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# ASSESSMENT OF CONSERVATION PRACTICE ON ENDANGERED SPECIES IN AFI SANTUARY OF BOKI LOCAL GOERNMENT AREA OF CROSS RIVER STATE - NIGERIA

## Abstract:

This research work assessed the conservation practiced on endangered species of Afi Mountain Sanctuary in Boki Local Government Area of Cross River State – Nigeria   Conservation is a panacea for the extinction of endangered species which has become a source of worry to environmentalism. Conservation brings about sustainability of endangered species in the ecosystem. This study was carried out using systematic sampling technique. One out of every five farmers and hunters was randomly selected making a total of 46 respondents used in this research work. The data generated for the study was collected using questionnaires and personal interviews. The conservation practice in the area was assessed. Hypothesis was tested at 0.05 significance levels. The analysis of the results shows that conservation practice has significant impact on the increasing number of endangered species in the study area. It was recommended among others that conservation should be encouraged in the area to boast tourism development and increase the revenue base of the Local Government Area and the state as a whole.

## Keywords:

Conservation, sanctuary, endangered species, extinction, ecosystem, sustainability.

**JEL Classification:**  Q57

## 1.0 Introduction:

According to Gold smith (1998) conservation is the sustainable use and protection of natural resources including plants, animals, mineral deposit, soils, clean water, clean air fossil fuels, such as coal, petroleum. Oze and Goin (1988) viewed conservation as a process of using natural resources (such as forest, water, animals) wisely, not just for today but for future generations. When the forest is use in a wise manner, the composition of fauna and flora of the forest will be intact for the next generation. Grainger (1986) identifies the different method of conservation to include

- biodiversity conservation
- forest conservation
- soil conservation
- water conservation
- energy conservation

While Goldsmith (1998) observed that conservation of natural resources can take many forms

- practicing sensible and sustainable logging
- setting aside land for natural reserve, natural park or forest reserves
- making and enforcing laws to protect wild life and forest plants
- Protecting our streams and rivers by not clearing land close to the water.
- Taking care on how to dispose of our waste product from industries and homes.
- Taking step to prevent erosion and setting houses close to streams and rivers.

This research work will focus attention on forest conservation how making and enforcing laws which protect wild life, endangered species and the forest resources are derived.

Gibbson (2001) saw, conservation as the controlled used and systematic protection lessened by creating national park. The gap created from 1930s to 1940s, as a result of the world II really limited the scope of conservation.

Grainger (1986) shows that in 1971 the United National Educational, Scientific and Cultural Organisation (UNESCO) and the New York Zoological Society and many other conservation groups, promote the establishment and the enhancement of national parks. These groups encourage Ethiopia to Create Blue

Mountains National Parks. This park covers an area of 2,471Km$^2$ which encompasses African's largest alpine ecosystem, preserving mountains, forest, swamps and grassland that support sixty four (64) mammal species including mountain Nyala Antelope, Semien wolf, and Meneliks bushbuck.

The World Wildlife Fund (WWF) is one of the organisations in the world that is interested in the creation and protection of national parks and preservation since in the 60's. World Wildlife Fund (WWF) major accomplishment was in 1973 when it helped the government of India to organise a project on Tiger. A cooperatives programme for protecting tigers and their native habitat. In Awake (May 8, 1998) shows that significant areas of several dozen of tropical rainforest in Central Africa, West Africa has been protected by national parks or reserves through World Wildlife Fund (WWF) sponsored. This organisation sponsored campaign in 1975 and was instrumental to the formation of Cross River State National Park a sanctuary for the country's largest lowland gorilla population. World Wild Life Fund (WWF) has invested more than 81.1 billion dollars in more than 11,000 conservation projects around the world

Chiras (1995) pointed out that Argentina's National Park Movement started in 1903 with the donation of unspoiled private land called the Andes Mountains of the Federal government. The land covers an area of 3,277km$^2$ Nature Huapi National park in 1934 was donated with an understanding that the area would maintain its natural state. Also in 1934 Argentina created it national park service, which in 1980 defined three types of protected area, national parks, national movements and national reserves. According to Awake (May 8, 1998) North and South America National parks were created for the purpose of tracts of unspoiled wilderness in Europe emerging as conservation movement in many countries reflected in the preservation of wildlife and open spaces, in Britain both the national trust in 1894 and the council for the habitat lost land to industrial expansion.

Chiras (1995) revealed that Africans wildlife was hunted heavily from the late 19$^{th}$ century to 20$^{th}$ century. By 1920 big-game hunters depleted wildlife population. Settlements in this area and have deforested large chunks of land. One of the vast forests that house elephant in eastern cape province in South East Africa was reduce to just eleven (11) elephants, Bontebok Antelopes were reduce to fewer than 30 animals, by 1930. while Travel and Tourism Magazine

(TTM) (2001) shows that South Africa had to take a drastic step by establishing Addo Elephant National Park which was established in 1931, the park now has more than 200 elephant's within its borders. This is encompassing an area of 241km$^2$ and is a home to cape buffalos Bontebok National Park near South Africans tips was also created in 1931; covering an area 31km$^2$ is a sanctuary for more than 300 Bontebok antelopes and more than 470 plant species. Mountain Zebra National Park of 1934 in South Africa protects more than 300 mountain zebras and several antelope species and 200 bird species.

Also in Travel and Tourism Magazine (2004) pointed out that Kenya's protected lands in 1940 called Marsahait National Reserves or Park. Within this park there are elephant and Kutu antelope. The area covered is 360km$^2$ of forest. Travel and Tourism Magazine (2001), emphasis that Nigerian park were established by decree No. 36 of 1990. The decree promulgated the National Park Service Board, a Parastatal of the Federal Ministry of Agriculture and National Resources, with Alhaji kwon Bukar Mergube as the Executive Director. According to the provision of the enabling decree, the national parks become widely regarded as the main purpose of conservation of nature, recreation, eco-tourism scientific and medical researches for the work of art and other cultural values of indigenous people surrounding each of the parks.

Travel and Tourism Magazine (2004), shows that Nigeria is vastly endowed with many national parks which are sited vastly across the country. These parks are known for their function and the role they play to sustain Pristine Eco-system with a variety of biological resources for recreational, scientific and cultural

objectives. As a result of these resources in the forest, the Federal Government established parks in order to develop and manage to meet international standard. The Federal Government establish eight national parks-in the country. In Travel Tourism Magazine (2001) pointed that southern part of Cross River State where we have the Oban hill forest and in the Northern part of the State Okwangwa sector near Obudu cattle ranch. These two sectors cover approximately 3,500km$^2$. The Cross River State National park has a link with Cameroon and Gabon forest but this forest is richer in specie both in flora and fauna than any other forest in Africa. In this forest there are 15 different species of primates,

including gorilla and chimpanzee as well as buffalo, Elephant, dunker antelope, warthogs and a number of smaller animals.

## 1.2 Statement of Problem

Our tropical rain forest is under a serious threat of logging for farming, logging for timber exploitation, bush burning for farming and hunting game. So, the forest ecosystem is dynamically unstable and very fragile. Some species of animal have gone extinct, while others are left in a reduce number. This is as a result of exposing the forest ecosystem to a new condition which most wildlife cannot withstand the degree of being exposed. Which make the animals being prone to danger of being hunted and killed by hunters.

Conservation of the tropical rainforest reduces deforestation of the forest, because deforesting brings about, low productivity, shrinking of the rainforest, low agricultural productivity, shortage of available lands; The socio-economic implication of deforestation in Nigeria are quite disturbing, They include the acute shortage of fuel wood, shortages of industrial timber, loss of biodiversity and genetic resources for their livelihood, destruction of wildlife, and global warming, greenhouse effect among others (Anijah-Obi, 1996).

The determination of the extinction rate is not possible because even human do not know how many species there are, and so it is not possible to understand the complex web of life and how it affect extinction. So, conservation is a practice that helps to reduce over cultivation, overgrazing, dessert encroachment, and other process that helps in depleting the soil, making condition suitable for securing a way for endanger species to lived in any area.

## 1.3 Objectives of the Study:

The objectives of the study are as follows;

i. To measure weather conservation practice have encourage or discourage proliferation of endangered species in the study area.

ii. To assess the role conservation play in sustainability of endangers species in our tropical rainforest of Afi Mountain Sanctuary.

iii. To evaluate the extent to which historical knowledge of conservation have encourage proliferation of endangered species in the study area.

## 1.4 Research Hypothesis:

$H_o$    conservation practice has not created significant impact on the number of endangered species in the study area.

## 1.5 Study Area

The study is centred on Afi Mountain Sanctuary of Boki Local Government Area of Cross River State – Nigeria. The area lies closer to the Northern part of Cross River State.  It is located on latitude $7^o$, 28'N and Latitude $6^o$, 37'N longitude $9^0$ 24'E and longitude $10^0$ 12'E.

Afi Mountain originally formed the North –Western portion of the Afi River forest. This reserve was created in 1930 and covers an area of $530km^2$ in Northern Cross River State, former South – Eastern Nigeria. The flora and fauna component of this mountain ecosystem is intact because the area is not being disturbed by human activity. In the year 2000, the Cross River State Government declared Afi Mountain Wildlife as a Sanctuary (AMWS) which covers about $85km^2$. Afi forest Reserve joined Mbe mountains to the East, covering approximately $100km^2$. Mbe Mountain is adjacent Okwangwo Division of the Cross River State National park, which is a large block of forest approximately $920km^{2,}$ stretching across to the Takamanda forest reserve in the Republic of Cameroon to the East.

Afi Mountain is a home of several endangers species, mostly populated of gorilla. Some small population of gorillas are found in Mbe Mountain in Okwangwo Division of Takamada forest reserve (Cameroon). Mbulu and Takpe forest (Cameroon) also house gorillas of the same species. Afi mountain is a home of many endangered Wildlife species e.g. Villerosus Chimpanzee, which are reserved on only Nigeria and Western Cameroon.

The available geographical information on Afi Mountain Sanctuary is scanty. The dominant rock types are ancient metamorphic rock of basement complex types. The rocks covers 30 per cent of the mountain top (Udo 1978). The rocks are Pre-Cambrian in age and are derived from molten rocks; they consist of largely acidic gneiss differentiated by their mineral composition. Most of them are rich in quarts and feldspar with varying amount of biotic, muscovite and pyrite. Where this occurs occasionally and remains in the profile are generally weathered in the mineral deposit of the mountain-range.

The soil is highly ferruginous tropical soils formed on crystalline rocks. The critical elements of the soil are organic matter and mineral nutrient. The soil is loamy and mixed with clay, dead plants and animal human content which enriched the soil (Atte 1994). The soil absorbs water particles and swells up as a result of

low sunlight reaching the soil due to forest cover. Siltation is low in the area with no logging activities taking place in the mountain area, while dry soils are found toward the base of the mountain. Quartz occurs in the vein of the rocks. The soil is quite stony in nature (Atte 1994). The soil derives leached mineral nutrients from the rocks and the soil is strongly acidic, with a medium of coarse texture, due to the metamorphic rock nature of the mountain.

The area has a tropical humid climate with wet and dry season. Wet season lasts from April to mid November while the dry season last from mid November to mid March according to (Agboola 1979). The area under study with the characteristics of a forest has eight (8) months of rainfall with four (4) months of dry season. The rainfall data shows that the regions have 35mm of rainfall annually (Agboola 1979). Relative humidity is the amount of moisture in the atmosphere. The moisture content in the atmosphere determines the amount of rainfall in an area.

The relative humidity of the study area is 80% .Months, like November, December and January have a low humidity due to the harmattan experienced. During the rainy season on May, June, July, August and September, the area humidity is 80% (Abgoola 1979).

The vegetation is evergreen, broadleaf forest. Different tree species are found in the forest ecosystem. The forest show characteristic of primary forest because of the absent of palm tree. Some are closer to the stream in this area. The forest floor is composed of dead plants leaves which decompose to increase the nutrient content of the soil.
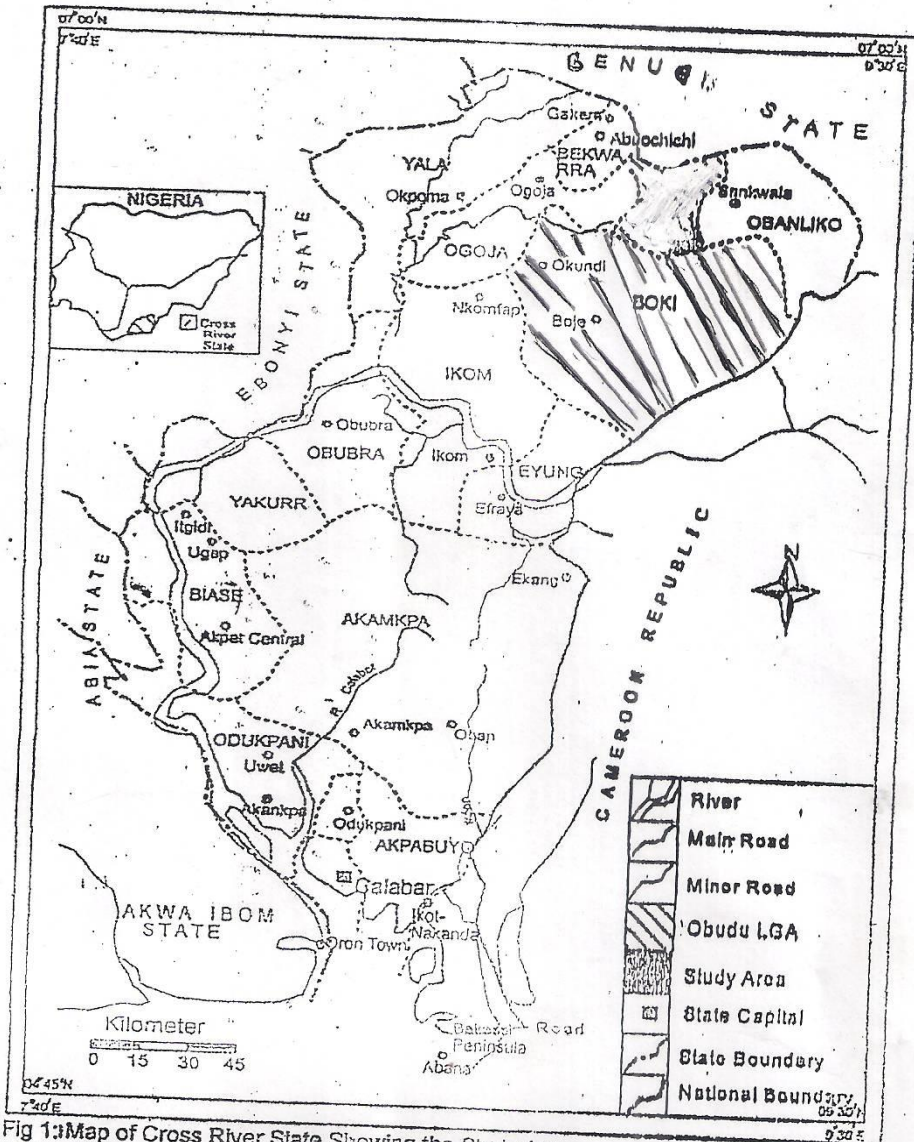
Fig 1: Map of Cross River State Showing the Study Area
Source: Ministry of Lands and Survey Calabar

## 1.6 Research Methodology

### 1.6.1 The Study Population

The Afi mountain sanctuary originally formed the Western portion of Afi river forest reserve. The study comprise of population of hunters and farmers in the study area. The number of farmers/hunters was 234 farmers.

### 1.6.2 Sample Population

The sample population selected was 46 farmer/hunters these numbers of farmers were selected by systematic random sampling technique where in every five household, one farmer/hunter is selected for the study, till the number 234 farmer/hunters is completed.

### 1.6.2 Data Collection Procedure

Each household is given a number, beginning from first household to the last household which is 234 farmers/hunters. The researcher and the research assistant went to the field to administer the questionnaire to each of the hunters/farmers. The systematic random sampling technique was use to administer the questionnaire. Where in every five household or one questionnaire is administer. So the total number of questionnaire administered were 46 farmers/hunters after the researcher and the research assistant administer the questionnaire. The questionnaire were collected and assembly for analysis.

### 1.6.3 Method of Data Analysis

T – Statistical test were used for the analysis of data at 0.05 significant levels.

A table showing how bush burning, secret hunting, cutting down of trees, causes the extinction of some endangered species in Afi sanctuary reserve.

**Table I: Causes of extinction of endangered species**

| Type of Cause | No of Respondent | Percentage |
|---|---|---|
| Bush burning | 2 | 8% |
| Secret hunting | 40 | 76% |
| Cutting down of trees | 4 | 16% |
| Total | 46 | 100% |

*Source Survey 2014:*

The table 1 above shows that secret hunting occupies 76% which give the researcher the insight that most endangered species are lost in the area through secret hunting. Another way that destroyed endangered species is through secret

cutting down of trees. 16% of the 46 respondents agreed that endangered species goes extinct through cutting down of trees. When trees are cut down the animal around that surrounding will change to new environment which many species may lose their lives in the process of hibernating from one place to another. There are little or no bush burning in the area as only 8% the respondents agree that there is bush burning. This is so because of the awareness created to communities around that area about the devastating effects of bush burning.

Effort has been made by the Federal Government on conservation, non-governmental organisation (NGO) and even the Cross River State Government through the establishment of forestry commission. The table below has been able to show the different effort made toward ameliorating these problems in the table area.

**Table 2: Effort toward Ameliorating the Problem.**

| Effort Made Toward Ameliorating Problem | No of Respondents | Percentage |
|---|---|---|
| Giving loan | 35 | 76.09% |
| Giving domestic animal | 5 | 10.87% |
| Educating the people. | 6 | 13.04% |
| **Total** | **46** | **100**%. |

*Source: Survey 2014*

The table 2 above shows that 76.09% effort was made toward reducing interest of destroying endangered species by giving the people in the community loans which will help them establish other businesses and aid them in generating income for living. Effort made by giving domestic animal and educating the people has the percentage of 10.87% and 13.04% respectively. This indicates that it will be proper to divert the people attention from the forest resources by giving them loan. 13.04% of the respondents agree that awareness on the dangers of killing and destroying forest resources is very low and so the villagers do this ignorantly. Government should do more in this area.

Table 3 below shows the number of each species destroyed Before and After conservation the practice was put in place in the area.

**Table 3: showing species destroyed before and after the establishment of Afi mountain sanctuary.**

| S/N | Species Code (N) | Species destroyed before Afi mountain sanctuary conservation (X) | Species destroyed after Afi mountain conservation reserve (Y) |
|-----|------------------|-------------------------------------------------------------------|---------------------------------------------------------------|
| 01 | Drill Monkey | 63 | 8 |
| 02 | Gorilla | 39 | 1 |
| 03 | Chimpanzee | 20 | 0 |
| 04 | Africa Grey Parot | 23 | 3 |
| 05 | Pangolin | 53 | 5 |
| 06 | Red-earned Monkey | 43 | 6 |
| 07 | Bare-header Rock Fowl | 15 | 2 |
| 08 | Crocodile alligator | 30 | 6 |
| 09 | Spotted-necked Otte | 37 | 4 |
| 10 | Hige-back Tortoise | 84 | 5 |
| 11 | Flying Squirrels | 178 | 20 |
| 12 | White Bush Dog | 105 | 12 |
| 13 | Water Chevrotain | 38 | 13 |
| 14 | Leopard/Tiger | 12 | 0 |
| 15 | Bush Pig | 55 | 1 |
| 16 | Bush Cow | 34 | 1 |

*Source: Survey 2014*

Before Conservation was implemented (X)

After Conservation was implemented (Y)

The research work is interested in finding out whether or not significant difference exist in the number of species destroyed before conservation practice in Afi mountain sanctuary and the number of endangered species destroyed after conservation practice was introduce in Afi mountain sanctuary.

Table three above show in each of the animal resources listed that there is serious conservation of animal resources after the conservation of Afi mountain sanctuary.

**Testing of hypothesis**

**Table 4:** Showing the values of species destroyed before and after conservation using

Student t- test.

| X | $(X - \overline{X})^2$ | Y | $(Y - \overline{Y})^2$ |
|---|---|---|---|
| 63 | 121 | 8 | 6.25 |
| 39 | 26 | 1 | 20.25 |
| 20 | 1024 | 0 | 30.25 |
| 23 | 841 | 3 | 6.25 |
| 53 | 1 | 5 | 0.25 |
| 43 | 18 | 6 | 10 |
| 15 | 1156 | 2 | 7 |
| 30 | 484 | 6 | 0.25 |
| 37 | 30 | 4 | 3 |
| 84 | 1024 | 5 | 10 |
| 178 | 15879 | 20 | 210.25 |
| 105 | 2809 | 12 | 42.25 |
| 38 | 28 | 13 | 56.25 |
| 12 | 1600 | 0 | 30.25 |
| 58 | 36 | 1 | 20.25 |
| 34 | 324 | 1 | 20.25 |
| $\overline{832}$ $\overline{X}$  52 | 388308 | $\overline{88}$ $\overline{X}$ = 5.5 | 473 |

*Source: Survey 2014*

$H_0$ = conservation practice has not created significant impact on the

number of endangered species in the study area.

$$t = \frac{\bar{x} - \bar{y}}{\sqrt{\dfrac{QX^2}{NX} + \dfrac{QY^2}{NY}}}$$

$$t = \frac{52 - 5.5}{\sqrt{\dfrac{QX^2}{NX} + \dfrac{QY^2}{NY}}}$$

$$QX = \sqrt{\frac{E(X - X)^2}{N - 1}} = E\sqrt{\frac{388308}{N - 16}} = 160.08$$

$$QY = \sqrt{\frac{E(Y - Y)^2}{N - 1}} = \sqrt{\frac{473}{15}} = 5.62$$

$$\frac{52 - 5.5}{\dfrac{160.08}{N - 16} + \dfrac{5.62}{N - 16}} = \frac{52 - 55}{\dfrac{180.09}{15} + \dfrac{5.62}{5}}$$

$$10.73 + 0.37$$

$$\frac{46.5}{11.1} = 4.19$$

Calculated t = 4.19

df = 15 + 15 -2 (15 + 15) - 2 = 28

Table value = 1.70

**Decision**

Since the calculated value is greater than the table value 1.70. It therefore means that the alternate hypothesis is accepted while null hypothesis is rejected. To this end, it shows that conservation practice has created a significant impact in the number of endanger species destroyed in Afi mountain sanctuary. This shows that the implementation of conservation policy has helped the protection of forest resources from the hands of the people.

The above analysis attest to the fact that the number of endanger species destroyed before the establishment of the park were greater than those species destroyed after the establishment of the park.

## Conclusion

Wildlife is not only an economic resource; it is also a national heritage that has pervasive influence on our language, religious belief, folklore and culture. The nature and the world, suffers a cultural loss whenever any species is exterminated. The present generation, therefore have a moral duty to preserve this heritage for the enjoyment and education of our children for future generations. Afi forest reserve is a large forest area immediately adjacent to the park with significance for forestry, tourism development and wildlife conservation within the reservation of viable population of such endangered species of animals like gorillas, chimpanzees, drill and forest elephants, special measure to control access and suppress hunting throughout the reserve area. Access control is also a condition of effective, preservation and proper forest management. The area is particularly important for gorillas, and thus has a role to play in the development of gorilla based tourism.

The process of conservation have increase the number of endanger species in Afi forest reserve. This research was made to cover 46 household samples covering a population of 234 household. This work infers that conservation is very important to maintain and reduce the rate of proliferation of endanger species in the Afi mountain sanctuary.

## Recommendations:

Having discovered that conservation is a veritable tool for keeping endangered species in Afi forest reserve in Boki Local Government of Cross River State.

The following recommendations were made as follows:

- ➢ Boki Local Government Council should encourage Boki people and other private sector to invest in tourism development in the area.
- ➢ Government should protect the rights of the Boki people to determine the extent of exploitation and/ or conservation of their natural resource.
- ➢ Government should send impressive conservation/tourism projects operator in the area. The need to employ the host communities who are qualified at the junior and managerial level should be looked into.
- ➢ Government should support conservation/tourism projects in Boki Local Government Area of Cross River State.
- ➢ Boki is unique because of its environment and so conscious efforts should be made by the government to protect this natural heritage.
- ➢ Government should actively participate in the prevention and control of natural, disasters such as erosion, forest fire, storm disasters etc.
- ➢ Government should assist non-profit making conservation/tourism projects, currently undertaking the maintenance of rural roads through direct labour.
- ➢ The council should take conservation/and tourism project as a priority in their budgets.
- ➢ Government should create conservation awareness of the Boki people, emphasizing the need for them to protect their environment.
- ➢ Government should encourage the development of Local Crafts industry to service the need for tourism thereby boosting business in the area.
- ➢ Government should be actively involved in training in other to further developed human resources which will facilitate conservation and growth in Boki LGA.
- ➢ Government should create a standing committee that will work in close collaboration with existing conservation/tourism project so as to develop the industry in the area
- ➢ Government explore the possibilities of disturbing royalty to the Cross River National park and other tourism board. For proper monitoring.

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