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in Selected States of Southern, Nigeria**

*Ampitan, T.A., Halidu, S.K., Ajayi, S.R., Oyeleye, D.O., Adeola,
A.J. & Zaccheus, J.*



Survey of Pangolin Availability and Trade in Selected States of Southern, Nigeria

 Ampitan, T.A.^{1*}, Halidu, S.K.², Ajayi, S.R.³, Oyeleye, D.O.⁴, Adeola, A.J.⁵ and Zaccheus, J.⁶

Federal College of Wildlife Management, P.M.B. 268, New Bussa, Niger State, Nigeria.

Corresponding author email address: rychy4christ2014@gmail.com

Corresponding author phone lines: +2347068417840 and +2348076760286



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Abstract

Purpose: The Study ascertain Pangolin availability and trade in five selected states of Nigeria.

Materials and Methods: Purposive sampling was use to select their involvement in wildlife trade especially Pangolins. Questionnaire was administered as interview guide to seventeen accessible marketers of wild animals and data were subjected to descriptive statistics and measure of central tendency.

Findings: All marketers were married women, between ages 35-54 years, 47.2% had 1-10years business experience with 17.6% having 31-40 years business experience, 94% of respondents confirmed

reduction in population of pangolin from the flow of supply through hunters, twelve dollars fourteen cents was the price depending on the size, *Phataginus tricuspis* was mostly traded and 21 species of wildlife were traded by these marketers.

Implications to Theory, Practice and Policy: A proactive step should be taken by relevant stakeholders to reduce trade in pangolin, through stringent legislation, intensive conservation education, provision of alternative sources of livelihood to both the hunters and marketers in the study areas.

Keywords: *Pangolin, Survey, Trade, Respondents and States of Southern*

1.0 INTRODUCTION

Pangolins are the most illegally trafficked mammals in the world Goode, (2015). Over the past decade, over one million pangolins are believed to have been illegally trafficked. They are listed on the international Union for Conservation of Nature (IUCN) Red List of Threatened species as endangered IUCN (2019). Pangolins are the only mammals with large, protective keratin scales covering their skin. Mammals are classes of vertebrate; air breathing animals whose females are characterized by the possession of mammary glands, while males and females are characterized by the sweat glands, hair/fur and a neocort region in the brain.

There are a total of two hundred and ninety (290) mammals' species in Nigeria IUCN (2007). In Nigeria the population of the Pangolins is reducing due to various human activities in their natural habitats IUCN (2019). Pangolins are unique mammals that are active at night. They live in hollow of trees or burrows, depending on the species, feeding only on termites and ants Nowak (1999). Pangolins belong to the Order Pholidota. The one (1) extant family, Manidae is divided into three (3) genera with eight (8) species distributed evenly between Africa and Asia continents; each continent has four (4) different species of Pangolins. According to Gaudin, T.J., R.J., Emery, and J.R., Wible, (2009) African Pangolins are classified into two genera: *Phataginus* (African Tree Pangolins) genus and *Smutsia* (African Ground Pangolins) genus.

The African pangolins species include *Phataginus tetradactyla* (Black-bellied pangolins), *Phataginus tricuspis* (White-bellied pangolins), *Smutsia gigantean* (Giant ground pangolins) and *Smutsia temminckii* (Temminck's ground pangolins) Maurice *et al.*(2017) and Gaudin, *et al.* (2009) Among the four (4) species of African origin three (3) has been identified to be domicile in Nigeria, hereafter referred to as Nigerian Pangolins. These include *Phataginus tetradactyla* (Black-bellied pangolins), *Phataginus tricuspis* (White-bellied pangolins) and *Smutsia gigantean* (Giant ground pangolins) Challenger and Waterman (2017; Sodeinde and Adedipe (1994). According to Ashokkumar *et al.* (2017) pangolin are also referred to as anteaters with respect to their preferred food that include ants and termites. They also have a large hardened overlapping plate-like and protective keratin scales that make the animal to be mistakenly for a reptiles. The scales only cover their dorsal side and tail, but their ventral sides are soft covered with few hairs and their head and limbs are hardened structure Maurice, *et al.*, (2019).

In Nigeria, pangolins inhabit natural forest; primary and secondary rain forest, moist tropical lowland and secondary growth forest, dense woodlands, especially along water courses or riverine and swamp forests dominated by palms, bamboo forest, forest savanna-cultivation and mosaic habitats IUCN (2007). Pangolins can adapt to some degree of habitat modification Challenger and Waterman (2017). According to Sodeinde and Adedipe (1994) their population in Nigeria recently has been limited to forest and biosphere reserves. They are mostly found around their preferred prey such as termites and ants. The most common among the Nigeria pangolin is the *Phataginus tricuspis* (White-bellied pangolins or tree pangolin). It is swiftest and smallest of the three other species. It is distributed across South East, North Central, South West and South-South ecological regions of Nigeria. The second most common Nigerian pangolin is *Phataginus tetradactyla* (black-bellied pangolins). It is confined to the South-South geo-political/ecological region of Nigeria Challenger and Waterman (2017).

Pangolins in Nigeria are vulnerable animals, because of their various important local, national and international utilizations. The demand for these animals is daily and the population is decreasing daily. According to Challender and Waterman, (2017), the animals are listed in Schedule 1 of Nigeria Decree (Law) No. 11. This schedule gives protection to the animals listed in this category against over-exploitation through national and international trade and are protected by law (Sodeinde and Adedipe, 1994). But in 2016 Convention on International Trade on Endangered Species of Wild fauna and flora (CITES) held in Johannesburg transferred all eight (8) species of Pangolin including all species in Nigeria such as *Phataginus tetradactyla* (black-bellied pangolins), *Phataginus tricuspis* (white-bellied pangolins) and *Smutsia gigantea* (giant ground pangolins) from Appendix II to Appendix I Challender and Waterman (2017). The implication of this decision is that species in Appendix I comprises of over 1,200 species that are threatened with extinction.

So trade in Wild-caught specimens of these species is illegal (permission is only granted in exceptional licensed circumstances), with full assurance that importing state should be able to care for the specimen adequately before it trade can be allowed. According to IUCN (2019), as recommended by Pangolin Specialist Group assessment of Africa Pangolin species, White-bellied Pangolin (*Phataginus tricuspis*) and Giant Pangolin (*Smutsia gigantea*) are endangered, why Temminck's ground Pangolin (*Smutsia temminckii*) and Black-bellied Pangolin *Phataginus tetradactyla* are vulnerable. As suggested by Morenikeji (2020), Nigeria is a useful hub for traffickers because of its porous borders and poor enforcement. Chinese buyers will pay anywhere between \$3 and \$20 for a pangolin- a relative fortune for local bush meat traders. According to the UNOD'CS World Wildlife Crime Report (2016), traffickers can get as much as \$250 for the scale from one Pangolin in market in Asia. Uwagbale (2020) reported that Nigeria already has a penalty of \$0.0066 fines (for a first-time offense) for hunting or selling a pangolin.

It is viewed as being highly inadequate as a deterrent measure for a global trafficking hub. This is especially true when compared with other African countries with less trade volume. However, more need to be done on wildlife policies that can provide definite reference points, systematic coherent view and action programmes to attain greater heights in wildlife management in the country Adeyoju (1975). This implies that without it the wildlife sector is bound to drift and this will have adverse effect on each of the species of wildlife in our nation especially the pangolin. Therefore, this study is out to survey the trade in Pangolin in some selected states of Southern, Nigeria and possible implication and how it affects its conservation.

2.0 MATERIALS AND METHODS

Study Areas

The study was carried out in three (3) Southern states of Nigeria, namely; Ekiti, Ondo and Edo. Ekiti state is in the Southwest region of Nigeria, with capital in Ado Ekiti. It has 16 Local Government areas with a coordinate of $7^{\circ}40'1''N$ $5^{\circ}15'1''E$. It has a total land area cover of 6,353 km² and a population census of (2006) with 2,210,957. In Ekiti state five (5) communities were sampled which included Ilawe-Ekiti, Ogotun- Ekiti, Odo-uro in Iyin-Ekiti, Igede -Ekiti and Igbara- Odo Ekiti.

Ondo state is also in the Southwest region of Nigeria, with capital in Akure. It has 18 Local Government areas with a coordinate of $7^{\circ}10'1''N$ $5^{\circ}05'1''E$. It has a total land area cover of 15,500 km² and a population census of (2006) with 3,460,877. In Ondo state two (2) communities were sampled Emure-ile and Owena Bridge. Edo state is in the South South region of Nigeria, with is capital in Benin City. It has 18 Local Government areas with a coordinate of $6^{\circ}30'1''N$ $6^{\circ}00'1''E$. It has a total land area cover of 17,802 km² Uwe (2000). Two (2) communities were also sampled which include Owan River and Uwa market in Benin City.

Methods of Data Collection

The study was in three (3) months from October to December, 2019. Each of these communities was purposively selected due to their involvement in the trade in wild animals' meat especially Pangolins as observed during the reconnaissance survey. Field survey was conducted in all these communities listed above. Questionnaire was administered as interview guide to seventeen (17) accessible marketers of wild animals (bush meat) in shops and stalls of the marketers in the study areas. Personal visits and observations were made, while discussions and interviews were conducted to obtain information on the study areas and their mode of operations as regards the trade in pangolin. Camera was used to obtain the photography's of the Pangolins and other wildlife products sold by the traders. Data collected were subjected to descriptive statistics (frequency count and percentage).

Study Limitations

Some of the Bush meat traders did not respond to our questions especially in Emure-ile and Benin City. This affected the numbers of traders that were available for the study samples in those states.

3.0 FINDINGS

Table 1, revealed the demographic characteristics of traders indicating that, all the marketers were females. It also shows that majority of them falls between the ages of (35-54years) with 59% and the least were women in the age's group of 55-74years. All the respondents were married women with most of them with primary, secondary and tertiary education (41%, 41% and 6%) respectively. The percentage of the women that had a least 1-10 years business experience is 47.2% while other had experiences of 11-20 years, 21-30years and 31-40years with 17.6% each respectively. Tables 2, showed a clear reduction in the population of the animals with (94%) alluding to fact that the animal population had reduced greatly in the study areas. Sources of acquisition of Pangolin in the study areas from Table 3, revealed that 76% of the supply to the marketers came from the bush meat dealers and buying from other markets accounted for 12%, hunting from the wild and other sources each recorded 6% respectively.

Table 4, shows that 65% of the marketers belong to Bush meat traders association, while 35% do not belong to any association, mostly due to the fact that there was no existing structure for the marketers to work with. The study also revealed that 71% of the marketers did not have any link with hunters associations even if it existed and 29% of the marketers revealed that there was an existing links with hunters association which aid there acquisition of the animals (Pangolins). Ninety four percent (94%) of the marketers interviewed revealed that they had 1-10 years experiences in pangolin trade. Forty seven percentage (47%) admitted to the fact that pangolin are more abundant in both seasons (dry and wet) of the year while 41% and 12% reported that the

animals were available in dry and wet season respectively (Table 5). Fifty nine percent (59%) of marketers reported purchasing killed pangolins, while 35% reporting purchased both live and killed pangolins. Eighty two percent (82%) of the respondent affirmed that the prices of both killed and lived pangolins ranges is twelve dollar fifty cents to twenty five dollars only (\$12.5 - \$25).

Table 5, also shows that 18% of the respondents reported that pangolin prices for both killed and live of big stock sold is twenty seven dollars fifty cents (\$11.5) and above. The study also revealed that 59% of the marketer sells both young and adult pangolins and 41% of marketers sell adult pangolin only (Table 6). Other species of wild animals displayed by the marketers revealed a list of twenty one (21) wild animals. These classes of animals show that Mammals are (71%), Aves (Birds) are (10%), Reptiles are (14%) and the least is Mollusca with 5%. The IUCN Conservation Status of the traded wild animals with 66.70% least Concern, 9.50% Critically Endangered and Threatened, 4.76% Endangered, Vulnerable and Data Deficient respectively (Tables 7).

Table 1: Demographic Characteristics of Marketers in Ekiti, Edo and Ondo States of Nigeria

Demographic Variables	Frequency	Percentages (%)	Modal Class
Gender			
Male	0	0	Female
Female	17	100	
Age			
15-34	6	35	
35-54	10	59	35-54
55-74	1	6	
75- Above	0	0	
Marital Status			
Single	0	0	
Married	17	100	Married
Widow	0	0	
Level of Education			
Primary education	7	41	Primary
Secondary education	7	41	Secondary
Tertiary education	1	6	
Non-Formal	2	12	
Business Experience			
1-10years	8	47.2	1-10years
11-20years	3	17.6	
21-30years	3	17.6	
31-40years	3	17.6	

Table 2: Marketers Perception of Pangolin Abundance in the Study Areas

Perceived status	Frequency	Percentage (%)
Increasing	1	6
Decreasing	16	94
Total	17	100

Table 3: Marketers Sources of Acquisition of Pangolin in the Study Areas

Variable	Frequency	Percentage (%)
Buying from the Market	2	12
Supply from dealers	13	76
Hunting from the wild	1	6
Other Sources	1	6
Total	17	100

Table 4: Marketers experience on Pangolin trade in the study areas

Marketers involvement Pangolin trade	Yes (%)	No (%)	Total	
	16 (94)	1 (6)	17 (100)	
Pangolin price per seasons	Dry (%)	Wet (%)	Both (%)	Total
	7 (41)	2 (12)	8 (47)	17 (100)
Pangolin sale & utilization taboo	YES (%)	NO (%)	Total	
	3(18)	14 (82)	17 (100)	

Table 5: Mode of Sale and Cost of Pangolin in the Study Areas

Mode of sale	Live (%)	Dead (%)	Both (%)	Total
	1 (6)	10 (59)	6 (35)	17 (100)
Pangolin Price	(₦ 5,000- ₦ 10,000)		(₦ 11,000-above)	Total
	14 (82)		3 (18)	17 (100)

Table 6: Age and Species of Pangolin Sold by the Marketers in the Study Areas

Ages structures	Young (%)	Adult (%)	Both (%)	Total
	0 (0)	7(41)	10 (59)	17 (100)
White-bellied	2(12)	10(59)	5(29)	17(100)
Black-bellied	0 (0)	2 (100)	0(0)	2(100)

Table 7: Wild Animals Species Traders display for sale in the study Areas

Wild animals	Scientific name	Class of Animals	IUCN Conservation Status
White-bellied Pangolin	<i>Phataginus tricuspis</i>	Mammal	Critically Endangered
Black-bellied pangolins	<i>Phataginus tetradactyla</i>	Mammal	Critically Endangered
Nile Crocodile	<i>Crocodylus niloticus</i>	Reptile	Least Concern
African Grey Parrot	<i>Psittacus erithacus</i>	Avian (Bird)	Endangered
Bushbuck	<i>Tragelaphus scriptus</i>	Mammal	Least Concern
Cane rat	<i>Thryonomys swinderianus</i>	Mammal	Least Concern
Giant Rat	<i>Cricetomys gambianus</i>	Mammal	Least Concern
Red flanked Duiker	<i>Cephalophus rufilatus</i>	Mammal	Least Concern
Tree hyrax	<i>Dendohyrax arboreus</i>	Threatened	Mammal
Red River hog	<i>Potamochoerus porcus</i>	Mammal	Least Concern
Giant forest hog	<i>Hylochoerus meinertzhageni</i>	Mammal	Least Concern
African Civet cat	<i>Civettictis civetta</i>	Mammal	Least Concern
Francolins	<i>Francolins bicalcaratus</i>	Mammal	Vulnerable
Giant land snail	<i>Archachatina marginata</i>	Mollusca	Data Deficient
Monitor Lizard	<i>Varanus niloticus</i>	Reptile	Least Concern
Porcupine	<i>Hystrix cristata</i>	Mammal	Least Concern
Rock hyrax	<i>Procavia capensis</i>	Mammal	Least Concern
Helmeted Guinea Fowl	<i>Numida meleagris</i>	Avian (Bird)	Least Concern
Giant land Tortoise	<i>Chelonoidis nigra</i>	Reptile	Threatened
Red flanked duiker	<i>Cephalophus rufilatus</i>	Mammal	Least Concern
Scrub Hare	<i>Lepus capensis</i>	Mammal	Least Concern

Discussion

The study revealed there was an unrestricted trade in wildlife especially in communities not very close to our protected areas in southern region of Nigeria. One hundred (100%) percentage of the people involved in the trade were female and no male was involved in the course of the study. This was in agreement with the report of Falconer (1992) who studied people uses and trade in non-timber forest product in southern Ghana and reported the involvement of female in the trade of wildlife in Kumasi. This assertion was also supported by Shotuyo *et al.* (2017) and Oyegbami, *et al.* (2017) who in their separate studies of bush meat trade in Southwest, Nigeria also came up with the same findings.

However, this was in contrast with the findings of Ojo, *et al.* (2019) who reported the contribution of bush meat trade to livelihood of bush meat traders in Maiduguri bush meat market in Borno state whose study revealed that bush meat trade was dominated by the male with 86% and female with 14%. This may be as a result of the beliefs of the northern Nigeria, who did not allow their

women to engage much in economic activities for religion and cultural reasons. Adults within the ages of 35-54 years dominate the business in the study areas. This was in agreement with the report of Infield (1988); Shotuyo *et al.* (2017); Oyegbami *et al.* (2017) and Ojo *et al.* (2019) in which the dominant age ranges between 31-41 for both male and female. This is a clear indication that the categories of people involved were youth, mostly male and female in their active year with little or no involvement of teenagers and elderly people. All the marketers interviewed were all married women but Ojo *et al.* (2019) reported 90% married men and women were involved in the trade.

The level of education for marketers involve in bush meat trade were dominated with primary and secondary leaver. The implication is that the level of education and awareness of traders in the southern region is low and these have affected the conservation of pangolins and others wildlife. The marketers had about 1-10 years business experience and other having between 11-40 years experiences. This shows that the culture of trade in wildlife resources especially pangolin had been with us for a very long time as reported by Heather (2016); Agboola and Adeyanju (2017). The rate of harvest of pangolin from this research findings revealed that the population of the animal is reducing drastically in the wild; this was corroborated by the reports of Wilkie and Carpenter (1999); Taylor *et al.* (2014) and Michael (2016).

The two species of the pangolin were the only species that were traded in the study areas that are critically endangered based on the International Union of Conservation of nature and natural resources. The sources of acquisition of Pangolin revealed that the animals were mostly gotten from dealers especially the hunters. The high price of the animals is as a result of the demand which is mostly below the supply from the wild, since the animals cannot be easily domesticated to multiply under ex-situ conservation arrangement. So, the need to sustain the wild population is very urgent to avert local extinction in the country and extinction of the various species in the entire world at large.

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

Pangolin is a unique mammal that had successfully attracted attentions of people especially illegal traffickers all over the world, due to various uses the animal is subjected to in the world. There is an unrestricted trade in pangolin by women and its population is on the decrease and vulnerable with it level of exploitation in Nigeria, which did not commensurate with its reproductive ability. This has made it population to reduce drastically in its natural habitats. To avoid possible extinction of the animal in the wild, where it can favourably thrive, intense conservation education and awareness campaign should be targeted toward the major stakeholders that are in both the rural and urban communities, to discourage them from engaging in this unsustainable trade and trend which has negative effect on the animal population. The major stakeholders (Community leaders, Hunters and Marketers mostly women) especially the community leaders should be properly educated so that they can create awareness among their subject to reduce this trade. The hunters and marketers should be given an alternative means of livelihood to discourage them from engaging in these illegal activities in the region and stringent legislation should be put in place at both state and national level to punish offenders.

Recommendations

In addition, the following recommendations were suggested:

- (a) Revision of national and regional policies, laws and regulations and promoting effective enforcement
- (b) Strengthen national and regional networks and institutions by building their capacity to enforce anti- trafficking laws.
- (c) Raising awareness of the problem and conducting behaviour change campaigns.
- (d) Effective police and prosecution of wildlife crime which include pangolins.

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