ENVIRONMENTAL EDUCATION – A STRATEGY FOR SUSTAINABLE WILDLIFE MANAGEMENT (A Case Study of Kainji Lake National Park, New Bussa, Niger State)

by

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CERTIFICATION

This research project has been read and approved as meeting the requirements for the award of the Postgraduate Diploma in Environment Management of the Federal University of Technology, Minna.

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DEDICATION

This Project is dedicated to the memory of my late Sister, Salamatu (may her soul rest in peace) and my wife, Malama Habibat Ahmed for her love and understanding throughout this programme.

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I am grateful to my Supervisor Dr. A.S. Abubakar from whom I have drawn a lot of inspiration, who criticised and took his valuable time to correct the manuscript.

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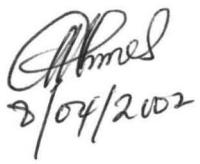


ABSTRACT

The increasing depletion of the wildlife (fauna and flora) at the Kainji Lake National Park is necessitated by an increase in rural population who are dependent on farming and hunting. It was revealed by the study that hunting is more lucrative than farming which explains the high incidence of poaching activities. Besides, higher percentage of the people hunted indiscriminately for both food and money. This calls for environmental education through community participation for a sustainable management of the wildlife resources.

In order to determine how to educate the local communities on the sustainable management of the wildlife resources, questionnaires were administered to ascertain the communities' reasons for involvement in poaching and determine their level of awareness on the activities of the Kainji Lake National Park. The study also examine the effects of the past and present management strategy adopted by the Kainji Lake National Park covering 1981 – 1983 and 1998 – 2000 periods respectively, with a view to determine whether there are changes in the trends of management as it affects poaching activities in the Park.

Significant recommendations were given based on findings.

CONTENTS

CHAPTER THREE

CHAPTER FOUR

CHAPTER FIVE

LIST OF TABLES

LIST OF FIGURES

Chapter One

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The environment is all that stock of physical and social resources available at a given time and location for the satisfaction of human needs and aspiration. Environmental problems emanate from man's inability to manage or conserve this resources due mainly from poverty and nutritional deficiency arising from under development. Others such as the destruction of wildlife and vegetation, deterioration of resources, atmospheric pollution among others arise from the process of development itself. All these problems are situated in different areas of specialisation. It follows therefore, that environmental education cuts across issues in several disciplines. For example, soil erosion and misuse of pesticides are environmental issues in the area of agriculture just as indiscriminate hunting and bush burning are a problem in wildlife conservation (Andrew, 1983).

The task of identifying these problems many of which have become so familiar that we tend not to notice them or to accept them as inevitable; of crystallising their bad effects on the quality of life in man, animals and plants; and of finding ways to combat these bad effects on the environment is environmental education. This education is necessary because most of the problems of the environment are man-made problems created in the pursuit of other wants and desires. As long as the satisfaction of there, other wants and desires is seen as development and modernising; as long as it remains enticing, publicly rewarding,

status boosting and ego sustaining, it will continue to weigh heavier on the societal priority list than the subtle but equally important environmental issues. There is need therefore, to create sound environmental awareness by educating the populace on the conservation of their environment. Environmental education is one of the most important in terms, of overall impact on the process of public consciousness raising and in channelling this consciousness into positive involvement for sustainable development.

1.2 AIMS AND OBJECTIVES OF THE STUDY

The aims and objectives of the study are as follows:

1. Determination of the local communities level of awareness on the activities carried out by the Kainji Lake National Park;
2. Identification of the past (1981 – 1983) and present (1998 – 2000) trends in management strategies adopted by the Park authority;
3. Investigating into the possible ways of attaining sustainable management with the involvement of the local communities.

1.3 JUSTIFICATION

Kainji Lake National Park had been prone to the menace of poachers on the wildlife (fauna and flora) evident from the greater numbers prosecuted in courts every year. This had led to the extinction of some wild animals and the degradation of vegetation in the Park. The majority of the people involved inn these practices are the local communities surrounding the Park, who had little or no formal awareness on the

importance of the park to their communities and the present or future implications of these practices on the Park in particular and the nation in general.

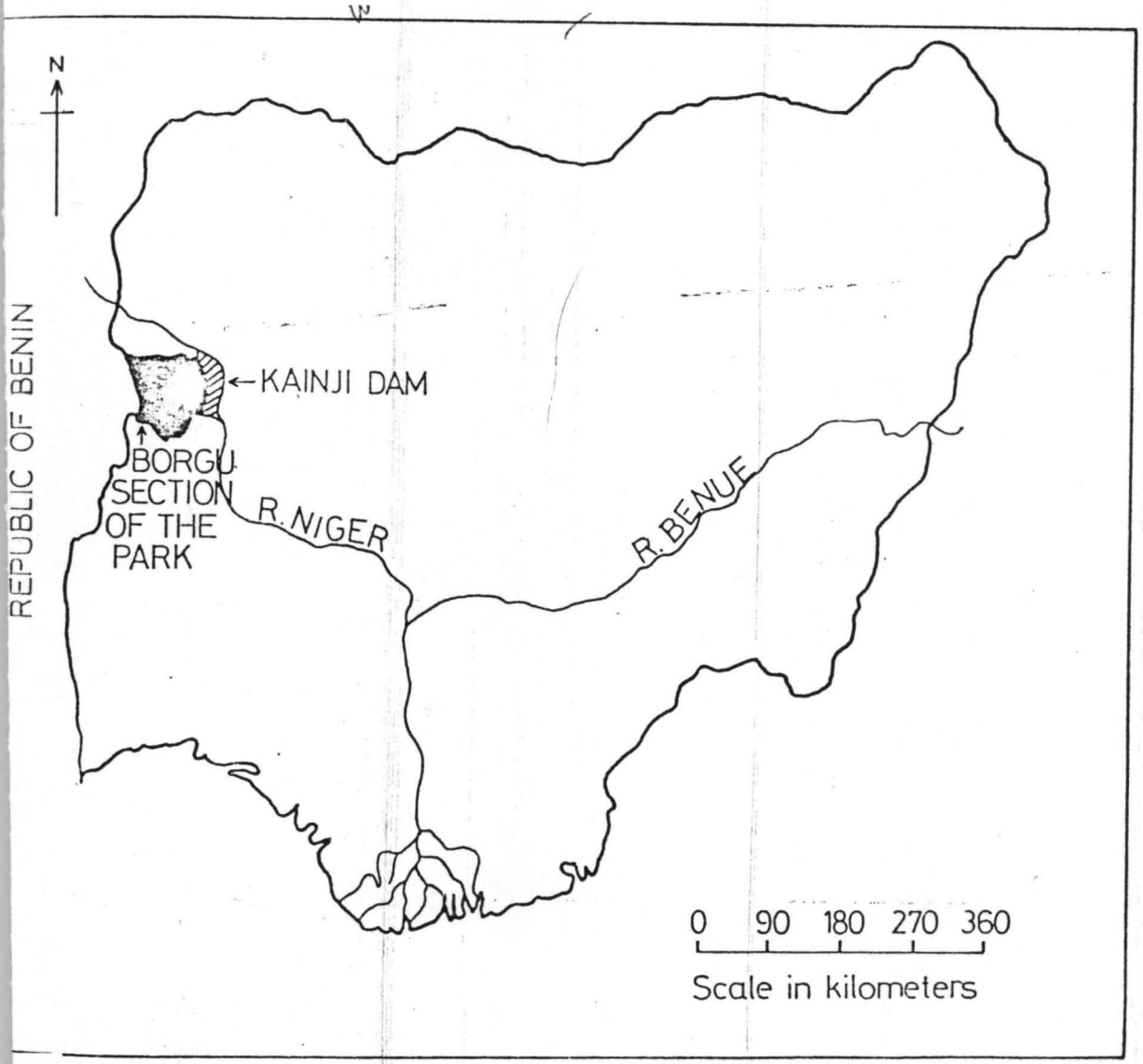
This work is therefore, aimed at finding out the reasons responsible for involvement and the level of their awareness with a view to educating them towards attaining a sustained wildlife resources.

1.4 DESCRIPTION OF THE STUDY AREA

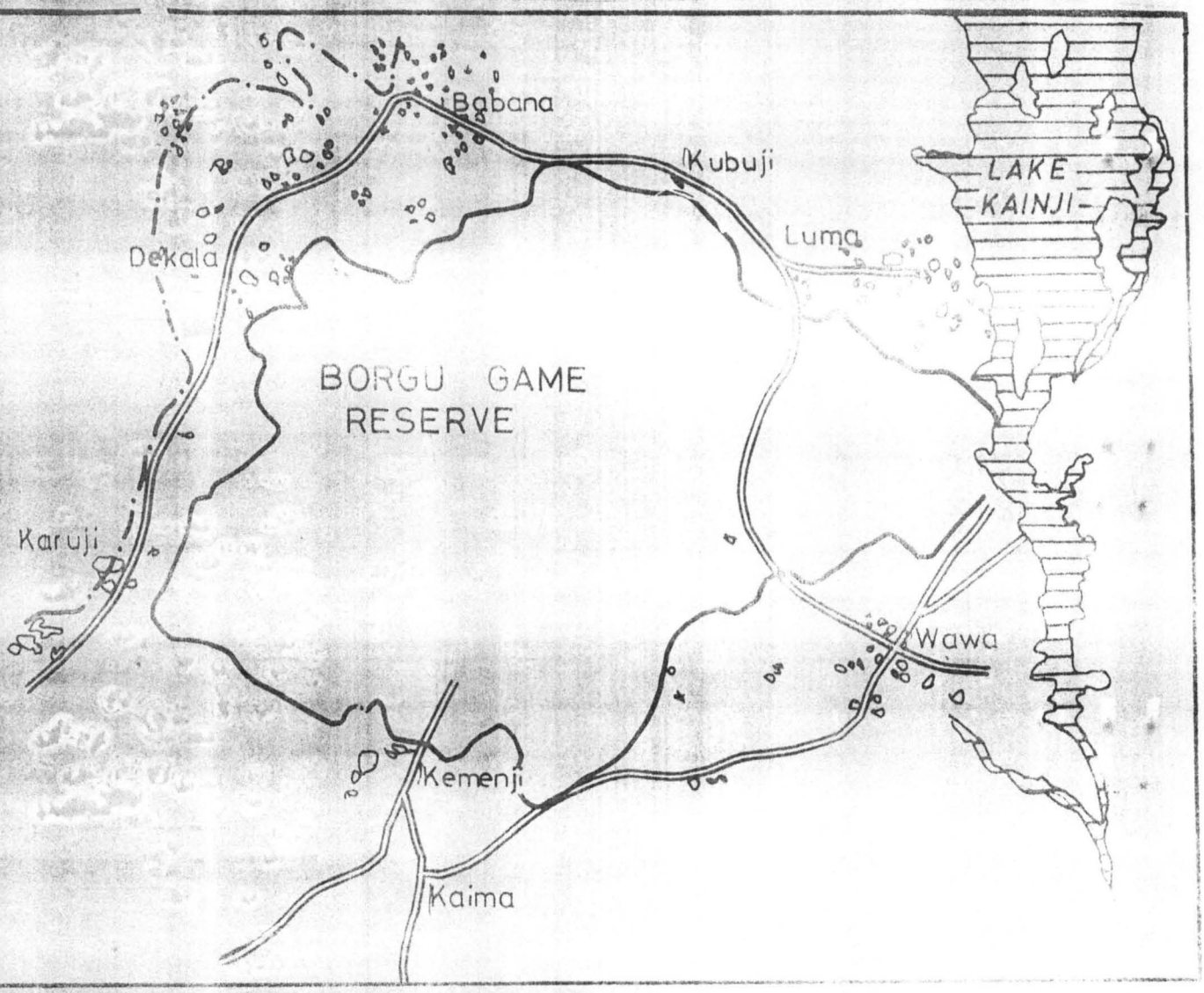
1.4.1 Location

The Borgu Section of Kainji lake National Park is the largest wildlife reserve in Nigeria covering an area of about 4,000 km² (Afolayan (1977). It is situated in Borgu Local Government Area of Niger State. The area lies between latitudes 9°45'N and 10°23'N and longitudes 3° 40'E. Borgu Sector of the Kainji Lake National Park is larger than the Zugurma Sector of the Park, which lies on the eastern part of Kainji Lake. (Fig. 1 & 2) shows the location of the park and the distribution of main towns and agricultural lands around the park respectively.

The main access to the Borgu Section of the Park is by the Wawa-Agwara road, which divided the area on a north-south line. The base camp at Tunga Zomo is about 18 km from Wawa along this road. The Visitors Camp where the tourists accommodation is located is near the center of the park and at a distance of about 45km from the base camp.



g 1 The location of Kainji Lake National Park. (Source Afolayan 1977)



2 Distribution of main towns and agricultural land around Borgu sector of the Park *(Source : Milligan, 1979)*

Climate

The Park has two marked seasons – rainy and dry seasons. The mean annual rainfall at Wawa (the former Head Office of the Park) and the western Park of the Park is 1220 mm (Ajayi and Hall, 1975).

The eastern part has an annual rainfall of about 1,000 mm (Hall, 1976). Thus there is variation in the amounts of rainfall in the around the park. Rainy season is long in the western part about (190 days) than in the eastern part (about 175 days) of the park (Hall, 1976).

The relative humidity seems to increase gradually from the dry season to the rainy season with the peak in the rainy season after which it declines again. The temperature is highest in the dry season before the rains and lesser during the wet season after which it increases again then drops to the lowest in December and January during the Harmattan. The diurnal cycle has been considered an important environmental factor affecting animal movements (Child, 1974), most especially in January and February when the greatest diurnal range in temperature occurs as a result of the harmattan.

Afolayan (1977) observed that animals do not come out early during the harmattan especially in areas along the Olli River where temperature could drop to about 1°C hence tourists are often advised not to start game viewing early in the morning.

1.4.3 Topography and Drainage

The accounts of relief and drainage of the park has been given by past authors. The eastern part of the park, which is lying on the Kainji Lake, is the lowest part. The lake is 142 metres above sea level and the ground rises gradually with increasing distance from the lake until it reaches an elevation of 300:350 meters at the areas around the western boundary (Ajayi and Hall, 1975). The landscape in the park is gently undulating but a few small hills occur either singly or in groups. Some of these hills rise up to 100 metres above their surroundings.

Child (1974) recognised two main drainage systems in tegh area. The Olli drainage system in the western part and the eastern drainage system consisting of rivers Menai, Timo and Doro with their tributaries which drain the eastern part of the park.

1.4.4 Geology and Soil

The Park area is underlain by the basement complex rock which was considered to be pre-Cambrian in origin but it was later proved that only the oldest rocks of this complex are pre-Cambrian (Child, 1974; Ajayi and Hall, 1975). Most of the area is composed of gneiss rocks and other units consist of younger metasediments, which are mainly schists and phyllites (Afolayan, 1977).

Several soil surveys have been carried out in areas around the park but not much has been done inside it. The analyses available have shown that the soils in the park are of low fertility. From the results of past analyses and other soil surveys around the park (Ajayi and Hall, 1975) have concluded that both the cation exchange

capacities and base saturation percentages of the soils are low and probably not suitable for agricultural purposes.

1.4.5 Vegetation and Wildlife Resources

The most recent vegetation of the Borgu sector of the Kainji Lake National Park was presented by Geerling (1973). Geerling recognised five major kinds of upland vegetation. That close to Kainji Lake named as

(i) *Acacia* Savanna woodland. Other parts of the upland vegetation named *Bwillea africana – Terminalia avicennoides* Savanna woodland

(ii) The *Afzelia* Savanna which is in the centre of the park towards the south

(iii) The *Detarium* Savanna woodland which is mainly in the southern part of the section and

(iv) They typical *Bwillea africana – Terminalia avicennoides* group.

The woody vegetation types along the rivers in the park were named riverine vegetation complexes. The *Terminalia macroptera* vegetation occurs in seasonally inundated areas along the valleys of the Olli River. Also, among the *Bwillea africana – Terminalia avicennoides* group of savanna woodland vegetation are patches of *Isoberlinia tomentosa* woodland which are very important as far as shelter for game is concerned.

The major wildlife species in the park have been grouped into four major categories by Ajayi and Hall (1975) on the basis of their association with vegetation

types. The first group are species which are associated with savanna woodland which includes Roan antelope (*Hippotragus equinus*), Western hartebeast (*Alcelaphus buselaphus*), Oribi (*Ourebia ouredi*), Grey duiker (*Sylvicapia grummia*) and Patas monkeys (*Erythrocebus patas*). Species that are associated with perennial water points include: Water buck (*Kobus defassa*), Kob (Adenota kob), Reedbuck (*Redunca redunca*), and Green monkey (*Cercopithecus aethiops).* The red flanked duiker (*Cephalophus rufilatus*) is associated with the fringing forests along the rivers. Hippopotamus (*Hippopotamus amphibius*) occurs in River Olli.

Chapter Two

2.0 LITERATURE REVIEW

2.1 Wildlife Conservation and Management

Wildlife management is the active manipulation of wild animals and their habitat for the benefits of mankind. It involves knowing the animals (population and behaviour) and understanding their environments. The commulative result is then geared towards evolving strategies that will ensure harmonious integration of the needs of the people and sustainable utilisation of the resources (Akegbejo, 1996). Nigeria is numerically rich in the number of wildlife conservation areas (Ayeni, 1978), but the level of management in most of the reserves is grossly inadequate.

Ayeni (1980) had reported that there are social and ecological problems of management of wildlife in Nigeria. He further stressed that in the few game reserve in which wildlife are greatly increasing in number, game poaching, lopping down of leguminous trees, outright logging and unregulated bush fires are constant threats, to the life of the parks. In general, game management field staff are ill-equipped, many have no ammunition or fire-arms for anti-poaching. Wildlife like other renewable natural resources can be managed to last indefinitely. The value of meat and animal products from wildlife is frequently greater than the value of the wood products.in the forest or the production of domestic livestocks on rangeland (FAO, 1970). This therefore, calls for a greater management plan and strategy in order to conserve the wildlife resources.

2.2 PROBLEMS OF WILD CONSERVATION

2.2.1 Game Poaching

Ajayi and Hall (1972), reported that one area of investigation among others that demands high priority and attention is poaching. As a sociological study, the poaching community should be examined. Until the outlook and methods of operation of the poachers is properly understood, it will be difficult to control poaching effectively. Poaching is a serious problem which still remains unchecked in the Kainji Lake National Park (KLNP) due mainly to the extensive nature of the Park and the staff strength which is too small to cope with its management. Arungbemi (1984), in his work explains that poaching represents the highest (70%) of the offence for which people are imprisoned in Kainji Lake National Parks. If poaching pressure continues rising unchecked (Ajayi and Hall, 1979), the future of the park as a game reserve will come into question.

The need for meat may partially be responsible for game poaching by the ignorant natives (Ehi-Ebewele, 1991) or for other commercial returns by others; and many more for the sadistic satisfaction of killing as a sport. This indiscriminate hunting and trapping sometimes result in wounding of wildlife mostly the adult ones which eventually die and rot away in the bush (Ayeni, 1985), the orphaned young ones then becomes easy prey to carnivores. The immediate effect of wildlife poaching is decimation of game numbers and making wildlife shy or wary of visitors and consequently more difficult for visitors to see (Ayeni, 1980).

2.2.2 Bush Burning

Indiscriminate and irresponsible bush burning many times extend to game reserves. The perpetrators are hardly ever identified and thus giving the impression that the National Forest Policy is ineffective or inefficient (Ehi-Ebewele, 1991). In Kainji Lake National Park, the effects of bush fires have been studied (Afolayan, 1977); but there are no studies others studies of this type in any other wildlife areas in Nigeria Savanna. Over most wildlife areas, the vegetation is set on fire annually between November and January or late February to the beginning of the rains. Early burning is done to provide early flush of palatable tender grass for wildlife and livestock. Despite the value of early burning in providing early flush, fires originating from outside the park and those set by poachers often penetrate into the burn-protected areas, particularly along the river beds around the waterholes and over the shelterbelts (Ayeni, 1985). Recent studies (Afolayan, 1977) indicates that each vegetation type should be considered separately in formulating policies about periodicity and intensity of burning. In Kainji Lake national Park, early burning in the *Afzelia* and *Isoberlinia* woodlands resulted in exposing the soil surface for the greater period of the year. The early flush product by early burning can not survive the heat and dryness of the dry season in the woodland areas. Beside, repeated early burning results in decreasing growth of perennial grasses. On the other hand, late burning may result in opening up woodlands by killing out regeneration suckers and trees as well as encouraging growth of perennial grasses. Compromise burning plant for KLNP has therefore, been proposed, consisting of:

1. Late burning, burning periodically to pen up the woodland along the game viewing tracks;

2. Early burning in the periphery of the park to serve as fire-breaks against incidental fires originating from outside the park; and

3. Scattered patchy burn in blocks around the central areas of the park with protection *Diospyros mespiliformis* forest relics and care that at no time are the entire banks of Olli River completely burned.

2.2.3 Illegal Grazing and Settlement

Illegal grazing of livestock in wildlife conservation areas is another source of concern. The Fulani herdsmen, who graze their livestock in wildlife conservation areas during the dry season, often attack carnivores, which are constant threats to their stock. During aerial surveys, over 10,000 head of cattle, and 50,000 sheep and goats were estimated in the Zugurma game reserve alone in 1978 (Ayeni, 1980). At Dagida game reserve and Kwiambana Game Reserve, leguminous trees such as *Afaelia africana* and in some cases, *Tamarindus indica* are lopped as Fulani invade such areas seeking pasture for their stocks during their annual migratory movements.

In some areas however, the problem of illegal human settlements and collection of honey, shea butter and borassus "planks" is dominant (Ayeni, 1983). In Kainji National Park, some fishermen illegally settle on the lakeshores where they construct temporary shelters. Milligan (1979) recorded the lowest number of wildlife near illegal fishing villages during repeated aerial census in the park, thus suggesting the possibility that the settlements might constitute hideouts for poachers. Herald

(1997) reported that the over-exploitation of wildlife by indiscriminate hunting and trapping with depletion of the wildlife resources often results from the increase in the rural population surrounding the area.

2.3 WILDLIFE UTILISATION

Henshaw and Child (1972) reported on the new attitudes regarding wildlife utilisation in Nigeria. According to the report, the most telling arguments for the protection of wildlife are their utilisation for meat (Charter, 1974; Ajayi, 1971) as well as for tourism (Ajayi, 1972; Afolayan, 1974).

If wildlife is to be utilised economically (Herald, 1997) the abundance and sustainability of the wildlife resources are essentially factors, where wild animals occur in large numbers, it is easier and more economical to hunt, capture or view them. The total value of annual bush meat has been estimated higher compared with the total value of animal based protein in Nigeria (Afolayan, 1980). Thus, one of the serious problems causing fast disappearance of wildlife population in Nigeria is scarcity of animal protein. Herald (1977) confirmed that this nutritional importance of wildlife become even more evident if the domestic consumption of wild animals by rural population in certain regions of the world is examined in comparison with that of other meats. Relevant nutritional survey carried out in many African countries shows that protein from wild animal features strongly in countries where livestock production is limited.

2.4 WILDLIFE AND ENVIRONMENTAL EDUCATION

The long-term aim of environmental education is to improve the management of the environment and promote satisfactory solutions to environmental issues (NCC, 1990). Much has been done to combat poaching in the park and surrounding areas such as involvement of the hunters as park guards; to prosecution and fining or imprisonment of arrested poachers for various offences. In spite of these however, there is still excessive amount of illegal entry and activity in the park. In order to achieve better results, Ayeni (1977), suggested to public enlightenment programme in the surrounding communities on the values of wildlife conservation rather than emphasis on the legal consequences of poaching in Nigeria. This is evident from the fact that most poachers interviewed already recognised that their activities were illegal, but believed that because of the moderately high returns from game poaching, it was worth the risks hence the need for education.

Fanira (1996) in his work stated that perhaps the greatest disservice that the educational systems in most countries including Nigeria has done to the future of mankind is its almost total neglect of proper environmental education. Yet it is this environmental education that can create the right awareness and ethics in mankind that will foster the needed harmony with the environment and guarantee sustainable development in particular and continued human existence and welfare in general. In order to guarantee a wholesome effect (Andrew, 1983), environmental education must adopt a holistic perspective on problems, examine the social cultural, ecological and other aspects of particular problems, since environmental issues are inherently inter-disciplinary.

Environmental education must help the people to acquire strong feelings of concern for the environment and motivation to participate in activities for maintaining and improving the quality of the environment. It must help the citizens to acquire a basic understanding of the total environment and associated environmental problems; and it must help individuals to develop consciousness and skills for the prevention of environmental abuses (Andrew, 1983). According to Katsina (1977), as people are the most valuable resource in development, their involvement in environmental protection and sustainable development depends upon their being aware of the environmental problems and their accessibility to environmental information in a language they understand and a form that can easily assist them to relate it to their own situation. There is therefore need to articulate environmental education with the persistent wildlife problems in Kainji Lake National Park to the understanding of the surrounding communities.

Chapter Three

3.0 DATA AND COMPUTATIONAL METHOD

3.1 DESCRIPTION OF DATA SET

There are two principal sources of data for this research study, which comprises of:

(a) Existing data on poaching directly available in numerical form in offices and libraries.

(b) Empirical data gathered in the field by the research.

The record on poaching used to determine the trend in management is obtained from the office of the Kainji Lake National Park (KLNP). The Senior Ranger and Park Guards were interviewed to gain official view on poaching and conservation techniques. These data will provide adequate answers to the trend in management strategy as it affects poaching. The mean trend in poaching both past and present has been calculated for easy statistical analysis.

3.1.1 Computational Method

The statistical analysis used is the Students T-test to determine if there is a significant difference between the past (1981 – 1983) and present (1998 – 2000) trends in management as it affects poaching. The data on Number of Arrest in the prospective years obtained from Kainji Lake National Park presented in Table 8 is used for the analysis.

3.1.2 Statistical Techniques

The Student T-test is used to compare the difference in pairs of means between past and present management strategies as it affects poaching.

In the comparison of the means, the null hypothesis H0 explains that there is no difference between the past and present trend in management strategy adopted by the Park.

H1 shows that there is difference between the past and present trends in the park management strategy.

From the result of the analysis, the calculated value (4.5) is greater than the tabulated (2.92). Thus the null hypothesis is rejected. The result of the analysis is presented in Chapter Four.

3.2 METHODOLOGY

In determining the local communities level of awareness on the activities of the Park, questionnaires were distributed to a population of sixty (60) respondents in four communities of Luma, Wawa, Doro and Gada-Oli surrounding the Park.

Fifty-five (55) responded out which Fourty (40) that contained detailed responses were selected and analysed (see Appendix 1: Questionnaire).

The second approach was the search for all sources of published and unpublished information relevant to the study the bulk of which was collected from the Office of the Kainji Lake National Park, New Bussa.

Present and probable problems were identified, significant conclusion and recommendations were drawn regarding the sustainable management of wildlife resource.

All data collected were analysed, interpreted, integrated and collated in both qualitative and quantitative terms.

Chapter Four

4.0 RESULTS AND DISCUSSIONS

The analysis of the results covers an analysis of views of local communities on the activities of the Kainji Lake National Parks.

Discussion also covers issues on prosecution of poachers as a management strategy adopted by the Kainji Lake National Park and type of penalty resulting from a contravention of a wildlife conservation law.

4.1 COMMUNITIES' REASONS FOR INVOLVEMENT IN POACHING ACTIVITIES

From the result of the study, it is interesting to note that majority of the people in the study area are involved in combined occupation. While hunting constitute 22.5%, about 35% of the sampled population is involved in farming and hunting combined (Fig. 1).

Table 1. Occupational Status of Respondents

Occupation	Number	Percentage
Farmming	7	17.0
Hunting	9	22.5
Fishing	6	15.5
Farming/Hunting	14	35.0
Others	4	10.0
Total	40	100%

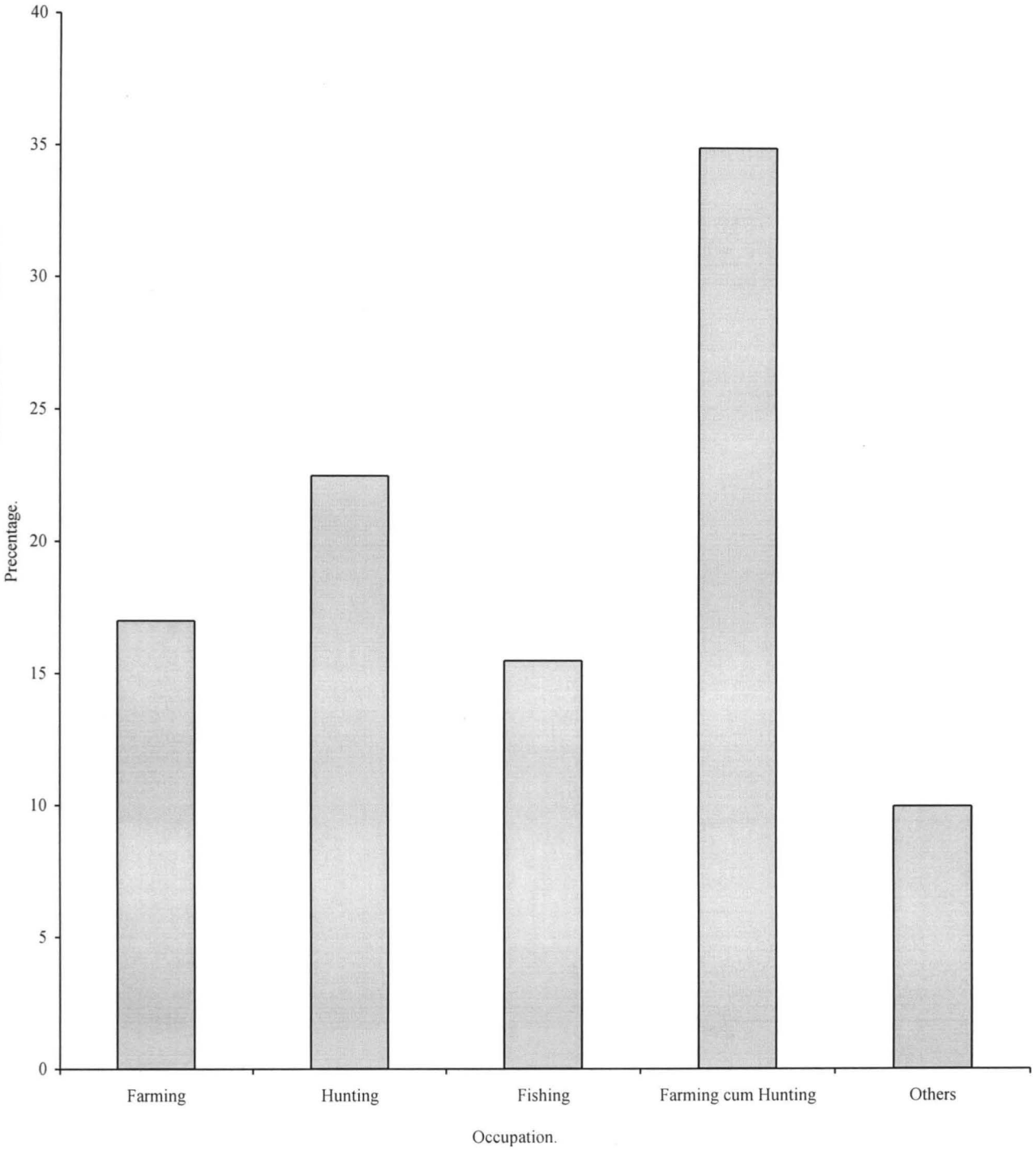


Fig. 3: Percentage Occupational Status of Respondents.

The people of the community are involved in these occupations for the past fifteen years. Majority of them fall within the active working age group of 31 – 40 years (Table 2) and are married with higher number of children ranging between 5 and 10 per household (Table 3).

Table 2. Age Groups of Respondents

Age	Frequency	Percentage (%)
Between 11 – 20	5	12.5
21 – 30	7	17.5
31 – 40	25	62.5
41 – 50	3	7.5
Total	40	100%

Table 3. Number of Children Owned per Household

Age	Frequency	Percentage (%)
1 – 5	16	40.0
5 – 10	21	52.5
10 – 20	3	7.5
Above 20	-	-
Total	40	100%

In ascertaining the reasons why the communities resorted to hunting-cum-farming as earlier indicated in Table 1, Figure 2 shows that 27.5% of the respondents resort to combined occupation of paching in addition to farming primarily for sale inorder to generate more income to sustain their socio-economic needs, while 57.5% poach

primarily for food. However, the tendency to poach for food or consumption may be on the decrease because of the increasing role of which the Fulani herdsmen play in providing meat for the local inhabitants around the Park at the cattle market in Wawa. It has been noted in the preceding Table 3 that grazing activities are on the increase in the Park because of its grazing potentialities.

Table 4. Reasons for Resorting to Farming-cum-Hunting

Reasons.	Number	Percentage (%)
Source of income	11	27.5
Source of food	23	57.5
Leisure	6	15.0
Total	40	100%

During the herdsmen stay in the Park, cattle meat is often sold to the inhabitants fo the settlements surrounding the Park. Even when they decide to move northwards during the rainy season, stressed animals are often sold at cheaper rates to the surrounding communities. Thus, further acting as a source of meat to the local inhabitants. So grazing in the Park may not be all that bad but how to utilise it for the optimum benefit of the Park and surrounding communities seems to be the crucial problem of concern which requires proper education.

Surprisingly however, 20% of the respondents claimed that their inaccessibility toe fertile agricultural land which limit their farming activities in addition to lack of alternative work to sustain their living standard during poor harvest involves them in hunting as a subsidiary occupation to earn a living.

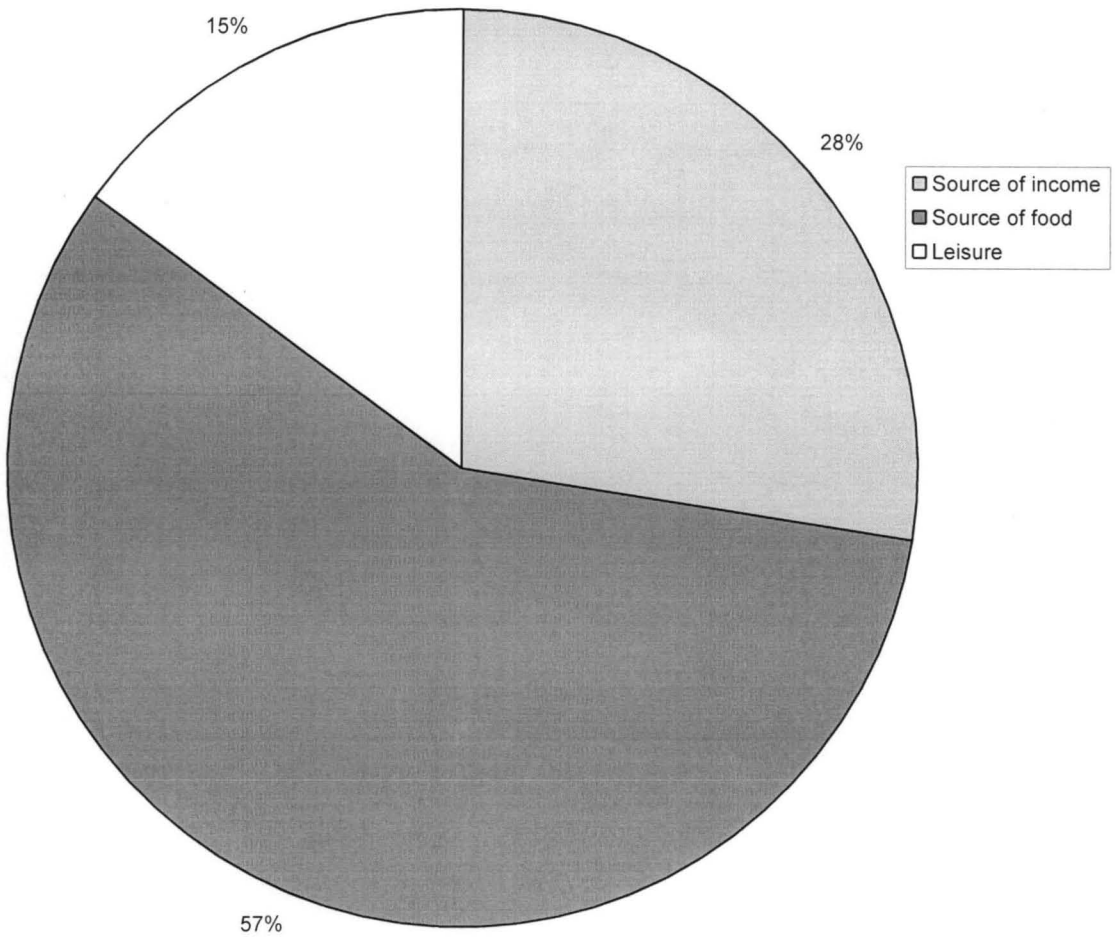


Fig. 4: Communities reasons for resorting to combined Occupation.

4.2 The Communities Level of Awareness on Park Activities

The people in the communities surrounding the park are of low educational background with illiterates constituting the highest number of total population sampled. The trend in the level of education of the surrounding communities is indicated in Figure 3.

Table 5. Education Level

Level of Education	Number	Percentage (%)
Illiterates	15	37.5
Primary	13	32.5
Secondary	9	22.5
Post-Secondary	3	7.5
Total	40	100%

The reasons for the high rate of illiteracy despite the high number of schools in the surrounding communities cannot be understood. But this cannot be unconnected with the absence of employment opportunities for those who are fortunate to be literate in the communities in addition to lack of interest and proper awareness on the values of education. Only 2% of the total number of respondents who completed secondary school education and 3% of the illiterates sampled are employed in the services of the Kainji Lake National Park. With the high level of illiterates in the communities, one would have hoped that their level of awareness on the activities of the Park will be limited. But greater percentage of the respondents (67.5%) as indicated in Figure 4 claimed to be aware of the activities of the Park. This awareness might not be

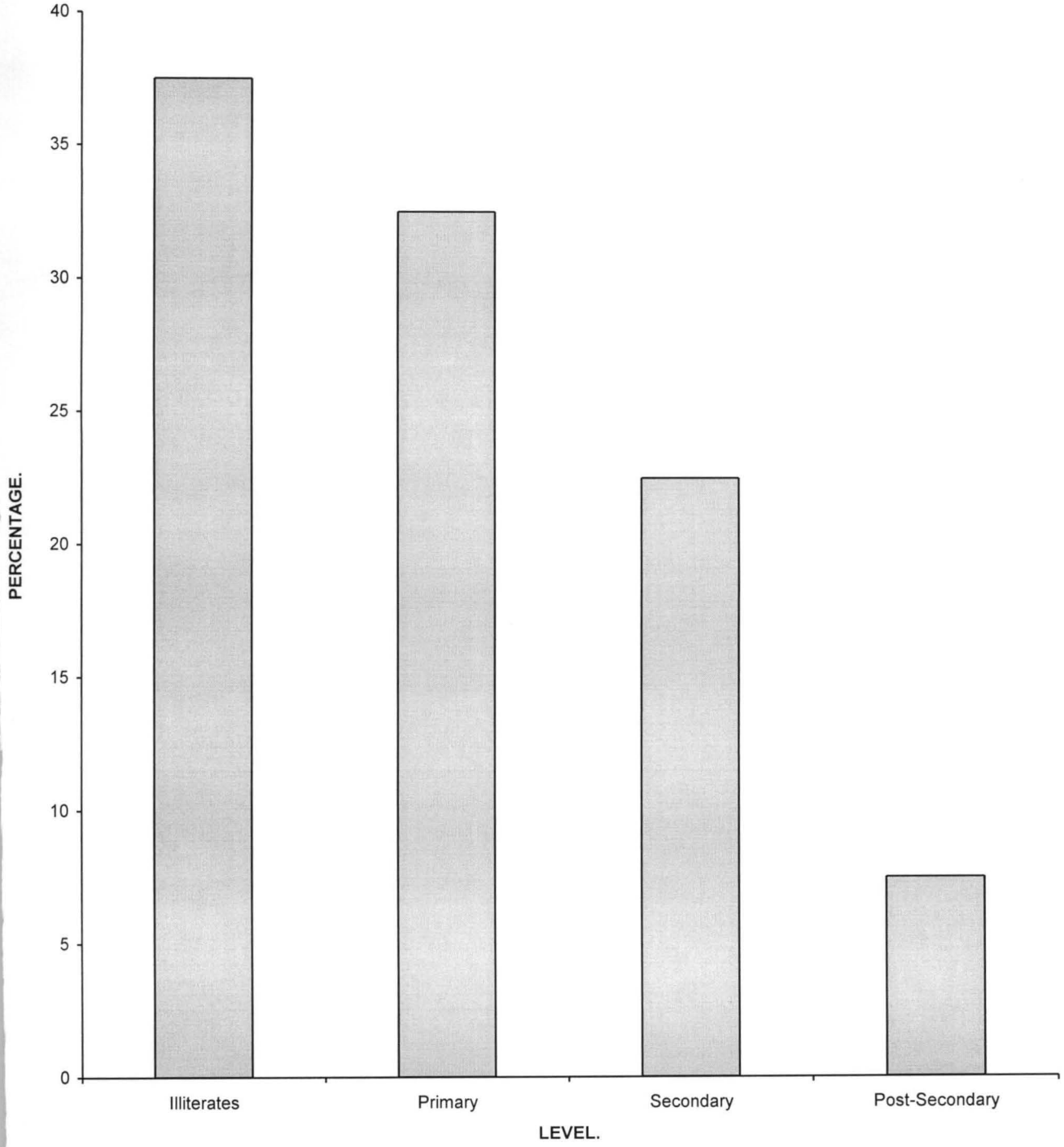


Fig. 5: Percentage of Educational level of Respondents.

unconnected with the regular prosecution of poachers in the Park. But such awareness has no serious impact on the activities of the inhabitants, since greater percentage of them are still involved in poaching.

Table 6 Communities Awareness of Park Activities

Aware ?	Number	Percentage (%)
Yes	27	67
No	11	28
Indifferent	2	5
Total	40	100%

However, the communities level of awareness and knowledge of the activities of the Park cannot be justified as about 25% of the total population sampled believed that poaching cannot limit the number of animals in the wild because they are natural gift which are inexhaustible. While 30% agreed that excessive poaching destroys the natural stock of the environment, but asserted that "*a hungry man is an angry man*". In the absence of alternative they are forced to poach for a living. This reveals that the communities are yet not fully aware of the concept of sustainable development on which they need to be educated.

4.3 MANAGEMENT STRATEGY OF THE KLNP

The arrest and prosecution of poachers is the management strategy adopted by the Park to conserve the wildlife fauna and flora. The reasons for arrest in the Park can be grouped into seven as shown on Table 7. Hunting/killing of animals attracted the

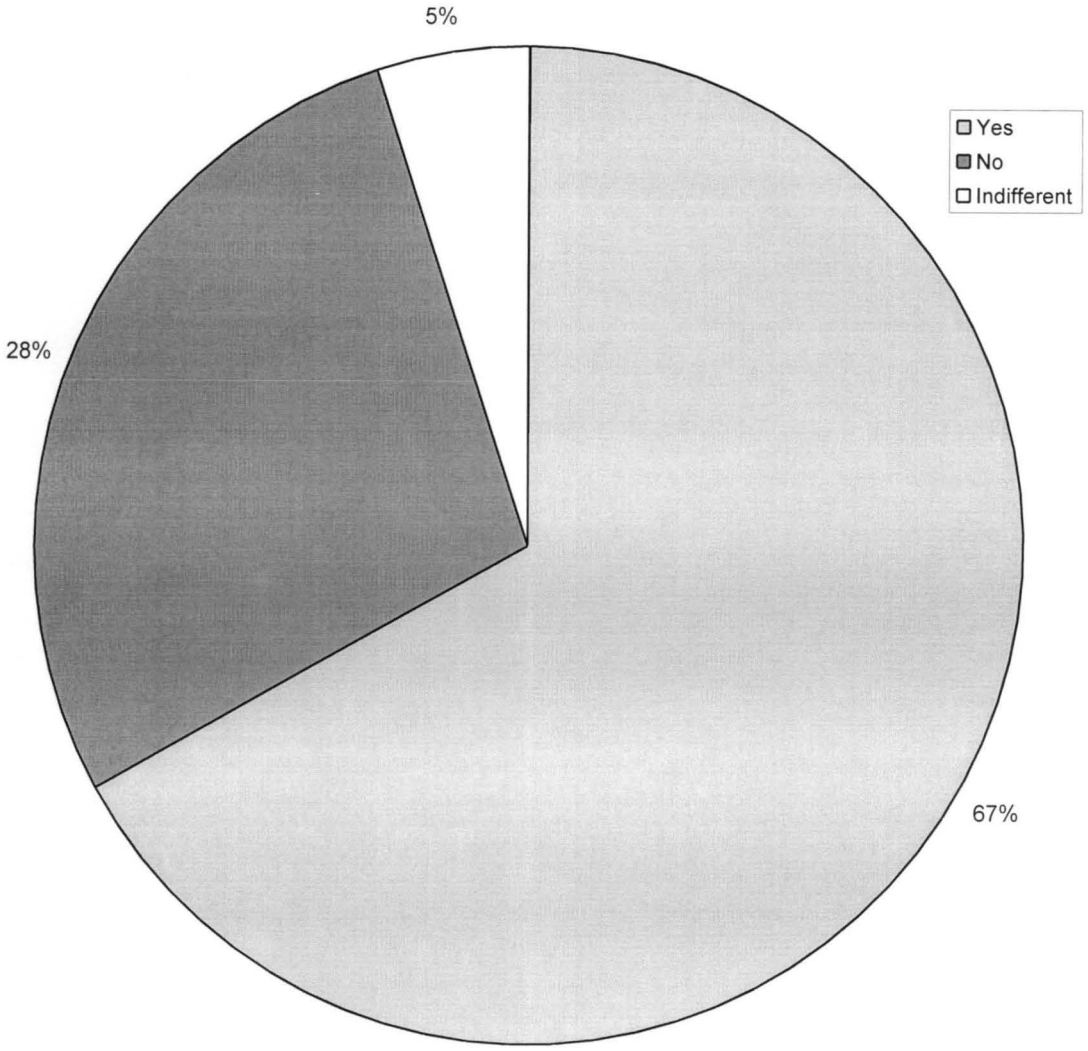


Fig. 6: Percentage of Peoples Awareness of Park activities.

highest numbers of offenders for both periods. While nobody was arrested for grazing during the 1981 – 1983 period, eleven people were arrested for the same offence during the 1998 – 2000 period. The reason for this is not clear but might be attributed to the fact that the herdsmen from the north are becoming aware of the potentials of the Park for grazing during the dry season particularly along the Oli River. This problem of grazing can also be related to the number of people arrested for trespassing and residing in the Park who were mostly herdsmen but whose cattle as at the time of arrest, had grazed away under the control of the younger herdsmen.

Table 7. Number of People Arrested and Distributed According to Types of Offence Committed During the 1981-1983 and 1998-2000 Periods

Year	Fishing	Hunting/killing	Residing	Trespassing	Grazing	Possession of Meat	Possession of Weapon
1981	-	18	-	1	-	9	-
1982	-	38	-	1	-	29	10
1983	1	11	-	6	-	6	2
Sub-total	1	67	-	8	-	44	12
1998	5	14	2	2	5	2	5
1999	-	8	-	-	2	1	2
2000	4	6	5	4	4	-	1
Sub-total	9	28	7	6	11	3	8
Grand Total	**10**	**95**	**7**	**14**	**11**	**47**	**20**

Source: Kainji Lake National Park

Interestingly, Table 7 indicates that while the offence for possessing bush meat attracted as many as 44 people in the period of 1981 – 1983, only 3 people were arrested for the same offence in the 1998 – 2000 period. This might be because the people are now more crafty in the art of hiding the bush meat and thus escape arrest even with the increasing number of road checks around the Park.

Table 8 shows the total number of arrests between the three year period of 1981 – 1983 and 1998 – 2000 to be 204. A breakdown of this figure reveals that the number of arrest (132) during the 1981 – 1983 period is higher than that of 1998 – 2000 which recorded 72 arrests.

Table 8. Number of Arrests Distributed According to Terms of Penalty Served

Year	No. Arrested	No. Acquitted	No. Convicted	No. Fined
1981	28	7	8	13
1982	78	10	11	57
1983	26	7	9	10
Sub-total (n^1)	132	24	28	80
% (n^1)	-	18.2	21.2	60.6
1998	35	8	12	15
1999	13	2	6	5
2000	14	7	6	11
Sub-total (n^2)	72	17	24	31
% (n^2)	-	23.6	33.3	43.1
Total ($n^1 + n^2$)	**204**	**31**	**52**	**111**
% ($n^1 + n^2$)	**-**	**15.2**	**25.4**	**54.4**

Source: Kainji Lake National Park

Also, comparing the percentage of people acquitted or convicted during the two periods, about 18% and 22% of the people arrested in 1981 – 1983 period were acquitted and convicted respectively, while 24% and 76% were acquitted and convicted respectively during the period 1998 – 2000.

From the above analysis, it is not possible to say whether or not prosecution as a management strategy adopted by the Kainji Lake National Park had been able to discourage people from poaching activities in the Park. This is because with evidence of higher number of Park Guards employed, Patrol vehicles, tracks and equipment available during the 1998 – 2000 period than in the past (1981 – 1983), more arrests would have been made during the 1998 – 2000 period. However, a counter argument might be that because of the heavier penalty during the 1998 – 2000, less number of people went to the Park which in turn affected number of arrests for the year. The argument becomes more meaningful when it is related to the ability to pay fines by the poachers on conviction. While during the 1981 – 1983 period 21.2% of those convicted went to jail and 60.6% paid fines, as high as 33.3% went to jail and as low as 43.1% paid fines during 1998 – 2000 period.

It can therefore, be calculated that more people are likely to go to jail on conviction during the 1998 – 2000 period than 1981 – 1983 period because of the heavier penalty attracted by the wildlife litigation policy. Since being imprisoned is a social stigma in the country and the court fines are not easily affordable, it is therefore, imperative that the tempo of this category of convicts to engage in poaching activities in the Park would have been less in the 1998 – 2000 period than

the 1981 – 1983 period, thus helping in the conservation of the wildlife resources in the Park.

Chapter Five

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The desire to poach in the Park is an intricate issue and cannot be devolved from the socio-economic realities operating at the national, state, local and village levels. Poaching is significantly not an activity in which people engage in for the purpose of deriving leisure, but rather, it is an activity associated in form or the other with the upliftment of living standards of the poachers. It has become imperative to reason that the solution to eradicate poaching activity in the Park does not lie solemnly on prosecution policy per se. How severe it might be and wildlife conservation policy cannot be made effective through the natural science approach alone. Because poaching is essentially a human affair that demands human approach. Hence the role of contemporary sociology in the formulation of wildlife conservation policy is crucial.

Physical planning with reference to rural planning may also have a role to play in the identification of human population thresholds and catchments to the Park and orderly location of infrastructures within the Park to avoid incompatible uses culminating into further poaching by opportunists. The present method of managing the Park mainly through the game guards and prosecution of arrested poachers need to be re-appraised. This is particularly necessary because the neighbouring communities surrounding the Park still hold negative views of the existence of the Park.

5.2 RECOMMENDATIONS

A quick and effective strategy for sustainable wildlife conservation and management in Kainji Lake National Park includes:

1. It is commendable that efforts are now being intensified by the Park management to recruit Game Guards and other Field Assistants from among the indigenes of the Park surrounding area. However, in view of the limited number of jobs that can be offered, it is suggested that new recruitment in this respect should be restricted to the indigenes living in settlements bordering the Park. This will enable the impact of the Park in terms of job opportunities to be more felt among the neighbourhood population.

2. Wildlife conservation ethics should be developed at grassroots level, publicity on the existence and importance of the Park should be intensified. This could be achieved through information folders; written in the local languages of the settlements surrounding the Park. In addition, the Radio Niger booster Station located at New Bussa could be used extensively to reach the people.

3. Creating game reserve zones within the vicinity of the Park for the exclusive use of the neighbourhood population to minimise their negative perception of the Park and the Game Guards and thereby keeping-in-check the incidence of indiscriminate killing of animals by these people.

4. In addition, resettlement-with-development-inputs might be adopted for the people in settlements within the immediate vicinity of the Park so that they can reasonably be located far away from the Park.

5. The management of the Park should adopt a consultative or participatory approach in which the Village Heads and functional groups in the communities surrounding the Park will serve as local guards because having implemented the recommendations in 1, 2 and 3 above, they will now see the Park more as their own.

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APPENDIX 1

Questionnaire on Environmental education:
A Strategy for Sustainable Wildlife Management.

Dear Respondent,

1. This is a research in partial fulfillment of the requirement for the award of PGD in environmental management by the Federal University of Tech. Minna.
2. The questionnaire is designed to gather reliable information for effective sustainable wildlife management.
3. Be assured that your response will be treated with utmost confidentiality
4. Thanks for your cooperation.

(Fill in or tick as appropriate).

1. Name of respondent (optional)----------
2. Village name ----------
3. Religion: [a] Christianity [b] Islam [c] others specify.
4. Age: between:

  11-20

   21-30

   31-40

   41-50

5. Marital status: [] Married [] Single [] Separated
6. Number of children: (a) 1-5 []; (b) 5-10 [];(c) 10 & above []
7. Educational background: (a) Primary []; (b) Secondary []; (c) Post-secondary []

8. Occupational status: (a) Farming []; (b) Hunting []; (c) Fishing [];

(d) Farming cum Hunting []; (e) others [].

9 For how long have you been engaged in this occupation?

.. 5 years ago []

10 years ago []

15 years ago []

10. Why did you resort to this occupation alone?

Source of food []

Source of income []

Source of food & income []

11. Did you have exception to the type of animals hunted in the park? Yes/No

12. If Yes above why ----------

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13. If no what is the future implication? ----------

14. Have you notice any changes in the number of animals in the park from the past to the present? Yes/No

15. If Yes specify the changes below:

Increase in the number of animals []

Decrease in the number of animals []

None of the above []

16. Can you give reason to the changes? ----------

17. What is the importance of the park to your community?

Conserve the wild animals []

Create job opportunities []

Give room for tourism activities []

Others specify:

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18. Are you aware of the likely consequence of continuous exploitation of the Wild. Yes/No ----------