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Perception on the Conservation Status of Primate Species in Maiha Local Government Area, Adamawa State

Bode A. S[1], Umar M. R[2], Adamu M. Y[3]
[1]Adamawa State University Mubi, Adamawa State, Nigeria
[2,3]Modibbo Adama University, Yola, Adamawa State, Nigeria
saiduahmedbode@gmail.com

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Abstract

This study investigates the status of primate species, the drivers of their decline, and local residents' perceptions regarding primate conservation in Maiha Local Government Area. Data were obtained through both primary and secondary sources. Primary data were collected using structured questionnaires administered through simple random sampling, while secondary data were sourced from journals, proceedings, books, brochures, and manuals. Descriptive statistics were used for data analysis. Primate species status was assessed through direct sightings, ecological indices, and interviews with key stakeholders, including forest and wildlife officers, traditional leaders, hunters, bushmeat sellers, and pastoralists. Six primate species were identified during the study period. Of these, two species, Baboon and Red Patas Monkey were found to be common, Tantalus Monkey was categorized as rare, and three species, Chimpanzee, Putty-nosed Monkey, and Mona Monkey were considered locally extinct. The primary factors contributing to primate decline included hunting (27.6%), farming (22.1%), logging (13.6%), grazing (10.5%), wildfire (8.3%), poverty (6.3%), population increase (3.4%), settlement (3.0%), infrastructure development (2.8%), and insurgency (1.9%). Respondents generally perceived

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primates as important and expressed willingness to support conservation efforts. Reasons for support or opposition to conservation were also documented. The study recommends enhanced conservation education, long-term monitoring of primate populations, diversification of income-generating activities to reduce forest dependency, and the establishment of protected areas to support primate and wildlife conservation.

Keywords: Primate Species; Conservation; Human-Wildlife Interaction; Species Decline; Community Perception

INTRODUCTION

Beyond sharing a close evolutionary history with humans, primates contribute importantly to the biological and cultural richness and the natural heritage of the countries in which they occur. Many primates play key roles in ecosystem dynamics and sustainability and are central figures in local and regional traditional knowledge, religion,folklore, history, and even economies (Fuentes, 2012). The Amazonian Guajá people integrate monkeys into their kinship and religious systems while also relying on primates as a sustainable food source (Cormier, 2016). As primates become locally rare or extinct, we risk losing complex ecological, social, and cultural relationships that have developed between humans and primates over millennia (Gouveia *et al*., 2014). Primates are prey, predator, and mutualist species in food webs and thereby influence ecosystem structure, function, and resilience. Their evolution, feeding ecology, and geographic distribution are closely linked to the diversification of angiosperms, a principal source of food (pollen, nectar, fruits, and seeds) for many animals and humans (Koné, 2008). Many primates have been identified or suspected as important pollinators due to their opportunistic nondestructive feeding on flowers and nectar (Chapman *et al.,* 2018). As consumers of different plant parts (fruits, flowers, seeds, gums, and leaves), primates can affect plant propagule dissemination, cause tree mortality, and may negatively affect the reproductive investment of some plants (Heymann *et al.,* 2011). In southern Nigeria, rural people rely on gathering primate-dispersed fruit and seed species suggesting the considerable importance of primate conservation to local human food security (Efiom, 2013). Globally, agriculture is the principal threat, but secondary threats vary by region. For example, livestock farming and ranching negatively affect 59% of primate species in the Neotropics. In contrast, in mainland Africa, Madagascar, and Asia, hunting and trapping affect 54 to 90% of the species. Logging is the third greatest threat to primates in all regions In addition,

exponential human population growth and associated human-induced forest loss increase opportunities for wild primates to become exposed to human and domesticated animal pathogens (Gillespie *et al*., 2018).

Human population growth and increasing per capita wealth have led to an increase in commercialized bush meat hunting relative to subsistence hunting in many parts of the world. This has become a major driving force for primate population decline, especially in Africa and Southeast Asia (Meijaard *et al.,* 2011). Although bush meat hunting is difficult to track, reports indicate that about 150,000 primate carcasses from 16 species were traded annually as bushmeat in urban and rural markets at 89 sites in Nigeria and Cameroon (Olivero *et al*., 2015).

Solutions to the challenge of primate conservation must include reducing human birth rates and population growth, improving health, reducing poverty and gender biases in education, developing sustainable land-use initiatives, and preserving traditional livelihoods **(**Millennium Ecosystem Assessment, MEA, (2015**).** Locally, people and governments need to become stakeholders in this effort and perceive that they can benefit from protecting primate populations and their forests while at the same time satisfying their basic needs. This will require education, rethinking, and investment from government, nongovernmental organizations (NGOs), and the private sector. There is no single solution to this global problem. Primate ecotourism may be an effective approach in some localities (Dalerum, 2014). In others, mini-livestock breeding may be a productive route to improve food security (Hare, 2011). Because bush meat is an important source of food and income for inhabitants from poverty-ridden primate range countries, as well as an important aspect of indigenous culture, in some countries, nonprimate game ranching and game farming may contribute to food security and indirectly to primate conservation (Hardouin *et al.,* 2003)

It has been noted that to mitigate wildlife poaching, interventions need to go beyond regulation by encouraging capacity building in local communities to conserve wildlife, reexamining sustainable off take mechanisms, such as regulated trade, ranching, and wildlife farming and to use social media and the Internet to reduce demand and, ultimately, to curb trade (Nekaris, *et al*., 2013 : Challender and MacMillan, 2014). Research activities were being undertaken at Maiha Local Government Area on wildlife resources but there has been paucity of information on the factors leading to the decline of primates. It is against this background that this study was conceived to understand the status of primate, factors leading to their

decline and resident's perceptions about the primate species in the study area. This is vital in the implementation of proper habitat management intervention, overall decision making as well as policy formulation and implementation of favorable projects for primate's conservation and wildlife resources as a whole.

MATERIALS AND METHOD

Location

Maiha Local Government is one of the 21 local government areas of Adamawa state. It is located between latitude 13° 09' and 13° 17' and longitude 9° 30' and 10° 14' in the northern part of Adamawa state with a total land mass of 1,180.32km^2. The local government shares common boarders with Mubi south in the west while Hong and Fufore local governments to the northwest and southwest respectively, It also share common border with Cameroon to the east (Adebayo and Tukur, 2021).

Maiha local government is mountainous in its eastern border. This is an extension of Mundara hills from Mubi south local government, It is part of the south trending mountain ranges along the state eastern border land popularly knowm as Adamawa highland. The eastern part of Maiha can therefore be described as Ridge Mountain. Hudu is the highest point in the local government with an average height of 3,700 meters above sea level, Low land areas are confined to the western part of Maiha local government (Adebayo, 2010).

The local government is well drained by many rivers, all of which are seasonal in Nature. The largest river is the Kilange, all other rivers in one way or the other are tributaries to the Kilange For example, rivers like mayo Pakka, mayo Kadam, mayo-Nguli and mayo Girgwandi whose source is from the eastern highlands, flow to the west and enter river Kilange at right angles**.** Some of the river have flat sandy beds and incised valley' sides. They are normally flood during the rainy season and dry sandy flat during the dry season. The rivers are characterized by braided channel and a few minor water falls rapids and cataracts (Adebayo, 2010).

Population Sampling.

For the purpose of this study, data collection involved the use of random sampling technique and structured questionnaires. Cochran (2000) method of determining sample size was adopted for this study. The method was used in determining the representative sample in

each of the 3 selected wards of the study area. A total number of 4236 respondents were randomly administered questionnaires in 3 wards of the study area namely: Manjekin, Pakka, and Tambajam with 1464, 1628, and 1144 respondents respectively.

Data collection

The data for this study was obtained from primary and secondary sources. Structured questionnaire was used to source for primary data while Journals, Proceedings, Texts, Brochure, and Manuals were used to elicit information for secondary data. The specie status was determined by direct sighting (DS), Indices (IND) as well as information from, forest/wildlife officers, traditional leaders, farmers, women leaders, traders, civil servants, artisans, hunters, bush meat sellers, pastoralists and students as describe by Ezealor (2015).

Data analysis

Descriptive statistics was employed in the analysis of data. The descriptive statistics used were: Tables, means, frequency distribution, percentages and charts.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

The socio-economic characteristics of the respondents is shown in Table 1. The result of the study depicted more male respondents 3016 (71.2%) than the female 1220 (28.2%). This may not be un-connected to the shyness exhibited by the female respondents toward answering the study questionnaire. However more conscious effort was made to ensure that adequate number of female were reached in order to capture their opinion on the study. The religious status revealed that 2851 (67.3 %) of the respondents were Muslims followed by 1279 (30.2 %) Christians and 106 (2.5%) traditional worshipers. The age distribution of respondents shows that 1279 (30.2 %) were between 18-27 years of age, 1669 (39.4 %) 28-37 years, 772 (18.2 %), 38-47 years, 309 (8.1 %) 48-57 years, 135 (2.6 %) were 58-67 years and 72 (1.7 %) of respondents were greater than 67 years of age. This indicate majority (87.8%) of the respondents are within the age bracket of 18 and 47 years. This is the energetic group of a society. It implies that majority of the respondents fall within the active segment of the population. Due to low level of industrialization in the study area this group are more negatively affected and in turn affects the natural resources in the study area.

This indicates demand for more farm land and natural resources (Lambert, 2016). Under the marital status 2822 (66.6 %) were married, 967 (22.8 %) single, 186 (6.5 %) Divorced, 164 (4.4 %) were widows and 97 (2.3 %) Widowers, Majority of the respondent where married. This is indicative of a possible fast population growth in the community. This therefore means more pressure on primate specie's and other natural resources. This agree with Ijomah and Akosim (2000) observation on the relationship between population growth and wildlife resources. Majority of the respondent acquired primary education 1605 (37.9%) followed by Secondary education 1275 (30.1 %) then informal education 991 (23.4 %) and the least is tertiary education with 365 (8.6 %). The result of distribution of educational attainment of respondents indicates that majority of them had one form of education or the other. Education will enable the respondents to read and understand any issue about conservation. The expectation is that the creation of awareness on wildlife conservation programmes will face little or no challenges (Haslam *et al*, 2016). Primary occupation is topped by crop farming with 1613 (38.1 %) then Business 1042 (24.6 %), Civil servant 538 (12.7%), Livestock farming 506 (11.9 %), Craftsmen 457 (10.8 %) and others 80 (1.9 %). Furthermore, the indication from the result is that farmers are in the majority in the study area. Therefore, the business of wildlife management may not be alien to the people. This finding is in consonance with the report of Tukur and Ray (2009). Result of monthly income of respondents showed that 1169 (27.6 %) of the respondents earned between #10000- #15000, 1317 (31.1 %) #16,000- 30,000, 1034 (24.4 %) ₦ 31,000-₦ 45,000, 453 (10.7 %) ₦46,000- #60,000 and 263 (6.2 %) of respondents earned greater than ₦60,000. Result of monthly income of respondents showed that majority (83.1 %) live below the level of $ 2.00 per day recommended by World Health Organization (WHO, 2017). It is hoped that the integration of wildlife management and enhancement of the agricultural production system will improve the revenue base of the rural dwellers and consequently emancipate them from poverty.

Table 1 Socio-economic Characteristics of the Respondents

Variable	Frequency	Percentage (%)
Gender		
Male	3016	71.2
Female	1220	28.8
Total	4236	100
Religion		
Islam	2851	67.3
Christianity	1279	30.2
Traditional	106	2.5
Total	4236	100
Age		
18-27	1279	30.2
28-37	1669	39.4
38-47	772	18.2
48-57	309	8.1
58-67	135	2.6
Greater than 67	72	1.7
Total	4236	100
Marital Status		
Married	2822	66.6
Single	967	22.8
Divorced	186	6.5
Widow	164	4.4
Widower	97	2.3
Total	4236	100

Table 1 Cont'd

Variable	Frequency	Percentage (%)
Educational level		
Informal	991	23.4
Primary	1605	37.9
Secondary	1275	30.1
Tertiary	365	8.6
Total	4236	100
Primary Occupation		
Crop faming	1613	38.1
Livestock faming	506	11.9
Business	1042	24.6
Civil servants	538	12.7
Craftsmen	457	10.8
Others	80	1.9
Total	4236	100
Income		
₦ 10000 - ₦ 15,000	1169	27.6
₦16,000 - ₦ 30,000	1317	31.1
₦ 31,000 - ₦ 45,000	1034	24.4
₦ 46,000 - ₦60,000	453	10.7
₦61,000 and above	263	6.2
Total	4236	100

Status of Primate Species in the Study Area.

The result in table 2 shows the status of primate species in Maiha local government area ,Six species of primates were identified during the study period, out of this number two (2) of them were common, they comprised of Baboon, Red Pates Monkey, with Tantalus Monkey as rare while Chimpanzee, Putty-nosed and Mona Monkey were in to extinction. There was no species of monkey abundant in the study area. The result of primate species of the study area is in consistent with Osunsina (2020) report of primate species of the savannah ecosystem of Nigeria,

Table 2 Status of Primate Species in Maiha Local Government Area

S/No	Family Name	Scientific Name	Common Name	Status
1	Cercopithecidae	*Papio Anubis*	Baboon	C
2	" " "	*Erythrocebus patas*	Red Patas Monkey	C
3	" " "	*Cercopithecus aethiops*	Tantalus Monkey	R
4	" " "	*Pan troglodytes*	Chimpanzee	Ex
5	" " "	*Cercopithecus nicitans*	Putty-nosed Monkey	Ex
6	" " "	*Cercopithecus mona*	Mona Monkey	Ex

KEY: A= abundant, C= common, R= rare, En= Endangered, Ex= Extinct

Factors Leading to the Decline of Primate Species.

Table 3 shows the factors leading to the decline of primate species in Maiha local government area according to the respondents. The factors was topped by Hunting with 2660 (27.6%) followed by Farming with 2136 (22.1%) then Logging 1316 (13.6%), Grazing 1018 (10.5), Wildfire 803 (8.3 %), Poverty 610 (6.3%), Population increase 328 (3.4%), Settlement 298 (3.0 %), Infrastructure 272 (2.8%) and least is Insurgency with 181 (1.9%). No response stood at 53 (0.5%). The result of this work is in consonance with the report of International Union for the conservation of Nature, IUCN, (2017) which indicates that the main threats to primate species in most African countries are hunting, loss of habitat due to agriculture, logging, bush burning, grazing, as well as population increase. In a related study similar

findings were also made by Food and Agricultural Organization of the United Nations, FAO (2018) specifying treats such as insecurity, infrastructure, settlements and poverty. It also added that there are other emerging threat such as invasive species, pollution and climate change bedeviling conservation of primate species.

Table 2: Factors leading to primate species decline in the study area

s/n	Factors	Frequency	Percentage
1	Hunting	2713	27.6
2	Farming	2136	22.1
3	Logging	1316	13.6
4	Grazing	1018	10.5
5	Wild fire	803	8.3
6	Poverty	610	6.3
7	Population increase	328	3.4
8	Settlement	293	3.0
9	Infrastructure	272	2.8
10	Insecurity	181	1.9
11	No response	53	0.5
12	Total	9670 9723	100

Attitude of respondents toward primate species.

The result in figure 1 shows the opinion of respondents about primate species in the study area. 2843 (67.1 %) of them were of the view that primate species are important while 1315 (31.0 %) saw it as un-important and 78 (1.8 %) fall within no response. Figure 2 also shows that 2831 (66.8 %) of the respondents are in support of primate species conservation while 1339 (31.6 %) were not in support of its conservation and 66 (1.6%) made no response. Majority of the respondents in the study area perceived primate species as something good and beneficial, hence, their support for the management and conservation of the primate species in their domains. Similar findings was made by Alexander (2015) in Belize while working on a community baboon sanctuary. This attitude is based on the anticipation that things could change and they will likely benefit in the future. The respondents attributed reasons for the support of conservation of primates. The reasons was topped by tourism with 784 (24.7 %), then education 431 (13.6 %), Employment 391 (12.3%), seed dispersal 356 (11.2%), research 307 (9.7%), meat 213 (6.7 %), Medicine 192 (6.0 %), Pet 172 (5.4 %), Trophies 154 (4.9 %), and the least is Magical purpose with 112 (3.5 %). No response stood at 62 (2.0 %). While some of the respondents attributed reasons for not supporting conservation of primates. The reasons was topped by Destruction of crops (pest) with 444 (29.7 %), then

Aggression 358 (24.0%), Cultural tradition 266 (17.8 %), Religious believe 208 (13.9 %), and the least is Spread of disease 151 (10.1 %). No response stood at 66 (4.4 %).

The result obtained on the reason for support of primate specie conservation by the respondents is in line with the report of Sussman, (2013) whom stated that today, many of these "monkey temples" are tourist sites, where the monkeys are protected, and provide an important source of income for local populations. Many traditional societies protect or tolerate primates and have integrated them into their historical narratives as sacred cultural figures and persons, as pets, and as food. Another findings also in consonance with this study is that of Wich, *et al.,* (2016) saying numerous primates are highly frugivorous, and their relatively large size enables them to disperse small and large seeds over long distances, enhancing forest regeneration. In the same vein Caughlin, *et al*., (2017) noted that in the absence of zoochorous seed dispersal by primates, plant populations can experience decreased genetic heterozygosity and increased genetic subpopulation differentiation, increased negative density dependence, and decreased recruitment. Other benefits stated in this study similar to what was obtained by Nijman, *et al.,* (2017) and Alves *et al.,* (2019) indicated that many primate species are traded for consumption, biomedical research, zoo and wildlife collections; as pets; for the sale of body parts (bodies, skins, hair, and skulls) used in traditional medicine; as talismans and trophies; and for magical purposes. Conversely, the negative attitude towards Primates specie conservation as reported in this study is evident in the findings of Gilardi *et al.,* (2020,) whom stated that Primates serve as pest because they are known to destroy crops and this can lead to financial losses to farmers. They can also cause power outage due to their frequent visits to electrical transformers. This study is also in consonance with the outcome of Brodie *et al*., (2019) whom stated that some primate species specialize in attacking humans. Such monkeys are very territorial and can be very aggressive towards people who enters their territory. People who live in areas where there are this types of monkeys suffer from anxiety and discomfort because they often get bitten, scratch or attacked. In a related findings Federman *et al*., (2016) reported that Monkeys can cause a lot of inconvenience to people and this can lead to annoyance and even hatred, they often steal food from people and this can be very annoying. The outcome in this study on primates on Cultural tradition and Religious belief is similar to the findings of Bello *et al*., (2015) that Choice of meat is prejudiced by culture, religion, taboos or simply by habit, that determine whether specie concern is socially acceptable or not. Similarly National Biodiversity Report, NBR, (2018) stated that the southern part of Nigeria view the consumption of primate as normal and in some cases a

delicacy. But this is contrary in the northern part of the country where the consumption of primate is prohibited by many people. The result on spread of disease fall in line with observations of Karesh, *et al.*, (2015) that Primates escaping or released from the pet trade or sanctuaries can carry pathogens with a potential of transmission to resident populations. Schaumburg *et al.*, (2017) also corroborate this findings mentioning ecotourism and research, despite contributing in positive ways to primate conservation, have the unintended consequence of exposing wild primates to human pathogens.

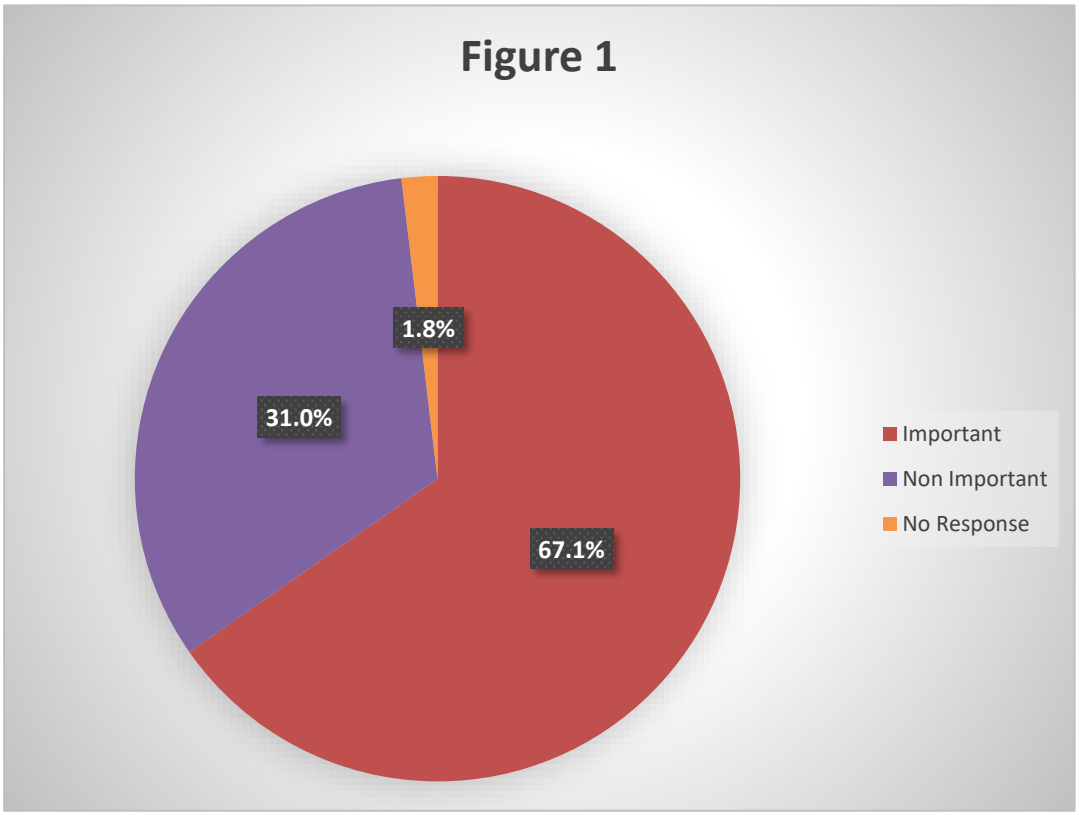


Figure 1: Respondents opinion on whether primate are important or not important

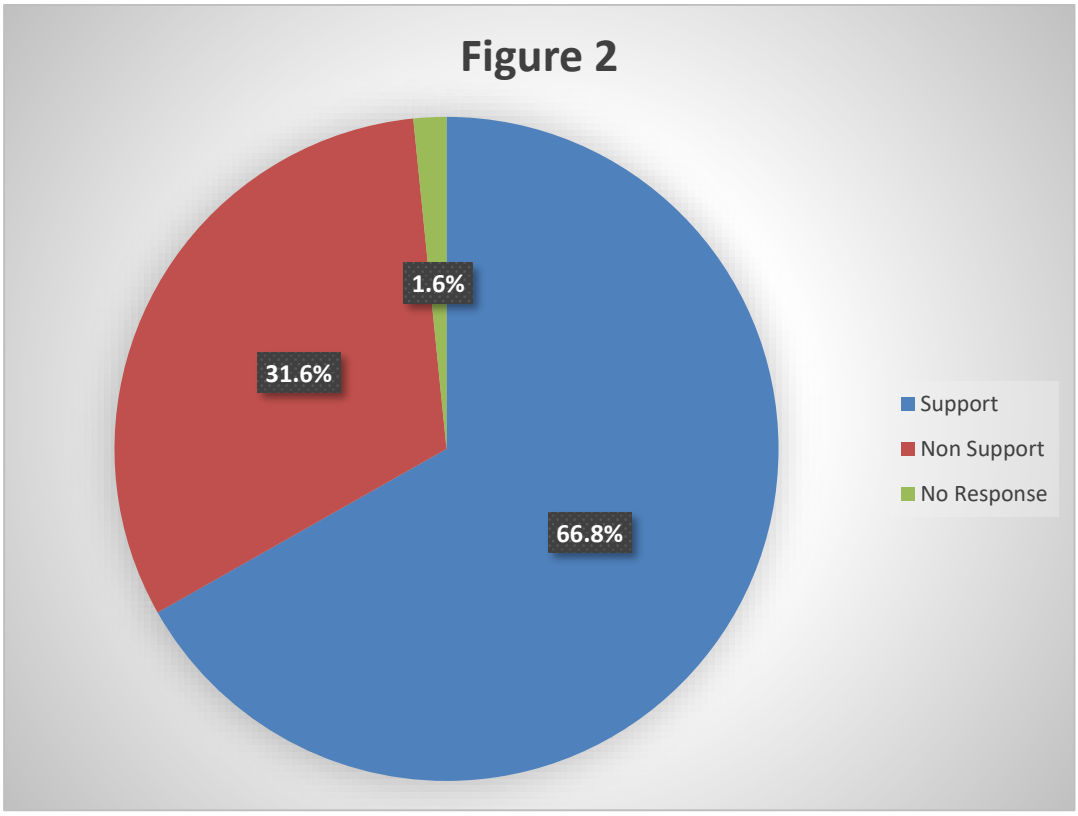


Figure 2: Respondents opinion showing support to primate conservation

Table 3: Reason for support of primate specie conservation

s/n	Reasons	Frequency	Percentage
1	**Tourism**	**780**	**24.6**
2	**Education**	**431**	**13.6**
3	**Employment**	**391**	**12.3**
4	Seed dispersal	**356**	**11.2**
5	**Research**	**307**	**9.7**
6	**Meat**	**213**	**6.7**
7	**Pet**	**172**	**5.4**
8	**Medicinal**	**192**	**6.0**
9	**Trophies**	**154**	**4.9**
10	**Magical purpose**	**112**	**3.5**
11	**No response**	**66**	**2.1**
	Total	**3174**	**100**

Table 4: Reason for non-support of primate specie conservation

s/n	Reasons	Frequency	Percentage
1	Pest	444	29.7
2	Aggression	358	24.0
3	Cultural tradition	266	17.8
4	Religious belief	208	13.9
5	Spread of disease	151	10.1
6	No response	66	4.4
	Total	1493	100

CONCLUSION

Long time survival of primate Species in the study area can only be achieved by adequately involving the local community in the conservation of natural resources. This is true because they are the cardinal factor towards its success or failure. The study revealed the primate Species in the study area including their status, threat factor leading to their decline in the study area which comprises of hunting, farming, deforestation etc. The attitude of respondents toward primate Specie's were found to be both positive and negative, with majority of them willing to support the conservation of primate.

Recommendations

On the basis of the research findings, the following recommendations were made:

i) There should be adequate conservation education programme for the people in the study area so as to help conserve the remaining primate species.

ii) Monitoring of all the primate species populations to investigate long term human activity effects on primate populations and distributions should be initiated.

iii) Income generation activities should be diversified and up-scaled e.g bee keeping, agroforestry to reduce human pressure on the forest.

iv) Establishment of a protected areas in the study area to enhance the conservation of primates and other wildlife species.

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