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THREATS TO BIODIVERSITY CONSERVATION IN CROSS RIVER NATIONAL PARK, NIGERIA

Bukola O. ADETOLA[1*], Abimbola O. ADETORO[2]

[1]Department of Ecotourism and Wildlife Management, School of Agriculture and Agricultural Technology, Federal University of Technology, Akure, Ondo State, Nigeria
[2]Department of Wildlife and Ecotourism Management, Faculty of Agriculture and Forestry, University of Ibadan, Oyo State, Nigeria

Abstract

Cross River National Park (CRNP) is a naturally endowed "biodiversity hotspot" with diverse resources ranging from picturesque topography, rivers, fauna and flora. However, the rate of illegal activities in the park is posing serious threats to these resources. This study investigated different forms of threats facing biodiversity conservation in the park between 1991 and 2012. The study revealed that logging, fishing/water poisoning, illegal entry and collection of Non Timber Forest Products (NTFP) were the common forms of threats in the park. Logging was ranked as the major threat to biodiversity conservation in the park by 42.05% of the respondents, while illegal entry posed the least threat (2.27%). Management constraints identified as threats to biodiversity conservation were inadequate funding, inadequate patrol equipment, unmotivated staff (poor salary) and inadequate support from communities bordering the park. The highest arrest of poachers (79) was recorded in 2008. Implications of these threats are loss of habitat, reduction in fauna resources amongst others.

Keywords: *Threats; Biodiversity; Poachers; Conservation; Cross River National Park.*

Introduction

Biodiversity is the wealth of all life forms found on earth and encompasses all species of plants, animals, microorganisms, the ecosystems and ecological processes. Moral justification and value to human existence are two major reasons for conserving biodiversity [1]. However, renewable natural resources are being utilized by humans at a rate exceeding their natural abilities to renew themselves [2]. Human encroachment into natural ecosystems is increasing drastically throughout the world. Forests are being exploited and cleared, farmlands have increased in extent, demand for grazing areas is on the rise and unregulated harvesting of the wild resources is becoming uncontrollable. As human activities exert pressure on the global environment, biological diversity declines, habitats are transformed and the population of some species dwindles to the point of extinction [3]. Since man is constantly at variance with nature, the ever increasing human population coupled with technological development place stress on the environment and the world's natural resources hence the unprecedented rate of biodiversity disappearance.

* Corresponding author: bukolatomi2@gmail.com, boadetola@futa.edu.ng

Conservation on the other hand is the planned management of a natural resource or the total environment of a particular ecosystem to prevent exploitation, pollution, destruction, or neglect and to ensure the future use of the resource. The goal of biodiversity conservation therefore is to ensure that such resources are not consumed faster than they are replaced. This is of great concern due to the fast growing population of the world and the adverse effect of changing climate on agriculture and genetic diversity.

Nigeria covers a total area of 924,000.89km^2 with an estimated population of over 160 million people of diverse ethnic and cultural backgrounds. As a result of its large land area, the country covers different climatic and ecological zones and it is rich in biodiversity with an array of fauna and flora [4]. This includes about 20,000 species of insects, 1,489 species of microorganisms, almost 1,000 species of birds, 247 species of mammals, 123 species of reptiles, about 1,000 species of fish and about 7,895 species of plants identified in 338 families and 2,215 genera [5]. The vegetation ranges from mangroves along the coast in the South to the Sahel savannah in the North [6].

Protected areas, as conservation tools, are among the most efficient ways to reduce the impact of humans on the remaining biodiversity [2]. In Nigeria, there are 445 forest reserves, 7 strict nature reserves, 1 biosphere reserve, more than 20 natural regeneration plots, more than 200 permanent sample plots, 32 game reserves/sanctuaries, 3 fish parks, 7 national parks and 3 Ramsar sites. Despite these, the destruction of natural habitats continues unabated resulting in the depletion of the country's biodiversity [7]. This study therefore investigated the forms of threats to biodiversity conservation in Cross River National Park (CRNP), Nigeria and analysed the trend of encroachment in the park.

Study area

The Cross River National Park (CRNP) lies between latitude 5^o 05'and 6^{o}29' N and longitude 8^{o}15' and 9^o 30' E in the Southeastern part of Nigeria in Cross River State (Fig. 1).

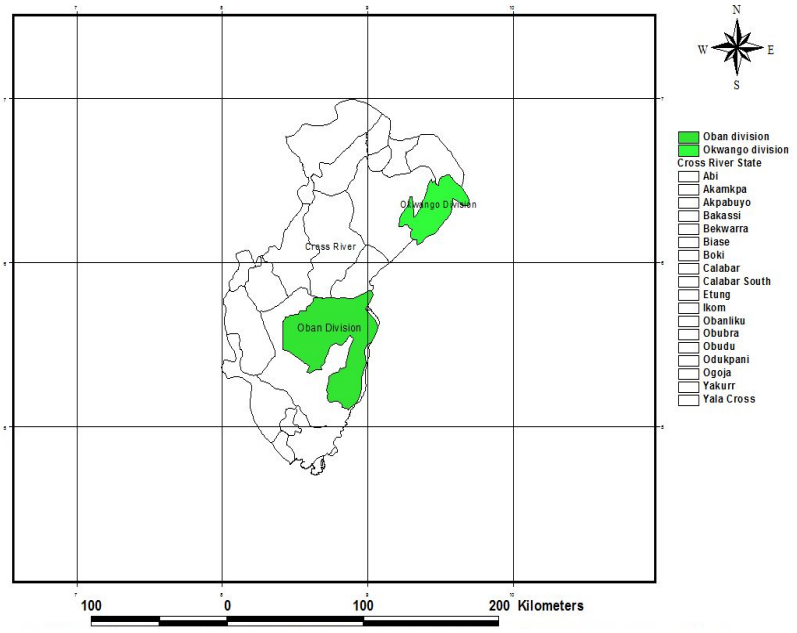

Fig. 1. Map of Cross River State, showing the two divisions of Cross River National Park

The Park covers a total area of 4000 km^2 and is segmented into two non-contiguous divisions – The Oban hills in the southern part covering 3000 km^2 and the Okwangwo Division in the northern part covering 1000km^2. The Park ecosystem consists of primary moist tropical rainforests in the North and central parts, while the southern parts contain mangrove swamps on the coastal zones. The CRNP has one of the oldest rainforests in Africa, and has been identified as a biodiversity hot spot. The park has a tropical climate characterized by a rainy season between April and November. The annual rainfall ranges between 2000 m to 3000 m; relative humidity in and around the park is well over 30%. The temperature rarely falls below 19°C with an annual mean of 27°C. The CRNP is one of the richest areas of tropical rainforest in West Africa; containing the remaining rain forest in Nigerian [8].

Methodology

Data Collection

Structured questionnaire and secondary data obtained from administrative records of the CRNP were used as instruments for data collection. A total of 102 questionnaires were administered to 30% of the Park officials and 88 questionnaires were retrieved. Poaching activities from 1991 to 2012 were obtained from Park records. Descriptive statistics were used for data analysis.

Results and Discussion

Staff experience and identified threats to biodiversity conservation

It was observed that 72.70% of respondents were male while 27.30% were female. The recognition of gender roles in biodiversity management is an important step in the achievement of conservation and sustainable use of biological resources [9, 10]. A significant number of respondents had obtained tertiary education (61.36%) and very few had basic primary education (4.55%) (Table 1). This indicated that most employees had the required skills for biodiversity management and conservation. The presence of professionals corroborates the suggestion of Green [11] that some industries required specially trained personnel to actualize set goals, and biodiversity conservation is a peculiar example. Most of the staff had work experience greater than 10 years (36.36%) and this implies that these workers are knowledgeable and could provide the needed information on threats to biodiversity conservation in the Park, over the years (Table 1).

Table 1. Some socio-demographic characteristics of staff respondents in Cross River National Park

Variables	Frequency (N=88)	Percentage (%)
Gender		
Male	64	72.70
Female	24	27.30
Educational attainment		
Primary	4	4.55
Secondary	30	34.09
Tertiary	54	61.36
Year in service with CRNP		
<5 years	27	30.68
5 – 10 years	29	32.96
>5 years	32	36.36

N means Total number of staff respondents
CRNP means Cross River National Park

Ranking of the different types of illegal activities revealed that 42.05%, 35.23% and 12.50% of respondents suggested that logging, hunting and NTFP collection, respectively, were the three major threats to biodiversity conservation in the Park (Table 2). Illegal entry, which is

a form of encroachment, was found to pose the least threat (2.27%). Some administrative constraints identified as threats to biodiversity conservation as shown in Table 3 were; inadequate funding (36.36%), inadequate patrol equipment (26.14%), weak support from neighbouring communities (20.46%) and insufficient incentives and remuneration to motivate staff (17.05%).

Table 2. Illegal activities in CRNP as identified by Park Staff (N = 88)

Illegal Activities	Frequency	Percentage (%)	Rank
Logging	37	42.05	1st
Hunting	31	35.23	2nd
Collection of NTFPs	11	12.50	3rd
Fishing/Water Poisoning	7	7.95	4th
Illegal entry	2	2.27	5th

Deforestation, which is a consequence of indiscriminate logging, hinders the significant role that rainforests play at the global level in climatic change mitigation, oxygen production and carbon cycling. Significant amounts of nitrous oxide, carbon dioxide, and methane are released into the atmosphere as a result of human activities (logging, clearing and burning) in forests [3]. It is an established fact that deforestation combined with illegal hunting has a terminal effect on wildlife populations [12].

The increasing incidence of poaching of wild animals stems from peoples need to supplement their protein intake with bush meat and generate income [13]. However, indiscriminate hunting of wild animals threatens their existence. Presently, some animals are on the global IUCN red list as threatened, endangered or extinct. Non- Timber Forest Products (fruits, nuts, vegetables, fish, spices, medicinal plants) are used for food, medicines, oil, resin, tannin, household equipment, fuel-wood and building materials and income generation. They are an indispensable part of the livelihood strategies of communities living in and near forests [14]. Fishing which is a major occupation in villages along coastal regions of the Park, sometimes involve the use of chemicals that pollute water bodies and threaten aquatic resources.

Table 3. Administrative constraints to biodiversity conservation in CRNP (N = 88)

Variables	Frequency	Percentage (%)	Rank
Inadequate funding	32	36.36	1st
Inadequate patrol equipment	23	26.14	2nd
Poor staff motivation (e.g. poor salaries)	15	17.05	4th
Weak support from neighbouring communities	18	20.46	3rd

Poachers arrest profile and strategies for improved biodiversity management

A detailed analysis of records from the time of Park establishment to date (1991 - 2012) revealed variations in the number of poachers arrested (Fig. 2). No arrest was made in the first three years (1991-1993) and the highest number of arrests (79) was reported in 2008. Arrest of poachers has been an effective management tool for protecting biological resources in protected areas but has not been able to totally stop poaching activities in Nigeria [15]. Moreover, 23.86% of the respondents suggested that more antipoaching patrol teams should be deployed with modernized state of the art patrol equipment. In addition, some staff (18.18%) opined that aggressive conservation awareness campaign/conservation education program should be introduced to better inform the local communities.

The respondents identified some basic infrastructures that required urgent attention. They include: roads, electricity supply, water supply, educational facilities, social amenities and health care delivery. Over 12% of the people interviewed proposed that the provision of alternative sources of livelihood to residents of the adjourning communities would reduce their dependence on Park resources (Table 4).

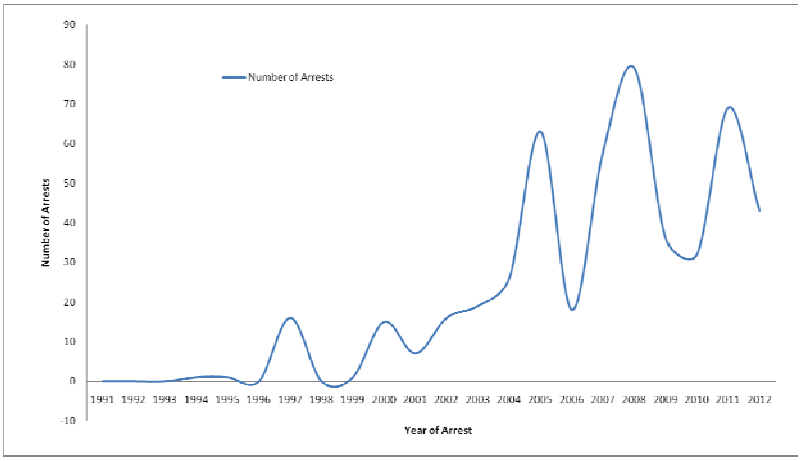

Fig. 2. Poachers arrest profile in Cross River National Park (1991 – 2012)

Table 4. Strategies suggested by staff respondents to stopping illegal activities in CRNP

Strategies	Frequency	Percentage	Rank
Employment of more community members to park service	10	11.36	6th
Powerful Antipoaching Patrol	21	23.86	1st
Motivation for rangers (incentives/improved salary)	13	14.77	4th
Awareness campaign/conservation education programmes	16	18.18	2nd
Provision of alternative livelihood option to divert dependence on park resources	11	12.50	5th
Provision of basic amenities to communities (infrastructures, social amenities, educational facilities, healthcare delivery, etc)	14	15.91	3rd
Expansion of buffer zone	03	3.41	7th

It has been reported that sustainable conservation of the national park requires empowering the local communities so as to reduce their interference in the implementation of the park management programme [16, 17]. Marguba [18] opined that the introduction of Support Zone Community Programmes would enhance biodiversity management and conservation in Nigeria's National Parks.

Conclusions

Encroachment into CRNP has been due to social and economic motives, with widespread poverty in the support zone communities of the park resulting in uncontrolled exploitation of the natural resources. Administrative constraints also hindered the long term sustainability of biodiversity. Thus, the realization of biodiversity conservation in CRNP depends on poverty alleviation, provision of alternative livelihood options and infrastructural development in adjourning communities. This will enable the local communities to appreciate the value of the biological resources and consequently support their conservation.

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