INTERNATIONAL JOURNAL OF CONSERVATION SCIENCE
ISSN: 2067-533X Volume 13, Issue 4, October-December 2022: 1285-1298 www.ijcs.ro

ASSESSMENT OF RURAL LIVELIHOOD IN VILLAGES AROUND OSSE RIVER PARK IN ONDO STATE, NIGERIA

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Abstract

This study assessed the rural livelihood in villages around Osse River Park in Ondo State, Nigeria. Ten villages were randomly chosen among villages surrounding the River Park. Questionnaire was administered to 150 respondents from randomly selected households to elicit information on the livelihood practices and the impacts of the park on their livelihoods. Data obtained were analyzed using descriptive statistics and chi-square analysis. The result revealed that most of the respondents were in their active age (25-54 years), predominantly married (75.3%), and with most of the respondents averagely educated (42%). Results also revealed that 72.0% of the respondents have access into the park to collect natural resources. The majority of the respondents were farmers (80.0%) with a household monthly income ranging from ₦18,100- ₦ 40,000. There is a significant difference in the community Ajagbale ($\bar{x}$ = 105.4) and Ifon ($\bar{x}$ = 99.38) to the livelihood activities of villagers living around the park. The park management should resolve the problem of wildlife pest to avert conflict, hostility and breeding of negative attitudes towards conservation. It is recommended that government and non-governmental organizations should create insurance and compensation schemes to make up for losses incurred by the villagers to stimulate their support.

Keyword: Assessment; Rural; Livelihood; Park; Villages; Osse River Park

Introduction

The management of established protected areas (PAs) has become fundamental to biodiversity conservation strategies [1, 2]. However, in Africa generally and Nigeria in particular human degradation is posing a serious concern to the success of this conservation strategy due to economic hardship and poor means of livelihood which is imposed on the common man mostly due to poor governance. Prohibition and exclusion of the local people from land and natural resources use as well as relocating people from their traditional lands has been the major characteristics of protected areas [1]. Protected areas are important in the provision of ecosystem services for surrounding communities through the production of food and other forest product obtained in the protected areas [3-5]. Adjacent communities to protected areas bear the costs of conservation through restriction from protected areas, and their

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non-compliance with these rules can influence their support, attitude and perception towards the protected areas [6].

Protected areas affect the livelihood and general well-being of the local people most especially in developing countries because they depend solely on agriculture and natural resources as means of livelihood [7]. A major determinant of either positive or negative attitudes towards conservation is the benefits and costs experienced by local people from the protected areas [8]. Wildlife can have direct costs for humans, such as loss of human life, crops, livestock, and livelihood resources [9]. This makes the rural villagers extremely susceptible to protected areas while trying to sustain livelihood. Negative perception can have a strong effect on local peoples' behaviour thereby leading to the destruction of natural resources. Most often, wild animals are poisoned or hunted as a measure of controlling them by persons with negative feelings toward wild animals. Maintaining the balance between the needs of the local people and biodiversity conservation has been a major task for protected area managers in recent years [10].

The feelings of infringement by protected areas on the cultural right of the local people and socio-economic activities due to conservation activities may often lead to resentment and lack of support for conservation goal [11, 12]. Also increased demand and over-exploitation of accessible natural resources in protected areas is due to the poverty among rural people [13]. The rise in biodiversity loss and conflicts between local communities and conservation initiatives has been attributed to the poor public relations and non-involvement of local communities in conservation activities [14]. Protected areas that provide alternative livelihood and make provisions for the socio-economic benefit for local communities are likely to fulfil their conservation goals and desired outcomes [15]. The possible denial of access to natural resources in the protected areas due to conservation strategies would likely cause negative perceptions about the benefit and relevance of conservation [16]. There is therefore the need to maintain a balance between the competing demand, livelihood survival and conservation of natural resources. This study is more important since Osse River Park is one of the major reserves in Ondo State. This study was therefore conducted to assess the rural livelihood in villages around Osse River Park, the impacts of River Park on household's livelihoods and perception and attitude towards Osse River Park.

Materials and method

Study area

The research study was carried out at Osse River Park (formerly known as Ifon Game Reserve) in Osse local government area of Ondo State, Nigeria. The reserve covers a total area of 282.72km^2 which is equivalent to 8.4% of the state and it is situated between latitudes 6˚ 40″ and 7˚ 15 ″ North and longitude 5˚ 43 ″and 5˚ 55 ″ East. Osse River Park has a unique quality because of its high forest vegetation as well as Savanna which made it easily accessible from all sides because of its central location [17].

Osse River Park has a boundary in the west and south by the Akure Benin express road, on the north-west by Ipele- Ido-ani expressway and on the east by river Osse and Asaboro rubber plantation [18]. Osse River Park has a unique ecosystem diversity because of its high forest vegetation as well as Savanna. The three major vegetation types in the park include tropical rainforest area covering 50% (150.22km^2), savanna woodland including forest/savanna mosaic which covers an area of 132.48km^2 and the riverine forest which occurs along with the courses of the major rivers draining the reserve. As a result of its location, it is easily accessible from all sides by visitors coming from the Southern and Northern parts of Nigeria. It is about 20 km from Owo, 80km from Akure, 6km from Ifon and about 80km from Benin City [19]. The reserve is drained by five important rivers which include Big Osse, little Osse and river Uwese, Okua and Orokin. Osse River Park is surrounded by various communities including towns,

villages, settlements and camps among which are: Ifon, Igbo-nla, Ikaro, Uwesse camp, Omi-arafa, Ori-ohi camp, Ipele, (Igbogburu (Ido-ani), Ago-Igbira, Ago-Alao, Ofale) and Elegbeka. While Ipele is under Owo Local Government Area, other communities fall under Osse Local Government Area. None of these communities is situated within the park protected area [19].

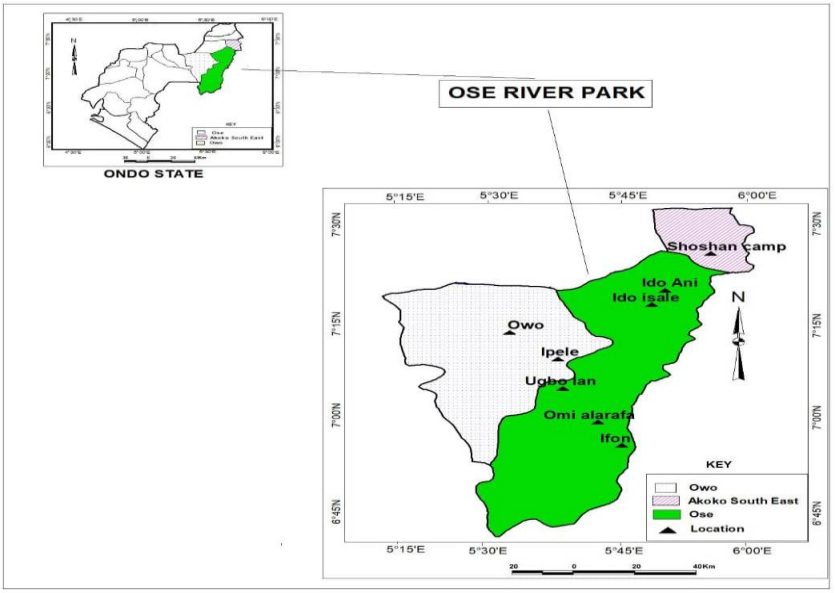

Fig. 1. Map of Osse River Park

Sampling procedure and Data Collection

The study areas' selection was through a purposive sampling of villages based on their proximity to the Park. The questionnaire survey used both closed and open questions and involved interviews of 150 respondents from randomly selected households from 10 villages: Ago-Imam, Uwese Camp, Shosha camp, Ipele, Ago idaji, Ago-Alao, Ajagbale, Omi-Alafa, Ifon, and Elegbeka. Respondents cut across the household heads, and his wife or other adults who represented the household. The household questionnaire was intended to collect information about household characteristics (age, sex, level of education and number of household members), different economic activities (e.g., crops production, fishing, and business), costs and benefits, and types of assets owned (e.g., land size, livestock), as well as household perceptions and attitudes towards conservation activities. The study was conducted for a period of 12 weeks (January – March, 2019)

Data Analysis

Data obtained were analyzed with descriptive statistics (percentage, table and bar chart). A correlation analysis (using Chi-square) was carried out to ascertain the relationship between household heads' characteristics and livelihood activities.

Result

Table 1 shows the demographic characteristics of the households. The majority of the respondent were male (75.3%) while (24.7%) were female. A significant proportion of the respondents (62.0%) were within the age range of 25-54 years. The result further revealed that the majority of the respondents were married (87.3%), while 10.7 % and 2.0% were single and divorced respectively. The major occupation of the respondents is farming (80%). The educational qualification of respondents revealed that most of the respondents (42.0%) had

secondary school education while 9.3% had tertiary education. On the household income, 42.0% of the respondents earned monthly income ranging from ₦18,000- 40,000 while 28.0% earned less than ₦18,000 per month, which was below the minimum age. The result of the household size by age reveals that the majority of respondent's households were within age size 0-10 (36.8%) while age size 41-50 were the least (0.8%). However, the majority of the respondents 67.30% had lived for over 10 years while 3.30% had lived for less than a year in the village around the river park. Farming is the major source of livelihood 76.7%, followed by livestock keeping 14%.

Table 1. Demographic characteristics of the households

Variable		Frequency n==150	Percentage (%)
Sex	Male	113	75.3
	Female	37	24.7
Age	15-24	18	12.0
	25-54	93	62.0
	55-64	20	13.3
	65 Above	19	12.7
Religion	Christianity	90	60
	Islamic	60	40
Marital status	Single	16	10.7
	Married	131	87.3
	Divorced	3.0	2.0
Occupation	Farming	120	80.0
	Trading	19	12.7
	Artisan	5.0	3.3
	Civil servant	6.0	4.0
Education	Non formal	19	12.7
	Primary	54	36.0
	Secondary	63	42.0
	Tertiary	14	9.3
Household income	<18,000	42	28.0
	18,000-40,000	63	42.0
	41,000-60,000	12	8.0
	61,000-80,000	17	11.3
	81,000 – 100,000	10	6.7
	101,000 and above	6	4.0
Household Ages	0-10	135	38.6
	11-20	129	36.9
	21-30	65	18.6
	31-40	17	4.8
	41-50	3	0.8
Years of residency	less than a year	5	3.30
	1-5 years	19	12.70
	6-10 years	25	16.70
	Above 10 years	101	67.3
Major Sources of livelihood	Farming	115	76.7
	Livestock	21	14.0
	Palm wine tapping	2	2.7
	Trading	9	6.0
	Civil Servant	1	1.7

The result of response to livelihood activities and park dependency around Osse River Park is shown in Table 2. A good number of the respondents (72.0%) revealed they were allowed to collect forest products while 28.0% indicated they have no access to the forest product. The result revealed that the respondent's access to the park is limited through conditional access (46.7%) and collection of forest products were done daily (64.7%). Farming (67.3%) is the major source of income among the respondents.

However, 50.7% believed that their livelihood activities do not have any impact on the wildlife population and the conservation of the river park. The respondent's form of cooking

energy was majorly firewood (80%) and the source of cooking energy were derived from the village forest (34.7%). Also, 41.3% of the respondents cultivated land 4-6km from the river park. The result of response to livelihood activities and park dependency around Osse River Park revealed that majority of the respondents (72.0%) indicated that they were allowed to collect natural resources.

Table 2. Respondents Livelihood activities

Livelihood questions	Frequency	Percentage (%)
Access into the park		
Yes	108	72.0
No	42	28.0
Type of access		
Conditional	70	46.7
Open access	43	28.7
Shared arrangement	3`	2.0
No access	34	22.7
Frequency of collection of forest product		
Daily	97	64.7
2-4 times a week	16	10.7
Once a week	6	4.0
Every two weeks	1	7.0
Don't visit the park	30	20.0
Forms of cooking energy		
Firewood	120	80.0
Charcoal	3	2.0
Kerosene	9	6.0
Gas	18	12.0
Sources of cooking energy		
Village forest	52	34.7
Community land	6	4.0
Within the river park	55	36.7
Owned farmland	19	12.7
Other source of energy	18	12.0
No	67	44.7
Impact of activities on wildlife resources		
Yes	74	49.3
No	76	50.7
Hunting	1	0.7

The result shows that households settled far from the park have access to larger farmland when compared with villages settled close to the park. Most households settled far from the park owned farmlands above 6 acres (47.7%), while households (56.8 %) close to the park recorded farmlands less than 1 acre, ($\chi 2 = 150.0$, df = 3, $P \leq 0.001$, Fig. 2).

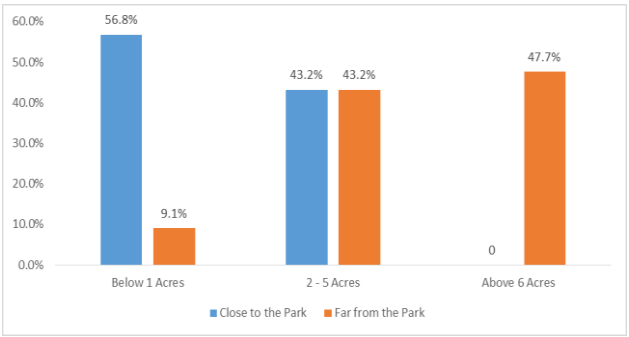

Fig. 2. Farmland size of households in relative to distance from the park boundary

The number and type of livestock owned by the villages close to the park and those far from the park differed (χ^2 = 15.45, df = 6, P ≤ 0.017). Most livestock were kept in the villages settled far from the park. Only pig was not kept by villages far from the park (Table 3). Figure 3 revealed the crop damaged which include cassava, yam, cocoa, maize, plantain, tomatoes, banana, pepper, melon, sugar cane and vegetable. Cassava (44%) and yam tubers (26%) were reported as the most damaged crop. The villagers identified seven (7) species of pest but stated that the grasscutter (30%) was the major pest destroying the farmers' crops and affecting their livelihood. Others include bushpig (16.8%), hare (13.3%), monkeys (20.1%), bushbuck (12.0%), guinea fowl (2.7%), and squirrel (10.1%) as problematic animals (Fig. 4).

Table 3. Livestock's number and type kept by the households

Villages	Types of Livestock					
	Chicken	Goat	Turkey	Guinea fowl	Pig	Cow
Close to Park	18	14	4	5	2	1
Far from Park	58	16	15	12	0	5

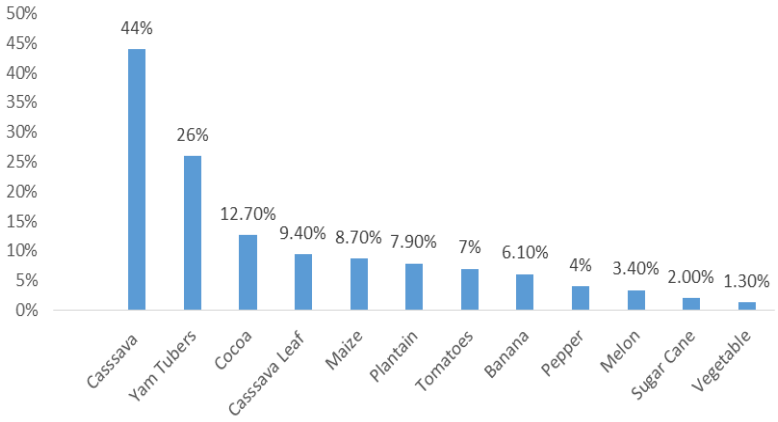

Fig. 3. Crop damaged by wildlife

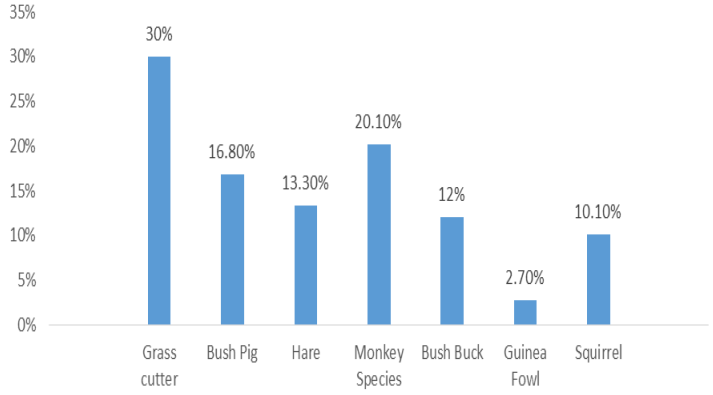

Fig. 4. Animals feeding on the crop

The result revealed that benefits were derived from Osse River Park (74.7%). It was also revealed that about 99.3%, 58.7%, 88.3% and 85.3% of the respondents have access to school, medicinal plants, water and firewood and building material respectively. The study identified less participation in eco-tourism activities (20.0%). However, the respondents claimed they have access to school (99.3 %), water for domestic livestock (88.3%) firewood

and building materials (85.3 %) and medicinal plants (58.7 %) from the Osse River Park (Table 4).

Table 4. Respondents Benefit derived from Osse River Park

Benefits derived from the Park	Yes	No
Benefit derived	112(74.7)	38(25.3)
School	149 (99.3)	1 (1.7)
Medicinal plant	88 (58.7)	62 (41.3)
Access to water	125 (88.3)	25 (16.7)
Firewood and building material	128 (85.3)	22 (14.7)

Table 5 shows respondents' perceptions and attitude towards Osse River Park. Almost all of the respondents (86.0%) revealed that they have a cordial relationship with the park and they report illegal activities which were conducted inside the river park (66.0%). Also, most of the respondents revealed that family members were not employed by the river park (95.3%). However, the majority of the respondents (67.3%) claimed that they enjoy the services provided by the park. Respondent's source of obtaining information about conservation issues shows that the majority of the respondents (72.0%) obtained information through Extension Officers. Furthermore, most of the households (84.0%) were not involved in the decision-making process in the park.

Table 5. Perception and Attitude towards Osse River Park

Perception/Attitude question	**Frequency**	**Percentage (%)**
Relationship with the reserve:		
Bad	21	14.0
Good	129	86.0
Reporting illegal activities:		
Yes	99	66.0
No	51	34.0
Involvement in ecotourism activities:		
Yes	30	20.0
No	120	80.0
Service provided by Osse River Park:		
Yes	101	67.3
No	49	32.7
Sources information about conservation:		
Extension officer	108	72.0
Village meetings	18	12.0
From friends	24	16.0
Involvement in decision making		
Yes	24	16.0
No	126	84.0

Commonly killed wild animals include *Thryonomys swinderianus* (40.1%), *Tragelaphus scriptus* (31.2%), *Synceru scaffer* (1.3%), *Erythrocebus patas* (11.2%), *Potamocherus porcus* (22.7%), *Lepus capensis* (16.7%), *Xerus erythropus* (11.4%), *Naja nigrocolis* (15.4%), *Erethizan dorsatum* (1.7%), *Francolinus bicalcaratus* (3.3%), *Loxodonta africana* (1.7%), *Pan troglodytes* (1.7%) and *Crocodylus niloticus*, (1.4%) (Table 6)

The result of the hypothesis "there is a significant difference in respondents' utilization of the river park around the study locations" was tested using the Kruskal-Wallis test and the results were presented in Tables 7 and 8. Result reveals that there is a statistically significant difference $\chi^2 = 35.029$, $P < 0.05$. Table 8 shows that there is a significant difference in the community Ajagbale ($\bar{x} = 105.4$) and Ifon ($\bar{x} = 99.38$) to the livelihood activities of villagers living very close to the Osse River Park in Ondo State. This implies that the rural villagers living around the river park in Ondo State utilize the park for sustaining their livelihood more

compared to the remaining communities. It was observed that individuals involve in utilizing the Osse river park in Ondo State were mostly the Ajagbale and Ifon community hence the influence on their use of utilizing the river park to sustain their livelihood.

Table 6. Scientific names and common names of animals killed in the park

S/No	Scientific Name	Common Name	Frequency	Percentage
1	*Thryonomys swinderianus*	Grass Cutter	60	40.1
2	*Tragelaphus scriptus*	Bush buck	47	31.2
3	*Syncerus caffer*	Buffalo	2	1.3
4	*Erythrocebus patas*	Red patas monkey	17	11.2
5	*Potamocherus porcus*	Red river hog	34	22.7
6	*Lepus capensis*	Hare	26	16.7
7	*Xerus erythropus*	Squirrel	11	17.4
8	*Naja nigrocolis*	Spitting cobra	23	15.4
9	*Steptopella senegalensis*	Laughing Dove	1	0.7
10	*Francolinus bicalcaratus*	Francolins	5	3.3
11	*Pan troglodytes*	Chimpanzee	1	0.7
12	*Numida melegris*	Guinea fowl	3	2.0
13	*Erethizan dorsatum*	Porcupine	1	0.7
14	*Loxodonta Africana*	Elephant	1	0.7
15	*Haliaeetus vicofer*	Eagle	1	0.7
16	*Crocodylus niloticus*	Crocodile	2	1.4

Table 7. Kruskal-Wallis test showing the difference of use/dependency of the park on the livelihood of the villagers around the study location

	Livelihood Activities
Chi-Square	35.029
Df	9
Asymp. Sig	0.001

Table 8. Mean Ranks

Community name	**N**	**Mean Rank**
Livelihood Activities		
Ago-Iman	12	59.46
Shosha	19	40.42
Owo	1	72.00
Ipele	44	81.49
Ago idaji	7	59.57
Ago Alao	1	58.50
Ajagbale	17	105.44
Elegbeka	7	93.86
Ifon	20	99.38
Omi-Alafa	22	57.89
Total	150	

Discussion

A large percentage of the respondents were male. This might be due to a culture which forbids women from participating in discussions or meetings involving men, thus women were not allowed to contribute when males are not around. This is in line with a study conducted in two National parks in Ghana and Tanzania where the majority of respondents were male [20]. Households in patriarchal African societies like the study area, are usually headed by males [21, 22]. The age group with the highest frequency was between 25-54 years indicating that the

respondents were still in their active age and as such, can undergo the stress and this has implications for the productivity of the respondents. This is similar to the study carried out in Od Oyo national park [23]. Farming was reported to be the major occupation of the respondents. This is an indication that farming was the major livelihood activity of the respondents living in the surrounding communities of the Park. Similarly, most of the communities around Kainji Lake and Cross River National Parks were farmers [24] and farming was the major livelihood activity of the people who live in the surrounding communities of the Park [25].

Most of the respondents had secondary school education, this is relatively high when compared with other studies [23, 25, 26]. This could be as a result of the closeness of some of the villages to urban areas. The literacy level of the respondents has been known to affect perception and relationship with the Park and its natural resources. The more educated individuals, the higher their support and involvement in park conservation of natural resources [27]. On the household income, most of the respondents earned monthly income below ₦ 18,000 ($52.17) which is below the minimum wage. This is an indication that most of the households' incomes were low considering the existing inflation rate and the uncertainty in the household income during the farming off season. The low-income families around the protected areas have been known to heavily depend on the natural resources in the protected areas for their livelihood. This observation is in line with a study which stated that when households are unable to generate enough income from farming, they depend more on natural resources for subsistence use and cash [28]. Communities around the protected areas rely on natural resources for their livelihood and forest products are essential in income generation and employment [29].

The study revealed that that livelihood assets among the villages varied, villages far away from the park have more livelihood assets than those close to the park. In terms of the farmland, households closer to the park have farmland less than 1 acres and without farmland above 6 acres, while households living far from the park have bigger farmlands. Households closer to the park have less farmland due to the restriction to farmland, since most of the lands are now under the control of the park. This will bring about low farm income and greater dependence on the park resources. This finding is in line with similar studies [26, 30]. A similar study at Kainji Lake National Park, Nigeria indicated that a greater portion of farmlands had been taken over by the government for the establishment of the Park, with reduced the size of land available for farming activities [25]. Also, households leaving close to the park have lesser livestock when compared with those leaving far from the park. This could be because villages leaving around the park have access to hunting wild animals to shore up their protein uptake and income. Since many of the households claimed unrestricted access to the park resources.

Among the most cultivated crop in the communities, Cassava and yam were reported as the most damaged crops by wildlife. This study confirms the report on incidences of the human-wildlife conflict involving encroachment of farms and destruction of food crops around protected areas by wild animals [31]. The study shows grasscutter as a major pest destroying crops and affecting farmers' livelihood. This is as a result of the closeness of their villages and farms to the park boundary, animals roam from the park because there is physical restrain at the boundary with the villages. Similar crop destruction by wild animals in Kainji Lake National Park Nigeria and Mole National Park, Ghana was observed [32]. Previous studies [27, 30] attributed causes of human-wildlife conflict to wildlife species such as rodents, primates, and ungulates destroying crops.

Most of the respondents also indicated that wild animals were killed in the area among which three species (Elephant, Buffalo and chimpanzee) were classified as endangered species by the International Union for Conservation of Nature and natural resources (IUCN) Redlist of

threatened species. A report indicated that then Ifon game reserve now Osse Park is rich in natural resources, but it has been heavily encroached, depleted and heavily degraded through illegal logging, hunting and farming and this has resulted in the loss of most of its resources [33]. Unrestricted access and over-exploitation of natural resources has been known to lead to the disappearance of many wildlife species.

The respondents claimed they derive benefits from the park ranging from access to school, medicinal plants, water, firewood and building material. It was also revealed that the benefits obtained were fairly distributed. There is a need to compensate communities and vulnerable households around protected areas with no access to forest resources, by providing livelihood projects that will benefit the people around the protected areas [34, 35]. A study on livelihood and conservation reported that local people living around protected areas were interested in participating livelihood projects that will benefit them [36]. Provisions of benefits from the conservation activities foster cooperation and participation which is needed for the achievement of conservation goals [37].

Respondent's source of obtaining information about conservation issues shows that most of the respondents obtained information through extension. Conservation education is an essential tool for sustaining and strengthening the knowledge of the local people which is necessary for biodiversity conservation [38, 39]. The study revealed that most of the respondents' households were not involved in the management of natural resources in the park and they are willing to be involved if engaged. Conflict often results when local communities around the protected areas are denied the opportunity of using natural resources and are excluded in decision making. It is difficult for local people to protect resources from which they receive no benefit nor are involved in its management. Similar studies conducted in Kainji Lake and Cross River National Parks affirmed this [27]. It has also been reported that attitudes, perceptions and impacts that local people have experienced from conservation activities are essential factors influencing sustainable and effective conservation activities [40]. Benefits derived from conservation-related efforts can positively influence local peoples' perception and attitudes towards protected areas [41].

A higher proportion of the respondents' believed in the establishment and existence of the park, however, they want the wild animals restricted within the park. This is an indicator of a right attitude towards the conservation of natural resources, even though their livelihood is threatened. The sustainable and effective conservation of wildlife resources around protected areas is dependent on the cooperation and involvement of the people whose livelihoods are affected by the establishment and management of the protected areas [27].

Conclusions and Recommendations

The overall assessment indicates households living around Osse River Park were mainly farmers and depends on the park for the sustainability of livelihood, although a few of them were involved in other activities. The household livelihoods of the communities were poor and will increase their dependence on the park resources. Access to resources by the households was the determinant of their different livelihood activities. Most of the villagers living close to the park have limited access to land for farming. The study further shows that villages around the park benefited from the park, in the form of social-service-related projects. The study revealed that crop damage from wild animals was very common in the area and responsible for the conflict, wrong attitude and perception about the park, which if reduced can encourage cooperation and right attitude towards the park. The study revealed that the main factor provoking negative attitudes toward wildlife conservation around the park is crop damage,

which if reduced could encourage a strong positive attitude. Osse River Park has many wildlife species which must be protected, most especially Elephant and Chimpanzee which has been previously sighted and effort must be made to protect them and the natural resources found in it. It is recommended that conservation education in terms of extension service should be encouraged to imbibe the culture of conservation for sustainable development and also create public awareness concerning the importance of the park. There is a need to introduce compensation and insurance schemes to make up for damages caused by wildlife pests and reduce the financial burden on their livelihood.

Acknowledgements

The authors are grateful to the staff of the Ministry of Environment, Department of Natural Resources, most especially Mr O. Aladelusi and Mr A. Solomon of the Department of Wildlife, Ministry of Natural Resource, Ondo State for rendering assistance towards research work.

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Received: October 10, 2021
Accepted: September 3, 2022