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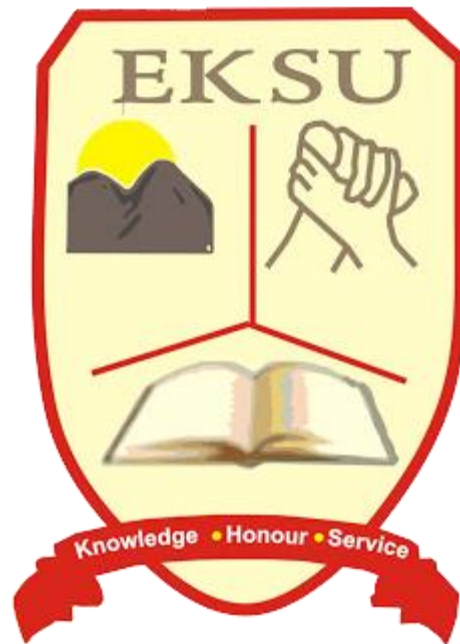
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Poaching and its impact on Wildlife Population in Ise Forest Reserve, Ekiti State.

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Abstract

Poaching wildlife for food is a major threat to wildlife conservation in Nigeria where the demand for bushmeat is ever-increasing, decimating wildlife resources in the protected areas. This study examines poaching and its impact on wildlife populations in Ise forest reserve, Ise-Ekiti, Ekiti State. Twenty-one forest officials and 23 hunters were interviewed using pre-tested structured questionnaires. Market surveys and short reconnaissance surveys were also carried out to sample animal species being poached and data collected were analyzed using descriptive statistics. The results show that 90.5% of the respondents were married and 61.9 % had no formal education. The majority (85.7%) combined hunting with farming and 52.4% earned between ₦20,000 and ₦30,000 monthly while 43.5% used Dane-gun, snare (30.4%), and traps (23.9%) and 67.86% hunt at night with 74.1% hunting ungulates with at least 2 kills per week. However, 85.7% agreed to a sharp decline in species being hunted with habitat destruction (52%), habitat fragmentation (40%), and slash and burn (8%) being the major threat to wildlife population in the reserve. Additionally, the prohibition of the unauthorized entry (52.8%), issuance of a hunting license (41.7%), and regulating hunting seasons (5.6%) would curb illegal hunting in the reserve. There is the need for active participation of the communities around the forest reserve in the planning and implementation of forest policies for the conservation of the animal diversity within the reserve for posterity.

Keyword: Poaching, bushmeat, questionnaire, Dane-gun, respondents, posterity

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Introduction

Wildlife populations are declining at an unprecedented rate across much of the globe (Novacek and Cleland 2001). The world is currently experiencing a mass extinction event with the loss of

large numbers of species as a direct result of human activities (Wake and Vredenburg, 2008). Of the world's 5,490 mammals, 79 are Extinct or Extinct in the Wild, 188 Critically Endangered, 449

Endangered, 505 Vulnerable and now 1,677 reptiles are listed on the IUCN Red List with 293 alone added in the year 2009 (IUCN 2009).

Rapid human population growth, climate change, and habitat conversion are causing the decline of many species (Thomas *et al.*, 2004) and hunting for meat and income is an additional key factor reducing wildlife across much of Africa, Asia and South America (Fa *et al.*, 2002). Evidence now exists that illegal hunting and the bushmeat trade also represent a severe threat to wildlife populations in the African region (Lindsey *et al.* 2011). Until recently the scale of the problem has not been adequately acknowledged and as a result, inadequate resources are available to address the issue.

Poaching, which involves the illegal killing, hunting, and capturing of wild animals for sale, is the biggest threat to wildlife after habitat destruction. Poaching is hunting without legal permission and the difference between poaching and hunting is the law (Worldanimalfoundation, 2017). Legal hunters also kill tens of millions of animals per year. For each of those animals, another animal is illegally killed. Whether done legally or illegally, all types of hunting have led to the extinction of species. If not controlled, many more animals will be doomed to extinction. The rise in human population has been accompanied by rapid economic growth in some parts of the world which has led to affluence and a huge and growing demand for a wild animal and animal by-products (Worldanimalfoundation, 2017)

Bushmeat hunting has been an important subsistence activity in many rural parts of Africa throughout history (Bowen-Jones *et al.*, 2003). Bushmeat serves as a key protein source and provides an alternative to livestock meat, especially in areas where tsetse flies are prevalent (Barnett 2000.). However, extensive bush meat hunting often causes pressures on various wildlife species, leading to their decline (Damania *et al.*, 2005) and frequently involves illegal hunting. In Central and West Africa, bushmeat offtake has been observed to occur at unsustainable levels, with harvest levels estimated to range from 1 to 3.4 million tons per year (Wilkie and Carpenter 1999). Increased and unsustainable levels of hunting have been a major cause of biodiversity loss and decline in wildlife populations throughout Africa (Redmond *et al.* 2006.) Poaching threatens not only wildlife but also local fish and plant populations. From an equity perspective, poaching deprives legitimate users, consumptive as well as

non-consumptive, of resource utilization opportunities (Muth and Bowe 1998). Unregulated hunting may also increase the danger of transmission of zoonotic diseases (Karesh and Noble 2009). Despite existing laws and regulations regarding hunting in Africa, it is difficult to restrict the use of bushmeat, as many rural people depend upon it to meet their basic nutritional needs (Robinson *et al.*, 2002). Poverty is known to be a major driver for illegal hunting by people living around protected areas (Songorwa *et al.*, 2007). Increased human populations around protected areas often result in escalating pressures on wildlife resources, and greater population densities are known to exacerbate illegal hunting (Røskaft *et al.*, 2009). Since bushmeat hunting is typical of areas with low food security and few realistic alternative meat sources, understanding the social contexts of communities in rural areas is essential for developing strategies to reducing the problem (Westphal *et al.* 1999). To identify the drivers behind and levels of bushmeat hunting, consumption, and trade in the communities around national parks and game reserves, it is necessary to obtain a realistic picture of how local populations perceive and understand specific social issues and livelihood conditions. It is widely accepted that current biodiversity loss and poverty are interwoven and that poverty and conservation must be recognized and addressed as interlocking challenges (Wolmer *et al.* 2004). This study, therefore, seeks to assess poaching and its impact on wildlife population, identify various methods of hunting employed in the harvesting of wildlife resources, identify the species of animals most hunted and why this animal is preferred and identify factors encouraging the illegal killing of wildlife resources in Ise Forest Reserve.

Materials and Methods

Study Area

Ise forest reserve is located in Ise-Ekiti, Ekiti State, South-West Nigeria between the latitude of 7.38(7°22 60 N) and longitude of 5.37(5°22 E) with an elevation of 366 meters above sea level, covering 56.77 km². Sunrises at 6:21 am and set at 7:27 pm. The reserve can be accessed from Ise Ekiti town which is about 6 km in a straight direction to the northern edge of the reserve (Figure 1). The weather is warmest in March with an average temperature of 32.8 °C at noon while December is

the coldest with an average temperature of 18.9 °C at night. The wet season has a rainfall peak around July and the dry season is around January. The land area is not cultivated as most of the natural vegetation is still intact. The landscape is mostly covered with mosaic croplands/vegetation. The

climate is classified as a tropical savanna (winter dry season), with a tropical dry forest biozone. The soil in the area is high in lixisols (lx), soil with the clay-enriched lower horizon; low cations exchange capacity (cec), and high saturation of bases.

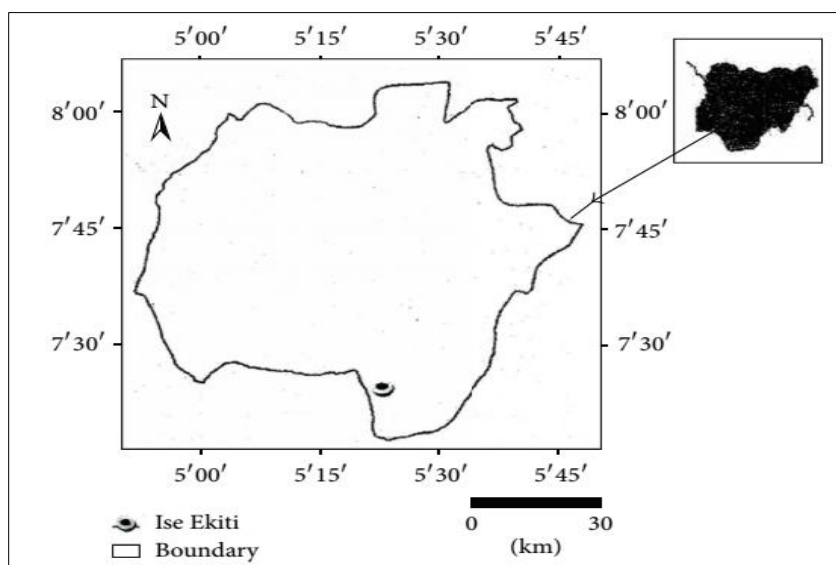


Fig 1: Map of the Study Area

Source: Orimaye *et al.*, 2016

Method of Data Collection

Data were obtained through the use of a structured questionnaire administered on hunters and forest officials. Market surveys and reconnaissance surveys were also carried out. Twenty-one (21) hunters were interviewed using a structured questionnaire on one to one basis. Questionnaire administration was done in the evening when they were found in a relaxation mood on one to one basis. The questionnaire was also administered on the forest officials in a common location in Ise-Ekiti and Ado-Ekiti during their monthly briefing. Questionnaires were administered to individual forest guards to be filled and returned immediately.

A market survey was also carried out three times during this time of visitation to the forest reserve. The area of the market visited were the bush-meat section of the market where animal killed by hunters were displayed for sale. Photograph of the commonly found animals on display was taken and the list of the animals was compiled.

Short forest reconnaissance (recce) surveys were carried out in the forest reserve. Hunter's trails and old logging routes were used in the forest reserves.

Transect length surveyed ranges between 4 km and 7 km in the reserve. Transects were traversed twice daily each day between 07.00 – 9.00 and evening 15 – 17.30 hours. The adjoining forest was also searched out for animal activities such as feeding signs, nesting sites, and listening to their calling. GPS locations of activities were taken and recorded. Data obtained were analyzed using the descriptive statistical method. Simple percentages and frequency were presented in tabular form.

Results

Table 1 below shows the socio-economic status of the respondents. Hunters interviewed out of the seven adjoining villages shows that Edege village had the highest (33.3%) number of respondents, followed by Abdul, Oparun, and Orente villages with 14.3% each while Ojo-Akute village had the least (4.8%), respondents. The gender distribution of the hunters interviewed shows that all were male with the majority (81.0%) falling between the middle-class age of 21 and 40 years, 14.2% were between 41 and 60 years while 4.8% were below the age of 20 years.

Similarly, 90.5% of the respondents were married, while 9.5% were single in the study area. The educational status of the hunters reveals that 61.9% had no formal education, 33.3% had primary education while 4.8% had secondary education. Also, majority (52.4%) of the respondents earned between ₦20,000 and ₦30,000, 28.6% earned between ₦10,000 and ₦20,000, and 14.3% earned above ₦30,000 while 4.8% earned below ₦10,000. On the occupation of the respondents, the majority (85.7%) combined hunting with farming while only 14.3% of the respondents were hunters.

Moreover, the interview of forestry officials shows that all respondents are male and the highest percentages (69.6%) came from Ise-Ekiti, 26.1% from Ilawe-Ekiti, and 4.3% from Aba-panu. The age class of the respondents reveals that 60.9% were between 21 and 40 years while 39.1% were between 41 and 60 years of age with all of them happily married. Furthermore, 47.8% of the respondents attained secondary education, 39.1% had tertiary, and primary had 13.0%.

Table 1: Socio-Economic Status of Respondents

	Frequency	Percentage (%)
Hunters		
Village		
Edege	7	33.3
Abdul	3	14.3
Orente	3	14.3
Sunday	2	9.5
Panu	2	9.5
Oparun	3	14.3
Ojo-Akute	1	4.8
Sex		
Male	21	100
Age		
<20 years	1	4.8
21-40 years	17	81.0
41-60 years	3	14.2
Marital status		
Married	19	90.5
Single	2	9.5
Educational background		
No formal education	13	61.9
Primary	7	33.3
Secondary	1	4.8
Income (monthly)		
<10 000	1	4.8
10 000-20 000	6	28.6
20 000-30 000	11	52.4
>30 000	3	14.2
Occupation		
Hunting	3	14.3
Hunting & farming	18	85.7
Forest Officials		
Village		
Ise	16	69.6
Ilawe	6	26.1
Aba panu	1	4.3
Gender		
Male	23	100
Age		
21-40 years	14	60.9
41-60 years	9	39.1

Marital status		
Married	23	100
Educational background		
Primary	3	13.0
Secondary	11	47.8
Tertiary	9	39.1

Source: field survey 2014

Table 2 shows the methods and tools engaged in wildlife harvesting in the study area. The result shows that 85.7% of the respondents combined both hunting and farming as their major sources of livelihood while only 14.3% had hunting as their main profession. Similarly, a large percentage (67.86%) of respondents hunt at night, 25.0%

combined both day and night hunt while 7.14% were involved in day-time hunting using individual hunting methods. The table further revealed that the majority of the respondents used Dane-gun (43.5%), snare (30.4%), and traps (23.9%) while 2.2% were involved in the use of catapult in harvesting wildlife from the reserve.

Table 2: The methods and tools engaged in wildlife harvesting in the study area

	Frequency	Percentage (%)
Full-time hunter		
Yes (Hunting only)	3	14.3
No (Hunting and Farming)	18	85.7
Hunting time		
Day-time only	2	7.14*
Night	19	67.86*
Both	7	25.00*
Method of hunting		
Individual hunting	21	100
Group hunting	0	0
Tools used for hunting		
Dane-guns	20	43.5*
Traps	11	23.9*
Snare	14	30.4*
Others	1	2.2*

* More than one response

Source: field survey 2014

Table 3 shows the array of species being hunted and various reasons for hunting the species. The result shows that ungulates (74.1%) were most hunted, followed by reptiles (18.5%), primates (3.7%), and birds (3.7%). Furthermore, 95.2% of the respondents assert that they hunt other species of animals while 4.8% hunted only the listed wildlife. On the sexual category of animals hunted, 50% agrees that they hunt both sexes, 38.10% hunted males while 11.90

hunted female. Likewise, 45.7% of the respondents claimed that they recognized the animals to be killed by their genital parts, 40.0% by their size (the males are usually bigger than the females) while 14.3% recognized the animals by colour. More so, the reasons for hunting wild-animals were identified. A large percentage (51.3%) hunt for their household consumption while commercial hunting had 48.7% of the respondents.

Table 3: Species of Animals Hunted and Reasons for Hunting

	Frequency	Percentage (%)
Species of animals hunted		
Primates	1	3.7
Ungulates	20	74.1
Reptiles	5	18.5
Birds	1	3.7
Other species hunted		
Yes	20	95.2
No	1	4.8
Sex of animals hunted		
Male	16	38.10*
Female	5	11.90*
Both	21	50.00*
Recognition of the animals		
Colour	5	14.3
Size	14	40.0
Genital parts	16	45.7
Reasons for hunting		
Subsistence	20	51.3
Commercial	19	48.7

* More than one response

Source: field survey 2014

Table 4 shows the extent of Wildlife depletion due to poaching. The hunting experience of the majority (47.6%) of the respondents is between 5 -10 years, 28.6% is between 10-20 years, 14.3% is between 20 years above while 9.5% is below 5 years. However, most (76.2%) of the respondents engaged in hunting activities 2 times in a week, 19.0% between 3-4 days while 4.8% only once in a week. Furthermore, a large percentage (76.2%) of the respondents kill at least 2 animals per week, 19.0% up to 3 animals per week while 4.8% kill 1 animal per week. On the population status of the specie hunted in the forest reserve, the majority (85.7%) of the respondents agreed to a sharp decline in their population while 14.3% claimed a stable population. However, the majority (76.2%) of the respondents have their highest kill during the dry season, 19.0% during the raining season while 4.8% claimed that it is no difference in the two seasons. The table also shows that the majority (95.2%) hunt within the forest reserve with only 4.8% in other forests apart from the forest reserve.

Table 5 shows the opinion of Forest guards on the factors affecting the Wildlife population in the reserve. On other threats to Wildlife population apart from hunting, 52% of the respondents agreed that habitat destruction, 40% habitat fragmentation, and 8% slash and burn are the major threat wildlife population in the reserve. Unfavourable weather conditions (46.7%), Predation and Parasitism (36.7%), and Food scarcity (16.7%) were ranked as natural factors affecting the wildlife population in the reserve. However, 91.3% of respondents opined that wildlife population status is decreasing rapidly while 8.7% still believe that the wildlife population is still intact in the reserve. On the mechanism to check illegal hunting in the reserve, 52.8% of the respondents believe that prohibition of unauthorized entry would check illegal hunting, 41.7% believes that issuance of hunting license would curb illegal hunting while 5.6% opined that regulating hunting seasons would curb illegal hunting.

Table 4: Extent of Wildlife Depletion due to Poaching

	Frequency	Percentage (%)
Years of hunting		
Below 5 years	2	9.5
5-10 years	10	47.6
10-20 years	6	28.6
20 years and above	3	14.3
Hunting day(s) per week		
Once	1	4.8
Twice	9	76.2
3-4 times	11	19.0
Number(s) of kills per week		
One (1)	1	4.8
Two (2)	16	76.2
Three (3)	4	19.0
The population of the species hunted		
Decreasing	18	85.7
Constant	3	14.3
Season of the highest kill		
Rainy season	1	19.0
Dry season	16	76.2
Both	4	4.8
Hunting in other forests?		
Yes	1	4.8
No	20	95.2

Source: field survey 2014

Table 5: Opinion of Forest guards on the factors affecting Wildlife Population in the Reserve

	Frequency	Percentage (%)
Other threat to wildlife population apart Poaching		
Habitat destruction	13	52.0
Slash and Burn	2	8.0
Environmental pollution	0	0
Habitat fragmentation	10	40.0
Natural factors affecting wildlife Population		
Food scarcity	5	16.7
Unfavourable weather conditions	14	46.7
Predation and Parasitism	11	36.7
The population of wildlife as regard hunting		
Increases	0	0
Decreases	18	91.3
Balance	3	8.7
Mechanism to check illegal hunting		
Issuance of license	15	41.7*
Regulated harvesting period	2	5.6*
Prohibition of unauthorized entry	19	52.8*

*More than one response

Source: field survey 2014

Table 6 shows the results species of animals sighted during a 56 km reconnaissance walk in the study

area. A total of 3 primates (2 Mona monkeys and 1 Red-capped Mangabey), one Ungulate (Duiker) 5

reptiles, and 1, 367 bird species were sighted and recorded

Table 6

Species of animals hunted	Total Observed
Primates	3
Ungulates	1
Reptiles	5
Birds	1, 367

Perp. Dist = 30 meters

Discussion

The result shows that Edege village has the highest number of hunters using the forest while Ojo-Akute had the least. The reason could be the proximity of the Edege village to the forest reserve while Ojo-Akute village is the farthest village to the forest. All the hunters interviewed were male and of marriageable age which could be attributed to the belief in Africa that hunting is majorly for men folks. Hunting and gathering of wild animals have constantly been a significant part of life in rural African cultures. These observations agree with the observation of Lahm (1993), Nathalie van Vliet and Nasi (2008), and Adefalu *et al.*, (2009) where all hunters they interviewed in their respective researches were male whose mean average age was 38.3 years similar to the age distribution of most of the respondents used in this research. This active age group falls within the dominant age group of between at 15-64 years in Nigeria (NMEC, 2008, Orimaye *et al* 2018). More so, most of the respondents had no formal education at all which signifies the low level of education in the rural area in Nigeria which corroborates the findings of Dadan *et al*, (2014) where he reported the existence of higher inequalities in educational achievement between rural and urban dwellers of China. McKenzie (2004) also opined that this inequality may be the distance of the available schools from home which may correspondingly affect attendance. However, most of the respondents combined hunting with farming, but their average income of ₦20,000 to ₦30,000 per month from hunting despite the use of primitive tools such as Dane gun, traps and snare is a clear signal that the population of wildlife within the forest reserve is negatively affected. This observation was equally noted by Okorafor *et al.*, (2012) where he reported that all (100%) hunter interviewed used all

the tools mentioned. IUCN (2000) and Fa *et al.*, (2002) affirmed that hunting has been specifically identified as a threat for 84 mammalian species and subspecies from West and Central Africa.

The large percentage of respondents who prefer to hunt mammals to other species of animals could be that most mammals are large-bodied animals which pose an easy target due to their size and also means more money from their kill (Orimaye *et al.*, 2017). This observation agrees with the studies of Peres (1990) and Bodmer (1995) that Neotropical hunters prefer large species, when these are available, for sale and their protein value. This trend was also corroborated by hunters with over 5 years' experience which have a particular species they hunt which have declined in population over the years. All these could have explained the reduction in the kill by the hunters over the years.

Conclusion and Recommendations

The results of this study revealed that wild animals are been hunted mostly for food (protein supplement) and to generate income. Most of the respondents claimed that they hunt for subsistence purposes. The study also showed that the species of animals most hunted were mammals and the majority of the respondents engaged in night hunting using primitive tools and equipment. Since these hunters hunt more than two times per week and almost all of them hunt exclusively within the reserve, the population of wild- animals have greatly declined. The rate of illegal exploitation can be attributed to poverty, the poor monitoring, and supervision of activities going on within the forest reserve. Based on the findings of this study, the following are recommended.

- More personnel should be recruited to monitor and supervise the activities going on within the forest reserve.
- The government should discourage the indiscriminate logging and all activities of farmers who practice various farming activities within the reserve.
- Conservation education/program should be initiated through mass media especially radio programs to prevent over-exploitation of these animals by the grassroots dwellers.
- Strict policies or measures should be put in place to ensure adequate management by relevant government agencies.
- Active participation of the communities around the forest reserve should be encouraged in the planning and implementation of forest policies.

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