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# Effectiveness of Community Participation in Wildlife Resources Conservation in Cross River National Park, Nigeria

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***Abstract-*** ***This study assessed the effectiveness of community participation in the conservation of wildlife resources in Cross River National Park, Akamkpa, Nigeria. Cochran's sample size formula was used to calculate the number of the park's communities. Out of 105 communities, eighteen communities within the support zone were purposively selected due to their significance, (proximity and acquaintance) and administrative convenience and used for the study. Total sample size for the study was 1,046, and the sample intensity was 0.022. Primary data was collected through the use of participatory rural appraisal tools namely questionnaires, semi-structural interviews, and focus group discussions. Kruskal–Wali's test was used to test the significance of the data. The result shows 92% of the respondents were males against 8% females. Majority aged 40-49 years (27%) and 50-59 years (26%) as well as 20-29 years, 30-39 years and 60 years upward were 14%, 19% and 3% respectively. Specifically, 40.4% of the respondents strongly agreed, while 32.2% agreed that they participate in wildlife conservation management. In terms of contribution to the park's management, 40.9% of the respondents strongly agreed, 32.9% agreed that they contribute to the park's management, while 26.2% disagreed. The table shows that majority of Rangers 37% agree that communities around the park contribute to the park management by reducing the rate of trespassing activities in the park, followed by 26% who helped to reduced poaching. It is also indicated in the table that, shares of 21% and 9% said their contributions to park management have also helped in reducing the rate of vandals and grazing respectively. The level of community participation in park management was moderate, with communities contributing to the park's decision-making processes, providing information, and supporting policy implementation. It is recommended that CRNP should establish a monitoring and evaluation framework to track community participation in park management.***

## I. INTRODUCTION

Nigeria is home to rich diversity of wildlife, including iconic species like African elephants, chimpanzees and gorillas (Henson *et al.,* 2009). The nation is experiencing a precipitous decline in wildlife populations, primarily due to the increasing pressures of habitat destruction from farming and bushmeat hunting and plantation activities (Brosius *et al.,* 2005). This decrease in wildlife populations has been acknowledged as a major concern not only by conservationists but also by local inhabitants (Abimbola, 2011). Bush meat consumption is an integral part of livelihood both as protein requirement and important source of supplementary income, but it is also of major socio-cultural importance. Over harvesting has been found to be the key reason for forest wildlife declines in Africa (Edmund *et al.,* 2000). Exploitation is increasing as a result of growing human populations, improved access to undisturbed forests, changes in hunting technology, and scarcity of alternative protein sources (Garcia, 2008). Overexploitation of wildlife for bushmeat in West and Central Africa is a serious issue which can lead to local, national or worldwide extinction of targeted species, with tragic ecological and economic repercussions. Sustaining various species of wildlife both for future economic and social reasons becomes an important point of direction if the balance in the ecosystem must be sustained invariably (Edet, 2005). Thus, effective wildlife management models need to be developed to secure bushmeat as a vital resource for both rural and urban populations and make it available for future generations (Edet, 2005). In some African countries, wildlife is still state property and hunting often illegal, leading to a situation of low ownership, non-recognition of user rights and even criminalization of use. The Cross River-National Park

(CRNP), a biodiversity hotspot in Cross River State, Nigeria, faces numerous conservation challenges, including habitat loss, fragmentation, and degradation, primarily due to human activities such as agriculture, logging, and poaching, which threaten the rich wildlife and ecosystem services, and the livelihoods of local communities that depend on them. Despite the establishment of protected areas, human wildlife encounter persists, and the effectiveness of top-down conservation approaches has been questioned, leading to a growing recognition of the need for community participation conservation initiatives that empower local communities to take ownership of wildlife conservation efforts. However, the effectiveness and sustainability of this community participation in CRNP remain unclear, with concerns about their ability to address the complex conservation challenges, ensure equitable benefit sharing, and foster long-term community engagement and commitment. The broad objective of this study is to assess the effectiveness of community participation in wildlife conservation of Cross River National Park in Nigeria. The specific objectives are to assess; the level of participation of communities in the management of the park and Effect of Communities contribution in the management of the National Park

## III. RESEARCH HYPOTHESIS

$H_{O1}$: Null Hypothesis: There is no significant difference in the level of participation of communities in the management of the park.

### 3.1 Study Area

The study was carried out in Cross River National Park (CRNP). CRNP is located in Cross River State, Nigeria and was created by Acts Nos. 36 and 46 of 1991 respectively. Precisely, it is under the control of the Federal Government of Nigeria with a legal instrument promulgated through decree No. 46 of 1991. The Park covers a total area of about 4000km$^2$ and consists of two geographically non-contiguous divisions namely; the Oban and Okwangwo Divisions (Fig 1). (Nchor *et al*., 2023).

### 3.2 Population and Sample Size

A total of one hundred and five (105) support zone communities is found in the park (CRNP). Cochran's sample size formula was used to calculate the number of communities for the sample size to arrive at 18 communities as shown below;

Formula: $n = \frac{Z^2 \sigma^2}{E^2 + \frac{Z^2 \sigma^2}{N}}$

Where:
n = sample size
Z = 1.96 (confidence interval @ 95%)
N = 105 (Total support zone communities)
E = 0.05 (Error 5%)
σ = 0.1192 (Standard deviation from pilot sampling due to clustering of communities)
n=18 communities

Eighteen (18) communities which was 0.167 sample intensity or 16.7% within the support zone communities in the park were purposively selected due to their significance (proximity and acquaintance) on the park and administrative convenience for the study. The Gbenga (2001) sample formula was used to determine the sample size of the projected population. This was made possible using the National Population Census data (Table 2) from 1991 up to year 2024 in the selected eighteen communities in the study area.

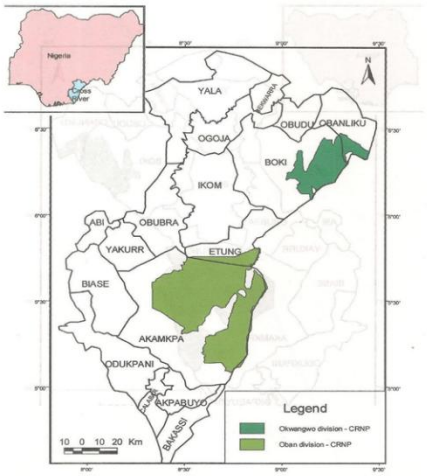


FIG. 1: Map of CRNP showing Oban and Okwangwo Divisions
Source: National Park Service, 2018

The population for 2024 was projected using the formula:

$P_n = P_o \frac{(1+K)^n}{100}$

*Where*;
$P_n$ = Projected population

$P_o$ = Initial population under consideration
K = Growth rate in %
n = Number of years estimated

3.4 Population sample size

The sample size (*n*) was determined with Cochran's formula:

Formula: $n = \frac{Z^2 \sigma^2}{E^2 + \frac{Z^2 \sigma^2}{N}}$

Where:
Z = 1.96 (confidence interval @ 95%)
N = 3387 (Population for the eighteen communities)
E = 0.05 (Error 5%)
σ = 0.9755 (Standard deviation from pilot sampling)
n=1015 respondents out of 3387

The sample "n" was thus calculated as 1,015, as shown in Table 2, this made up 30% of the entire household-heads, thus same 30% was used as sample size for the rangers, Table 3 which was 31 out of 102 rangers. Therefore, the total sample size for the study is 1,046 (1,015+31), and the sample intensity is 0.022 or 2.2%. A systematic sampling method was employed to select respondents from villages, where household was selected using a sampling interval of one house, in situations where the total number counted is less than the required number, the procedure was repeated using a different house as starting point. Questionnaires for the rangers were purposively administered to the available rangers on site because some of them were on field-duty.

3.5 Sources of data collection

Data collection instruments such as interview guides and questionnaires were comprised of two sections. The first section consisted of information about personal characteristics of respondents such as gender, age, level of education, etc., while the second section focused on the assessment of the effectiveness of community participation in wildlife conservation in CRNP. Likert scale method was used to obtain information, this allows respondents to make personal decisions based on individual degree of rating and intensity of items contained in the questions, which varied from, Strongly Agree (SA), Agreed (A), Neutral (N), Disagree (D) and Strongly Disagree (SD).

3.6 Data Analysis

The *Kruskal–Wali's* test was used to determine whether the mean ranks of the response groups are the same or different across the communities.

*Kruskal–Walis* is defined as:

$$H = \frac{12}{N(N+1)} \sum_{I=1}^{K} \frac{R_I^2}{n_i} - 3(N+1)$$

Where;
*H* = Kruskal–Walis' test result
*k* = number of groups used for comparison
*N* = total size of the sample
*ni* = i-th group's sample size
*Ri* = total of the ranks related to i-th group

## IV. RESULT

4.1 Demographic and Socio-Economic Characteristics of Respondents

In the Table below (Table 4), the distribution of respondents by gender, age, educational level, Duration of stay in Study Area, as well as their Occupation are presented. The table shows that majority of respondents (92%) were found to be male against their female with (8%). A predominance of males in the population can indicate various sociocultural dynamics, such as traditional gender roles where the males are expected to be the primary earners or decisionmakers in the community. The age bracket indicated that majority (27%) are between 40-49 years, followed by (26%) for 50-59 years. The proportion of those within the range of 20-29 years, 30-39 years and 60 years upward accounted for 14%, 19% and 3% respectively. While those that are below the age of 20 years was found to be 11%. This goes to shows that the communities' members that participate in the management are those within their active age. Furthermore, it is also presented in the table (Table 1) that the majority respondents were found to be those with secondary education which accounted for 40%, followed by 37% for primary, 18% for tertiary, while 5% are those with no formal educational. The reason for having people with no formal education was because there were no rules or regulations set aside by the park management regarding the educational requirement before individual can participate in the park management. From Table 1, majority of the respondents (34%) were farmers while students constituted the least (5%) as reflected in the result. The

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focus on farming as a primary occupation indicates an agrarian economy.

TABLE 1
Demographic and Socio-Economic Characteristics of Respondents

| Gender Differences | Frequency | Percentage |
|---|---|---|
| Male | 868 | 92% |
| Female | 75 | 8% |
| Total | 943 | 100 |
| Age of Respondents | | |
| Less than 20 years | | |
| 20-29 years | 104 | 11 |
| 30-39 years | 132 | 14 |
| 40-49 years | 179 | 19 |
| 50-59 years | 255 | 27 |
| 60 years and above | 245 | 26 |
| | 28 | 3 |
| Total | 943 | 100 |
| Educational Qualification | | |
| Primary | 349 | 37 |
| Secondary | 377 | 40 |
| Tertiary | 170 | 18 |
| No formal education | 47 | 5 |
| Total | 943 | 100 |
| Duration of stay in Study Area | | |
| Below 10 years | 75 | 8 |
| 10 - 19 years | 215 | 23 |
| 20 – 29 years | 466 | 49 |
| 30 years and above | 187 | 20 |
| Total | 943 | 100 |
| Occupation | | |
| Students | 47 | 5 |
| Civil Servants | 151 | 16 |
| Traders | 264 | 28 |
| Farmers | 321 | 34 |
| Hunters | 160 | 17 |
| Total | 943 | 100 |

Source: Field Survey, 2025.

TABLE 2
Level of participation of communities in the management of the park.

| Villages | SA | A | N | D | SD | Total |
|---|---|---|---|---|---|---|
| Osomba | 17 | 13 | 2 | 1 | 4 | 37 |
| Oban | 30 | 25 | 5 | 15 | 6 | 81 |
| Mangor | 4 | 2 | 1 | 2 | 1 | 10 |
| Aking | 13 | 8 | 2 | 4 | 6 | 33 |
| Orem | 6 | 2 | 3 | 2 | 1 | 14 |
| Akor | 24 | 29 | 5 | 16 | 10 | 84 |
| New Ndebiji | 5 | 3 | 1 | 2 | 2 | 13 |
| Abung | 2 | 2 | 0 | 1 | 0 | 5 |
| Mkpot | 51 | 43 | 9 | 15 | 18 | 136 |
| Etara | 20 | 21 | 3 | 0 | 7 | 51 |
| Old Ekuri | 3 | 16 | 19 | 4 | 2 | 44 |
| Nsan | 18 | 22 | 4 | 5 | 9 | 58 |
| Butatong | 2 | 10 | 14 | 1 | 3 | 30 |
| Bokalum | 4 | 47 | 10 | 6 | 12 | 79 |
| Okwangwo | 5 | 9 | 21 | 1 | 3 | 39 |
| Wula 1 | 61 | 44 | 8 | 4 | 16 | 133 |
| Oshonikpa | 7 | 28 | 19 | 3 | 8 | 65 |
| Kayang 1 | 0 | 20 | 7 | 1 | 3 | 31 |
| Total | 381 | 304 | 59 | 98 | 101 | 943 |
| Percent | 40.4 | 32.2 | 6.3 | 10.4 | 10.7 | 100.0 |

The H statistic is 32.8482 (4, N = 90). The p-value is < .00001. The result is significant at p <0 .05.

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4.2 Participation of communities in the management of the park.

The research findings in Table 2 indicate that a significant proportion of host communities' members participate in the conservation management of the park. Specifically, 40.4% of the respondents strongly agreed, while 32.2% agreed that they participate in conservation activities. This suggests that the park's conservation efforts have been successful in engaging local communities and fostering a sense of ownership and responsibility among them. The high level of participation may be attributed to various factors, including the park's community-based conservation approach, which emphasizes collaboration and cooperation with local stakeholders. Additionally, the provision of economic benefits and incentives, such as ecotourism revenue and sustainable livelihood programs, may have motivated community members to participate in conservation efforts.

4.2.1 $H_{O1:}$ Null Hypothesis: There is no significant difference in the level of participation of communities in the management of the park

The test statistics (H) of 32.8482 (Table 2) indicates that there is a significant difference in the level of participation among the communities. The p-value of 0.0001 is extremely low, indicating that the observed difference is statistically significant and unlikely to occur by chance. The result of the null hypothesis test rejects the null hypothesis, which states that there is no significant difference in the level of participation of communities in the management of the park. Instead, the test suggests that there are significant differences in the level of participation among the communities.

TABLE 3
Communities' Contributions in the Management of the Park by Rangers

| Kinds of Contribution | Frequency | Percentage |
|---|---|---|
| Giving information | 16 | 52 |
| Agent (informant) | 4 | 13 |
| Historical site | 6 | 19 |
| Conflict resolution | 5 | 16 |
| Total | 31 | 100 |

Source: Field Survey, 2025

4.3 Community contribution to the park management

Table 3 present the information on the communities" contribution to the park management. The figure indicated that giving of information to park management is the major contribution communities give to the park management as 52% of the rangers agree to this; because of the nature of the work and government policy attached, most of the work required by the park from the communities is usually information about the encroachers, grazers and mostly whenever the loggers enter the park, the information is always gotten from the communities, agent with 15%. Some members of the communities were employed by the park to be their agent or informant and they reported cases to park on any suspected move or activities observed or noticed. Historical site with 19% was the second most contributed information, it was also found out that the communities contribute to the park in the area of historical site, when tourist visited the park, there are some historical site in the communities which the communities helped to accompany the tourist while conflict resolution with 15%, if there is conflicts between the park management and the community, the communities' leader interfere in order to resolve the conflict.

TABLE 4
Effects Communities' Contribution in the Park Management (Rangers)

| Contribution | Frequency | Percentage |
|---|---|---|
| Reduced Poaching | 8 | 26 |
| Reduced Vandals | 7 | 21 |
| Reduced Trespassing | 11 | 37 |
| Reduced Grazing | 3 | 9 |
| Others | 2 | 7 |
| Total | 31 | 100 |

Source: Field Survey, 2025.

4.4 Effects of Communities contribution to the management of the park

Table 4 entails information on the effect of communities' contribution in park management. The table shows that majority of Rangers 37% agree that communities around the park contribute to the park management by reducing the rate of trespassing activities in the park, followed by 26% who helped to reduced poaching. It is also indicated in the table that, shares of 21% and 9% said their contributions to park management have also helped in reducing the rate of vandals and grazing respectively.

4.5 Discussion

4.5.1 Community participation

Communities are actively participating in the management of the park through various means, including providing information, supporting policy implementation, participating in enlightenment programs, and contributing to decision-making, is consistent with similar studies. For instance, Kumar *et al.* (2017) found that community-based conservation initiatives led to increased community participation in management decisions and conservation efforts. Similarly, Walpole and Thouless (2005) reported that community involvement in conservation efforts resulted in improved conservation outcomes and increased community engagement. However, in contrast to the findings of Brosius *et al.* (2005), who noted that community participation in park management was often limited to providing labor and resources, this study found that communities are actively engaged in a range of management activities. This discrepancy may be attributed to differences in the level of community engagement and the effectiveness of community-based conservation initiatives. Nonetheless, the finding that communities are actively participating in park management highlights the importance of collaborative conservation efforts and community-led initiatives, as emphasized by Kareiva and Marvier (2012). Furthermore, the study's findings support the assertion by Ellis, (2004) that community participation in management decisions is essential for effective conservation outcomes. The discovery that the level of participation by the community in park management is sustainable in the conservation of wildlife resources is consistent with similar studies that have demonstrated the effectiveness of community-based conservation initiatives. For instance, Kumar *et al*. (2017) found that community-led conservation efforts resulted in significant improvements in wildlife populations and habitat quality. Similarly, Walpole and Thouless (2005) reported that community involvement in conservation efforts led to increased community engagement and improved conservation outcomes. The sustainability of community participation in park management is also supported by the work of Nadasdy (2003), who found that community-based conservation initiatives were more effective and sustainable when they were led by community members and supported by park officials. In contrast, Brosius *et al*. (2005) noted that top-down approaches to conservation often failed to engage local communities and were therefore less effective and sustainable. Overall, the finding that community participation in park management is sustainable in the conservation of wildlife resources highlights the importance of collaborative conservation efforts and community-led initiatives, as emphasized by Kareiva and Marvier (2012). By recognizing the value of community participation and supporting community-led conservation initiatives, park officials can help to ensure the long-term sustainability of conservation efforts.

4.5.2 Effective conservation

Community effective participation in the conservation of wildlife resources in national parks in Nigeria is crucial for the long-term survival of the country's rich biodiversity, as evidenced by the success stories from parks like Cross River National Park, where community-led conservation initiatives have led to a significant reduction in wildlife poaching and habitat encroachment (Weston *et al*., 2003), and an increase in community engagement and participation in conservation activities, with community members actively involved in wildlife monitoring, habitat restoration, and conservation planning, and benefiting from ecotourism and sustainable livelihood initiatives, demonstrating that when communities are empowered to take ownership of conservation efforts (Measham and Barnett, 2008), they can become effective stewards of wildlife resources, and highlighting the need for national parks in Nigeria to adopt community-based conservation approaches that prioritize community engagement, participation, and benefit-sharing, to ensure the effective and sustainable

conservation of wildlife resources for future generations (Lawrence, 2006). Community participation in the conservation of wildlife is remarkably effective in Cross River National Park management, as evidenced by the significant reduction in wildlife poaching and habitat encroachment, which has resulted in a notable increase in wildlife populations, including endangered species such as the Cross River gorilla, Nigerian-Cameroon chimpanzee, and African forest elephant, (Hibbert *et al.,* 2003) and this success can be attributed to the park's community-based conservation approach, which empowers local communities to take ownership of conservation efforts through the establishment of community-led conservation committees, provision of economic incentives, and capacity building programs, leading to improved community attitudes and behaviours towards wildlife conservation, enhanced community-park management relationships, and increased community engagement in conservation activities, ultimately contributing to the effective conservation of wildlife in Cross River National Park (Bruyere and Rappe, 2007). The finding that 73.8% of the respondents (40.9% strongly agreed and 32.9% agreed) agreed they contribute to the park's management has important implications for the long-term sustainability of the park's conservation efforts (Mehta & Heinen, 2001). It suggests that the park's management authority has been successful in building trust and partnerships with local communities, which is critical for effective conservation (Paul, 2005). Furthermore, the high level of contribution may indicate that community members are willing to take an active role in managing the park's natural resources, which can help to reduce human-wildlife conflicts and promote more sustainable land-use practices. However, it is also important to note that 12% of the respondents remained neutral, which may indicate that there are still some uncertainties or doubts about the effectiveness of community contributions to the park's management (Powell and Colin, 2008).

## V. CONCLUSION

1. This study aimed to investigate the dynamics of community participation in the management of the Cross River National Park (CRNP). The findings of this study provide valuable insights into the means by which communities communicate with the park, the level of community participation in park management, and the perceived contribution of communities to park management. The study revealed that communities communicate with the park through various means, including community leaders, indigenous staff, and direct communication with park officials. The level of community participation in park management was found to be moderate, with communities contributing to decision-making processes, providing information, and supporting policy implementation. The sustainability of community participation in park management was also found to be moderate, with communities indicating a willingness to continue participating in park management efforts. The CRNP management should establish a monitoring and evaluation framework to track community participation in park management, including the effectiveness of communication channels, the level of community engagement, and the impact of community contributions on conservation outcomes.

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