



## Assessment of Stakeholder Involvement in the Management of Yankari Game Reserve Bauchi, Nigeria

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### Authors' contributions

*This work was carried out in collaboration between all authors. All the authors designed this study, managed literature searches, data collection and analysis. The first author AEO wrote the first draft of the manuscript. While authors TNT and POE edited and approved the final manuscript.*

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### ABSTRACT

**Aims:** To examine the involvement of stake holders in the management of Yankari Game Reserve (YGR).

**Study Design:** The study is a survey that is cross-sectional, descriptive and analytical.

**Place and Duration of Study:** The study was carried out at YGR, Bauchi, Nigeria between June and November 2014.

**Methodology:** Applying a multistage sampling approach, 139 staff members of YGR and 320 members of the host community were randomly selected and interviewed with semi structured-questionnaire to elicit data. Data collected were analyzed using descriptive statistics.

**Results:** The highest proportions; 94.2% and 95.7% of the respondents respectively asserts that host community members were not involved in the management and protection of YGR. Similarly, 92.2% of YGR staff members asserted that host community leaders and opinion leaders were not consulted for inputs in management decisions about YGR. Also, majority (83.7%) of the

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respondents reported that community associations like hunters, traditional rulers, youths and non-timber forest products collectors were not involved in the management of YGR. Assessment of stakeholder involvement in management activities showed that Government was leading in capacity building (69.0%), financing (70.4%) and management decision making (58.0%). Non-governmental organizations (NGOs) were leading in awareness creation (71.4%). Among the NGOs that were involved in the foregoing management activities, World Wide Fund for Nature (WWF) was leading by 70.5%.

**Conclusion:** The management of YGR was therefore carried out primarily by government with the support of NGOs. Host community involvement was very low. This portends a conflicting relationship between government and host communities over the conservation and management of YGR. Management should therefore work towards enlisting all stakeholders in the management processes of the reserve to ensure a more effective management regime at the reserve.

*Keywords: Protected area; nature conservation; questionnaire survey; host community; management activities.*

## 1. INTRODUCTION

Protected areas are sites for conservation of habitats and species biodiversity aimed at protecting the damaging impact of human activities on natural resources therein, particularly wildlife [1]. Protected areas are economic engines. Through tourism, they provide employment and other livelihood opportunities. Water and fisheries, which are of immense economic value, are also harbored by the protected areas.

Yankari Game Reserve (YGR) is Nigeria's oldest and best-known wildlife sanctuary [2]. The reserve was first designated as a game reserve by the British colonialists in 1956. By 1957, it was conceived as a forest reserve and later designated as Game Reserve by the defunct Northern Nigeria Regional Government. The establishment of this reserve marked the beginning of concerted efforts at wildlife conservation in Nigeria [3,4]. Following the adoption of National Resource Conservation Strategy in 1985 and the subsequent promulgation of Decree No.36 of 1991, YGR was upgraded to a National Park [5]. This was reverted to its initial status of a Game Reserve following its handing over to Bauchi State Government in 2006 [2].

According to the most recent survey conducted in 2006, YGR is home to one of the largest remaining elephant populations in West Africa with an estimated 348 elephants [2]. The park boasts of two potential tourist attractions; the Wikki and other natural hot spring pools and the man-made caves, which archaeologists believe were dug into sandstone cliffs as hiding places during the slave-trade era [2]. YGR has a unique location, surrounded by agricultural farmland and human settlements [6].

According to the Nigerian Environmental Study Team [7], research efforts in Natural Resources and wildlife conservation in Nigeria are very low, and there is paucity of information and data for the development of effective management plan for the protected areas. Thus, the creation of forest reserves in Nigeria has not yielded the desired result because strategic plans are not available to tackle the challenges associated with this conservation practice [8]. The YGR, in Bauchi State, Nigeria, is besieged by management challenges. The reserve is under the pressure of human interference and disturbance [9]. There are reported cases of increased poaching activities, grazing offences, uncontrolled burning / fire out breaks, and declining tourists and tourists' activities on the park. This means YGR requires a more careful and intensive participatory management regime, incorporating stakeholder interests, to survive.

Conservation scientists have advocated the inclusion of many partners and an array of stakeholders including the community members in the management and governance of protected areas [10,11,12]. The knowledge and skills of these stakeholders if available and utilized will engender the conservation and management of wildlife resources on a sustainable basis [13]. This means adequate information on the knowledge and skill of stakeholders of reserves requires documentation for effective planning. The YGR lacks this kind of data and information [7,12]. The World Conservation Union [14] also reported that the forestry sector in Nigeria is poorly funded and formal records are not in place to ascertain its revenue generation potential for effective development, the YGR inclusive. On the other hand, [11] decried that Management of Game Reserves do not always carry along their host communities while taking and implementing

managerial decisions. This often results to chaos, anarchy, poor cooperation and confrontation between management staffs and host communities. This study therefore examines management activities at YGR to determine the level of involvement of stakeholders in this regard. Outcomes would be useful for recommending appropriate management approaches for improved biodiversity, environmental protection and sustainable livelihood development. In fact, it aims at providing data for informed management and conservation decisions about YGR.

## 2. METHODOLOGY

### 2.1 Study Area

The YGR (9.50°N, 10.30°E) lies within the Sudan savanna vegetation zone. The vegetation at the reserve is usually described as *Burkea africana* Hook woodland because of its dominance in the reserve. Other savanna wood species present are *Bauhinia rufescense* Lam, *Prosopis africana* (Guill and Perr) Taub, *Vitellaria paradoxa* (Gaertn.f), *Calotropis procera* (Ait), Ait f., *Prosopis juliflora* (Sw) Dc syn. *Prosopis chelensis* (Molina) Stuntz, *Ziziphus spp*, and *Diospyros mespiliformis* Hochstex among others with open canopy and a continuous layer of annual and perennial grasses [15]. The Reserve records an average rain fall of about 1000 mm per year occurring between April and October.

The Gaji and Yashi River dissects the reserve giving succor and security to both the fauna and flora resources within the reserve. The reserve also contain four natural warm springs; Wikki, Gwana, Dimiland and Mawulgo. However, only the Wikki warm spring is developed for tourists' recreation. Other tourism resources in the reserve include the Marshall Caves, Dukkey wells, Shaushau and Ampara ancient iron smelting sites and Dogonruwa rock paintings among others.

The Reserve also houses a wide variety of wildlife species, prominent among which are the savanna elephant (*Loxondonta africana* Blumenbach), buffalo (*Syncerus cafer* Sparrman), baboon (*Papio anubis* Lesson), hartebeests (*Alcelaphus buselephus*, Pallas), waterbucks (*kobuselli psiprymnus* Ogilbyi), hippopotami (*Hippopotamus amphibious* Linnaeus), crocodile (*crocodiles niloticus* Schneider), Lions (*Panthera leo* Linnaeus), Roan antelopes (*hippotragus equinus* Linnaeus), warthog (*Phacochoerus aethiopicus* Gmelin),

and a profusion of birdlife especially at Gaji River valley [15].

YGR is surrounded by 15 host communities within the range of 1-5 km [16]. These host communities are predominantly subsistent farmers and hunters with few engaged in petty trading businesses.

### 2.2 Study Population and Sampling Procedure

The study population comprises the host community members and the staff members of YGR. The sample size for the study was 459 respondents comprising 139 staff members of YGR and 320 members of the host communities.

A sampling intensity of 50% was applied to randomly select eight (8) host communities out of the 15, within 1-5 km around the YGR, for the study. In each host community, a systematic random sampling approach was used to identify 40 households and the most senior male or female household member present was selected as respondent. Thus, 320 Host community members (HCM) were selected as respondents for the study.

Staff population at YGR was 211 distributed in five departments as shown in Table 1. Out of this number, 139 respondents were sampled using Taro Yamane's formula (equation 1) recommended by [17] for this kind of data collection.

$$n = \frac{N}{1+N(e^2)} \dots \quad (1)$$

Where; N = Population,  
1= constant,  
e = tolerable error or limit of precision,  
n = sample size

Respondents were sampled from each Department proportionately using the following relationship:

$$nh = \frac{n \times Nh}{N} \dots \quad (2)$$

Where: nh = Sample size for a Department,  
Nh = Staff population in each Department  
n = Staff to be sampled for the study (sample size for the study).  
N = Total staff population of YGR

The sampling frame for staff members of YGR is presented in Table 1.

### 2.3 Data Collection and Analyses

Data for the study were collected using two sets of semi-structured questionnaires with distinct questions administered on 459 respondents. The first set, comprising of 320 copies, was administered on 320 respondents sampled from the host community members (HCMs). The HCMs were primarily requested to indicate which associations within their communities were involved in the management of the reserve ascertaining their areas of involvement. The questionnaire copies were then retrieved and data on their involvement in the management of YGR collated. Similarly, the second set was administered on 139 staff members of YGR to elicit data on stakeholders' involvement in funding, staff training, protection and other management issues of the reserve. The opinion of two forest economists, two conservation scientists, one biometrician and two ecologists (in the College of Forestry and Fisheries, University of Agriculture Makurdi) were consulted during College seminars at validating the research instrument- the semi-structured questionnaire. The validated instrument was then administered on respondents for data collection.

Data collected were analyzed using descriptive statistics. Tables and charts were utilized in presenting the results.

## 3. RESULTS AND DISCUSSION

### 3.1 Results

#### 3.1.1 Host community involvement in the management of YGR

The responses of YGR staff members on the involvement of HCM in the management of YGR are presented in (Table 2). A greater proportion of the staff (94.2%) agreed that HCMs were generally not involved in the management of YGR. Only 5.8% of the staff members indicated that some HCMs are sometimes employed in the management of the reserve, such as protecting the reserve from poaching activities. Furthermore, 92.8% of the staff members agreed that the views of community leaders and opinion leaders of the community are not usually consulted for inputs on managerial decisions about YGR. The general import from the result is that HCMs are rarely involved in the management decisions of YGR.

**Table 1. Sampling frame for staff members of Yankari Game Reserve, (<sup>a</sup>N=211)**

Name of departments	Staff population by department	Sample size by department
Conservation/Recreation	105	69
Finance	13	9
Administration/Personnel	11	7
Hotel management	47	31
Estate management	35	23
<b>Total</b>	<b>211</b>	<b>139</b>

Note: <sup>a</sup>N= Staff Population

**Table 2. Yankari game reserve staff responses on the involvement of host communities in its management of the reserve**

Responses criteria	Frequency	Percentages
<b>Are host communities involved in the management of YGR?</b>		
Yes	8	5.8
No	131	94.2
Total	139	100.0
<b>Does management consult community heads and opinion leaders for inputs in the management of YGR?</b>		
Yes	10	7.2
No	129	92.8
Total	139	100.0

Note: YGR = Yankari Game Reserve

**3.1.2 Responses of community members on the involvement of community associations in the management of YGR**

The Responses of community members on the involvement of community associations in the management of YGR is presented in Table 3. From this result, 83.7% of the respondents debunk the involvement of community associations in the management of YGR; however, 8.1% reported that ‘traditional rulers’ association; a body of custodians of customs, values and beliefs of the people in the host communities, was involved in the management of YGR. Furthermore, 3.8% of the respondents assert that hunters associations were involved in the management of YGR, while 2.5% and 1.9% assert that Non-timber forest products collectors and youth associations respectively were also involved in the management of YGR. No women association in any of the villages adjoining YGR was reportedly involved in its management. The result therefore shows that the involvement of community associations in the management of the reserve was very low.

**3.1.3 Comparative assessment of Stakeholders involvement in the management of YGR**

The involvement of stakeholders namely Non-Governmental Organizations (NGOs), the Government and the Host Community Members (HCM), in the management of YGR is presented in Fig. 1. Four management criteria namely Capacity building, awareness creation, financing and decision making were considered.

Government was the major key player in capacity building with 69.0% followed by NGOs (21%) and the Host community (10.0%). NGOs were the key players in awareness creation as 71.4% of the respondents asserted. Government and host communities followed in that order with 20.0% and 8.6% respectively. In terms of financing, most respondents (70.4%) asserted that Government is the key player. This was followed by NGOs (20.0%) and then HCM with 9.6% of

the responses respectively. Government (58.0%) was also a key player in decision making, followed by NGOs (35.0%) and then the HCM (7.0%).

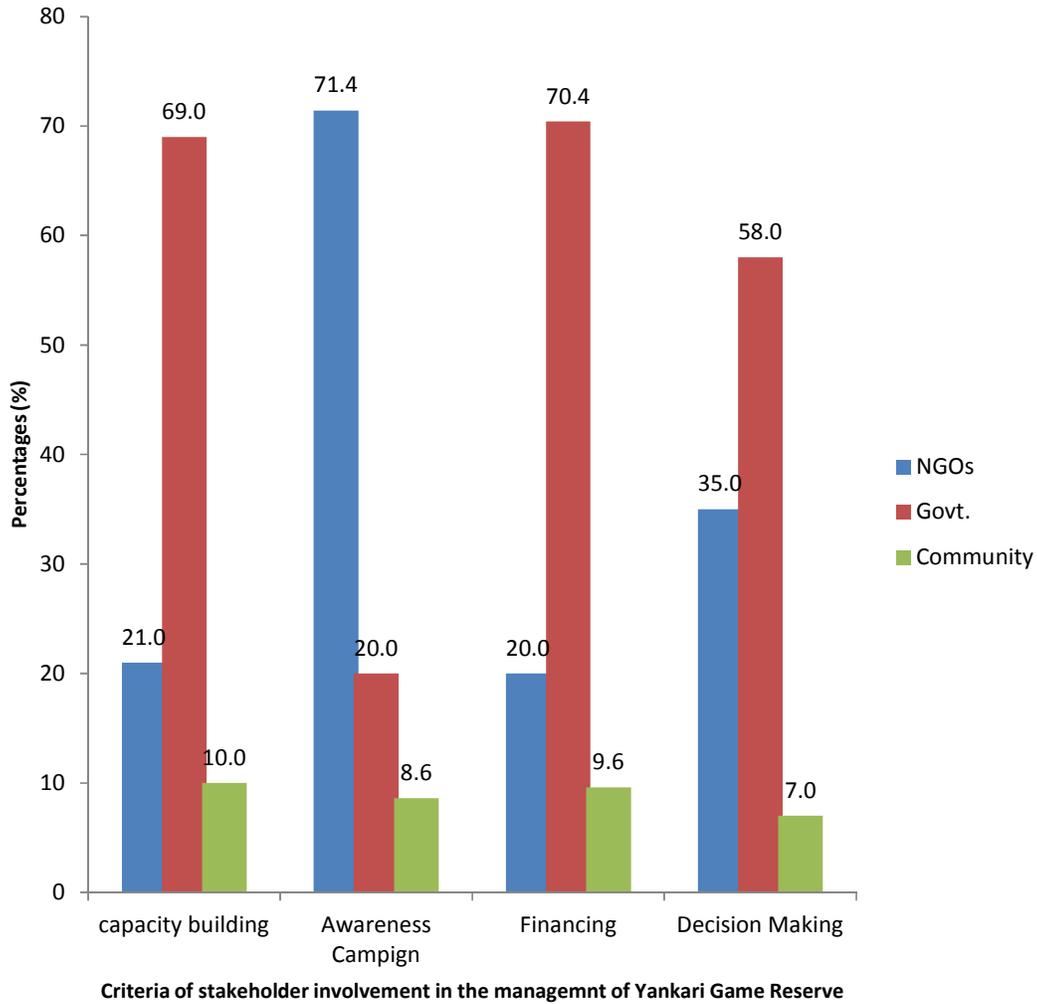
The management activities on the reserve were therefore carried out primarily by government with support from non-governmental organizations. Host community involvement was very low.

**3.1.4 Assessment of NGOs’ involvement in the management of YGR**

The staff members of YGR were asked to indicate in their own perception the NGOs that contribute predominantly to the management of YGR. The result is presented in Table 4. Majority of the staff members 70.5% asserted that World Wide Fund for Nature (WWF) contributed more to the management activities in YGR. The Nigerian Conservation Foundation, NCF (13.7%), Friends of the Environment, FOTE (7.2%), Nigerian Environmental Study Team, NEST (6.5%), and Nigerian Environmental Society, NES (2.1%) followed in that order. The NGOs were involved in the management of YGR to engender sustainable co-management of the natural resources of the YGR and its host communities through sound environmental conservation practices. They were also to develop wildlife-based eco-tourism / recreation in the YGR and its host communities as well as undertake bio-monitoring, education and research activities in the area. According to the staff members, the five NGOs were involved in management activities like funding, staff training, awareness creation and decision making processes, with the WWF playing the dominant role in all these management activities. Other NGOs contributed marginally. WWF was concerned mainly with funding for staff training, wildlife conservation and bio-monitoring. NCF had concern for awareness creation and eco-tourism/recreation development at YGR, while NEST, FOTE and NES had interest in education and research activities.

**Table 3. Involvement of community associations in the management of Yankari Game Reserve**

<b>Associations</b>	<b>Frequency</b>	<b>Percentages</b>
Women associations	0	0.0
Hunters associations	12	3.8
Traditional rulers associations	26	8.1
Youth associations	6	1.9
Non-timber forest products collectors association	8	2.5
None of the above	268	83.7
Total	320	100.0



**Fig. 1. Stakeholders' involvement in the management of Yankari Game Reserve**

**Table 4. Involvement of Non Governmental Organizations in the management activities of Yankari Game Reserve**

Non Governmental organization	Frequency	Percent (%)
NCF	19	13.7
WWF	98	70.5
NEST	9	6.5
FOTE	10	7.2
NES	3	2.1
Total	139	100.0

*Note: NCF: Nigerian Conservation Foundation; WWF: World Wide Fund for nature; NEST: Nigerian Environmental Study/Action Team; FOTE: Friends of the Environment; NES: Nigeria Environmental Society*

### 3.2 Discussion

Inferences drawn from the involvement of the host communities in the management of YGR indicated that they were marginally involved in the management of the Reserve. Considering the low educational level of the inhabitants and their engagements as non-administrative staff, their active involvement could be expected at best in providing traditional and indigenous intelligence for management decisions on the reserve. The Moreover, modern school of thought on conservation and management of protected areas canvasses participatory approaches [18]. When local communities feel that both government and conservation stakeholders value wildlife more than their lives, livelihoods or aspirations, retaliation and opposition to conservation initiatives can be swift and

uncompromising. One solution to this is to empower communities to manage and benefit from wildlife resources found in communal group ranch dispersal areas [19].

Although there was a popular opinion of the non-involvement of community associations in the management of YGR, the little involvement of some few associations like the traditional rulers, hunters, non-timber forest products collectors, and the youths played vital roles in the development of YGR. They were reportedly involved in mobilizing contractors / casual staff for YGR. They were also involved in brokering peace, security and cordial relationship between the host communities and the reserve. For instance, the traditional rulers and youths were sometimes involved in resolving crises of poaching and encroachments on the reserve for farming, non-timber forest products collection and bush burning. It is therefore important for the Management of YGR to work towards enhancing the involvement of these associations in the management decisions of the reserve.

The low involvement of HCM and NGOs in managing YGR contrasts the findings of Wahab and Adewumi [20] in the case of Kainji Lake National Park (KLNP), Nigeria. HCM and NGOs like the global environmental facility (GEF) through the local environmental empowerment programme (LEEMP); a government local development programme, and the international development association (IDA) were actively participated in managing KLNP. These NGOs provided HCM with some financial assistants as incentives to elicit their support in managing the park. Thus, HCM to KLNP were involved in decision making, control and protection of the park and ecotourism development. Similarly, Ndenecho [21] reported the active involvement of community based organizations (CBOs) and other NGOs in the management of natural resources in North-west Cameroon. In both cases (KLNP and North-west Cameroon), serious cases of conflicts were not reported. Thus Androde and Rhodes [22] assert that community participation in protected area management activities is significantly related to the level of compliance with protected area policies. As level of community participation in protected area management increases, their compliance with protected area policies also increases. Consequently, for a successful and effective protected area management, community participation is imperative.

The government played the most prominent role in the management of YGR. This was shown in their involvement in capacity building, financing and decision-making. Awareness campaigns on conservation practices were however propagated by NGOs. In this light, World Wide Fund for nature (WWF) was most involved due to its close attention in harnessing the endangered species in African Sub-Saharan region.

#### **4. CONCLUSION**

The management status of YGR reflects an extremely low involvement of host communities; indicative by the low involvement of community heads, opinion leaders and local associations in the management functions of the reserve. This portends a conflicting relationship between government and host communities over conservation and management initiatives at the reserve.

The involvement of some non-governmental organizations in capacity building, awareness creation, financing and decision making functions at the YGR portends a more effective management of the reserve in time. NGOs like WWF, NEST, ECS, FOTE and NCF were involved in the management of YGR in the area of capacity building, awareness creation, financing and decision making. Of all these NGOs, the WWF was therefore dominant in the provision of the aforementioned services towards the management of YGR.

The YGR management should ensure the involvement of host communities and local Associations in managerial decision-making about the reserve. The management should also ensure more and equitable provision of basic infrastructural facilities and amenities to adjoining communities to the reserve.

The management of YGR should work towards keeping their relationship with the current NGOs partnering with it, while more efforts are made at enlisting other NGOs in their management functions. Assistants from these NGOs and their activities should be directed at the host communities to boost and enhance their social relationship with the reserve and the host communities. This study did not investigate the reasons for the low involvement of host community members in the management of YGR as well as strategies for a future greater involvement of HCM and types of involvement of different NGOs. The study

therefore recommends further studies on this subject addressing the aforementioned inadequacies.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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