

Assessment of Knowledge and Experience of Hunters on Natural Saltlicks of Old Oyo National Park

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Abstract

Background: The impetus behind wildlife geophagy has not only remained a mystery but continued to gain scientists attention lately. To this day, lucking around natural saltlicks (NSs) for hunting or poaching on geophagic animals is not uncommon among hunters, especially in a protected area. Although, hunters' reasons for doing so may seem obvious but their experience over the years had not only suffered neglect but also lack of documentation. Perhaps, understanding this experience may help unravel the geophagic impetus. This study therefore focused on the collection of information on the existing knowledge of hunter-wildlife-saltlick relationships in Old Oyo National Park (OONP).

Materials and Methods: Data were collected by interviewing 18 respondents (3 workers of OONP and 15 hunters) using purposive, snow ball and convenient sampling techniques. Information gathered from the interview was subjected to thematic content analysis and was followed up by observation method.

Result: The result revealed 36 locations (including Wawa, Ajaku, Ibuya, Toka, Olotaara, Olopekan, Odo koko, Ayinta, Eleekan, Ipade aaye, Alalegba, Agbon eerin, Igbo alata, Aladere, Tofolo e.t.c) that were thought to contain numerous NSs in the park. Apart from hunters and wildlife (like giant rat, kob, waterbuck, bushbuck, duiker, baboon) which directly utilize NSs, some members of the community (especially pregnant women of certain family) also utilize the NSs indirectly.

Conclusion: Hunters have verse knowledge of NSs of OONP than have been envisaged and their experience is too important to be neglected. This suggests the importance of considering knowledge of members of the community for incorporation in formulating conservation policy for protected areas.

Keywords: Geophagy, Hunter, Natural saltlick, National park, Protected area

Date of Submission: 28-11-2020

Date of Acceptance: 13-12-2020

I. Introduction

Geophagy, the deliberate eating of soil by animals and humans has been reported by many authors (Pebsworth et al., 2011; Young et al., 2011; Sitienei, 2012). Places where animals practice this phenomenon are commonly called "mineral licks", "clay licks", "natural licks" or "salt licks" (Young et al., 2011; Dudley, 2012). It has also been given several native names in deferent part of the world, for instance, in Russia, it is called "solonetz", or "Kudur", while its mineral content is called "kudurites" (if consumed by animals generally) or more specifically called "gastroliths" (if ingested by birds and reptiles only), which acts as natural bait for wild animals upon which hunters easily poach (Panichev et al., 2013). Sienne et al. (2014) has relatively called it "bias", while the people of Peru call it "colpas" (Norris, 2008).

The debate on the motivational drivers of animal salt-licking has been on lately and widespread among different researchers (Krishnamani and Mahaney, 2000; Young et al., 2011; Dudley, 2012; Lavelle et al., 2014). Although, several reasons like nutrient supplementation and medication have been investigated (Ketch et al., 2001; Pebsworth et al., 2011; Young et al., 2011; Sitienei et al., 2012; Slabach et al., 2015), but none seems to better resolve the controversy till date. So far, no single driver has been identified for etiology of geophagy, rather a multiple of factors have been suggested (Krishnamani and Mahaney, 2000; Sienne et al., 2014). Several available studies have only concentrated on behavioural study of geophagic animals and/or analyzing nutrient composition of the licked soil, but fail to report hunters' experience on NSs. A closer look at the existing knowledge of hunters that once inhabited our protected areas may suggest a way out, since hunters-wildlife-saltlicks relationship has not been fully explored in the past. Also, that the present researchers now use camera trap to study the behaviour of geophagic animals at the NSs (Norris, 2008; Pebsworth et al., 2011; Akinsorotan, 2017) does not completely replace this probable much needed knowledge of the hunters around the NSs. Nevertheless, the knowledge of these hunters, who wait patiently at the NSs areas for several hours, should not be neglected as it may suggest a clue for the much needed impetus for NSs.

On the other hand, the quest of wildlife and forest researchers as to ecological significance of NSs in management decision making is of great important value for consideration (Dormaar and Walker, 1996; Montenegro, 2004) and cannot be over-emphasized. From time immemorial, hunting has been one of the means of sustenance for most rural people of OONP, being a major source of their protein. Despite the effort of the management of OONP in anti-poaching, illegal hunting still continue in the park (Akinsorotan, 2017; Halidu, 2019; Adewale and Alarape, 2020). Akinsorotan (2017) recently estimated the occupancy site for illegal hunting of wild animals in OONP to be high with ψ 0.97. It is therefore important to understudy the activities of these poachers, especially those causing threat to the safety of wildlife around NSs (Adewale and Alarape, 2020). Whether the existing knowledge and experience of the old hunters, if gathered over the years, is worth investigating or not could generate another forms of argument, especially in a protected area like OONP, where most hunters are potential poachers. All the same, it is perhaps, not worthwhile to look down on the knowledge of the past occupiers of the park.

Knowledge and experience of hunters in relation to NSs seldom occur in many literatures. However, understanding the relationship between the hunters and the geophagic animals at the natural saltlick will go a long way in management decision making. Should we allow this knowledge to go into oblivion without documentation, then the drivers of geophagy might also be far from reaching. In the time to come, hunters may cease to exist in the park, due to intense management effort, but their experience of such important keystone resource, if not tapped and documented may represent another lost of valuable resource in the park. To find this, an indebt, semi-structured interview was conducted for 18 respondents using purposive, snow ball and convenient sampling techniques to understand; (1) how the hunters perceive the NSs and the geophagic animals (2) the hunting experience gathered around the NSs over the years in OONP.

II. MATERIALS AND METHODS

Study Area

Located in the Northern Oyo State and west central part of Nigeria, between latitude 8°10'N and 9°05'N and longitude 3° and 4°20'E, found the fourth largest (of the seven) National Parks in Nigeria with a total land mass of 2,512sq.km² and five ranges; Marguba, Tede, Oyo-Ile, Sepeteri and Yemoso. It is characterized with a high forest and dense savannah mosaic woodland ecosystem, hosting different kind of wildlife like roan antelope, (*Hippotragus equinus*), western hartebeest (*Alcelaphus buselaphus*), red flanked duiker (*Cephalophus rufilatus*), oribi (*Ourebia ourebi*), buffon's kob (*Kobus kob*), buffalo (*Syncerus caffer*), bushbuck (*Tragelaphus scriptus*), baboon (*Papio anubis*), common or grimm's duiker (*Sylvicapra grimmia*), and Ibadan malimbe (*Malimbeus ibadanensis*) (Oyeleke et al., 2015; Ojo, 2016; Akinsorotan, 2017).

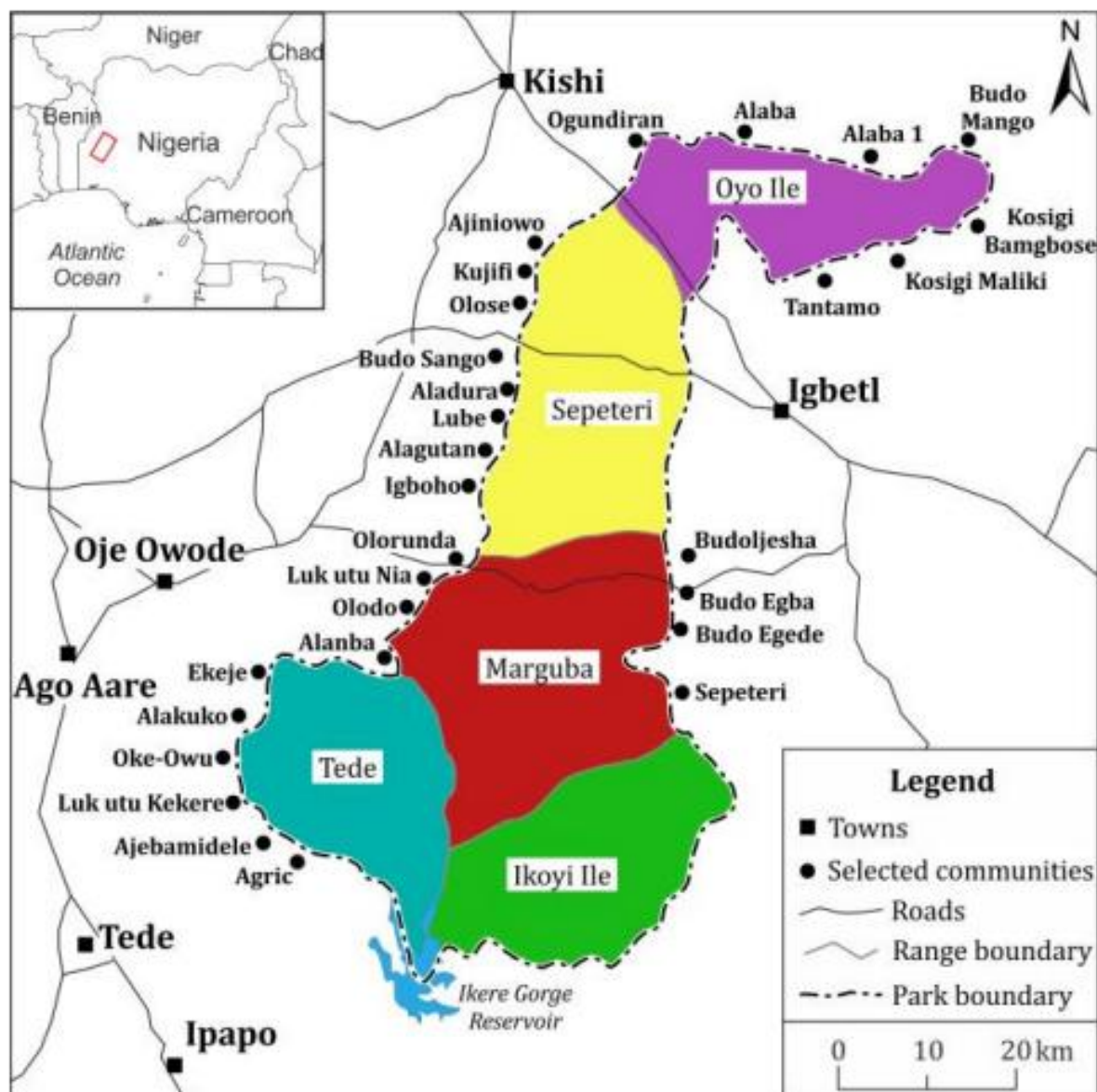


Figure 1: Map of Old Oyo National Park (Ogunjinmi and Braimoh, 2018)

Sampling Techniques

A combination of sampling techniques was employed in this study; purposive, snowball and convenient sampling techniques were thought to be most suitable. Firstly, a purposive sampling technique was used to select three key informants (heads of Akoto-base camp, Ibuya-base camp and research officer unit) from among the members of staff (who were thought to be well enriched with information most relevant to the research objectives) at Marguba range division of Old Oyo National Park (OONP). Secondly, using snowball and convenient sampling techniques, the objective of the study was well discussed with the three key informants, who in turned guide towards identifying old-time hunters (through the help of the leaders of the hunters association in each range) of the park that are eligible for participation in the study with the use of the following criteria:

Hunters' inclusion criteria

These include hunters who:

- practice full-time or part-time hunting in and around the park before it was established
- had in the past, frequently hunted in the park and may still presently hunt or recently stop hunting elsewhere.
- had in the past, hunted in the area for a period not less than 10 years and to a large extent, can still recall the hunting activities (especially activities relating to geophagy).

- are willing to participate in the research, without being forced, and had probably being authorized by their leaders.

Hunters' exclusion criteria

These exclude hunters who:

- presently hunt in the park (i.e poachers)
- had in the past, seldomly hunted or had stop hunting long time ago (or whose ideas are no longer currently relevant to the study objective).
- had in the past, hunted in the area for a period less than 10 years and to a large extent, finds it difficult to recall his/her hunting activities (especially relating to geophagy).
- are not willing to participate in the research and/or are not probably authorize by their leader

Procedure methodology

The study employs qualitative research method (face-to-face interview and observation) which involves the direct conversation with the respondents (3 key informants and 15 hunters) using semi-structured questionnaire, in relation to the objective of the study. The study was conducted from May through July, 2019 to elicit information in regards to the location and utilization of NSs in the area. The first 3 key informants (head of Akoto-base camp, Ibuya-base camp and research officer unit) were asked only one question after making them understand the objective of the study and hunter inclusion and exclusion criteria; "Who from among the hunters, should I turn to, to interview this topic". Through their response, a set of 15 capable respondents (hunters) cutting across the whole ranges were referred to for subsequent interview (but not without the help of hunters' association in each respective range).

Face-to-face interview was conducted (and recorded via field notes and a voice recorder) with a total of 15 respondents 15 hunters. Where the hunters did not understand the language of the interview (i.e English) or used vernacular names to identify species of animals or object that are difficult to easily understood, the situation was immediately resolved by appropriate translation through the intervention of the accomplice (rangers), most especially in Yoruba/English language. To further enhance the quality of information obtained, several fieldtrips were made to each of the camp/bit/town and referred (mentioned) locations for adequate data collection and observation, while photographing and videotaping as it deemed necessary. For easy interpretation and representation, each respondent from among the hunters is coded using the initials of their location (range, camp/bit, town) and their age (Table 1).

Table 1: Visited Range, Number of Hunters interviewed and Corresponding Reference Code/Interviewee

Range (Division)	Camp/bit	Town	No of staff Interviewed	Reference Code/Interviewee
1. Marguba	Akoto base-camp	Sepeteri	04	MASH-57yrs, MASH-64yrs, MASH-66yrs, MASH-83yrs
2. Tede	Tede camp	Erin	03	TTEH-64yrs, TTEH-65yrs, TTEH-70yrs
3. Yemosho	Oloka bit	Oloka	03	YOOH-84yrs, YOOH-87yrs, YOOH-55yrs YYYY-48yrs, YYYY-52yrs
4. Sepeteri	Yawota bit	Yawata	02	
	Sepeteri camp	Igboho	01	SSIH-50yrs
5. Oyo-Ile	Booni bit	Booni	02	OBBH-63yrs, OBBH-65yrs
TOTAL			15	

Data Analysis

Since the interviewees are relatively small in number (15), no qualitative data analysis software was used but thematic content analysis. Therefore, the content of the interview was organized thematically, presented using topic / theme and discussed using descriptive analysis. Where new theme emerged, these were later added for analysis. This allows conclusion to be easily drawn from the findings by comparing and contrasting the themes carefully as described by Creswell (2003) and presented following the method of Rocha and Fortes (2015).

III. Result And Discussion

1. Demographics

To have a thorough insight into the subject matter, a total of 15 hunters were interviewed (as referred by the 3 key informants), all of whom were males, as females seldom engage in hunting activities (and if engage in hunting activities at all, only involve in backyard hunting of small animals like snails, rats and bird's eggs). Most of these hunters were regarded as great (fearless) hunters in their active time, as they were involved in killing dangerous animals like lion, tiger and elephant (They are known to be; "Ode apeerin and "Ode apefon"). All but one were above 50 year of age (Table 1), indicating while they were carefully and purposively selected

(by following hunters' inclusion and exclusion criteria) and therefore referred to as "old-time hunters", as it is believed that the older they were in hunting activities, the more their wealth of knowledge and experience. All claimed to have been involved in hunting activities from time immemorial, probably as a little child, since hunting were known to be major occupation of some families in the past. In fact, three of them, whose experience was supposedly highest, were more than 80 year-old (MASH-83yrs, YOOH-84yrs, and YOOH-87 yrs) (Table 1). With the exception of one with secondary school education (YYYH-48yrs), who was also the youngest, majority of the respondents (8 out of 15) were illiterates, while few of them (6 out of 15) had elementary education.

2. Hunting as a means of livelihood

All respondents testified that their hunting was never restricted to places around the park alone but elsewhere (both before and shortly after the creation of the park). All claimed that they never wanted to stop hunting in the park initially, but the constant persecution suffered in the hands of the park guide (rangers) had put them to rest. All the hunters (15) had reported combining hunting with other job like farming, butchering of cow, tailoring, carpentry work and/or at one time act as herbalist in the community. It is not surprising that all belong to one hunting association or the other as this is the norms for traditional hunters in Yoruba land and even few of them (5 out of 15) also claimed to have led the association at one time or the other. All of them also claimed to have started hunting activities at time immemorial, when their fathers used to take them along for hunting as a child.

3. Knowledge of location, types and number of lick

When asked whether they have knowledge of the NSs or not, they all responded in affirmative, indicating that the phenomenon (geophagy) is not a new thing to the hunters and seems to have been known long time before now.

Table 2: Thirty six (36) geophagic locations reported by the respondents at OONP

Marguba (22)	Oyo Ile (4)	Yemoso (7)	Tede (2)	Sepeteri (1)
Ajaku Tokan, Odo koko, Eleekan, Olopekan, Tamori, Igbo eleekan, Asinwole, Igbo alapere, Uhuntuupu, Abata Eleranko,	Ibuya Olotaara, Ayinta, Ipade aaye, Iju apa, Oojiyo, Oloni Alaaro, Oopo, Ladepe, Imodi	Abata funfun, Abata Alalegba Agbon eerin Igbo alata,	Abata Aladere Abata Igbori	Abata Tofolo

A number of areas where NSs can be found were mentioned by the respondents; Marguba (22), Oyo-Ile (4), Yemoso (7), Tede (2), Sepeteri (1); making a total of 36 places (Table 2). Some selected pictures of NSs found in some of these places, during field trip, are shown in figure 2-4. Majority of the respondents (10 out of 15) claimed to have visited places mentioned, not later than a period before the establishment of the park. However, few of them (5 out of 15) acknowledged their hunting activities even after the establishment of the park, despite warning of no visit by unauthorized candidates into the park. Of the 5 respondents that visited the park after the establishment, only two of them claimed to actually went for hunting, while the rest (3 out of 5) visited the park for the purpose of butchering of Fulani dead cow and helping the rangers and soldiers to catch kidnappers that once intruded the park. They all however, claimed not to have any reason to revisit the park in the future.

Types of lick and licked Soil

Natural licks have been known to be most frequent along river side (Krishnamani and Mahaney, 2000). This is not different from the report of the respondents in OONP. According to the respondents, NSs can be dry or wet and sometimes located in a wetland area popularly known as "abata" by the local hunters or along river bank (eti odo).

There are two categories of "akho" (saltlicks); "akho abata"(Wetland NSs) and "akho eti odo" (riverside NSs)(YYYH-52yrs, TTEH-70yrs and MASH-83yrs).

We called them "akho abata", because they are usually formed from the remains of run-off water carrying along lots of nutrients and depositing it at the end of a sloppy area, usually following a heavy rainfall, while "akho eti odo" is referred, when they are located beside river (TTEH-70yrs and MASH-83yrs).

Both “akho abata” (wetland NSs) and “akho eti odo” (riverside NSs) are similar to what Ayotte et al. (2008) refer to as dry NSs and wet NSs respectively. Adewale and Alarape (2020) also described dry and wet NSs in OONP.

We usually describe natural saltlicks close to river or usually flooded by rain or river as wet natural saltlicks (MASH-83yrs and MASH-64yrs) (fig. 5).

Some natural saltlicks also formed when soil nutrients beneath the roots of fall off or standing trees are exposed (for wildlife to feed on) after heavy rainfall (MASH-64yrs). Therefore, dry natural saltlicks are commonly found under the roots of trees (MASH-57yrs) (fig. 2-4).



Figure 2: Dry natural saltlicks found under tree roots at Oopo area of Marguba range in OONP



Figure 3: Dry natural saltlicks found under tree roots at Ajaku area of Marguba range in OONP



Figure 4: Dry natural saltlicks found under tree roots at Ajaku (Imodi) area of Marguba range in OONP



Figure 5: Wet natural saltlicks found close to Ogun River at Ipade Aaya in OONP

Asides Adewale and Alarape (2020) that reported dry and wet NSs, there have been no report, whatsoever from OONP on the use of artificial licks, however, the respondents seems to find a way around it by using urine or table salt to produce artificial natural licks as a form of bait to attract wildlife during hunting. To attract the animals to a particular spot (like NSs) or to increase chances of their kill, the hunters either collect their own urine for a period of 3-5 days or get some table salt sprinkled on the existing dead or abandoned NSs or on upland area (MASH-83yrs, YOOH-87yrs, YOOH-55yrs and YYYY-48yrs).

This makes the animal to frequent the place for a number of days. Sometimes, a day urine can be used (SSIH-50yrs and MASH-83yrs)

Upland (dry) natural saltlicks can also be created unintentionally for the wildlife in a situation where Fulani herdsmen (poachers), who also usually poured table salts on land surfaces for their cow to lick, just left their "iga" (settlement area) during herding in the park without clean up. This left over salt, together with soil later in the night serves as stimulants in attracting to the spot (YOOH-55yrs, OBBH-63yrs and OBBH-65yrs).

Of all the three major types of soil (clay, sandy and loamy), none of the respondents reported to have seen wildlife ingesting soil other than clay soil. This is in line with other reports that clay is majorly consumed by animals. The properties of clay described as a good adsorbent agent for detoxifying pathogens, organic and inorganic may explain why they are major constituents of the geophagic soil (Pebsworth et al., 2011; Young et al., 2011, Williams and Haydel, 2010; Williams, 2017)

3. Background information on hunter, community, saltlick area and forms of hunting

Since all hunters agreed to hunting at NSs, it is worth knowing the method(s) used by various hunters in carrying out this obnoxious act (in the park). Some commonly mentioned ways by almost all the respondents are summarized below:

(1) **Use of Bush as Hideout:** Some hunters used bush as cover to hide around NSs to kill animals. While this can only be used during the raining season, when the forest is still bushy, at dry season, the hunters usually employ other strategies.

(2) **Use of Built Hideout:** Some hunters claim to build hideout near the NSs. The kind of hideout built is by entangling leaves of nearby trees together, while seating down at strategic place (tree branch) at the back of the cover to target animal visiting the licks.

(3) **By Climbing Trees:** Where no trees have enough leaves to entangle together to make cover, hunters may climb to the top of a tree to hide. This is said to be commonly practice by the hunters, as it not only perfectly hide them from the animals but also from anybody approaching the NSs area.

(4) **Use of Trap:** Where hunters find it difficult to stay at the NSs area, various kinds of traps are usually employed. The use of trap known as "takute" or "oguru" in Yoruba and rope strategically placed (usually in circular form) either vertically at the surface or buried underground along the trails leading to the NSs are not uncommon.

Climbing to the top of trees also helps to prevent animals, especially buffalo, from perceiving the hunters' smell, as this are usually carried to the animals far away by the wind, at distance beyond imagination (TTEH-64yrs and TTEH-65yrs).

It is however sometimes surprising to see some animals carefully circumventing the trap in a logical and unbelievable ways, as if they were guided by certain spirits. Therefore, hunting by trap is usually a game of luck, not only at the NSs but also elsewhere (YOOH-55yrs).

Some hunters wait painstakingly at the NSs, yet without being able to kill any animal. This is very discouraging and that is why we say that only extremely patient hunters can benefit in killing animals at licks (YYYH-48yrs).

Generally, hunting is usually restricted during raining season, partly because the forest is bushy and inaccessible. To enable frequent kill at NSs, some hunters usually appeal the spirit with sacrifice, before embarking on a journey of hunting, especially if it has to do with NSs. Mostly, the hunters, through sacrifice, appeal to the deity called "esu" (devil) for bumper harvest.

Lick visitation time by wildlife

All the hunters agreed that animals are most frequent at midnight or early in the morning at NSs, either at the start of raining season or at the end of raining season. Although, some hunters believed that some clever animals do salt lick in the afternoon.

Nocturnal animal will not salt lick in the night except when there is a full-moon period as animal hardly feed in the darkest night (YYYH-52yrs).

Some hunters believed that small animals, like giant rats, frequent the NSs mostly in afternoon at the early period of raining season (February – March), while big games like kob, water buck, bush buck, duiker and

baboon, usually restrict feeding to night period especially during the late raining period (November - December). These wildlife falls among the animals found in OONP as discovered by Oyeleke et al. (2015).

Animal majorly lick soil in the midnight not usually day time because the soil may be warm during the day, unless it rains, so hunting at licks is done between the hours of 6pm to 6am. Such animal will therefore use afternoon to feed on grass and delay geophagy till night (YOOH-87yrs).

Hunters' lick visitation time

Majority of the hunters (10 out of 15) prefer hunting at NSs in the morning or night as this is the time most animals eat soil, while very few of them may hunt in the afternoon, because animals are not commonly found, especially at NSs, except when it just rained or the place is marshy enough to allow easy salt licking.

Hunting in the afternoon is usually done immediately after rain, since most animals prefer salt licking after rain, when soil will be soft enough to chew (TTEH-65yrs and TTEH-64yrs).

In raining period, hunting at NSs is usually done when rain has just begun (around April/May), when grasses are rarely taller than a ruler (30cm) and still make the animal visible enough or during late rain (around November/December), when grasses are drying out, but still allow visibility (OBBH-65yrs, YOOH-84yrs and YOOH-87yrs).

Places of hunting

Hunting is not restricted to NSs alone, all the hunters claimed to majorly hunt in the forest. They love hunting at the river bank too, especially during the dry season and more frequently in other places during the early period of the wet season.

Besides this area now called OONP, we also hunt in other places both around the licks and other forest areas (TTEH-64yrs and TTEH-70yrs).

Shooting period at saltlicks

Few hunters claim to shoot the animals straight away, as soon as they arrive, but majority of them claimed to always allow the animal to settle down enough, before releasing the trigger or wait for long period after the arrival of the animal at the NSs before shooting.

Quotas of animals killed at natural saltlicks area

Based on many challenges encounter in killing animals at NSs, all the hunters said that usually small quantity of animals are killed at the NSs (20-30%/ annum) when compared to the ones killed in other places. Larger portion of their kill was usually from the forest since hunting at licks is within certain restricted period of time (like night, early morning and late evening).

In line with our (forefather) hunters' adage which says that hunting of animals is best practiced while on the move (walking), "lorii rin, lode n peran" (YOOH-84yrs).

Natural saltlick users and pattern of utilization

It appears that the eating of soil by the animals at NSs is like eating food somewhere without salt (forest grasses), thereby prompting them to look for salt elsewhere (NSs area). From careful observation, the lick soil appears to more or less smell like salt (YOOH-84yrs and YOOH-87yrs).

There are some other things we use the NSs for:

- Some pregnant women in certain family do eat lick soil, so we help them to fetch some during hunting period. These pregnant women usually consume the lick soil immediately after birth. This has been reported by various authors (Pebsworth et al., 2011; Young et al., 2011).
- Some families use wildlife killed at the NSs areas for medicines. Such medicine thought to cure persons that usually have stillbirth "abiku" (by eating it during pregnancy). Vermeer et al. (1985) had reported the eating of soil by Nigerians because of its medicinal function, especially pregnant women.

We use to collect the lick soil from any geophagic areas of the park, but some of the commonly places where we frequently collect lick soil are those closer ones, especially the ones found at Ajaku, Ibuya and Oopo (MASH-57yrs, and MASH-64yrs)

IV. Conclusion

Until now, there is rarely any discussion on NSs of OONP, apart from the one recently published by Adewale and Alarape (2020) which concluded that there was no enough record in regards to the knowledge of the location and numbers of NSs in OONP, thus hindering their adequate monitoring and protection by the management staff. Having reported a total of 36 locations (Table 2), where NSs can be found (in this study), cutting across all ranges of the park, as against that of the few (restricted to Marguba range) earlier reported (Adewale and Alarape, 2020). It is however obvious from this study that the hunters seem to be well knowledgeable about the NSs in the park. This further explains the important of incorporating the experience of local community in the management of protected areas as suggested by Adewale and Alarape (2020). Ignoring such an important knowledge could lead to a loss of valuable information that could have helped in the ecological sustainability of valuable resources (Montenegro, 2004). It is by this that our attempt towards adequate conservation of the wildlife, as well as understanding the reason(s) behind geophagy (most especially) can be realized.

Acknowledgement

The authors are very grateful to the management and staff of Old Oyo National Park, for their permission and support for carrying out this research.

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