

1 **Assessment of Stakeholder Involvement in the**  
2 **Management of Yankari Game Reserve Bauchi,**  
3 **Nigeria**

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15 **ABSTRACT**  
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**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 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.

17 **Keywords:** Protected area, nature conservation, questionnaire survey, host community,  
18 management activities

19 **1. INTRODUCTION**

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

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

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

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

51 Conservation scientists have advocated the inclusion of many partners and an array of  
52 stakeholders including the community members in the management and governance of  
53 protected areas [10, 11, 12]. The knowledge and skills of these stakeholders if available and  
54 utilized will engender the conservation and management of wildlife resources on a

55 sustainable basis [13]. This means adequate information on the knowledge and skill of  
56 stakeholders of reserves requires documentation for effective planning. The YGR lacks this  
57 kind of data and information [7, 12]. The World Conservation Union [14] also reported that  
58 the forestry sector in Nigeria is poorly funded and formal records are not in place to ascertain  
59 its revenue generation potential for effective development, the YGR inclusive. On the other  
60 hand, [11] decried that Management of Game Reserves do not always carry along their host  
61 communities while taking and implementing managerial decisions. This often results to  
62 chaos, anarchy, poor cooperation and confrontation between management **staffs** and host  
63 communities. This study therefore examines management activities at YGR to determine the  
64 level of involvement of stakeholders in this regard. Outcomes would be useful for  
65 recommending appropriate management approaches for improved biodiversity,  
66 environmental protection and sustainable livelihood development. In fact, it aims at providing  
67 data for informed management and conservation decisions about YGR.

## 68 2. METHODOLOGY

### 69 2.1. Study Area

70 The YGR (9°50'N, 10.30°E) lies within the Sudan savanna vegetation zone. The vegetation  
71 at the reserve is usually described as *Burkea africana* Hook woodland because of its  
72 dominance in the reserve. Other savanna wood species present are *Bauhinia rufescense*  
73 Lam, *Prosopis africana* (Guill and Perr)Taub, *Vitellaria paradoxa* (Gaertn.f), *Calotropis*  
74 *procera* (Ait), Ait f., *Prosopis juliflora* (Sw)Dc syn. *Prosopis chelensis* (Molina) Stuntz,  
75 *Ziziphus spp*, and *Diospyros mespiliformis* Hochstex among others with open canopy and a  
76 continuous layer of annual and perennial grasses [15]. The Reserve records an average rain  
77 fall of about 1000mm per year occurring between April and October.

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

84 The Reserve also houses a wide variety of wildlife species, prominent among which are the  
85 savanna elephant (*Loxondonta africana* Blumenbach), buffalo (*Syncerus cafer* Sparrman),  
86 baboon (*Papio anubis* Lesson), hartebeests (*Alcelaphus buselephus*, Pallas), waterbucks  
87 (*kobuselli psiprymnus* Ogilbyi), hippopotami (*Hippopotamus amphibious* Linnaeus.),

88 crocodile (*crocodiles niloticus* Schneider), Lions (*Panthera leo* Linnaeus), Roan antelopes  
89 (*hippotragus equinus* Linnaeus), warthog (*Phacochoerus aethiopicus* Gmelin), and a  
90 profusion of birdlife especially at Gaji River valley [15].

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

## 94 **2.2 Study Population and Sampling Procedure**

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

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

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

106 
$$n = \frac{N}{1+N(e^2)} \dots \text{Equation 1}$$

107 Where; N = Population,  
108 1= constant,  
109 e = tolerable error or limit of precision,  
110 n = sample size

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

113 
$$nh = \frac{n \times Nh}{N} \dots \text{Equation 2}$$

114 Where: nh = Sample size for a Department,  
115 Nh = Staff population in each Department  
116 n = Staff to be sampled for the study (sample size for the  
117 study).  
118 N = Total staff population of YGR  
119

120 The sampling frame for staff members of YGR is presented in Table 1.  
121

122 **Table 1: Sampling Frame for staff members of Yankari Game Reserve, (<sup>a</sup>N=211)**  
 123

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>

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

### 125 **2.3 Data Collection and Analyses**

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

## 141 **3.0 RESULTS AND DISCUSSION;**

### 142 **3.1 Result**

#### 143 **3.1.1 Host community involvement in the management of YGR**

144 The responses of YGR staff members on the involvement of HCM in the management of  
 145 YGR are presented in (Table 2). A greater proportion of the staff (94.2%) agreed that HCMs

146 were generally not involved in the management of YGR. Only 5.8% of the staff members  
 147 indicated that some HCMs are sometimes employed in the management of the reserve,  
 148 such as protecting the reserve from poaching activities. Furthermore, 92.8% of the staff  
 149 members agreed that the views of community leaders and opinion leaders of the community  
 150 are not usually consulted for inputs on managerial decisions about YGR. The general import  
 151 from the result is that HCMs are rarely involved in the management decisions of YGR.

152 Table 2: Yankari Game Reserve Staff responses on the Involvement of Host Communities in  
 153 its Management of the Reserve

Responses Criteria	Frequency	Percentages
Are Host Communities involved in the Management of YGR?		
Yes	8	5.8
No	131	94.2
Total	139	100.0
Does management consult Community Heads and Opinion Leaders for inputs in the Management of YGR?		
Yes	10	7.2
No	129	92.8
Total	139	100.0

154 Note: YGR = Yankari Game Reserve.

### 155 3.1.2 Responses of community members on the involvement of community 156 associations in the management of YGR

157 The Responses of community members on the involvement of community associations in  
 158 the management of YGR is presented in Table 3. From this result, 83.7% of the respondents  
 159 debunk the involvement of community associations in the management of YGR; however,  
 160 8.1% reported that 'traditional rulers' association'; a body of custodians of customs, values  
 161 and beliefs of the people in the host communities, was involved in the management of YGR.  
 162 Furthermore, 3.8% of the respondents assert that hunters associations were involved in the  
 163 management of YGR, while 2.5% and 1.9% assert that Non-timber forest products collectors  
 164 and youth associations respectively were also involved in the management of YGR. No  
 165 women association in any of the villages adjoining YGR was reportedly involved in its

166 management. The result therefore shows that the involvement of community associations in  
167 the management of the reserve was very low.

168 Table 3: Involvement of Community Associations in the Management of Yankari Game

169 Reserve

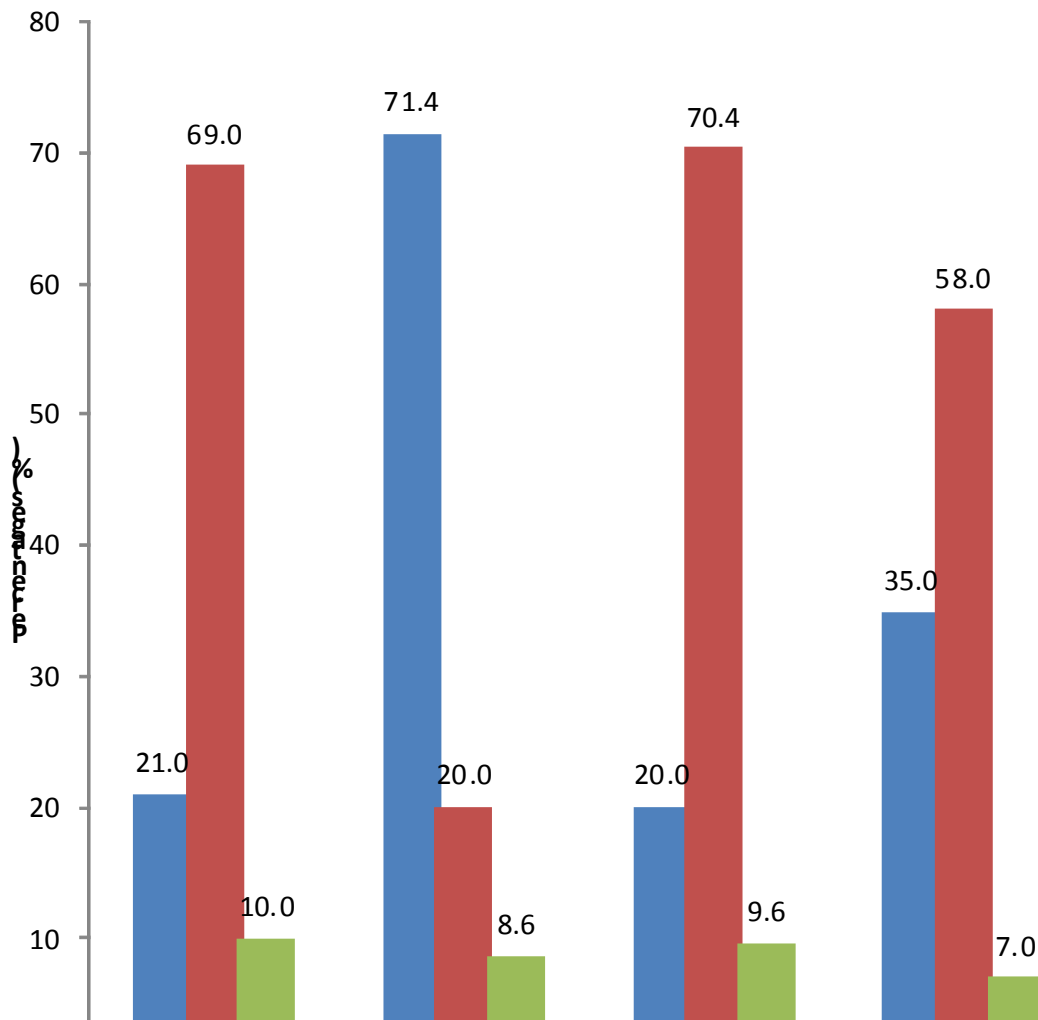
Associations	Frequency	Percentages
Women Associations	0	0.0
Hunters Associations	12	3.8
Traditional rulers Associations	26	8.1
Youth Associations	6	1.9
Non-timber forest products collectors Association	8	2.5
None of the above	268	83.7
Total	320	100.0

170 **3.1.3 Comparative Assessment of Stakeholders Involvement in the Management of**  
171 **YGR**

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

176 Government was the major key player in capacity building with 69.0% followed by NGOs  
177 (21%) and the Host community (10.0%). NGOs were the key players in awareness creation  
178 as 71.4% of the respondents asserted. Government and host communities followed in that  
179 order with 20.0% and 8.6% respectively. In terms of financing, most respondents (70.4%)  
180 asserted that Government is the key player. This was followed by NGOs (20.0%) and then  
181 HCM with 9.6% of the responses respectively. Government (58.0%) was also a key player in  
182 decision making, followed by NGOs (35.0%) and then the HCM (7.0%).

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



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

187 **3.1.4 Assessment of NGOs' Involvement in the Management of YGR**

188 The staff members of YGR were asked to indicate in their own perception the NGOs that  
 189 contribute predominantly to the management of YGR. The result is presented in Table 4.  
 190 Majority of the staff members 70.5% asserted that World Wide Fund for Nature (WWF)  
 191 contributed more to the management activities in YGR. The Nigerian Conservation  
 192 Foundation, NCF (13.7%), Friends of the Environment, FOTE (7.2%), Nigerian  
 193 Environmental Study Team, NEST (6.5%), and Nigerian Environmental Society, NES (2.1%)  
 194 followed in that order. The NGOs were involved in the management of YGR to engender  
 195 sustainable co-management of the natural resources of the YGR and its host communities



196 through sound environmental conservation practices. They were also to develop wildlife-  
 197 based eco-tourism/recreation in the YGR and its host communities as well as undertake bio-  
 198 monitoring, education and research activities in the area. According to the staff members,  
 199 the five NGOs were involved in management activities like funding, staff training, awareness  
 200 creation and decision making processes, with the WWF playing the dominant role in all  
 201 these management activities. Other NGOs contributed marginally. WWF was concerned  
 202 mainly with funding for staff training, wildlife conservation and bio-monitoring. NCF had  
 203 concern for awareness creation and eco-tourism/recreation development at YGR, while  
 204 NEST, FOTE and NES had interest in education and research activities.

205  
 206 Table 4: Involvement of Non Governmental Organizations in the management activities of  
 207 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

208  
 209 NOTE:  
 210 **NCF:** Nigerian Conservation Foundation  
 211 **WWF:** World Wide Fund for nature  
 212 **NEST:** Nigerian Environmental Study/Action Team  
 213 **FOTE:** Friends of the Environment  
 214 **NES:** Nigeria Environmental Society

### 215 3.2. Discussion

216 Inferences drawn from the involvement of the host communities in the management of YGR  
 217 indicated that they were marginally involved in the management of the Reserve. Considering  
 218 the low educational level of the inhabitants and their engagements as non-administrative  
 219 staff, their active involvement could be expected at best in providing traditional and  
 220 indigenous intelligence for management decisions on the reserve. Moreover, modern

221 school of thought on conservation and management of protected areas canvasses  
222 participatory approaches [18]. When local communities feel that both government and  
223 conservation stakeholders value wildlife more than their lives, livelihoods or aspirations,  
224 retaliation and opposition to conservation initiatives can be swift and uncompromising. One  
225 solution to this is to empower communities to manage and benefit from wildlife resources  
226 found in communal group ranch dispersal areas [19].

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

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

253 The government played the most prominent role in the management of YGR. This was  
254 shown in their involvement in capacity building, financing and decision-making. Awareness

255 campaigns on conservation practices were however propagated by NGOs. In this light,  
256 World Wide Fund for nature (WWF) was most involved due to its close attention in  
257 harnessing the endangered species in African Sub-Saharan region.

## 258 **5. CONCLUSION**

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

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

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

274 The management of YGR should work towards keeping their relationship with the current  
275 NGOs partnering with it, while more efforts are made at enlisting other NGOs in their  
276 management functions. Assistants from these NGOs and their activities should be directed  
277 at the host communities to boost and enhance their social relationship with the reserve and  
278 the host communities. **This study did not investigate the reasons for the low involvement of**  
279 **host community members in the management of YGR as well as strategies for a future**  
280 **greater involvement of HCM and types of involvement of different NGOs. The study**  
281 **therefore recommends further studies on this subject addressing the aforementioned**  
282 **inadequacies.**

283 **COMPETING INTERESTS**

284 We hereby declare explicitly that no competing interest is attached to this research activity.

285 **AUTHORS' CONTRIBUTIONS**

286 All the authors designed this study, managed literature searches, data collection and  
287 analysis. The first author, Okochi, E.A wrote the first draft of the manuscript, While Tee, T.N  
288 and Egwumah, P.O edited and approved the final manuscript.  
289

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