anchomanes difformis</i>	5.26	10.34	-	15.6
<i>Anthocleista djalonesis</i>	0.88	0.25	1.99	3.12
<i>Anthonatha macrophylla</i>	1.75	1.35	0.98	4.08
<i>Baphia nitida</i>	1.75	0.25	1.34	3.34
<i>Barteria nigritiana</i>	0.88	0.25	2.30	3.43
<i>Calamus deerratus</i>	5.26	5.66	0.11	11.03
<i>Cannarium swinifurthii</i>	0.88	0.25	2.17	3.3
<i>Cissus quadrangularis</i>	1.75	0.25	-	2.00
<i>Coelocaryon preusii</i>	4.39	2.46	7.78	14.63
<i>Costus schlechteri</i>	3.51	3.94	-	7.45
<i>Dissotis rotundifolia</i>	1.75	0.69	-	2.44
<i>Elaeis guineensis</i>	3.51	1.72	5.90	11.13
<i>Entandrophragma cylindricum</i>	0.88	0.37	3.60	4.85
<i>Fagara macrophylla</i>	2.63	1.23	5.09	8.95
<i>Guara cedrata</i>	0.88	0.25	7.66	8.79
<i>Harungana madagascariensis</i>	0.88	0.25	1.81	2.94
<i>Irvingia gabonensis</i>	1.75	0.74	7.39	9.88
<i>Khaya ivorensis</i>	0.88	0.25	5.52	6.65
<i>Lonchocarpus griffoneanus</i>	0.88	0.25	1.85	2.98
<i>Maesobotrya barteri</i>	0.88	0.79	2.08	3.75
<i>Manniophyton fulvum</i>	1.75	0.25	1.92	3.92
<i>Mansonia altissima</i>	2.63	1.23	4.04	7.9
<i>Marantochloa cuspidate</i>	1.75	5.66	-	7.41
<i>Microdesmis puberula</i>	3.51	0.25	-	3.76
<i>Mitragyna ciliata</i>	1.75	0.49	2.54	4.78
<i>Momordica charantia</i>	1.75	0.74	-	2.49
<i>Musanga cecropioides</i>	3.51	1.23	4.49	9.23
<i>Myrianthus arboreus</i>	1.75	0.62	2.30	4.67
<i>Nephrolepis cordifolia</i>	3.51	0.62	-	4.13
<i>Newboldia laevis</i>	0.88	0.74	0.14	1.76
<i>Palisota hirsute</i>	7.02	26.61	-	33.63
<i>Pentaclethra macrophylla</i>	5.26	1.23	13.16	19.65
<i>Phoenix reclinata</i>	0.88	0.74	-	1.62
<i>Piptadeniastrum africanum</i>	2.63	0.74	3.98	7.35
<i>Platyserium stemaria</i>	1.75	1.73	-	3.48
<i>Rauvolfia vomitoria</i>	3.51	0.86	-	4.37
<i>Smilax anceps</i>	3.51	4.55	-	8.06

Figure 4: Vegetation Health Analysis for Mkpok Forest in Akwa Ibom State

Source: (Ezekiel et al., 2023)

The figure above is an analysis of the vegetation health of a communal forest (Nkpok forest) adapted from a secondary data source. The figure above shows high IVIs of vegetation species within this communal forest.

3.3 Cost-Benefit analysis of communal and state-controlled wildlife management in study area

Table 5: Extract of Survey Responses			
S/N	Items	Communal	State Controlled
1.	Which wildlife management approach do you think is more expensive to operate?	54 (18%)	246 (82%)

From table 5 above, about 246 respondents opined that state controlled wildlife management approach is more expensive, while 54 respondents conjectured that communal wildlife management was more expensive to operate.

Table 6: Construct of Cost-Benefit Analysis (CBA)				
	Cost	Value	Benefit	Value
State Controlled Wildlife Management	Resource use conflicts	High (3)	Eco-tourism revenue	High (3)
	Operational costs	High (3)	Reduced human to wildlife conflicts	High (3)
	Bureaucracy and inefficiency tendencies	High (3)	Ecosystem Services	Medium (2)
	Local Involvement	Medium (2)	Biodiversity preservation	High (3)
	Community Displacement/Loss of Local Lands	High (3)	Habitat restoration	Medium (2)
Communal Wildlife Management	Resource use conflicts	Low (1)	Biodiversity preservation	High (3)
	Operational costs	Low (1)	Ecosystem services	High (3)
	Inefficiency tendencies	Low (1)	Cultural preservation	High (3)
	Local Involvement	High (3)	Preservation of Local Land	High (3)
	Inefficiency tendencies	Low (1)	Habitat Restoration	High (3)

Table 7: Summary of Benefit-Cost Ratios (BCR)			
Conservation Approach	Total Cost	Total Benefit	BCR
State Controlled Biodiversity Conservation	14	13	0.93
Communal Biodiversity Conservation	7	15	2.14

4. DISCUSSION

From the results presented in table 3, a greater percentage of respondents (192) opined that both the communal and state-controlled biodiversity conservation approaches are very ideal within the region of Akwa Ibom State. Infact, figures 1 and 2 are strong evidence of the effective strides of both the communities and the state government in conserving biodiversity within the study area. These figures are images of a state protected forest and a communal sacred forest and are clear demonstrations of the concerted efforts made by the proprietors of the two biodiversity conservation approaches within the study area. When comparing the communal approach of conservation to the state-controlled approach, table 4 showed that a greater percentage of respondents agreed to the communal approach being more effective in preserving wildlife habitats, improving vegetation health and enhancing ecosystem services in line with the postulation by (Izah et al., 2018; Justice and Mbuotidem, 2021). However, the state-controlled approach was appraised by majority to be more efficient in reducing human-wildlife conflicts (Ezebilo, 2011). According to the vegetation index analysis conducted by researchers in 2022 as presented in figure 3, most of the state-controlled areas (protected forests) have high vegetation index figures (Udoma-Michaels and Akinola, 2022). This indicates a good vegetation health in protected forests and further attests to the efficiency of the state-controlled approach to biodiversity conservation in the study area. From the figure, all protected areas have a vegetation index figure of 0.4726 and above, as against the unprotected areas which have an index figure of less than 0.142. These unprotected areas have been affected grossly by the indices of urbanism, and thus, do not support biodiversity. Like the state-controlled areas, the

communal sacred forests have also been analysed to show high vegetation index as presented in figure 4. Thus, in line with the analysis of a study in 2023, this study attests to the high heterogeneity of floristic species in this area which is a good indication of high vegetation index and of course, high biodiversity of floristic species within the forest (Ezekiel et al., 2023). The Mkpok forest, thus, stands as a specimen of sacred groves within the study area, and the high heterogeneity and density of floristic species within it attests to the efficiency of communal approach in ensuring biodiversity conservation. The cost-benefit analysis of both approaches as presented in table 6 leads to a determination of their Benefit-Cost Ratios (BCR) as presented in table 7. The Benefit-Cost Ratio (BCR) of the communal approach is higher than that of the state-controlled approach. Moreover, table 6 shows that the total costs for the communal approach to biodiversity conservation (7) is much lower than that of the state-controlled approach (14). Moreover, when asked which was more costly to operate, a total of 246 respondents out of 300 respondents agreed that the state-controlled approach was more expensive. This attests to the general opinion within the study area that the communal approach of biodiversity conservation is more cost-effective than the state-controlled approach to biodiversity conservation as maintained by (Zabbey et al., 2021).

5. CONCLUSION

As interesting as it is, the analysis and responses within this study all point out to the fact that the communal and state-controlled approaches to biodiversity conservation are both ideal in ensuring that biodiversity within the study area is conserved. The analysis particularly showed that the vegetation index of both state protected and communal sacred forests were either high or both high and heterogenous. The existence of both

state protected and communal sacred forests are proof of the strides that have been ensured by the communities and the state government who are principal proprietors of these approaches within Akwa Ibom State. However, based on the survey responses regarding the efficiency of the communal approach to biodiversity conservation and the results of the cost-benefit analysis conducted, the study finds that it is more beneficial and cost-effective for conservation stakeholders in Akwa Ibom State, including the state government, to completely adopt, support and invest in the communal approach of biodiversity conservation. Thus, in line with this stance, the study recommends that the state government should establish a communal framework for the active conservation of biodiversity within the state's rural areas, while ensuring that it plays a supervisory role within this framework. However, the government would still ensure that it retains its responsibility of directly protecting biodiversity within the urban areas, as it infuses biodiversity concerns into its construction and development strides. This is paramount to reducing wildlife habitat fragmentation, loss of vegetation index and reduced ecosystem services.

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