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Full Length Research Article

ASSESSMENT OF WILDLIFE MONITORING EFFORTS OF KAINJI LAKE NATIONAL PARK, NIGERIA (2010 - 2019)

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ABSTRACT
Protected areas are the cornerstones of wildlife conservation efforts; hence it's monitoring and protection is fundamental to halting biodiversity declines. This work then assess the effectiveness of wildlife monitoring efforts such as anti-poaching patrol in Kainji Lake National Park, Nigeria to evaluate the level of success of protective operations for the improvement of anti-poaching programmes for sustainable wildlife management. Secondary data were sourced from the official records of anti-poaching activities including arrests and prosecutions were obtained from the management information unit of the park. The data obtained were analyzed using descriptive statistical analysis using table, figure and graph. The results show that arrest and prosecution made for grazing of livestock and poaching were the major offences committed in the ten (10) years appraised. Highest offenders (206) were arrest and prosecuted for grazing of livestock in 2018. The year 2016 had the lowest arrested offenders in Kainji Lake National Park in the last decade (123 offenders) while 2018 had the highest with 287 offenders. The total number of arrest and prosecution made within the ten year period was 1,849. The highest revenue generated in Park in a year was ₦9,010,108.22 in 2018 while the lowest revenue generated in the last ten years was ₦6,466,223.60 in 2016. The total revenue generated in the study area from 2010 to 2019 was ₦74, 355,351.24. There appears to be relationship between arrests of offenders and revenue generation across the years (direct proportion). Evaluation of records of arrests and prosecution between 2010 and 2019 show that high number of offenders arrested and prosecuted for grazing of livestock and poaching for the period evaluated could heighten conflict in the study area. Therefore, local participation of communities surrounding the park is also important to the effectiveness of protective practices.

Keywords: biodiversity, patrol, poaching, protection, wildlife monitoring

INTRODUCTION

Human beings have seriously encroached into many wildlife habitats and permanently occupied lands formally inhabited by wild animals (Ijeomah and Aiyeloja, 2010). This has led to wanton destruction and emigration of wildlife species (part of our national heritage) to more stable ecosystems. Through creation of wildlife refuges in form of game reserves and national parks rural inhabitants were forced to vacate part of their 'acquired life – dependent' land and other part of environment for wildlife species, in many cases without compensation (Adetoro *et al.*, 2011). But even inside the national parks created purposely for protection of species, game populations still appear to be under threat. Ijeomah and Emelue (2009) reported that many herds of elephant at Kainji Lake national park have emigrate to neighouring countries, and populations of some species in many Nigerian parks have continuously decreased while some endangered species have vanished from the park environment. This is an indication that every game species in Nigeria including those abundant in national parks are under threat especially as owners of parklands are agitating to reclaim their lands in the face of human population explosion and poverty (Ijeomah and Emelue, 2009).

According to Ijeomah *et al.* (2013), Poaching and illegal trade in wildlife has become an organized, lucrative and a capital intensive business, with trafficking routes extending from remote national parks and reserves, where animals are trapped and killed, to major urban centres where they are sold and consumed. Due to this high commercial value of wildlife products, tension in protected areas is continuously increasing at a global scale. Poaching, therefore, has become more universal and a frequently occurring phenomenon.

In order to protect the natural resources inside protected areas, wildlife laws and regulations have been promulgated as a global conservation tool for protection of species, most remain unenforced, due to limited human, financial and material resources required to monitor illegal activities and enforce existing laws. These organs have in many cases become antagonistic with the indigenous people due to differences in the way the two sides perceive the natural resources (Newmark *et al.*, 1993). Through decades, the law enforcement organs have in many cases not been very effective in saving the species from decline (Leader-Williams *et al.*, 1990). Rules and measures to enforce wildlife laws are at the heart of conservation. However, wildlife acts by themselves cannot deal with all known anthropogenic threats. Complementary actions are therefore needed to back up legislation. Newmark *et al.*, (1993) stated that it is likely that the three crucial factors in mitigating the effects of conflict on biodiversity are the continuous on-the-ground patrol by well-trained field staff, continuous law enforcement and secured funding.

Mitigation of poaching in protected areas requires effective strategies for reducing demand or controlling supply of bushmeat. Most strategies aimed at reducing poaching have included both enforcement measures, such as increasing the number of anti-poaching patrols in protected areas to reduce supply, and community-based programmes to improve the wellbeing of nearby communities and provide alternatives to poaching (Hilborn*et al.*, 2006; Kaltenborn *et al.*, 2008).

The types of resources exploited levels and nature of utilisation, are highly variable and depend on the resources available, the locals' people and sometimes outside collaborators where financiers inject money to local people to enticing them to exploit the resources illegally. Illegal hunting (poaching), grazing and logging are usually the major challenges experienced in Kainji Lake National Park (Ijeomah and Ogbara, 2013), and is more or less common in Nigerian protected areas (Adelakun *et al.,* 2015; Ogogo *et al.*, 2014). However, without comprehensive monitoring and evaluation of project activities, not only will conservation

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programmes have difficulties in assessing their own impact and identifying potential improvements, but they will also limit availability of information to the conservation community as a whole, thus slowing the progress of wildlife protection.

Therefore monitoring and evaluation has taken on increasing importance (Stem *et al.,* 2005) as it can provide public and internal accountability (Hockings *et al.* ,2000). This work then assess the effectiveness of wildlife monitoring efforts such as anti-poaching patrol in Kainji Lake National Park, Nigeria to evaluate the level of success of protective operations as a tool for sustainable wildlife management.

MATERIALS AND METHODS

Study area

Kainji Lake National Park (KLNP) is located approximately 560km north of Lagos, and 385km southwest of Abuja, Federal Capital of Nigeria. It covers a total area of 5,340.82km^2. The two sectors of KLNP lie approximately between latitudes 9^0 40'N and 10^0 30'N and longitudes 3^0 30'E and 5^0 50'E. It is made up of two non-contiguous sectors; the Borgu Sector and the Zugurma Sector. The Borgu Sector of KLNP (Bs-KLNP) is situated on the land area shared between Borgu Local Government Area (LGA) in Niger State and Kaiama as well as Baruten LGAs, Kwara State. It is bordered on the east by the Kainji Lake, popular for the National Electric Power Authority's (now Power Holding Company of Nigeria's) Hydro-electricity Generation Station and supply of freshwater fish. Its western border is contiguous with inter-national boundary of Nigeria and the Republic of Benin. The Zugurma Sector (Zs-KLNP) is situated in the land area shared between Magama and Mashegu LGAs of Niger State. The tributary of Kontagora River on the Northwest side and River Manyara on the north borders the Zugurma Sector (Ayeni, 2007).

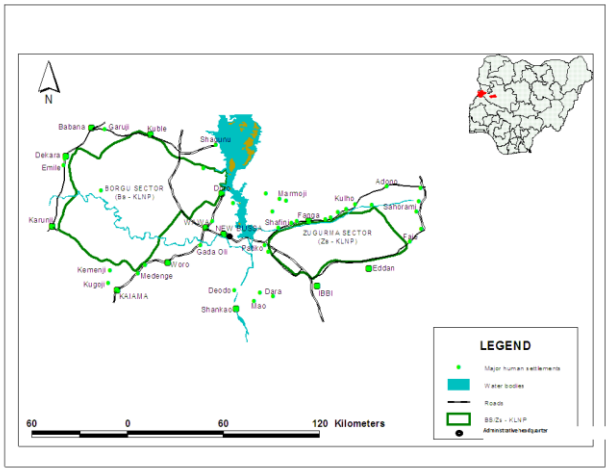

Figure 1. Map of Kainji Lake National Park Showing its Administrative Headquarter and Surrounding Villages.
Source: Ayeni, 2007

Data Collection, Processing and Analysis

Secondary data were sourced from the official records of anti-poaching activities including arrest, compoundment and imprisonments were obtained from the management information unit at the Headquarters of the Kainji Lake National Park, New Bussa, Nigeria.

The data obtained were analyzed using descriptive statistical analysis using table, figure and graph.

RESULTS

Arrest and prosecution of park offenders from 2010 - 2019

This study revealed that arrest and prosecution made for grazing of livestock and poaching were ranked number one and two respectively among offences committed in the ten (10) years appraised (Table 1). 206 offenders were arrests and prosecuted for grazing of livestock in 2018; this was highest number of arrests for a single offence committed for the period evaluated. However, there was lesser arrest and prosecution made for logging in the park in 2010 to 2019 (no arrest in 2012 and 2014) hence the offence was ranked overall fourth in the study. Arrest and prosecution for illegal entry into park for mining, collection of Non-Timber Forest Products (seeds, leaves, firewood, tree bark *etc.*) and water were the ranked 3rd.

Table 1: Arrest and prosecution of park offenders from 2010 and 2019

Years of arrest	Illegal activities			
	Poaching	Logging	Grazing	Illegal Entry
2010	66	10	118	20
2011	63	11	108	9
2012	22	-	87	19
2013	46	12	40	30
2014	48	-	72	31
2015	48	54	40	8
2016	34	12	75	2
2017	34	4	99	59
2018	16	34	205	32
2019	52	13	183	8

Source: Administrative records (Park Ecology and Resource Management Unit), 2020

Annual arrests and prosecution of offenders in Kainji Lake National Park (2010- 2019)

Annual arrests and prosecution of offenders in the park between years 2010 to 2019 is presented on Fig 2. The year 2016 had the lowest arrested offenders in Kainji Lake National Park in the last decade (123 offenders) while 2018 had the highest with 287 offenders. The total number of arrest and prosecution made within the ten year period was 1,849.

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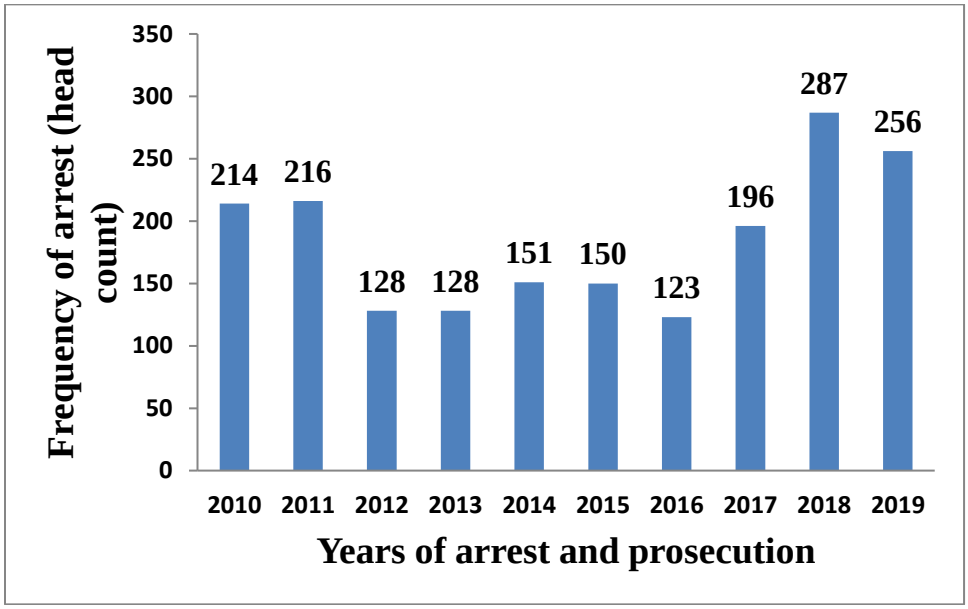

Figure 2: Annual arrests and prosecution of offenders in Kainji Lake National Park (2010- 2019)
Source: Administrative records (Park Ecology and Resource Management Unit), 2020

Internally Generated Revenue by Kainji Lake National Park from 2010 – 2019

Yearly internally generated revenue by Kainji Lake National Park is presented on Figure 3. It was observed that there had been instability in the revenue generated from 2010 to 2019. The highest revenue generated in Park in a year was ₦9,010,108.22 in 2018 while the lowest revenue generated in the last ten years was ₦6,466,223.60 in 2016. The total revenue generated in the study area from 2010 to 2019 was ₦74, 355,351.24.

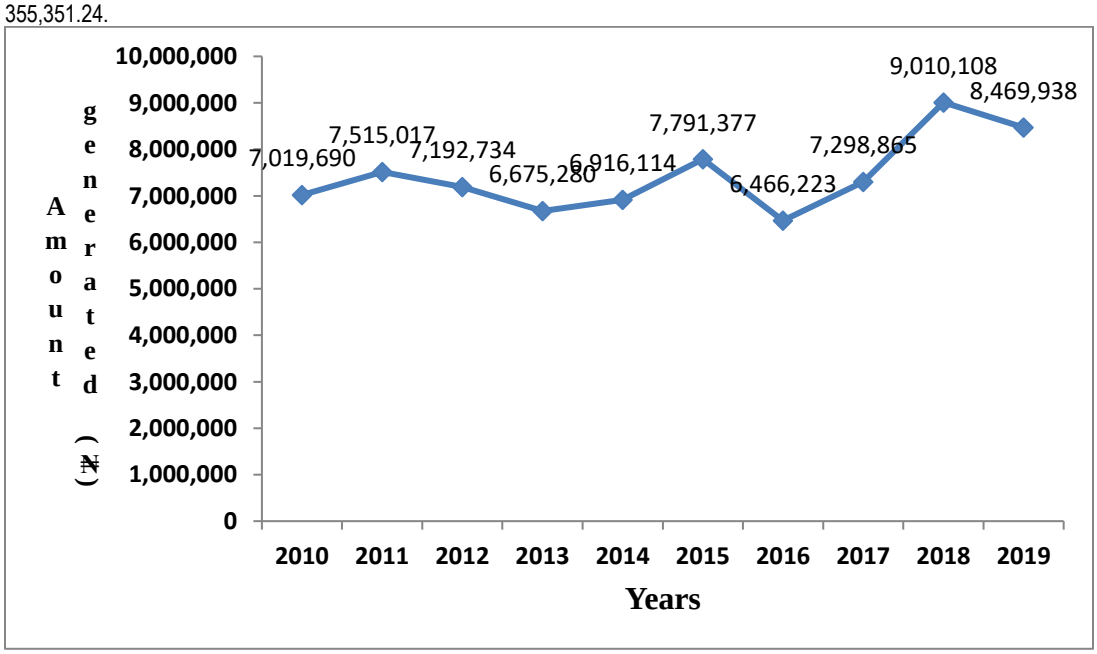

Figure 3: Internally Generated Revenue by Kainji Lake National Park in 2010-2019
Source: Administrative records (Park Finance and Account Unit), 2020

Relationship between percentage Internally Generated Revenue and Arrests and Prosecution in Kainji Lake National Park

From Figure 4, it was observed that there appears to be relationship between arrests of offenders and revenue generation across the years (directly proportion). Increasing percentage of arrest and prosecution directly proportional to increase in the percentage revenue generated in 2011, 2014, 2017, and 2018 while both decreases in 2012, 2016, 2019. On the contrary, there was no established relationship between the two (2) variables in 2013 and 2015. However, fine paid by offenders arrested and prosecuted for a given year may not necessarily determine the level of revenue generated in the park because revenue from

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ecotourism (entry fees, accommodation charges, income generated from catering and services as well as proceeds from sales of souvenirs) and other tourist's frivolous spending in the park will go a long way at influencing the scale of revenue generation for the park.

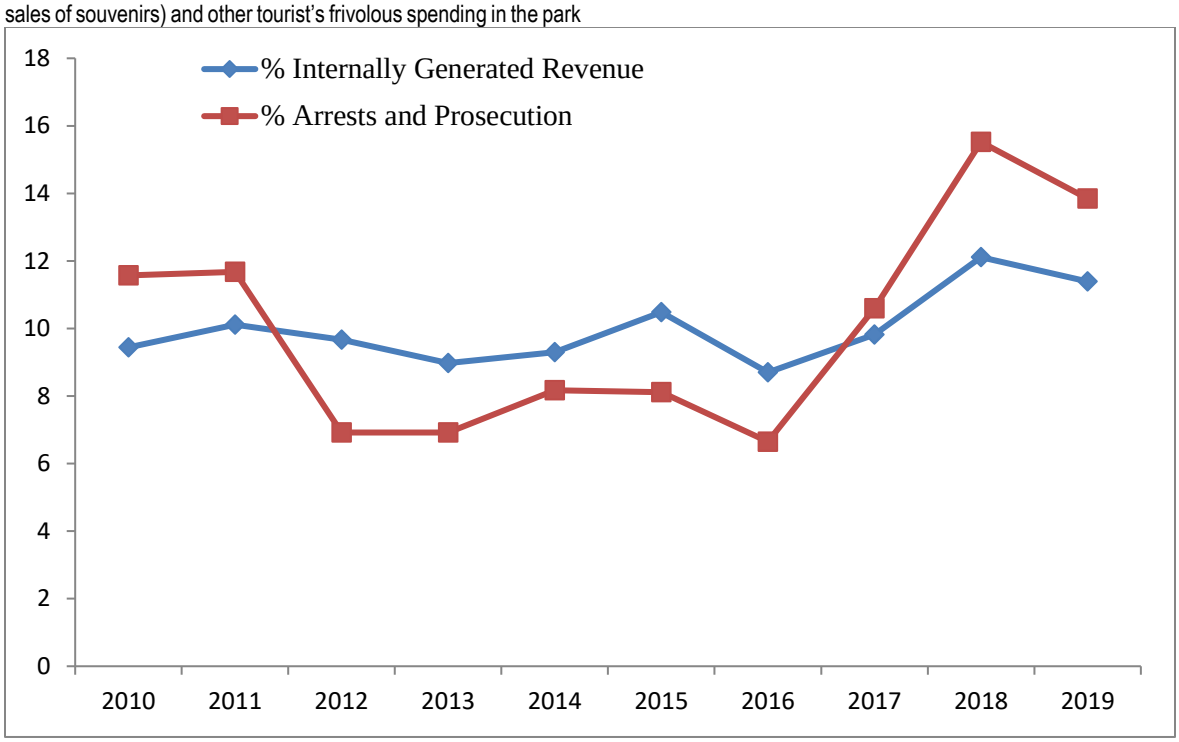

Figure 4: Relationship between percentage annual Internally Generated Revenue and Arrests and Prosecution in Kainji Lake National Park

DISCUSSION

From the study, analysis of records of arrests and prosecution between 2010 and 2019 show that grazing of livestock and poaching were the major illegal activities in Kainji Lake National Park. High number of offenders arrested and prosecuted for grazing of livestock and poaching for the period evaluated could heighten conflict in the study area. This was early posited by Ijeomah and Ogbara (2013) that these two offences are the major causes of conflict between communities and official of the Park. High level of grazing could be as result of inability of herdsmen to hardly substitute their herds' food it with any alternative. Ijeomah *et al.*(2013) was of the opinion that cattle herders can hardly find other suitable, readily available and culturally acceptable free resource to serve as a substitute for vegetation. Moving herds from one location to another requires food and water and as such cannot be easily controlled. According to Nigerian Environmental Study/Action Team (NEST,1991), in a situation where herds are to be moved from one point to another it becomes difficult to stop them from grazing since they require food and water to live. This also creates an avenue for Fulani cattle herders to hunt or kill animals that pose threats to their herds.

High level of arrests and prosecution in the park show that wildlife resources are in danger of illegal exploitation. Ijeomah and Emelue (2009) reported that wild populations remained under threat even inside protected area established for sustainable wildlife.

There were 287 and 256 arrests in 2018 and 2019 respectively totaling 543. This is comparatively lesser to 627 arrests within 22 months by anti-poaching cross-border organization called Big Life Foundation in Amboseli Reserve between Tanzania and Kenya (Big Life Foundation, 2012).

Obviously, the proceeds from wildlife offenders arrest and prosecution has gone a long way in contributing to the internally generated revenue National Parks, which compliment in the funding and management of the park especially in times of inadequate funding from the federal government (Meduna *et al.,* 2005). The relationship between arrests and prosecuted offenders and internally generated revenues had shown the potential of wildlife protection unit towards generating substantial resources for both conservation and economic development. This is also significant given that protected areas are under increasing pressure to provide economic justification for their existence (Balmford *et al.,* 2009).

Within the limitations of resources, the protection forces in the park were doing a commendable work; they had arrests and prosecuted 1,849 offenders between 2010 and 2019. This suggests that increasing effective patrol effort is likely to improve arrests, but this should be expected to increase to a point where optimum effective patrol effort required will not increase arrests as all patrol units would then be arresting most of the poachers taking part on illegal activities. At this point, the number of arrests would gradually come to a level whereby increasing patrol effort would not raise the catch per unit effort as poachers become discouraged by strong patrol units.

Conclusion

There are effective monitoring activities towards wildlife management in Kainji Lake National Park.

From the study, many offenders were arrested and prosecuted for different illegal exploitation activities ranging from grazing of livestock, poaching, entry into park for mining and collection of non-timber forest products and logging activities. Though there had

been unpredictable internally revenue generation, however it was observed that arrest and prosecution had direct relationship with internally generated revenues.

Findings through anti-poaching patrol records showed rangers are frequently exposed to the hand of poachers armed with different weapons and sometimes engaged in resisting arrest with rangers before they are subdue, overpowered and arrested, hence the provision of adequate sophisticated arms will enhance the effectiveness of anti-poaching activities while a well motorable jeep tracks that cut across the park to compliment the available ones for easy and timely detection of illegal activities in the park will improve monitoring efforts. Combatant training and re-training of park protection staff will also go a long way to prevent challenges been confronted by rangers in anti-poaching activities. Regular environment education awareness in all the surrounding communities should also be intensified and continuous conservation education from the primary or lower school to be able to impact the spirit of conservation to young ones from tender age.

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