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**TOO MUCH PRESSURE TO
HANDLE? LION
DERIVATIVES USED IN
TRADITIONAL MEDICINE IN
NIGERIA, WEST AFRICA**



Too much pressure to handle? Lion derivatives used in traditional medicine in Nigeria, West Africa.

Born Free Foundation



Lionesses at rest after feeding in Yankari National Park © Talatu Tende

Abstract

We carried out a questionnaire-based survey examining the use of lion (*Panthera leo*) derivatives in traditional medicine in the communities surrounding Yankari Game Reserve, a protected area in Nigeria, which harbours one of West Africa's few surviving lion populations. Over 230 semi-structured interviews were held in 20 communities and field surveys were carried out in nearby markets to validate interviewee responses. Results indicate the use of lion body parts in traditional medicine is practiced widely amongst the local communities. 73% of respondents had some beliefs about the use of lion derivatives as traditional medicine, describing a total of 22 lion body parts with either believed therapeutic or preventative properties. Nearly half of the respondents interviewed (107) had personally used lion body parts in the last 3 years for medicinal purposes, reflective of a high consumer demand. Fat was the most common body part utilised by the communities with both genuine and fake fat available to buy in two of the markets surveyed. Poor health related to "spiritual attack" was a common concern amongst the communities, with 17 body parts reported to have some involvement in spiritual protection for good health. The future of lions in this region depends on the capacity of the reserve management to create alternative health options and economic activities for the communities to deter from impacting the resident lion population in Yankari and reduce any potential cross border trade that may fulfil demand. Furthermore, we recommend conserving all wild lion populations that provide animal products for medicine by increasing their global level of protection from trade.

Introduction

The African lion, *Panthera leo*, is disappearing across the continent with a population suspected to have declined by 30-50% over the past two decades (Woodroffe & Frank, 2005). West African lion populations are particularly vulnerable and due to small population sizes have recently been reclassified from Vulnerable to Endangered in the IUCN Red List of Threatened Species. According to the IUCN there is not a single population of lions in West or Central Africa that is large enough to be viable (IUCN, 2006).

In Nigeria, the number of mature individuals is estimated by two separate recent surveys at 200 (Bauer & Van Der Merwe 2004) and 75 (Chardonnet, 2002). Both estimates are significantly below the Endangered criterion level. Yankari Game Reserve is one of the few protected areas in which lions are still found in Nigeria with an estimated 50 individuals (Chardonnet, 2002).

The causes behind this continental population reduction are still not well understood, although some possible causes have received more attention than others. The impact of international trade in lions and lion parts is a potential threat that has so far received little investigation. *Panthera leo* is currently included in CITES¹ Appendix II which means international trade is permitted, albeit regulated. An often illegal form of trade involves the use of wild animals' body parts as medicinal products, which is relevant because it implies additional pressure over fragile wild populations (Costa-Neto, 2005).

Animals and their body parts have long been used as medicinal resources for the treatment of many illnesses and diseases in many different cultures (Alves & Rosa, 2005). Indeed, many drug companies have been evaluating animals as sources of drugs for modern medicine and acknowledge the role of indigenous peoples throughout the world in identifying biological resources. The annual global trade in animal-based medicinal products accounts for billions of dollars per year (Kunin & Lawton, 1996). However, as has been demonstrated in seahorse species (McPherson & Vincent, 2004) and tigers (Von Hippel, 2002), animals are often overexploited sources for traditional medicine, which can have a devastating effect on the wild populations of such species.

Beliefs in African traditional medicine involve magical powers attached to special healing acts when wild animal by-products are used as directed by a traditional healer. For the majority of people in Nigeria, traditional medicine remains one of the only sources of health care (Offiong, 1999). Such reliance on traditional medicine may be due in part to the high cost of conventional medicine and the inaccessibility of modern health care facilities. In many cases, traditional medicine is also often deemed a more appropriate method of treatment.

Virtually no data are available on the use of lion products in West African traditional medicine. Several papers have researched bushmeat trade in this area (Anadu *et al.* 1988, Martin *et al.* 1983) and although there are similarities in the commercialization of the trade allowing substantial profits to accrue to middlemen, there is no reference to the role traditional medicine plays. Adeola (1987) detailed the use of lion parts in cultural ceremonies (installation of traditional rulers) in Nigeria and in a later study (Adeola, 1992) further analysed traditional medicine products. Amongst the 14 big game species recalled by farmers in savanna zones to be used for medicinal purposes, lions were not mentioned. However, the study only involved 12-15 households per state which is unlikely to be representative of overall use. This study partly addresses this short fall with over 230 respondents interviewed from one state (Bauchi).

Here we present the results from a systematic survey conducted in the communities surrounding Yankari Game Reserve. Our aims were to assess the current use of lion products in traditional medicine and to provide an indication of the pressures exerted on the population within the reserve and nationally, as well as potential demand for cross-border trade. This paper aims to identify whether poaching for traditional medicinal practices is a significant and real threat to wild lion populations.

¹ Convention on International Trade in Endangered Species of Wild Flora and Fauna <http://www.cites.org/eng/app/index.shtml>

Method

Yankari Game Reserve, in Bauchi state, Nigeria (9.6 North and longitude 10.66 East) is a 2,244km² island of woodland savanna, dominated by two main rivers and known for its warm springs and resident populations of elephant, hippopotamus and lion, amongst other species. 26 communities currently surround the reserve (new communities are continuously developing, see Appendix), which are divided into 3 provinces: 1) Duguri (South/ South West) 2) Gwana (East) and 3) Pali (North). The human population in the study area is mostly rural (approximate population for 7km radius of reserve is 5003²) and vegetation around the reserve has been largely cleared for agriculture.

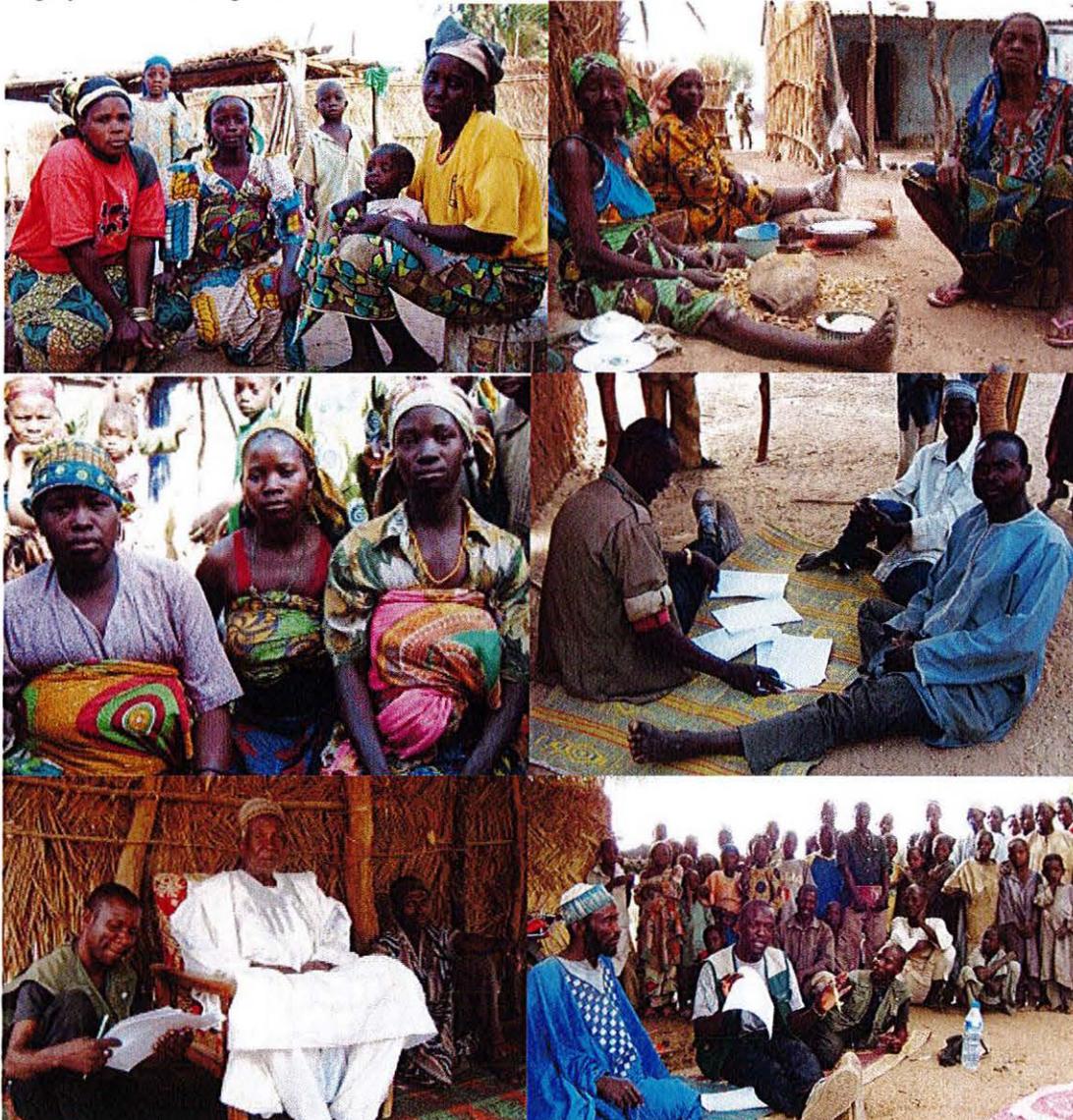


Fig. 1 Interviews conducted in communities. Women interviewed inside home enclosures, permission obtained from Community Heads, men interviewed in community setting.

Interview data were collected from February to March 2007, following preliminary surveys carried out in August 2006. Six to eight communities were selected from each province, with 20 communities chosen in total to enable a fair representation of the area. Due to cultural requirements within the communities we selected interviewees by asking each Community Head to introduce us to a minimum of five men and five women. In total, 234 respondents were

² <http://www.fallingrain.com/world/NI/0/Yankari.html>

sampled. Respondents of the same sex were never interviewed from the same family (to avoid repetition of data) and were representative of the community in age, income and religion. Interviews were conducted in the most prevalent local dialect, Hausa. Prior to the interview, the objective of the study was explained to enable the participant to understand why the research was being conducted. Females were always interviewed in their home by female interviewers and for cultural reasons were not allowed to leave their enclosures or enter the community. Males were interviewed at home or in the community.

The religion of the majority of respondents interviewed was determined as Muslim (99%), representative of Bauchi state, with the remaining 1% (3 respondents) declared as Christian. Over 30 tribes were represented amongst the respondents with Hausa (27%), Fulani (25%) and Jarawa (12%) being most prevalent. All respondents lived in mud houses (as opposed to block) with no running water. 30% of the respondents had some school education, with just over half of those surpassing primary level (54%). Almost three quarters of the respondents that had received an education were male (73%).

A high percentage of respondents earned an income (83%), with 72% earning throughout the year as opposed to once in a while. Of those earning, just less than half were female (43%). The main occupation was farming (see Appendix). Most people that farmed to earn an income also had a second occupation such as cattle fattening or working in government roles (civil servants). The use of ground nut oil to make ground nut cake was a prevalent role amongst the women, as well (as other local spices).

A semi-structured health questionnaire, focusing largely on the use of lion parts in traditional medicine was administered by the questionnaire author who had previous experience of working with the local villagers and native healers. The questionnaire followed closely the research approach outlined by Bernard (2006). A further four interviewers were trained by the author (two female and two male) to conduct the questionnaires and were periodically quality checked during the interview process. The questionnaire was pre-tested with five villagers and subsequent corrections were made before starting the field work.

The final questionnaire comprised open and closed questions and the following issues were addressed (See Appendix for full questionnaire):

- a) Survey data: language of interview, translator present, community (locality of residence). This part of the questionnaire was filled out by the interviewer prior to each interview.
- b) Socio-demographic data: direct specific questions were asked about age, economic status, education, religion and family status.
- c) Current status of health and available resources: the aim of this section was to gain an understanding of what good health meant to the communities and what resources they had available to achieve desired health.
- d) Animals used in traditional medicine: this section was open to reduce bias in the animals that were recorded.
- e) Lion parts used in traditional medicine: the aim of this section was to determine the types of lion parts used in traditional medicine, what they were used for, how often they were used (in the past 3 years), where they were sourced from, how easily available they were and what the cost implications were.
- f) Lion parts used in any other traditional practice: This part of the questionnaire was to understand if lions were killed specifically for medicinal use or for other reasons. Other cultural practices involving lion body parts were recorded in this section.

We also surveyed local markets to gather information on the availability of lion products for sale, and gain an understanding of their cost and demand by interviewing market traders and traditional healers³.

³ Respondents sometimes termed traditional healers as native healers. For the purpose of this study the two are equivalent terms

Results ⁴

Lion body parts in traditional medicine

Table 1 indicates the 22 lion body parts utilized for healing and preventive medicine in the three provinces surrounding Yankari Game Reserve (YGR). 73% (171) of all respondents had some knowledge about the use of lion derivatives for traditional medicine, describing at least one body part.

Nearly half of all respondents interviewed (107) reported to have personally used lion body parts in the last 3 years for medicinal purposes. The remainder had either used lion body parts further in the past or had learned of its uses through stories told by family and/or friends.

Table 1. 22 lion body parts* listed by villagers around YGR for healing and preventive medicine (in order of frequency mentioned)

Part used	Main uses
Fat	Dislocation / fracture / broken bone, back pain, rheumatism / joint pain / 'bone marrow pain', protection against spiritual attack
Skin unspecified	Protection from evil spirits, whooping cough, self empowerment, child protection from convulsions
Bone	Rheumatism / joint pain / bone marrow pain, bone fractures, back pain
Meat	Nutrition, increase general health
Teeth	Protection of children's teeth during teething, teeth gum infections, migraine
Lungs	Whooping cough, spiritual protection.
Forehead skin	Protection/ immunity against evil spirits/enemy, empowerment
Vein	Spiritual protection, erectile dysfunction
Throat Parts	Whooping cough, spiritual protection, asthma, increase sound of voice
Eyes	Protection from evil spirits, empowerment.
<i>Dung</i>	Spiritual protection / empowerment, night fever and ear problems
Heart	Spiritual guidance, protection of crops, ceremonies
Liver	Spiritual protection, headache, temper heart
Claws	Spiritual protection, ear problem
Whiskers	Spiritual protection
Penis	Spiritual protection, erectile dysfunction
Leg	Joint pain
Breast	Breast feeding mothers trouble feeding
Nose	Stomach problem
Blood	Spiritual empowerment
<i>Saliva</i>	Ear problem
Brain	Back pain and rheumatism

* *Dung* and *Saliva* are included in table to complete list of derivatives mentioned

⁴ (Note: Data requires further statistical analysis. Current results are an overview only)

The average number of body part types used by respondents in the last three years was one (the most common being fat). An example of responses received include:

"I've used fat five times and am presently looking for it"
"No matter the amount of money it is or I have, I will get it. I last used it three months ago"
"Native healers bring it to the village to sell it every day"

The highest number of different body parts used in the last three years by one respondent was eight.

Table 2. Composition of lion body parts use by villages around YGR for healing and preventive medicine

Part used	Number of respondents	Percentage of all respondents* n. 234	Number of respondents personally used in last 3 years
Fat	144	62	73
Skin unspecified	79	34	37
Bone	44	19	26
Meat	21	9	8
Teeth	16	7	9
Lungs	11	5	4
Forehead skin	10	4	5
Vein	7	3	4
Throat Parts	5	2	3
Eyes	4	2	2
<i>Dung</i>	4	2	3
Heart	4	2	1
Liver	4	2	3
Claws	3	1	2
Whiskers	3	1	3
Penis	2	-	1
Leg	2	-	1
Breast	2	-	1
Nose	2	-	1
Blood	2	-	Not used
<i>Saliva</i>	1	-	Not used
Brain	1	-	1

* Some respondents mentioned more than one body part

Lion fat was the most frequently used body part mentioned. 62% of respondents described using lion fat in medicine, with just over half of those respondents reporting to have used it in the last 3 years. The main medicinal benefits described were the healing of fractured and broken bones, back pain and rheumatism.

The second most prevalent body part mentioned was skin (34%). Half of these respondents described wearing *layas* (type of talisman worn around the neck or waist) as preventative medicine to protect from spiritual attack and in some cases offer spiritual empowerment (see Fig. 2). Skin was also reported to have healing powers with 20% of the respondents describing its use to cure whooping cough by soaking the skin in water and drinking the water. An example of responses received include:

“Sends ghosts away from small children”
“Protection against wizards, witches and enemies”
“Those that want to empower themselves to get more things so they are noticeable wherever they are”

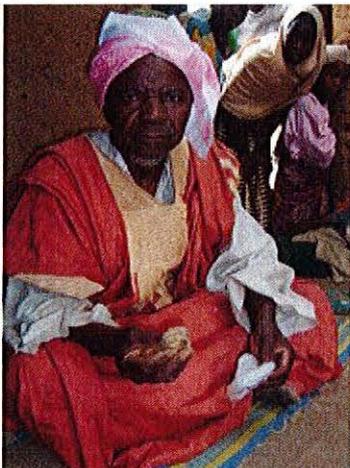


Fig. 2 A young boy and woman wearing 'Layas' for spiritual protection (note: skin unspecified)

The use of bone was also mentioned many times, making it the third most recalled lion body part used in medicine. The majority of respondents described the use of bone for rheumatism, joint problems and 'bone marrow pain':

“Soak the bone in water and drink the water or rub the water in”
“Burn bones, blend with cow fat and rub in area of pain”

Other body parts that were highlighted by the survey as having medicinal properties included lungs and throat for whooping cough (Fig. 3), veins for spiritual protection and eyes for empowerment. Some body parts unexpectedly did not feature highly, such as the use of claws, which were mentioned by only three respondents. An example of responses received include:



Eyes: “Use as masquara, dry out lion eyes, blend with masquara, if use will give you a charming spirit”
Veins: “Spiritual protection from bush spirits, rub veins all over body”
Lungs: “Majority whooping cough, boil skin in water and drink water”
Throat: “Use anytime sickness arises (whooping cough). Soak it in water and child sips the water. You can re-use it again and again. Dry it to store it”

Fig. 3 Respondent with part of lion throat used for treating whooping cough.

One of the most common uses described across the different derivatives was spiritual protection. 17 of the 22 body parts mentioned were reported to have some involvement in spiritual protection, with spiritual protection properties being mentioned 102 times by 70 respondents. The survey was not designed to probe this use further although qualitative feedback points to two main types of spirits that respondents were referring to: 1) spirits from the bush and 2) spirits around the home.

"Used for protecting children, tie round waist/neck against those spirits that come out around the home"

"Rub fat on it before wearing it, protects from evil spirits which come from the bush, as reside near the bush"

Cost and availability

Looking at the top three lion body parts mentioned, the majority of respondents claimed all were difficult to acquire (table 3). Similar trends across the three body parts are observed with affordability and sourcing and are reflective all lion body parts mentioned. The majority of respondents felt the body parts were expensive, although the equivalent cost in Naira⁵ for what an individual deemed costly varied. A finger tip of lion fat ranged from 50 to 5000 Naira (more expensive compared to surveyed market prices, 50 – 500 Naira). Bone was deemed less costly with a maximum cost of 2000 Naira for a fingertip. To put these prices in context, at the time of the survey, a bag of maize lasting an average family of 9 individuals for 3 weeks, cost 3500 Naira. A month's house rent in the area was an estimated 1500 Naira.

Table 3. Cost and availability of lion fat, skin and bone

		Fat	Skin	Bone
Accessible	Easy / Fairly Easy	8	7	4
	Very / Fairly difficult	130	67	34
Source	Local hunter	98	54	29
	Native healer	59	29	19
	Market	58	28	18
Affordable	Cheap	11	8	4
	Very expensive	124	64	32
Price range* (Naira)	Finger tip	50 - 5000	30 - 5000	100 - 2000

*Top and bottom 5% not included

Although local hunters are a main provider of lion body parts, it became obvious from the interviews that no clear distinction could be made between the different sources. Local hunters were also sometimes native healers (Hausa terminology '*Mai Maganin Gargajiya*') and both local hunters and native healers sold in markets, as well as visiting communities. However, what did become clear and was mentioned by several respondents was that not all body parts were sourced from Yankari Game Reserve and there was possible cross border activity:

"Native doctors get it and come to the communities to sell it. Sometimes they get it from the forest (Yankari). Some people go near Cameroon to get it and then sell to the native doctors"

"Sometimes native healers get it from Yankari or business men from Cameroon"

Women in general were less knowledgeable about the sourcing and costing, which is expected considering their movements are restricted to within their home enclosures.

"Since being married I am not allowed to leave the house"

⁵ 1.00 Nigerian Naira = 0.01 US dollars

By-products or primary products?

The survey was designed to understand if lions were sourced specifically for body parts used in medicine or if they were killed for other reasons and then the body parts obtained as by-products. Whilst the majority of respondents (105 of 171) said lions were killed specifically for medicine, many of these noted the additional benefit of lion meat for nutrition:

"We kill it for medicine and then use meat for nutrition"

Only 23 respondents claimed lions were killed specifically for meat due to its nutritional as opposed to medicinal value. Surprisingly few respondents claimed lions were killed due to conflict with farmers (table 4). Similarly, despite a lion skin being estimated to be worth 10,000 Naira if sold for decoration, only 4 respondents claimed lions were killed for decorative purposes.

Table 4. Motivations for killing lions other than traditional medicine

Reason for killing lion	No. respondents
Meat for nutrition	23
Conflict	4
Decoration	4
Making money	3
Prayers (skin)	1

Respondent health choices and alternatives

Only 14% of respondents claimed to have below average health, with almost half claiming their health to be good or very good. Whilst both modern drugs and traditional medicines are used in the communities, for many people, traditional medicine remains one of the few accessible and affordable sources of health care. Although the majority of respondents did not list native doctor as their first choice for health care (table 5), native doctors were ranked the highest scoring health care option (table 6).

Table 5. Respondent healthcare choice

	1st choice	2nd choice	3rd choice
Local health clinic	98	19	2
Hospital	82	55	8
Native doctor	51	112	27
Chemist	3	18	27

Table 6. Ranking scores for healthcare options

	Ranking score (1st = 3, 2nd = 2, 3rd = 1)
Native doctor	404
Hospital	364
Local health clinic	334
Chemist	72

The reliance on traditional medicine is partly owing to the high cost of conventional medicine and the inaccessibility of modern health care facilities. Medicines from native healers are quite clearly the cheapest option (table 7). Many also commented that the hospitals were too far away, with Bauchi state hospital being over 20km away from the nearest community, making for unaffordable healthcare due to additional transport costs:

“The hospital is too far away or it would be my first choice every time”

“It is over 50km away (Bauchi) which makes very expensive”

Table 7. Medicine costs from alternative health providers

Medicines obtained from health sources	Very expensive	Quite Expensive	Sometimes expensive	Cheap	Free
Native doctor	8	21	8	141	13
Clinic	59	45	5	9	0
Hospital	83	41	8	6	0
Chemist	35	13	2	1	0

In many cases, traditional medicine is deemed a more appropriate method of treatment. Indeed many people mentioned that upon reaching hospitals they are advised to return to native healers for treatment:

“Most times after lab tests, we are told the sickness is for native doctors to heal”

“Sometimes you find the sickness is not for the hospital and you have to come back to the native doctor”

“If sickness is still serious you have to go back to the native doctor”

“Most sicknesses are sickness of bush, spirits that only the native doctor can help with”

Thus, whilst some may not recognise spiritual related health issues as valid health concerns, it is a prevalent cause for many people to seek remedy and needs to be taken into consideration when addressing the communities' health care options.

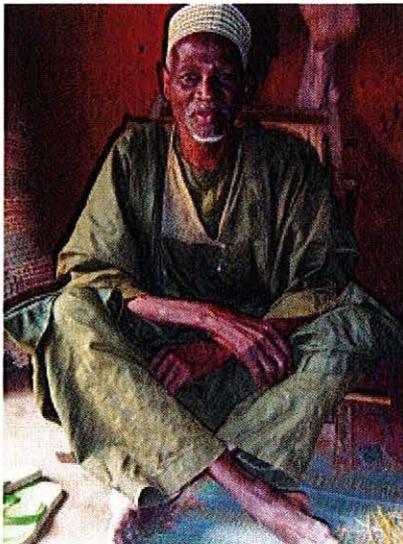


Fig 4. Chairman of traditional healers (Bauchi - resides in Alkaleri community)



Fig 5. Native healer rubbing ointment on man with arm pains (Bogga community)

Market surveys and body part availability

On visiting local markets and talking to native healers and/or traders we found both genuine and imitation body parts on sale for medicinal purposes.



Fig. 6 is a picture of lion fat believed to be genuine⁶, for sale in Mudalawan market, Ningi (Bauchi State). The market is 60km from Yankari Game Reserve. On speaking to the vendor a cube of lion fat was priced at 200 naira a piece and its advised use was for back pain, dislocated or fractured bones (as mentioned by 105 respondents in the survey). The vendor reported that demand was high, selling an average sum of 10,000 naira a week.

Fig. 6 Genuine lion fat for Sale, Mudalawan market

In Alkaleri Market, the chairman of the traditional healers (Fig. 4) directed us to stalls run by native healers and/or traders where four market vendors were interviewed. According to the chairman, lion parts were not difficult to obtain from the native healers, although they were costly. All four vendors admitted to selling lion products but only one stall had body parts available for sale, which was imitation lion fat (Fig. 7). Despite being imitation, the fat was sold at 50 naira a piece under the guise of originating from 'lion' and suitable for back pain, knee pain and rheumatism, again indicating a level of demand for lion products for medicinal use. Other than fat, the vendor also claimed to be able to source bones (for rheumatism) and skin (for spiritual protection) on request.

⁶ Respondents were asked to discriminate between genuine and fake lion fat. Genuine lion fat has a more oily texture and is 'grey' coloured. Fake lion fat is more solid in texture and more yellow in colour.

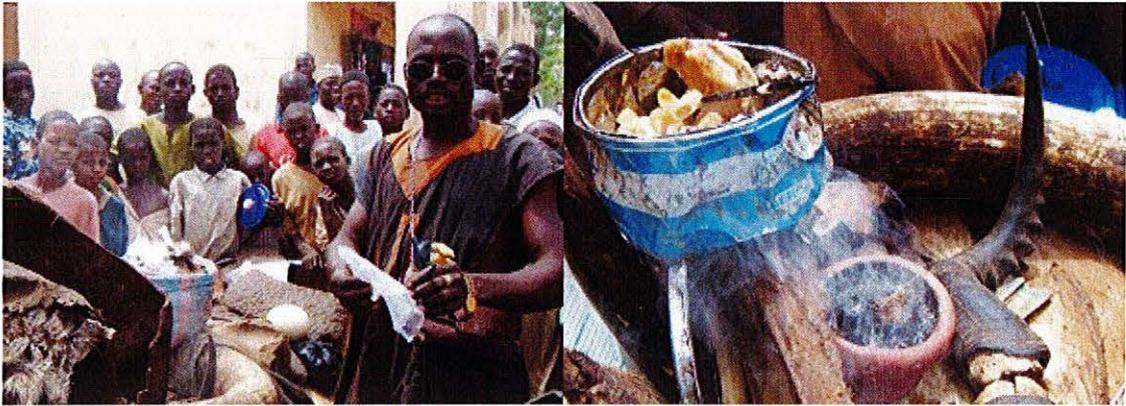


Fig. 6 Imitation lion fat for sale on market stand in Alkaleri

The price for a cube of lion fat (finger tip size) given by all 4 vendors ranged from a minimum of 50 naira to 500 naira. All four vendors mentioned the availability of fat, skin and bone on request.

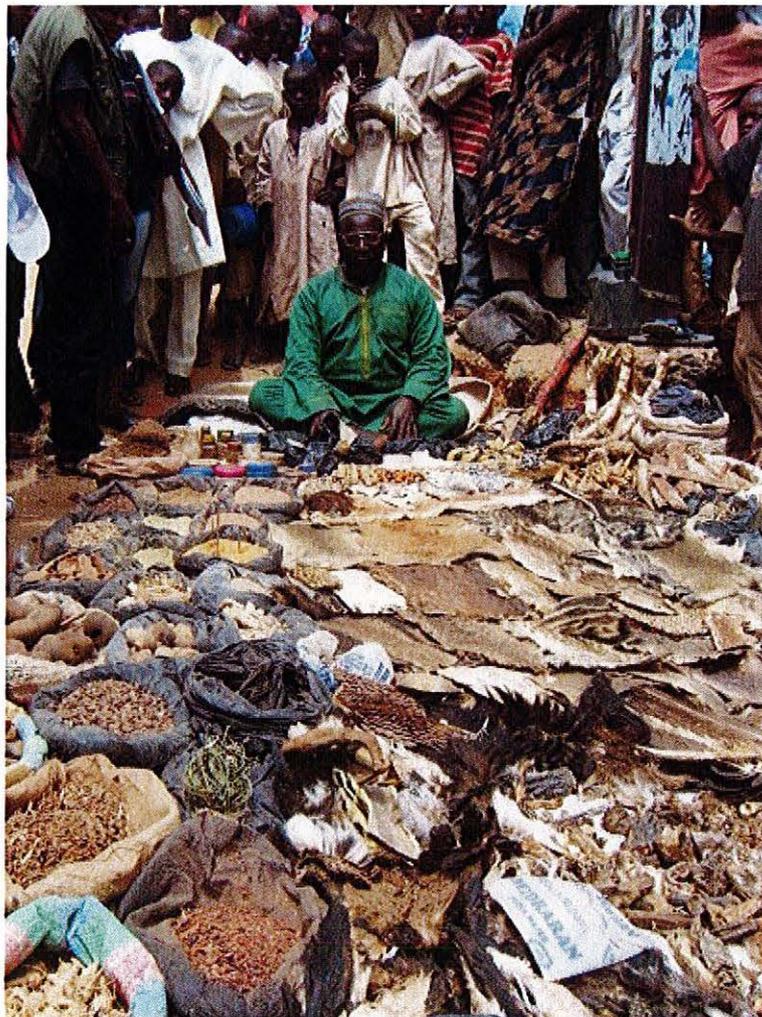


Fig. 7 Native healer selling medicines at stall in Alkaleri Market

Other animals used in traditional medicine

The survey also recorded other animals used in traditional medicine, but the section was open ended with neither species nor their body parts probed for specifically. The resulting data allows an insight into use but is limited regarding cross species comparisons.

The communities demonstrated a high level of knowledge concerning the use of animal products in healing and preventative medicine, with only 10% (24) of respondents not recalling any animal based products.

Table 8. Top 10 animals mentioned by respondents to have medicinal properties

Animal	No. respondents	Animal based product
Elephant	110	Dung (83), Skin (22), Ivory (14), Fat (4), Meat, Teeth (3), Ear (2), Trunk, Tail, Liver, Blood, Stomach (1)
Hyena	85	Skin (47), All body / live (16), Meat (15), Dung (9), Fat (8), Intestine, Stomach (5), Bone (4), Skull (3), Tail, Saliva, Teeth, Hooves, Womb (2), Lung, Eye, Ear (1)
Python	54	Fat (46), Skin (9), Head (2), Meat (2)
Buffalo	25	Meat (10), Horn, Skin (4), Dung, Fat (3), Heart (2), Lung, Womb, Bone, Tail, Hair (1)
Hippopotamus	22	Fat (11), Skin (7), Meat (3), Bone (2), Liver (1), Womb (1)
Roan Antelope	17	Meat (9), Horn, Skin (2), Fat (1)
Crocodile	17	Skin(10), Teeth(4), Lungs, Meat(3), Fat, Ear, Liver, Bones(1)
Duiker	15	Meat(8), Horn, Skin(2), Blood, Womb, Heart, Genitals(1)
Water Buck	14	Meat (8), Placenta, Womb (2), Skin, Fat (1)
Baboon / monkey	9	Fat (5), Veins (2), Meat, Genitals, Tail (1)

Although almost half of respondents interviewed (47%) mentioned the use of elephant products, 75% of those discussed the medicinal properties of dung as opposed to integral body parts. The burning of dung was described to offer protection from evil spirits, relief from dizziness and cures for yellow fever. Thus the most prevalent animal listed for providing medicinal body parts was the hyena. Hyena skin appeared popular amongst the communities for spiritual protection and healing whooping cough. Young children with complaints such as bed wetting, convulsions or in need of spiritual guidance were said to be placed on top of live hyenas for cures. Pythons appeared popular with the communities for providing fat. Similar to lion fat, it is used for back pain and dislocated/fractured bones.

Conclusion

As with any questionnaire survey, the reliability of the data used in this study is affected by the target population's cooperation. In our survey, due to good links with the local Non Governmental Organisation in the area (Savanna Conservation Nigeria) and gaining prior permission from Community Heads, respondents were very cooperative. Most people we approached were positive towards our intentions. Furthermore, the study was designed with a good geographical sample spread across the communities, allowing enough time to cover all the area. However, there were sources of bias. The use of wild animal body parts in traditional medicine is known to be an unavoidable activity not permitted by the Nigerian government and superstitions surrounding the powers attached to such animal products may have lead to some respondents giving evasive answers.

Despite the lack of previous studies to compare results to, the uniformity of this study's results is still indicative of valid trends. For instance 57 people from 20 communities (some more than sixty kilometres apart) listed the same uses for lion fat (dislocated/fractured bone). These results were further validated during market surveys where both genuine and imitation lion fat were sold for similar health cures, demonstrating a demand for these products.

Utilization of lion body parts by the local communities around Yankari Game Reserve, as confirmed by this survey, is largely for traditional medicine. Significantly, the survey results indicate that lions are killed for their body parts, as opposed to body parts being secondary value by-products. Fat was the most common body part utilised by the communities with skin and bone also appearing to have both healing and preventative medicinal properties. Over 20 different lion body parts were described useful in traditional medicine by the communities and with native healers achieving the highest ranking score for accessible healthcare, the threat of medicinal trade on wild lion populations would appear critical.

The threat of trade on wild lion populations appears not only to affect the population in Yankari Game Reserve but also potentially affect populations in neighbouring countries. Cross border activity was indicated by several respondents during open ended discussions, with Cameroon spontaneously mentioned and to a lesser extent, Niger, as potential sources for obtaining lion products (body parts).

Whilst this study only focuses on a limited geographical region in West Africa, it is important to note Born Free has also been investigating similar trade impacts on populations across Africa. Preliminary surveys in Burkina Faso and Botswana indicate a high demand of lion body parts for medicinal use. Again, there is uniformity across the body parts deemed most useful and their respective application. In Western Ghana, Ntiamao-Baidu (1992), reported lion skin uses for convulsion, weak child and the wearing of talismans for protection powers, as found in our survey results for Nigeria.

The future of wild lion populations depends on the recognition of trade as a critical pressure and the capacity of local, national and international organisations to address this. At an international level we recommend lions are uplisted from CITES Appendix II, to CITES Appendix I, which would ban commercial international trade.

Acknowledgments

Born Free and Penny Morris (the principal researcher) would like to express our gratitude to Mr P. Davies and Mr. H. Etuk for their guidance, support and patience during preliminary visits to the Nigeria. My thanks and appreciation also goes to the encouragement, generous support and advice from Mr A. P Leventis and Mr P. Hall. This study would also not have been possible without the tireless work of Mr J. Ifeanyi and all his team of dedicated rangers and researchers at Savanna Conservation Nigeria. Lastly, I'd like to thank the time given to us by the communities involved in the study and the hospitality they offered.

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Appendix:

Outline of statistics:

234 respondents were sampled from 20 of the 26 communities to represent the 3 provinces (as shown below).

Description of communities surrounding reserve

Communities	Province	Interviewed?	Size	Details	Age of village
Bakin Dutse	Duguri	No	-	-	-
Bogos	Duguri	Yes	Don't know	Major route used by poachers from other bordering states e.g Plateau, Taraaba	New
Dagudi / Talishot	Duguri	Yes	3000-4000	Mostly farmers, less problem with bushmeat	Old
Dan	Duguri	Yes	5500	Mostly farmers, less problem with bushmeat	Old
Dogan Ruwa	Duguri	Yes	2500	Mostly farmers, less problem with bushmeat	Old
Duguri	Duguri	Yes	12000	Known for some bushmeat trade, take to Bauchi to sell	Old
Gaji Gamu	Duguri	No	-	-	-
Kuka	Duguri	Yes	3000	Many hunters live in Kuka	New
Mainamaji	Duguri	Yes	5000	Closest / borders reserve	Old
Rimi	Duguri	Yes	1800	Major route used by poachers from other bordering states e.g Plateau, Taraaba	Old
Bogga	Gwana	Yes	3000	Poaching is tradition	New
Digare	Gwana	Yes	Don't know	Poaching is tradition	New
Futuk	Gwana	No	-	-	-
Gale	Gwana	Yes	5000	Poaching is tradition	New
Mansur	Gwana	Yes	5000	Poaching is tradition	New
Rahama	Gwana	No	-	-	-
S/mala	Gwana	Yes	Don't know	Poaching is tradition	New
Walakerol	Gwana	No	-	-	-
Yalo	Gwana	Yes	Don't know	Poaching is tradition	Old
Alkaleri	Fali / Pali	Yes	800000	Bushmeat trade centre / lion fat for sale in market	Old
Fanti	Fali / Pali	Yes	15000	Problem area, bushmeat trade passes through, vehicle routes	New
Gar	Fali / Pali	Yes	15000	Bushmeat	New
Jada	Fali / Pali	No	-	-	-
Kwala	Fali / Pali	Yes	4500	Bushmeat	New
Maiari	Fali / Pali	Yes	5000	Bushmeat	New
Pali / Fali	Fali / Pali	Yes	11000	Farmers (not problem area)	Old

Respondent demographics:

Age and sex of respondents interviewed

Age	Number of respondents	Male	Female
<21	22	0	22
21 - 40	98	42	56
> 40	114	77	37
Total	234	119	115

The majority of respondents interviewed were Muslim (99%), representative of Bauchi state, with the remaining 1% (3 respondents) being Christian. Over 30 tribes were represented amongst the respondents with Hausa (27%), Fulani (25%) and Jarawa (12%) being most prevalent.

Tribes of respondents interviewed

Tribe	Number of Respondents
Hausa	64
Fulani	59
Jarawa	27
Badugura / ri	14
Jaku	11
Boboli	8
Dugurawa	7
Kanuri	5
Duguri	4
Bajakuwa	3
Bajari	3
Bolawa	3
Bahaushe	2
Bakatsine	2
Barbariya	2
Buri Buri	2
Tarok	2
Other	16
Total	33

No. children per respondent interviewed

No. children per respondent	Number of respondents
>6	122
5 to 6	50
3 to 4	30
1 to 2	38
0	4

No. wives per household

No. wives in household	Number of respondents
3 to 4	86
1 to 2	25
2	83
1	36
6 or more	4

Economic activities of respondents (many were involved in more than one)

Economic activities	No. respondents
Farming	75
Ground nut oil / cake	34
Trader / Trading	29
Civil servant	24
Rice or corn peeling / pounding	9
Business man	6
Tailor / knitting / sewing	6
Fatten cattle / husbandry	6
Beans cake / Rice cake	9
Local spices e.g Maggi	5
Village head	3
Traditional healer	2
Guinea Corn Wine	2
Health personnel	1
Teacher	1
Mechanic	1
Vegetables	1
Palm oil	1
Local pasta (talia)	1
Local hunter	1
Iron bender	1
Hair braiding	1
Fishing	1
Wood seller	1
Building	1
Coconut oil, salt	1
Photographer	1
Barbers	1

Lion derivatives used by communities ('Not stated' not included)

Lion derivative	Number of respondents	Main uses	Personally used in last 3 years
Fat	144	1) Dislocation / Fracture / Broken bone (57). 2) Back pain (48). 3) Rheumatism / joint pain / bone marrow pain (41). 4) Protection against spiritual attack (17)	72 (47 once or twice, 22 several times, 3 frequently). (64 not used, 34 used >3 yrs ago, 30 never used, 8 not stated)
Skin unspecified	79	1) Protection from evil spirits (40). 2) cough / whooping (16). 3) Self empowerment (13). 4) Child protection from convulsions (6).	37 (26 once or twice, 9 several times, 2 frequently). (38 not used, 23 never used, 4 not stated)
Bone	44	1) Rheumatism / joint pain / bone marrow pain (24). 2) Bone fractures (6). 3) Back pain (4)	26 (15 once or twice, 7 several times, 4 frequently). (18 not used, 13 never used)
Meat	21	1) Nutrition (14). 2) Increase general health (8).	8 used (5 once or twice, 3 several times). (11 not used, 2 no detail)
Teeth	16	1) Protection of children's teeth	9 (4 several times, 4 once

		during teething (10). 2) Teeth gum infections (4). 3) Migraine (2).	or twice, 1 frequently). (7 not used)
Lungs	11	1) Whooping cough (10). 2) Protection (1).	4 (2 frequently, 2 once or twice). (7 not used – 6 never used)
Forehead skin	10	1) Protection/ immunity against evil spirits/enemy (8). 2) Empowerment (4)	5 (2 several times, 3 once or twice). (3 not used - 2 never used, 2 not stated)
Vein	7	1) Spiritual protection (5). 2) Erectile dysfunction (1)	4 (2 several times, 2 once or twice). 3 not used – 2 never used
Throat Parts	5	1) Whooping cough (2). 2) Spiritual protection, asthma, increase sound of voice	3 (2 several times, 1 once or twice). 2 not used (1 never used)
Eyes	4	1) Protection from evil spirits (4). 2) Empowerment (1).	2 (1 several times, 1 once or twice). 2 not used (but have in past) 0 never used.
Dung	4	1) Spiritual protection / empowerment (2). 2) Night fever and ear problems	3 use (3 once or twice). (1 not used, but has in past) 0 never used
Heart	4	Spiritual guidance, protection of crops, ceremonies	1 (once or twice). (3 not used - 2 never)
Liver	4	Spiritual protection, headache, temper heart	3 (2 several times, 1 once or twice). 1 not used – 0 never used
Claws	3	Spiritual protection, ear problem	2 (2 several times). 1 not used
Whiskers	3	Spiritual protection	3 (2 once or twice, 1 several times).
Penis	2	Spiritual protection, Erectile dysfunction	1 (once or twice a year). 1 not used but has in past
Leg	2	Joint pain	1 (once or twice). 1 never used
Breast	2	Breast feeding mothers trouble feeding	1 (once or twice). 1 not used, has in past
Nose	2	Stomach problem	1 (once or twice). 1 never used
Blood	2	Spiritual empowerment	Not used (has in past)
Saliva	1	Ear problem	Never used
Brain	1	Back pain and Rheumatism	1 (once or twice)

Questionnaire design (format altered for presentation)

BORN FREE YANKARI HEALTH STUDY
Survey questions - PATIENTS

(**INTERVIEWER: PLEASE NOTE ALL INSTRUCTIONS FOR YOU TO CARRY OUT THIS QUESTIONNAIRE ARE IN CAPITALS)

INTERVIEWER PLEASE RECORD THE FOLLOWING BEFORE THE INTERVIEW:

- ▶ Language of Questionnaire: English
- ▶ Language of interview:
- ▶ Home language of respondent:
- ▶ Village:
- ▶ Translator used: (Yes, No)
- ▶ Date:

INTRODUCTION AND WARM UP

- ▶ INTRODUCE YOURSELF TO RESPONDENT (TELL THEM YOUR NAME)
- ▶ REASSURE RESPONDENT REGARDING CONFIDENTIALITY - TELL THEM IT IS **FOR RESEARCH PURPOSES WITH NO FURTHER CONSEQUENCES**
- ▶ TELL RESPONDENT TO RELAX AND ENJOY IT!

Explanation of research objectives:-

TELL RESPONDENT: *The purpose of this interview is to discuss your community's health. I work for a charity (Born free) and we would like to understand how happy you and your family are with the help available to you for looking after your health. What do your friends and family need medicines for and where are you able to get medicines from? This will allow us to understand how easy it is for your community to take care of its health.*

1) Can you describe what you think 'good health' is? (INTERVIEWER PLEASE RECORD ANSWERS IN BOX)

2) Do you feel your health is? (INTERVIEWER PLEASE READ OUT ANSWERS A - D)

- a) Not good b) Average c) Good d) Very good

3) When you or your family have problems with your health who do you most often go and see for help? (INTERVIEWER PLEASE RECORD THE TYPE OF PERSON CONSULTED, NOT THEIR INDIVIDUAL NAME E.G MODERN DOCTOR, TRADITIONAL HEALER, NURSE AT LOCAL CLINIC)

4) What choice of help is available to you or your family for healthcare issues? (INTERVIEWER READ LIST A - G) (TICK)		5) Are you satisfied with the help you receive there?	6) If answer is no, state reasons why not satisfied (INTERVIEWER PLEASE RECORD REASONS GIVEN)
a) Traditional Healer		a) Yes b) No	
b) Spiritual / Faith healing		a) Yes b) No	
c) Local Health Clinic		a) Yes b) No	
d) Government Hospital / Doctor / Nurse		a) Yes b) No	
e) Private Hospital Hospital / Doctor / Nurse		a) Yes b) No	
f) Shop / Market / Pharmacy		a) Yes b) No	
g) Others (specify)		a) Yes b) No	

7) What reasons have you or your family needed to seek medical advice and treatments for in the past year? (INTERVIEWER STRESS AGAIN THAT THIS DATA IS TOTALLY CONFIDENTIAL)	8) (INTERVIEWER FOR THOSE MENTIONED PLEASE ASK) Have you ever seen a traditional healer for this?
	Yes / No

9) Please name some of the medicines and treatments you or your family have used from:	Name of medicines/herbs/animal parts	10) In general, how expensive are the treatments you receive from these different people?
a) Traditional Healer		a)free b)cheap c)quite expensive d)very expensive
b) Spiritual / Faith healing		a)free b)cheap c)quite expensive d)very expensive
c) Local Health Clinic		a)free b)cheap c)quite expensive d)very expensive
d) Hospital / Doctor / Nurse		a)free b)cheap c)quite expensive d)very expensive
f) Shop / Market / Pharmacy		a)free b)cheap c)quite expensive d)very expensive
g) Others (specify)		a)free b)cheap c)quite expensive d)very expensive

11) Please describe what wild animals and their body parts are used in your community to help with good health? These may not have been necessarily used by yourself and your own family, but are ones that you know have been used in the community. *(DO NOT READ LIST, BUT DO PROMPT LION IF NOT MENTIONED)*

Animal	State body parts used E.g Skin, teeth, claws, heart, tail, fat, ivory, spines, hair, feathers, penis, leg, head, blood, horn, eyebrow hair, bones, liver, kidney, eye, nose, hooves, intestine, whole, sole, etc
a) Lion	
b) Elephant	
c) Hippo	
d) Buffalo	
e) Antelopes (SPECIFY)	
f) Bucks (SPECIFY)	
g) Kob	
h) Duiker	
i) Leopard	
j) Hyena	
k) Porcupine	
l) Pangolin	
m) Birds (SPECIFY)	
n) Snake (specify e.g python, cobra, adder)	
o) Warthogs	
p) Baboon	
q) Rat (SPECIFY)	
r) Snails	
s) Lizard (SPECIFY)	
t) Crocodile	
u) Other (SPECIFY)	

PLEASE ASK THE FOLLOWING QUESTIONS FOR EACH LION BODY PART USED (IF LION IS NOT USED PLEASE ASK FOR ELEPHANT BODY PARTS)

(REPEATED)

<p>Lion /Elephant (DELETE AS APPROPRIATE)</p>	<p>DESCRIBE BODY PART USED e.g fat, claws, tail, skin</p>
<p>12) Describe thoroughly what the item is used for?</p>	
<p>13) How successful is it as a treatment / medicine?</p>	<p>a) Very successful b) Fairly successful c) Fairly unsuccessful d) Very unsuccessful</p>
<p>14) How affordable is it?</p>	<p>a)free b)cheap d)Fairly expensive e)Very expensive</p>
<p>15) How much does it cost? (Naira)</p>	
<p>16) How easy is it to get hold of?</p>	<p>a) Very easy b) Fairly easy c) Fairly difficult d) Very difficult</p>
<p>17) Where can it be sourced from?</p>	<p>a) Local hunter b) Traditional / faith healer c) Local doctor/nurse d) Market/shop e) Friends/family f) Traders g) teachers h) Religious leaders i) Other</p>
<p>18) How often have you or your family used this item in the last 3 years?</p>	<p>a) not used b) used once or twice c) used several times d) used frequently / a lot</p>

19) Are lions, used for treatments and medicines, caught especially for this reason or are they caught for other reasons?

a) animals killed specifically for medicine / treatments

b) animals killed for other reasons and then body parts used as medicines/treatments
(LIST OTHER REASONS WHY ANIMALS KILLED IF NOT SPECIFICALLY FOR MEDICINE)

20) What other reasons do people use animal body parts for? (READ LIST)	(TICK)	21) Are lion products used for this purpose in the community? (RECORD DETAIL WHERE GIVEN)
A) Calling up/ appeasing spirits, ancestors, gods or witches		Yes / No
B) Incantations		Yes / No
C) Gifts to rulers / traditional leaders / chiefs		Yes / No
D) Installation of rulers / traditional leaders / chiefs		Yes / No
E) Marriage ceremonies		Yes / No
F) Death / burial ceremonies		Yes / No
G) Sacrifices		Yes / No
H) Other tribal ceremonies (ASK RESPONDENT WHICH CEREMONIES)		Yes / No
I) Religious ceremonies / prayer		Yes / No
J) Before / during Hunting		Yes / No
K) Special (magical) healing powers		Yes / No
L) Protection / immunity (ASK RESPONDENT PROTECTION FROM WHAT)		Yes / No
M) Prevention (ASK RESPONDENT PREVENTION FROM WHAT)		Yes / No
N) Increased bravery / confidence		Yes / No
O) Making voice louder		Yes / No
P) Curses		Yes / No
Q) Decoration / ornamental		Yes / No
R) Food		Yes / No
S) Other (Please Describe)		Yes / No

RESPONDENT DEMOGRAPHICS

INTERVIEWER PLEASE ASK/ RECORD:

22) Age	23) Sex	24) Religion	25) Name of tribe
a) Less than 20 years b) 21-40 years c) More than 40 years	a) Male b) Female	a) Christian b) Muslim c) Other	

26) Do you have children?	27) Number children in household	28) Number women in household
a) Yes b) No	a) 1-2 b) 3-4 c) 5-6 d) >6	a) 1-2 b) 3-4 c) 5-6 d) >6

29) Does your household have running water?	30) Have you been to school?	31) If yes, number of years attended school
a) Yes b) No	a) Yes b) No	

32) Do you currently have an income/earn cash?	33) Do you earn cash throughout the year or only once in a while?	34) What do you do to have an income / earn cash?
a) Yes b) No	a) Throughout year / constant b) Once in a while / infrequently	

