



Preliminary survey on the bushmeat sector in Nord-Ubangi Province (DR Congo): Case of Gbado-Lite city and its surroundings

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ABSTRACT:

A survey was carried out of 100 bushmeat vendors (33 males and 67 females) aged between 15 and 65 years, of which 44% had a high school education, 28% were illiterate, and 28% have a level of primary education. Our results show that the sale of bushmeat is an activity more practiced by married people (71%). 151 carcasses of 18 species (belonging to 2 Classes, 9 Orders and 16 Families) have been recorded. In terms of specific richness, the order of Cetartiodactyla dominates (22.2% each) followed by Primates and Rodentia (16.7% each), Carnivora and Squamata (11.1% each), Chiroptera, Crocodylia, Pholidota and Testudines (5.56 % each). *Philantomba monticola* (19.29%), *Sylvicapra grimmia* (17.21%), *Cercopithecus* spp (11.25%) and *Cricetomys emini* (11.25%) were the most commonly encountered species in different markets. Lokame (27.8%) and Mando (22.2%) forests are places of origin for more animals. Gun hunting is the predominant mode of capture (38.42%) followed by traps (36.42%) and manual capture (25.16%). Regarding the condition of the animals for buying or selling transaction, it was noticed that very few animals are kept alive (15% vs 85%), but they were sold mainly smoked (55% vs 45%) and portions (60% vs 40%). The promotion of peri-urban mini-farming of highly consumed wild species such as small mammals (*Aulacodes* and *Emin* rats) and short-cycle breeding (poultry farming, fish farming) as well as the in situ conservation of biodiversity in partnership with local communities could be a sustainable solution.

Keyword: *Hunting, wildlife, in situ conservation, domestication, Nord-Ubangi.*

INTRODUCTION

The Democratic Republic of the Congo (DRC) is an exceptional biogeographic region in Africa. It is one of the world's reservoirs of biodiversity, as the results of our work show, and more than 50% of its national territory is covered by different types of forest with many wild and endemic animal species [1-22]. Wildlife is the main source of animal protein in the diet of populations living in forest regions of Central Africa [23]. In DRC, especially in Nord-Ubangi province, the population has always practiced a customary hunting of self-subsistence, which plays an important role in the economic and cultural organization of their society [14].

The current global economic crisis linked to the fall in prices of main export cash crops (coffee, cocoa, palm oil, etc.) and their lack of constraint has favored the emergence of a commercial hunting that meets the demand of urban markets [24]. However, the quantities of meat offered in these markets are increasingly important and pose a serious threat to the survival of different animal species. The objectives of this study are to identify animal species sold, their origin, the capture methods, the animal age, sex, condition of purchase and sale.

The significance of this study is obvious because a better knowledge of bushmeat supply network would make it possible to propose alternative solutions to this activity and the setting up of

legislation governing the exploitation of wildlife that is better suited to a high value conservation area such as Nord-Ubangi province of which the high biological diversity, the presence of rare ecosystems (inselbergs, permanent clearings, and bays in forests), ecological services, etc. are all indicators that make its forest block a priority area for conservation.

MATERIALS AND METHODS

The present study was carried out at Gbadolite (4 ° 17 'north latitude, 21 ° 2' east longitude, altitude: 500 m above the sea) and its surroundings. The climate is of AW2 type in accordance with the Köppen classification [14, 15]. Analyzed data are based on a market survey of: Gbadolite (25 people), Mangundu (25 people), Mando (25 people) and Molegbe (25 people). A total of 100 people were interviewed using a questionnaire. This includes two parts: Sociodemographic data (age and sex of respondents, level of education, family situation) and information on bushmeat (name of species, origin, capture method, animal age, animal sex, its state to purchase capture, and sale). Species identification was done using on-line guides and databases [25, 26]. Classical methods of descriptive statistics were used to analyze the results. Origin software version 6.1. was used to plot the curves.

RESULTS AND DISCUSSION

The survey was carried out among 100 vendors (including 33 men and 67 women) whose age was comprised between 15 and 65 years old. The age groups ≥ 61 years, 53-57 years and 34-39 years constitute 51% of vendors. And the following age groups: 22-27 years and 47-53 years are the least represented (Figure 1).

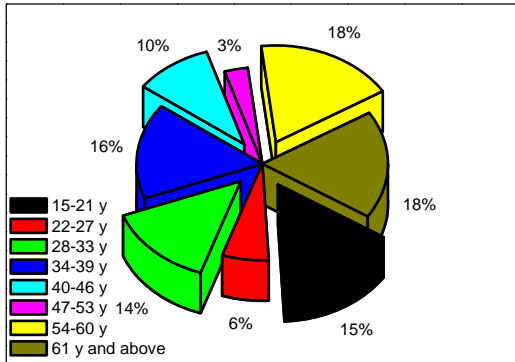


Figure 1. Age of respondents

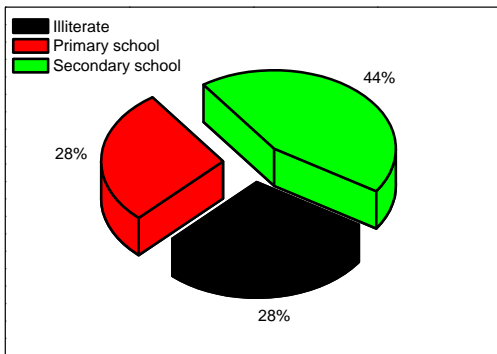


Figure 2: Level of education of bushmeat vendors
This figure shows that 44% of bushmeat vendors have a secondary

education level while illiterates and those with a primary education level represent 28% respectively.

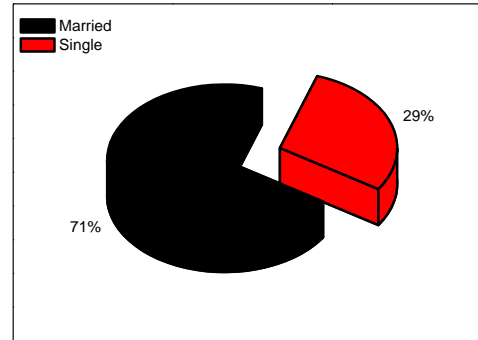


Figure 3: Marital status of bushmeat vendors
The sale of bushmeat in Gbadolite and its surroundings is the most popular activity practiced by weds (71%) than bachelors (29%).

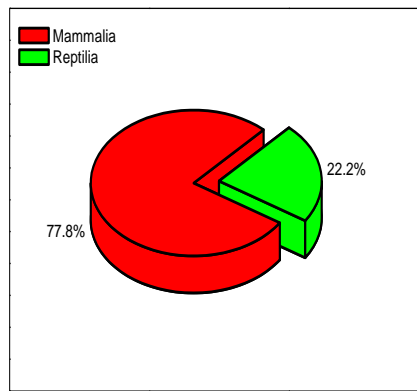


Figure 4 : Different classes of listed animals and their frequency

Table I: List and frequency of listed species and their status of protection

Scientific accepted name	Vernacular name	Class (Order, Family)	Specimen Number	%	Conservation status (IUCN) [27]
<i>Cercopithecus spp</i>	Makako (Lingala)	Mammalia (Primates, Cercopithecidae)	17	11.25	Least Concern to Endangerd
	Nvi (Ngbandi)				
	Singe (Français)				
<i>Philantomba monticola</i> (Thunberg, 1789)	Mboloko (Lingala)	Mammalia (Cetartiodactyla, Bovidae)	29	19.29	Least Concern
	Ba (Ngbandi)				
	Cephalophe bleu ou Gazelle (Français)				
<i>Syncerus caffer caffer</i> (Sparman, 1779)	Pakasa (Lingala)	Mammalia (Cetartiodactyla, Bovidae)	4	2.64	Not yet assessed for the IUCN Red List
	Ngba (Ngbandi)				
	Buffle (Français)				
<i>Kinixys erosa</i> (Schweigger, 1812)	Koba (Lingala)	Reptilia (Testudines, Testudinidae)	11	7.28	Data Deficient
	Nako (Ngbandi)				
	Tortue articulée d’Afrique (Français)				
<i>Sylvicapra grimmia</i> (Linnaeus, 1758)	Kulupa (Lingala)	Mammalia (Cetartiodactyla, Bovidae)	26	17.21	Least Concern
	Ngandi (Ngbandi)				
	Céphalophe de Grimm (Français)				

<i>Thryonomys swinderianus</i> (Temminck, 1827)	Simbiliki (Lingala)	Mammalia (Rodentia, Thryomyidae)	6	3.97	Least Concern
	No/Tope (Ngbandi)				
	Aulacode (Français)				
<i>Pan troglodytes</i> (Blumenbach, 1799)	Mokomboso (Lingala)	Mammalia (Primates, Hominidae)	4	2.64	Endangered
	Nvo (Ngbandi)				
	Chimpanzé (Français)				
<i>Cricetomys emini</i> (Wroughton, 1910)	Mopute (Lingala)	Mammalia (Rodentia, Nesomyidae)	17	11.25	Least Concern
	Nve (Ngbandi)				
	Rat géant d'Emin (Français)				
<i>Sus scrofa</i> (Linnaeus, 1758)	Sombo (Lingala)	Mammalia (Cetartiodactyla, Suidae)	6	3.97	Least Concern
	Mbenge (Ngbandi)				
	Porc sauvage/Sanglier (Français)				
<i>Python regius</i> (Shaw, 1802)	Nguma (Lingala)	Reptilia (Squamata, Pythonidae)	3	1.98	Least Concern
	Nkwan (Ngbandi)				
	Boa (Français)				
<i>Mecistops cataphractus</i> (Cuvier, 1825)	Lokekele (Lingala)	Reptilia (Crocodylia, Crocodylidae)	2	1.32	Critically Endangered
	Ngunde (Ngbandi)				
	Faux gavial (Français)				
<i>Varanus niloticus</i> (Linnaeus, 1766)	Mbambe (Lingala)	Reptilia (Squamata, Varanidae)	2	1.32	Not yet assessed for the IUCN Red List
	Nzanga (Ngbandi)				
	Varan du Nil (Français)				
<i>Nandinia binotata</i> (Gray, 1830)	Gambala (Lingala)	Mammalia (Carnivora, Nandiniidae)	3	1.98	Least Concern
	Ganvana (Ngbandi)				
	Civette (Français)				
<i>Genetta victoriae</i> (Thomas, 1901)	Mosole (Lingala)	Mammalia (Carnivora, Viverridae)	2	1.32	Least Concern
	Solo (Ngbandi)				
	Genette géante (Français)				
<i>Phataginus tricuspis</i> (Rafinesque, 1821)	Kakolo (Lingala)	Mammalia (Pholidota, Manidae)	1	0.66	Vulnerable
	Kan (Ngbandi)				
	Pangolin (Français)				
<i>Perodicticus potto</i> (P.L.S. Muller, 1766)	Ebeya (Lingala)	Mammalia (Primates, Lorisidae)	2	1.32	Least Concern
	Ga mbowa (Ngbandi)				
	Potto de Bosman (Français)				
<i>Atherurus africanus</i> (Gray, 1842)	Mboke (Lingala)	Mammalia (Rodentia, Hystricidae)	3	1.98	Least Concern
	Kumba (Ngbandi)				
	Porc épic (Français)				
<i>Eidolon helvum</i> (Kerr, 1792)	Lingembu (Lingala)	Mammalia (Chiroptera, Pteropodidae)	13	8.60	Near Threatned
	Kpongbo (Ngbandi)				
	Chauve-souris (Français)				

This table shows that 151 carcasses of 18 species (belonging to 2 Classes (Figure 4), 9 Orders and 16 Families) have been recorded. In terms of specific richness, the order of Cetartiodactyla dominates (22.2% each) followed by Primates and Rodentia (16.7% each), Carnivora and Squamata (11.1% each), Chiroptera, Crocodylia, Pholidota and Testudines (5.56 % each) (Figure 5). *Philantomba monticola* (19.29%), *Sylvicapra grimmia* (17.21%), *Cercopithecus spp* (11.25%) and *Cricetomys emini* (11.25%) were the most

commonly encountered species in different markets.

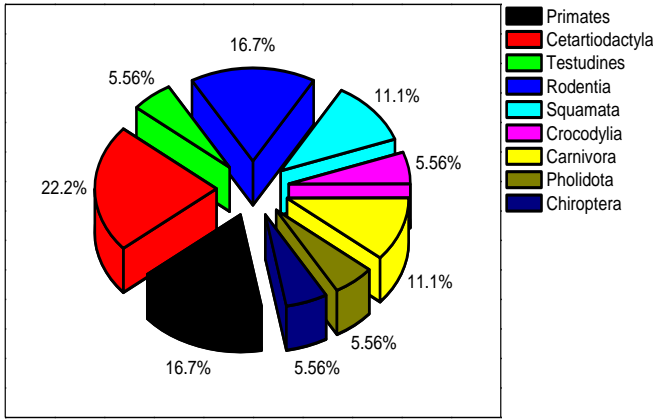


Figure 5 : Different orders of listed animals and their frequency

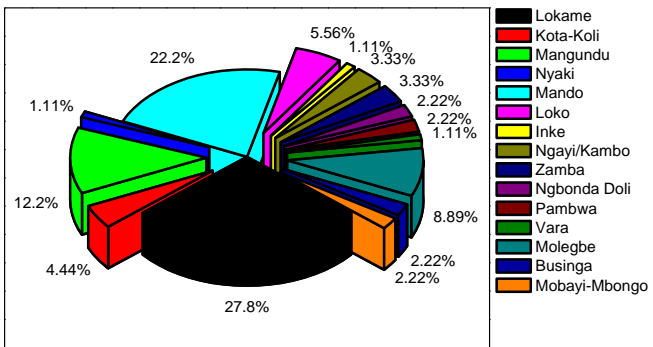


Figure 6: Bushmeat origin

Lokame (27.8%) and Mando (22.2%) forests are places of origin for more animals followed by Mangundu (12.2%), Molegbe (8.89%), Loko (5.56%) and Kota-Koli (4.44%). The other forests have a low frequency ($\leq 3.33\%$).

Measures to regulate hunting in these forest ecosystems where conversion to community reserves is necessary to promote the sustainability of hunting based on the balance of production of each animal population (kg/ha/year) [24]. Legislation governing the exploitation of wildlife in these ecosystems would prevent the overexploitation of wildlife resources.

Figure 7 gives different modes of animal capture.

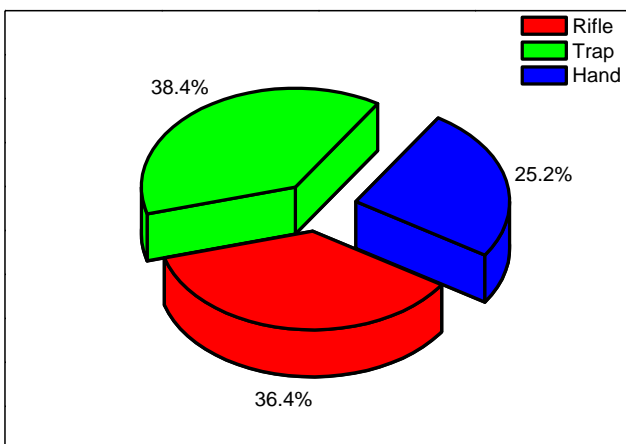


Figure 7: Animal capture methods

Out of 151 carcasses, gun hunting is the predominant mode of

capture (38.42%) followed by trapping (36.42%) and manual capture (25.16%). It is well established that rodents are largely captured by traps, primates using guns and Cetartiodactyla by both predominantly gun methods. The manual capture mainly concern reptiles (e.g. turtles) [24].

Figure 8 displays the age of animals sold in different markets surveyed.

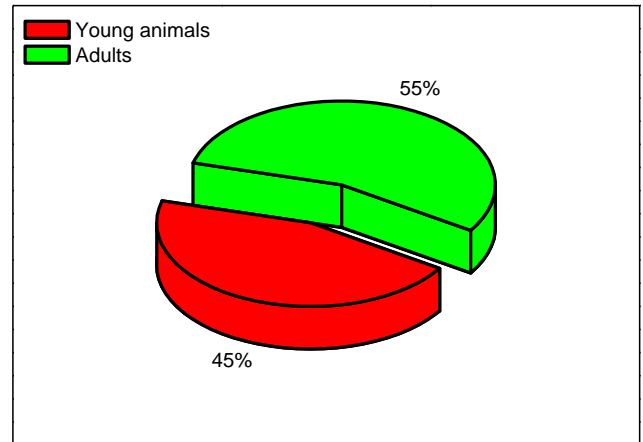


Figure 8: Ages of animals sold

Following the age of animals, we found that adults largely dominate the displays (55%). However, the proportion of young animals sold is not negligible (45%). This shows the non-compliance with hunting practices in Nord-Ubangi province.

Figure 9 shows the sex of animals sold in different markets surveyed.

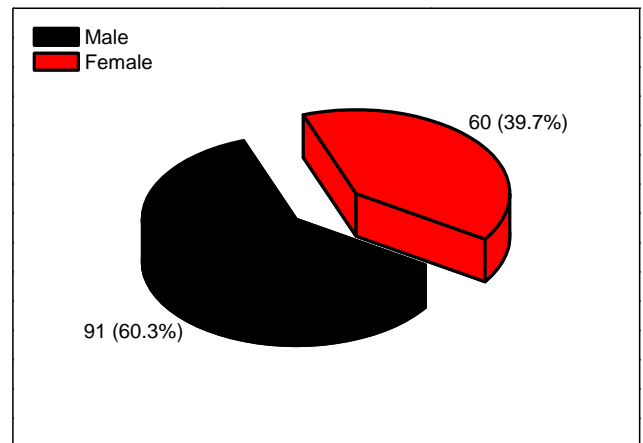


Figure 9: Sex of animals sold in different markets surveyed

Depending on the sex of species sold, it can be noted that all clearly sexed animals, 60% were males and 40% females, these results show that non-compliance with hunting regulations in North-Ubangi which can create an imbalance in terms of sex ratio. As for the condition of the animals in the purchase or sale transaction, very few animals were found (15% vs 85%) (Figure 10a), most were sold smoked (55% vs 45%) (Figure 10c) and in pieces (60% vs 40%) (Figure 10b).

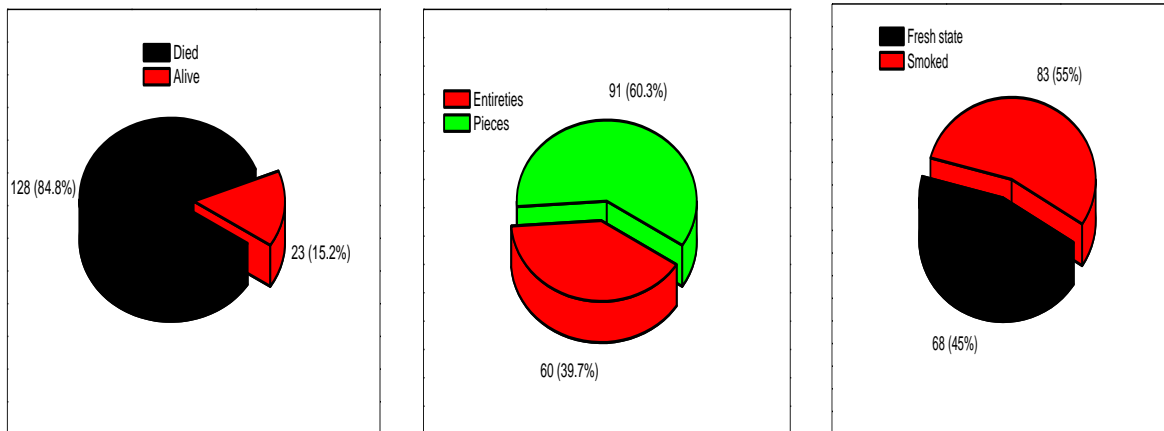


Figure 10 : Animal status at the transaction



Figure 11 : Some illustrative photos taken in the field

Hunting is currently a serious threat to wildlife conservation in the Northern Ubangi forest block despite the fact that this practice has always contributed to the food balance of the forest population.

CONCLUSION AND SUGGESTIONS

The bushmeat trade is currently playing a key role in the economy of several households in Nord-Ubangi province, as it involves a number of actors namely: hunters/trappers, intermediaries and vendors. In order to ensure good management of wildlife resources in this part of the country, the State must implement development programs aimed at protecting the nature such as encouraging the creation of a hunting association and the authorization of their activity according to the season and hunting quotas in relation to areas, species and means of collection.

Peri-urban mini-farming of highly consumed wild species such as small mammals (Aulacodes and Rats of Emin) could be a sustainable solution and only animals from farms can be traded. Measures to meet the growing demand for animal proteins will include the promotion of short-cycle species (poultry, fish farming). It is also desirable that public awareness work be initiated for a participatory approach to the *in situ* and/or *ex situ* conservation of Nord-Ubangi province biodiversity for present and future generations.

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