

**ECOTOURISM MANAGEMENT AND SUSTAINABLE UTILIZATION OF
BIODIVERSITY IN PANDAM WILDLIFE PARK, NIGERIA**

By

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ABSTRACT

Ecotourism management and sustainable utilization of biodiversity in Pandam Wildlife Park (PWLP), Nigeria was studied using structured questionnaires, field survey, in depth interviews of key informants and administrative records. A set of 100 questionnaires were randomly administered to tourists in the park to obtain information on tourists' experience and level of satisfaction of the park. The second set of 20 questionnaires were randomly administered to 50% of the park officials to obtain information on low impact management strategies and challenges in the park, while information on revenue and tourist statistics were obtained from administrative records. Results showed that various low impact management strategies are operational in the park. Major challenges of tourism in PWLP are insufficient workers (100%), poor funding (100%), and poaching (100%). Tourist respondents complained of the seasonal nature of tourism (82.0%) and difficulties in siting game. Eighty and seventy percent of tourist respondents rated their satisfaction level high during nature guide trailing and recreation, respectively. Satisfaction level from lake cruising was rated very high by 60.0% of the respondents, while 55.0% rated game viewing low. Tests of relationship between accommodation of tourists and tourists' satisfaction with game viewing, time of lake cruising and tourists satisfaction level, and time of recreation and tourists' satisfaction level using chi-square were all significant ($P < 0.05$). Tourist statistics increases progressively from 3,204 in 2000 to 27,705 in 2004. However, the highest revenue generated in the park was ₦383,181.76k in 2001.

Key words: Pandam Wildlife Park, Ecotourism Management, Sustainable Utilization, Biodiversity, Nigeria.

INTRODUCTION

Overview of the Non-sustainable Utilization of Resources in Nigeria

One of the most serious global challenges to the present generation is how to sustain utilization of limited natural resources in the face of ever increasing human population. This is worse for countries like Nigeria with high rates of poverty, where the governments are nonresponsive to the needs of the people, and the majority of the people heavily rely on natural resources, such as forests, land, and water for survival.

Evidences of non-sustainable management of resources are numerous in Nigeria. Wase Wildlife Park has been destroyed (Ijeomah *et. al.*, 2005a). Lake Chad basin has decreased from 25,000km² to 2500km² between 1960 and 2000 (Jauro, 1998). One third of the Pai River Game Reserve of Plateau State has been de-reserved for farming, with the remaining two third neglected (Ijeomah, 2007). The Mado Tourist Village has been abandoned due to mismanagement. The Yankari Wildlife Park, which was opened to the public in 1962 and upgraded to a national park in 1991, has been degraded to a game reserve on June 1st, 2006 (Iduh, 2007; Ogogo, 2008) in pursuit of good management for sustainability. The Nasarawa Game Reserve proposed as far back as 1971 in Nasarawa State (the then Plateau State) is yet to be established. The Calabar Zoo has stopped functioning and all the animals therein were distributed to other zoos. Natural endowments of Nigeria, such as the African elephant (*Loxodonta africana*) in Kainji Lake and Cross River national parks, have permanently emigrated to Niger Republic and the Republic of Cameroon, respectively (Ijeomah and Aiyeloja, 2008). Most fruit trees in the eastern part of Nigeria, particularly oil bean (*Pentaclethra macrophylla*), breadfruit (*Treculia africana*), and Star apple (*Chrysophyllum albida*) are endangered because of use pressure, building of houses, and road construction without serious plans for regeneration (Ijeomah and Ogara, 2006).

The periods of fallow for lands in most rural areas in Nigeria (particularly eastern Nigeria) have been reduced from about ten to three or two years. Consequently, most wildlife species have lost their habitats. Even sacred forests that formerly served as the last wildlife refuge are presently being cleared, either for agriculture or religious reasons (The Nation, 2009). The Akpam sacred forest of Dikenafai, Imo State was cleared by a chief priest for farming (Ijeomah *et al*, 2007),

while parts of the Urashi sacred forest has been cleared for religious reasons. Many forests in Benue State are annually burnt by the Tivs while hunting for rat, which is their cultural delicacy. The country has lost many known and some unknown and unnamed endemic species through these means (NEST, 1991), whereas every species has a special role it plays in ecosystem sustainability. Loss of one species could lead to chains of extinction. Raven (1976) reported that the extinction of each tropical plant species leads potentially to the loss of another 10-30 insect species. These insects and other species play important roles in plant pollination and seed dispersal. In the Ivory coast alone, elephant (*Loxodonta africana*) disperses the seeds of 37 tree species with only seven of these trees having backup carriers. In parts of the Ivory coast, where elephant has become locally extinct, none of the thirty tree species (except the old ones) were found, although many animals depend on them (Tangeley and Miller, 1991; Ijeomah *et al.*, 2005b). Tangeley and Miller (1991) emphasized that seven common squirrels in the country feed specifically on one of these trees. 'Take the lemurs out of Madagascar and 20 different trees in the forest could disappear because their seeds are no longer dispersed. In parts of India, tigers are suffering from lack of prey, which is being killed by human' (Carey, 1999). Cultural means of conservation is failing in many areas due to pressure and change of attitude. Consistent increase in the cost of kerosene (the cheapest cooking fuel from Petroleum) is forcing the masses to change to fuel wood. Hence, the rate of deforestation is fast increasing (Faleyimu *et al.*, 2008) as there is no affordable alternative fuel for cooking (NEST, 1991). High rate of logging without commensurate artificial regeneration has drastically reduced the number of merchantable trees in the forest; timber contractors are afraid of losing their livelihood. In the northern part of Nigeria, desert encroachment poses its own challenges. Human beings have dominated the physical structures in Lagos, Abuja, and Port Harcourt, taking over spaces formerly occupied by fauna and flora.

In the riverine areas, particularly the Niger Delta, pollution of rivers with chemicals from petroleum industries and refineries have killed and castrated many fish species, and have denatured the soil by altering its chemical composition (Ibaba, 2002). Succession is taking place. Water hyacinths are reducing water surfaces (NEST, 1991). Fishermen are rendered jobless; pollution on land has killed vegetation, which serves as cover for wild animals. Crops have become stunted in Ogoni, Rivers State. Illumination through gas flaring has caused animals to emigrate. Farmers have become jobless and are turning to militants. Poverty is fast spreading in

the cities and poor urban youths are migrating to their respective indigenous rural communities for militancy, which they considered lucrative due to corruption. Every species is affected because of the tension on ecosystems.

All protected areas in Nigeria are economically dependent on either the federal or state government. Failure of the government to release fund leads to stagnation of conservation activities. Since money is released on the basis of government interest and policy, most game reserves in Nigeria exist only on pages of Newspapers without effective form of management and protection for ecosystems therein. Many hectares of the Stubb Creek Reserve in Akwa Ibom State have been ceded to different institutions, and petroleum firms are presently drilling oil in the reserve. There is no substantive forest remaining in Akwa Ibom State. The rate of poaching is continually increasing and even becoming more organized. This organized poaching is not for consumption alone but for commercial purposes. The forests are becoming empty of animals (Redford, 1992; Carey, 1999; Carey, undated). If the 230 inhabitants of three Waorani villages in Ecuador could kill 3,165 individuals of wild animals at subsistence level in less than a year (Yost and Kelly, 1983), and 2,847,000 rural Brazilians (FIGBU, 1982) could kill an estimate of 38 million individuals of animals with about 36 million fatally wounded (at subsistence level) in a year, it then predicts that the number of animals killed by about 60 million rural Nigerians in a year will be staggering.

In an attempt to check poaching and placate the host communities, participatory management approach was introduced in protected areas with the aim of involving host communities at different levels. Many authors have applauded the Cross River forestry commission for the success of community forestry in the state (at least for the flora) - the presence of soaring, buttressed tropical trees, does not guarantee the presence of resident fauna; many times trees remain in a forest that human activities have emptied of many of its large animals (Redford, 1992). Similar arrangement of community forestry exists at the Bimbia Bonadikombo community ecotourism forest of Cameroon; however, the community guards in the forest are so aggressive and tend to exploit visitors (Ijeomah *et al.*, 2005b) through their economic demands. This shows that they are not satisfied with the proceeds obtained from the arrangement, and may embark on certain unethical practices for economic reasons when the opportunity arises.

It was on this basis that Carey (undated) faulted the concept of local community participation in conservation area management, maintaining the opinion that sustainable hunting does not exist anywhere among indigenous people except where human population is still relatively low, animal numbers are high, and non indigenous biologists are available to provide long term guidance. The solution to problems of sustainability is effective human population control, which is difficult to achieve in rural areas.

Ecotourism was introduced in protected areas as a means of solving financial challenges. But management of conservation areas would have been easier without the presence of tourists because of negative impacts. The study, therefore, surveys the low impact management strategies embarked upon by the management of Pandam Wildlife Park since inception in 1972, and the implication of these strategies on ecotourism development.

MEHODOLOGY

Pandam Wildlife Park is located North of Benue River (Ezealor, 2002) and South of Plateau State (Akosim, 1997) along Lafia–Shendam Road in Quaanpan Local Government Area of Plateau State (Ijeomah, 2007). It lies between latitudes $8^{\circ}35^1\text{N}$ and $8^{\circ}55^1\text{N}$, and longitudes $8^{\circ}00^1\text{E}$ and $8^{\circ}45^1\text{E}$, as shown on Figure 1. The park covers an area of 224 square kilometers.

Data for the study were collected with the aid of structured questionnaires, field surveys, personal interviews, and administrative records. A set of 100 questionnaires were randomly administered to tourists in the park to obtain information on tourists' experience and level of satisfaction in the park. Another set of 20 questionnaires were randomly administered to 50 percent of the park officials to obtain information on low impact management strategies and challenges in the park. Information on revenue and tourist statistics was obtained from administrative records.

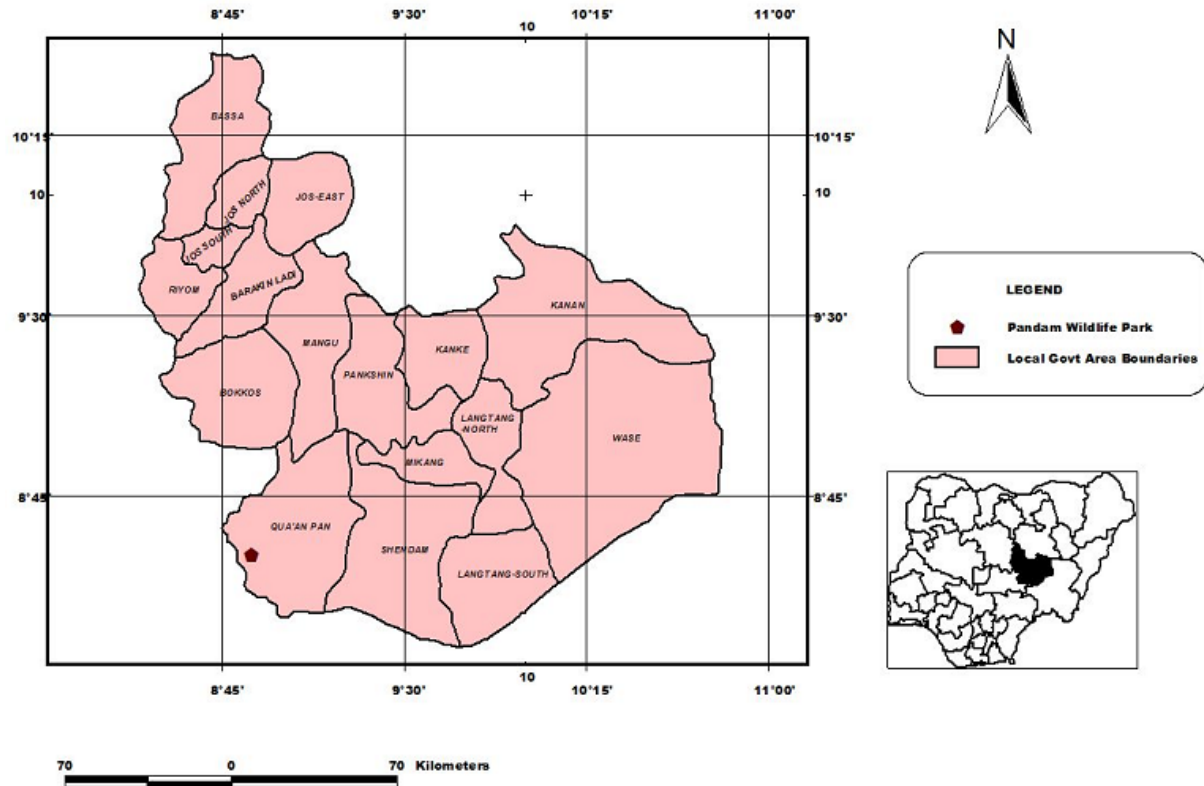


Figure 1: Map of Plateau State Showing the Location of Pandam Wildlife Park

RESULTS

Low Impact Tourism

Table 1 shows that all staff respondents indicated compulsory use of tour guides, non-creation of awareness for visitors, closed and open seasons for fishing, closed and open seasons for tourism, accommodation of few visitors in the lodges, non-commercialization of playing ground, daily patrolling of park by game guards, creation of out-stations, and community involvement in anti-poaching exercises as management strategies for low impact tourism in Pandam Wildlife Park. Table 2 presents the major challenges of tourism in Pandam Wildlife Park as insufficient workers (100%), poor funding (100%), and poaching (100%). Figure 1

shows a pictorial evidence of poaching in Pandam Wildlife Park - poachers' harvest with small meshed (unauthorized) fishing net.

Table 1: Management Strategies for Low Impact Tourism in Pandam Wildlife Park

Strategies	Percentage Values
Compulsory use of tour guides	100
Non creation of awareness	100
Off and on season period for fishing	100
Off and on season for tourism	100
Accommodation of few visitors in lodges	100
Non commercialization of playing ground	100
Daily patrolling of park by game guards	100
Creation of five out stations	100
Community involvement in anti poaching exercise	100

Table 2: Environmental Challenges of Tourism in Pandam Wildlife Park

Challenges	Percentage values
Insufficient workers	100
Poor funding	100
Poaching	100
Insincerity of workers	20.0
Pressure to de-reserve part of the park	50.0



Figure 1: Poachers' Harvest with the Use of Small Sized Net

Assessment of Tourist Experience and Level of Satisfaction

Table 3 shows that the satisfaction level of 80.0% and 70.0% of respondents were high during nature guide trailing and recreation, respectively. Satisfaction level from lake cruising was rated very high by 60.0% of the respondents, while 55.0% of the respondents rated game reviewing low. Respondents' comments on site management are presented in Table 4. Tourist respondents complained about the seasonal nature of tourism (82.0%) and the difficulties in siting animals (73.0%). Tables 5, 6, and 7 show that tests of relationship between accommodation of tourists and tourists satisfaction with game viewing ($X^2 = 113.586$); time of lake cruising and tourists satisfaction level ($X^2 = 73.237$); and time of recreation and tourist satisfaction level ($X^2 = 198.00$) using Chi-square were all significant ($P < 0.05$).

Table 3: Assessment of Tourists Experience and Level of Satisfaction

Activities	Level of Satisfaction		
	Low	High	Very high
Lake Cruising	27.0	3.0	60.0
Game viewing	55.0	15.0	30.0
Recreation	10.0	70.0	20.0
Nature guide trailing	15.0	80.0	5.0
Sport fishing	0	0	0

Table 4: Complaints by Tourists about Site Management

Complaints	Percentage
Inability to site animals	73.0
Insufficient canoe for lake cruising	64.0
Seasonal nature of tourism	82.0

Table 5: Relationship between Accommodation of Tourists and Tourists' Satisfaction with Game-viewing

	Accommodation			
		Lodges	Pandam Village	No accommodation
Satisfaction With game Viewing	Low	0	0	55
	High	7	8	0
	Very high	25	4	1

Significant relationship exist ($P < 0.05$): $X^2 = 113.586$

Table 6: Relationship between Time of Lake Cruising and Tourist Satisfaction Level

Time	Satisfaction Level		
	Low	High	Very high
Morning (7 – 11am)	28	0	0
Afternoon (11.01 – 4.00pm)	0	2	9
Evening (4.01 – 6.00pm)	7	1	1

Significant relationship exist ($P < 0.05$): $X^2 = 73.237$

Table 7: Relationship between Time of Recreation and Tourist Satisfaction Level

Time	Satisfaction Level		
	Low	High	Very High
Morning	8	0	0
Afternoon	0	70	20
Evening	1	0	0

Significant relationship exist ($P < 0.05$): $X^2 = 198.00$

Tourist Statistics and Revenue Generation

Table 8 reveals that tourist influx increases progressively from 3,204 in the year 2000 to 27,905 in the year 2004. However the highest revenue generated in the park was ₦383, 181.76k in 2001 while 2003 recorded the least revenue of ₦183, 631.17k as show in table 9.

Table 8: Tourist Visitation to Pandam Wildlife Park

YEAR/MONTH	2000	2001	2002	2003	2004
January	200	485	851	265	2,961
February	176	500	782	435	1,442
March	125	559	874	435	1,442
April	445	299	355	3,190	4,753
May	445	299	355	2,153	2,053
June	80	437	593	1,643	1,573
July	38	23	425	1,344	2,207
August	43	545	474	974	1,299
September	56	17	915	594	1,223
October	55	21	2,058	610	1,295
November	41	836	2,050	705	1,295
December	1,821	3,262	1,204	1,784	3,006
Total	3,204	7,416	10,986	15,788	27,905

Grand Total: 65,299 Tourists

Table 9: Summary of Revenue Generation from Pandam Wildlife Park between 2000 and 2004

<i>Months</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>
January	31370.00	36,789.00	40388.68	42640.00	60,487.32
February	34465	32,748.00	45,365.00	27500.00	56,579.88
March	45750	35,595.00	58,329.00	25052.66	45,438.00
April	42540	45,036.00	50,999.00	44,678.55	24,617.00
May	54405	64,898.00	29,911.00	43,796.92	19,341.00
June	19325	19,262.84	7687.00	17,121.32	17,316.00
July	21520	8,828.80	4956.00	9,492.90	10,483.00
August	13755	7616	8671.00	12054.00	12,215.00
September	13795	6081.04	3541.00	10,665.00	12,975.00
October	12,680	9,625.00	15,250	16,000	17,235.00
November	29069	64,125.00	36,166.55	14,484.82	31,305.00
December	27215	52,577	36850.00	20,127.00	65,640.00
<i>Total</i>	<i>345,889</i>	<i>383,181.76</i>	<i>287,115.23</i>	<i>283,631.17</i>	<i>373,632.2</i>

DISCUSSION

Sustainable Tourism Management Strategies and Challenges

Since the Park was not previously collecting gate fee (this was not done until 2005), it would have been easy for a visitor to enter the park without being guided. The management of the park, however, monitors the movement of visitors to avoid anti-conservation practices. Awareness for tourist visitation is not being created by the park management, though visitors are cordially welcomed. This is to avoid overcrowding of tourists which might negatively impact the eco-destination. Ijeomah *et al.* (2005c) reported that on an annual basis, the Jos Wildlife Park is always overcrowded with tourists, and polluted with dust, which impairs respiration and visibility during festive periods, particularly between December 24th and January 1st. Occurrence of such levels of environmental pollution in the Pandam Wildlife Park could lead to death of both human and wild animals. This is because Pandam is a relatively hot region (being low land), unlike Jos that is always cold due to its high lands (PSTC, 2005; Ijemoah, *et al.*, 2005b).

‘Open and close’ seasons for fishing are observed in Pandam Wildlife Park to check cases of over-fishing in the Pandam Lake. Maximum of 20 visitors could be accommodated in the lodges at a time to ensure unique experience and prevent overcrowding. This is contrary to the report of Kamuaro (1996). The playing ground at the centre of the park is not commercialized, unlike the pine forest of the Jos Wildlife Park that is rented out for social functions on a regular basis. To ensure easy monitoring of the park, five security out-stations were created in communities bordering the park. Game guards are stationed in these outstations on a daily basis. The people of Kayarda community are incorporated into the anti-poaching programme of the park. They can arrest poachers and contact the park management for prosecution.

Understaffing and inadequate funding are challenges to the provision of adequate protection for the resources in the face of poaching and consistent pressure from neighboring communities to de-reserve part of the park. Similar cases of inadequate protection from poaching due to understaffing, and demand for de-reservation of part of conservation areas, exists in both Old Oyo and Cross River national parks. It is only in Buya section (part of the core area) of the Old Oyo national park that animals are adequately protected. The demarcating water bodies in Buya section make it difficult for them to poach animals due to the fear of being caught. Also, in the

Kainji Lake national park, poachers hardly cross the Oli River to poach for animals. However, Kainji Lake national park has lost its buffer zones to farmers.

Occasionally, some workers do connive with poachers to exploit resources in a non-sustainable manner. Figure 1 shows a picture of different species of fish caught in the Pandam Lake with small meshed net – an evidence of destructive harvesting.

Tourists' Experience

Tourists cherish lake-cruising in the Pandam Lake, recreating in the cool natural environment, and trailing the nature guide (Table 3). Experience in game viewing was rated low by many tourists (Table 3). In *in situ* management of species, games can hardly be sited without prior knowledge of the behaviour of the species. This is contrary to what obtains in captive management of species. The satisfaction level of game viewing is low for tourists that are non-residents (in the lodge or Pandam village). Animals in the park, particularly baboons, move in hundreds between about 6:30 and 7:30 in the morning and evening on a daily basis. They are the most conspicuous species in the park and move in a company of monkeys within this time interval, as reported by Ijeomah and Ogogo (in press). During these periods, the primate species cover the entrance of the Park, the Park administrative building, and even the lodges. In the afternoon, they return to their hiding places. Ijeomah and Ogogo (in press) reported that this pattern of operation has been consistent for many years. Tourists that visit only in the afternoon will miss this beautiful site. Nevertheless, one of the biggest games in the Park, the *Hippopotamus amphibious*, can hardly be sited by tourists, as they operate in the night.

Tourists' experience of lake cruising is rated high between 11:00 a.m. and 4:00 a.m. when the weather is not cold. Similarly, recreation in the park is more cherished when the weather is hot. The boat for lake cruising is hardly available nor in a good condition to be used by tourists. Often times the boat operators are unavailable. Similar observation was made in Oli River of the Kainji Lake national park.

Tourist Influx and Revenue Generation

The lack of awareness for visitors in the Park has affected both tourism growth and revenue generation (from tourism) in the park. The cumulative number of tourists in the park between the years 2000 and 2004 was 64,699, whereas Ijeomah (2007) documented that Jos Wildlife Park (an

eco-destination) in the same Plateau State had 65,828 tourists in 2000 alone. The park management does not create awareness for tourist visitation yet the few visitors that patronize the park are not made to pay an amount that would help the management to cover costs, unlike in Lake Nakuru National Park of Kenya (Bolton, 1997), Galapagos Island (Tangeley and Miller, 1991) and the recommendations of Goosling (1999). Revenues generated between June and October were relatively lower than that generated in other months. Between June and October are closed seasons for fishing in the Pandam Lake. The non-correspondent increase between tourists' influx and revenue generation is because the park does not rely on revenues generated through gate takings. Similarly, tourists who visited Wase Wildlife Park (before its closure) and Assop Falls Resort did not pay gate fees.

CONCLUSION

Pandam Wildlife Park is a conservation area that has been sustainably managed since 1972. Low impact tourism has been maintained in this eco-destination through regulation of tourist numbers (non-creation of awareness) and monitoring of tourists. However, the fear of overexploitation has led to the under utilization of biodiversity in the park for tourism, and limited avenues for revenue generation. Lake cruising, which would have been lucrative, is inefficient and ineffective; sport fishing is yet to be introduced; and the lodges are always empty, whereas the few visitors are not heavily charged to cover management costs - fifty naira and twenty naira are paid by adults and children, respectively, from 2005. Though the park resources are presently intact, with time, the pressure from host communities might build up and hinder efficient conservation of resources in the eco-destination.

The tourism resources in the Park could be packaged and introduced to the public for optimal utilization without destroying the ecosystem. This will generate more money for conservation and bring about greater level of empowerment to the host communities.

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