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Conservation Conflicts in Protected Areas in Nigeria: Case Study of Kainji Lake National Park

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Abstract
The exploitation of natural resources in Kainji Lake National Park (KLNP) had led to conservation conflicts within the environment. Information on conservation conflicts in the park is sparse. Thus, conservation conflicts around KLNP environment were assessed. A total of 600 structured questionnaires using simple randomized sampling technique were used, 40 copies were administered in each of the 15 communities sampled. Data were analyzed using both descriptive statistics and analysis of variance (ANOVA). The result revealed that, conservation policies were poorly implemented, only 48% of the people were involved in decision making and 52% excluded. Four causes of conflict were identified: poaching (40%), deforestation (35%), overgrazing (14%) and agricultural practices (11%). Conflict evidence evaluated indicated 80.6% and 19.4% claimed ignorance of conflicts in the study area. ANOVA for conflicts indicated high conflicts with the natural resources of the park. Similarly, the ANOVA for incidence and absence of conflict in the park showed that conflicts have become common phenomena in KLNP environment. Hence, management measures like rural livelihood programs and awareness campaign were suggested to reduce the overdependence of the people on the natural resources and to militate against conservation conflicts in KLNP.

Keywords: Conservation conflict, Policy making, Management, Livelihood, Communities

Introduction

Conservation of biodiversity has become a challenging endeavour in the phase of ever increasing human population. This has precipitated critical concerns of a sixth mass extinction event, attracting research attention to find efficient approach of conserving biodiversity (Raup and Sepkoski, 1982 and Barnosky *et al.*, 2011). However, the interest to resolve this challenge is limited by the opinion differences in support of conservation objectives. The different interests and priorities against conservation objectives have resulted to damaging and costly conflicts witnessed across the world which have threatened the implementation of modern conservation procedures (MacDonald and Service, 2007). Conflicts are clashes in priorities and world views and the imposition of one value system on another. The conflicts in conservation are often bothered on the impacts on biodiversity and humans such as the impact of carnivores on livestock and the impact of protected areas on livelihoods (Redpath *et al.*, 2013). Consequently, a potent way to alleviate these problems has been to build robust science and develop empirical evidence to understand these impacts with a view to proffering practical solutions. For instance, conservation conflicts occur when the traditional inhabitants around natural resources are deprived access to the resources by force of control or promulgation of law restricting people from using such resources (Jeminiwa, 2012). Similarly, conflicts arise when conservation involves the preservation of protected areas that threaten the livelihoods of the people in the environment.

In Africa, most people depend directly on natural resources for their livelihood and wellbeing. In Nigeria like many other developing countries, most of the population depends on these resources for food, personal needs and income (Jeminiwa, 2012). Forests as the repository of biodiversity constituted one of the main renewable natural resources of mankind. They are vital in the maintenance of environmental stability, provision of raw materials for wood-based industries and provision of food, rural livelihood and employment for millions of people especially in and around the forested areas in the world. Nevertheless, lack of total acceptance of conservation objectives among the people is limiting to the progress and success of biodiversity conservation in Nigeria. These variations of interests

resulted in the devastation and conflicts which form the major challenges to modern conservation around the globe (Young *et al.,* 2016).

These conflicts negatively affect biodiversity, livelihoods and human wellbeing, and therefore concerted effort is required for their management at both local and regional levels. The increasing knowledge of the complexity within conflicts has made some scholars to suggest multidisciplinary approaches, particularly through better integration of ecological and social science (Manfredo and Dayer, 2004; Treves, 2009; White and Ward, 2010). Understanding the changing social contexts for conflict between conservation and human welfare is critical in biodiversity conservation. Conservation conflicts between protected areas and human livelihood have become a burning issue in conservation planning which requires acute investigation. Hence, this study assessed conservation conflicts in Kainji Lake National Park (KLNP) with a view to providing possible management measures which could be adopted to reduce the conflict impacts on the park and its environment.

Methodology

Study Area

The study was carried out in KLNP known as the ecotourism flagship park of the nation. The park is situated in the north central part of Nigeria between Niger and Kwara States close to the Nigeria border with the Republic of Benin. It is located on latitudes $9^0$45'N and $10^0$23'N and longitudes $3^0$40'E and $5^0$47'E with an area of 5340.82sq.km (Figure 1). It was established in 1979 by the amalgamation of two former games reserves (Borgu and Zugurma) under Decree 46 of 29th July 1979, thereby making Kainji Lake the premier national park in Nigeria. It covers Borgu, and Mashegu Local Government Areas (LGAs) of Niger State, and Kaiama and Baruten (LGAs) of Kwara State. KLNP has many adjoining communities within and outside the park and most of the communities have been in existence before it was gazetted as protected area.

Population Size of Sampled Communities around Kainji Lake National Park

The study area comprised of five districts which were; Wawa, Babanna, Zugurma, Kemeji and Dekala (Table 1). Wawa district had the highest population of 17,550 (29.34%), followed by Kemeji with 11,800 (19.73%), Zugurma with 11,700 (19.56%), Babanna with 10,693 (17.87%) and Dekala district had the least population of 8,080 (13.51%). However, the total population of all the villages sampled was 59,823 and Garuji village in Babanna district had the lowest population of 693 (1.16%) among the communities.

Data Analysis

Primary and secondary data were used for this study. The primary data were obtained with the use of structured questionnaires and in-depth interviews methods (Diaw *et al.*, 2002). Secondary data used were the population data of the communities around the park which was obtained from National Population Commission with the assistance of Global Environmental Facility (GEF) World Bank assisted project (2009) in Nigeria. There were five districts in KLNP from which three communities each were selected using simple random sampling technique. The total population of the sampled communities was 59,823 as compiled by GEF (2009). A total of 600 structured questionnaires were used for this study and 40 copies each were administered in the 15 communities sampled around KLNP which was in line with the methods used by Diaw *et al*. (2002). The data collected were analyzed with both descriptive and analyses of variance (ANOVA) using Statistical 7 software respectively.

Results and Discussion

Demographic Information of Respondents in Kainji Lake National Park

Gender

The gender characteristics of the respondents in the study area showed that 58% of the respondents were male, while, 42% were female. This implies that the male population dominated in the study area. This is in conformity to Adeniji *et al.* (2015), who observed that male population in the zone responded promptly to research questions than the female population in the area. These were evident in Sabon-Kadi and Kubli (4.7%) and also Gulbi where most of the respondents (5.0%) were male (Figure 2). Nevertheless, the age distribution of the respondents in the study area revealed that 12% of respondents were below age 20, 57% were between age 21 and 40, 26% were between 41 and 60 years, while 5% of the respondents were above 60 years of age. This also showed that large number of the respondents between the age of 21 and 40 years were the work force of the study area. About 26% who fall between the age of 41 and 60 years constitute the working population and the least population of respondents were dependents (Figure 3).

Educational Status

The educational characteristic of the respondents revealed that 15.6% of the respondents have no formal education, 43.2% had primary education and 32.7% had secondary education, while 8.5% had tertiary education. However, Kwazure and Bezira in Babanna and Kemije districts had no respondents with tertiary education. Benya in Deakala district respondents all had formal education. Nevertheless, none of the respondents had tertiary education. These indices gave an indication that the study area composed of rural areas with low population of literate dwellers in the environment (Table 2). The high population of respondents with primary education differs from the report of Ojo *et al.* (2018), who observed high number of people with tertiary education in the zone. This may be attributed to the provision of low and middle level educational facilities like primary and secondary schools by the federal government around Kainji dam and its environment. The closeness of these schools might have accounted for high primary education among the Kainji dam staff

dependants and the adjoining communities' population. This corroborated the report of Adeniji *et al.* (2015) that lack of will-power for education as a result of the doctrine of religion affiliation contributed to the high population of people with primary education in the area.

Occupational Distribution

The occupational distributions of the respondents revealed that majority of the people were engaged in farming and fishing in the study area. Farming was the main occupation of the respondents in the study area as evident in Sabon-Kadi, Kwasure, Muliya and Gulbi in Wawa, Babanna, Zugurma and Dekeala districts with 6.3% respondents each. This implies that the rural dwellers were predominantly farmers and are bound to infringe into the park for fertile land and space to plant their crops. This conformed to the observations of Jeminiwa *et al*. (2020), who noted that farming was one of the major drivers of degradation in Mokwa forest reserve and most of the protected areas in the zone. Likewise, it was also discovered that 49.5% were crop farmers, 24.6% engaged in fishing and 5.1% were civil servants, while 21.1% of the people derived their livelihood in other socio-economic activities in the area (Table 3). This is consistent with Ojo *et al*. (2018) that farming is the main vocation of the people in the zone.

Community Participation in Conservation Policies

The proportions of people who supported the conservation objectives of the government were less than the population of the people who were against conservation policies in the study area (Figure 4). About 48.0% of the respondents attested to their support on policy making by the government, while the majority of the people (52.0%) confirmed their disagreement with the management of the park. Young *et al*. (2010) asserted that, the fallout of management failure to involve the rural dwellers around the protected areas in decision making were often one of the causes of conservation conflicts in Africa as evident in Kainji lake national park and its environment. Likewise, Larinde and Chima (2014) have earlier reported that government's failure to allow rural participation in conservation policy making is a great challenge to conservation and forest management in Nigeria. This implies that the failure of the park authorities to consider the opinions of the rural populace in policy making and implementation may have aggravated conservation conflicts in the park and its environment.

Causes of Conservation Conflicts in Kainji Lake National Park

The result of the causes of conservation conflict in the study area showed that violation of conservation rules and regulations in the park were usually caused by illegal felling of trees, farming practices, overgrazing and poaching (Table 4). In Kemije districts, deforestation was the major causes of conflict as evident in Teneba (3%), Nanu-Shagaba (3.7%) and Bezira (4.3%). Likewise, deforestation was also the main cause of conflict in other villages in the study area especially in Dekala district while 4% were recorded in Bezhi, Benya (3.0%) and Gulbi (2%) villages respectively. This corroborated the reports of Ojo *et al.* (2018) and Jeminiwa *et al*. (2020), who asserted that people in the zone are usually recalcitrant to the protected area rules and regulation as trees were indiscriminately cut for their local uses as against the Government laws on conservation and games preservation. In the same vein, poaching has contributed enormously to the phase-off between the government and the people on forest and wildlife conservation in the study area. According to Anadu (1987) and Jacob *et al*. (2015), who noted that poaching has become the main threat to wildlife conservation and the major cause of conflicts between the adjoining communities around protected areas and the government authorities in Nigeria. Poaching has been a major challenge in Wawa district as exemplified in some villages such as Gada Olli with 3.6%, Sabo-kadi (4%) and Leshibe (3.0%). It was also the main cause of conflict in some other communities like Gulbi, Benya, Garaji and Kwasure in Dekala and Babanna districts respectively. Overgrazing and farming practices have equally been identified as causes of misunderstanding and disagreement among the people and the Government. Subsequently, poaching activities had the highest respondents with 40.0%, followed by deforestation (35.0%) and overgrazing (14.0%), while farming activities (11.0%) was the least cause of conflict in the park.

Evidence of Conflicts in Kainji Lake National Park

The analysis of data on the trends and evidence of conflicts in the study area (Table 5) showed that high number of respondents have experienced conservation conflicts in their environment. About 80.6% of the respondents attested to have witnessed one form of conflict or the other, while 19.4% claimed not to have participated in conflict in the communities around Kainji Lake National Park. However, some incidence of conservation conflicts were recorded in some villages like Gada Olli, Garuji, Patiko and Bezira with 6% each to mention few while, 5.7% were documented in Muliya and Faje in Zugurma district of the park each. This report conformed to Digun-Aweto and Merwe (2020), who reported the evidence of conservation conflicts in adjacent communities around Nigerian Cross River National park where conflicts have become a challenge in the management of the park. According to Andrew-Essien (2014), conservation conflicts have become a regular occurrence in protected areas in Nigeria due to the poverty level of the people coupled with unstable economic situation in the country. This might have made the rural populace to resolve in the indiscriminate exploitation of natural resources in protected forests and parks for their livelihood as against conservation objectives. This implies that poverty and the poor economic status of the people and the nation have escalated the incidence of conservation conflicts in the park.

Analysis of Variances for Causes of Conflicts in Kainji Lake National Park

The analysis of variance conducted for causes of

conflicts showed that there was no significant difference in the causes of conservation conflict in the study area with F-value (1.07) and P-value (0.42) at p≤0.05. This implies that conservation conflict has become a common phenomenon in all the districts and villages in the study area (Table 6).

Analysis of Variances for Evidence of Conflicts in Kainji Lake National Park

The analysis of variance for evidence of conflicts between the government authority and the communities around the park revealed that there was no significant difference in the evidence of conservation conflicts in the study area with F-value (1.16) and P-value (0.04) at p≤0.05. It is statistically clear that there was no significant difference between the incidence and absence of conflict in the study area. This is a pointer to the fact that conflict has become a regular incident in Kainji Lake National Park and its environment (Table 7).

Impact of Conservation Conflicts on Kainji Lake National Park

Conservation conflicts in KLNP have become a major issue which have attracted attention from the stakeholders in attempt to mitigate the detrimental impacts on the sustainable management and conservation of the park. The effects of conflicts identified in the study area (Table 8) indicated that decreased wildlife population was the highest impact (38.3%) recorded in the study area. This may be ascribed to the illegal poaching activities which are on the increase by the nomadic herdsmen and local hunters in and around the park. According to Adedoyin *et al.* (2018), hunting of wild animals for meat, hide and skin and big games like elephants for their ivories have become a great challenge in the conservation of wildlife resources in Nigeria. This implies that poaching activities are the major drivers of depletion of wildlife resources in the park. This agrees with the observations of Odunlami and Osumenya (2020), who noted that bush meat is the major source of protein for rural people especially areas around the national parks and other protected areas in Nigeria. This was followed by forest degradation effects (25.0%) which conformed to the report of Fisher (2016) that ecosystem degradation is one of the critical effects of conservation conflicts in tropical forest landscapes. Nevertheless, climate change had the least effects (3.3%) in the study area. The reduction of vegetation cover of protected areas has been attributed to forest conflicts and other anthropogenic factors which in turn resulted to climate change. This was corroborated by the findings of Birkett and stevens-wood (2005) that vegetation cover change is one of the drivers of global warming which has become a great challenge around the world. Nevertheless, about 71.3% of the rural populace attested to the negative impacts of conservation conflicts on both lives and socio–economic activities of the people, while 28.7% of the people were ignorant of the menace of conflict in the study area. This implies that conflicts have impaired the effective park biodiversity management and conservation as well as the socio-economic development of the people in the study area.

Management Measures for Conservation Conflicts in Kainji Lake National Park

Some management strategies were identified and documented as measures to resolve conservation conflicts in the park (Table 9). Rural livelihood programs had the highest respondents with 43.7%. Pourcq *et al*. (2017) noted that rural livelihood programs will enhance wildlife conservation by reducing the overdependence of the people on the forests which in turn lessen the mode of conservation conflicts in protected areas at local and regional levels. This implies that the scheme will likely boost the living standards and the economy of the people and consequently reduce conflicts in the study area. Awareness campaign (22.0%) was equally identified as a measure to mitigate conservation conflicts in the park. According to Digun-Aweto *et al.* (2015), who noted that, the attitudes of local communities in or adjacent to protected areas are vital in achieving conservation of biodiversity. In a rural setting especially around protected areas, awareness campaigns promote the right attitude to sustainable use of natural resources and reduce conservation conflicts in the area. This conformed to the findings of Montana and Mlambo (2018) who reported that, awareness campaign was a helpful tool which enhances biodiversity conservation in Gwayi valley conservation area in Zimbabwe. The involvement of people in policy making (18.8%) was also suggested as a strategy to reduce conservation conflicts in the study area. This agreed with the findings of Digun-Aweto *et al*. (2018) that the participation of the people around protected areas in policy implementation fosters their understanding about sustainable use and conservation of natural resources. This indicated that the involvement of the rural populace in the management of the park will reduce conservation conflicts in the park. While the least strategy documented was enforcement of regulations (4.3%) and this will promote forest conservation and proper conflict management in the park. This conformed to the findings of Ijeomah *et al*. (2012) that enforcement of wildlife laws and regulations reduce conflicts in games reserves in Nigeria. According to Olatunbosun (2013), the enforcement of wildlife laws instils fear and caution to the adjoining communities around parks and games reserves, thereby mitigating the incidence of conflicts in the parks. This implies that stiffer measures and punishment for park offenders will reduce conservation conflicts in the study area.

Conclusion

Conservation and conflict in Kainji Lake National Park (KLNP) has been an issue of great concern due to the detrimental effects on the biodiversity of the park over time. The study showed that, conservation policies were poorly implemented and communities in the study area were less involved in decision making. Some of the causes of conflict identified were poaching, deforestation, overgrazing and agricultural practices. It was also evident that most respondents were aware of conflict, while others claimed ignorance of the problem

in the park. Rural livelihood programs were the main strategy suggested to reduce conservation conflicts in the study area. However, other management measures such as awareness campaign and involvement of people in policy making and implementation were also identified for effective conflict control and management in the study area. Analysis of variance revealed that there was no significant difference in the causes of conflict which was an indication that all the communities in the study area were grossly in conflict with the natural resources of the park. Thus, it was recommended that government should embrace rural empowerment programs to improve the standard of living of the people in order to reduce the overdependence on the natural resources of the park for their existence. Likewise, the communities should also be privileged to participate in the policy making and implementation processes in order to have a sense of belonging and commitment in the management of the park.

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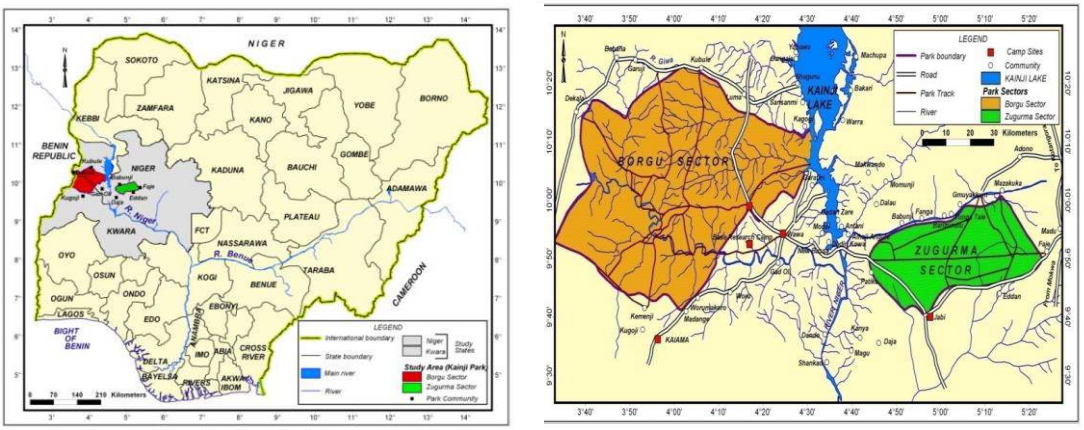

Figure 1: Map of Kainji Lake National Park and its surrounding communities (inset is map of Nigeria with the location of the study area)

Table 1: Population size of selected communities around Kainji Lake National Park

District	Villages	Population	Percentage
Wawa	Gada Olli	10,050	16.80
	Sabon Kadi	5,000	8.36
	Leshibe	2,500	4.18
Babanna	Kubli	6,000	10.03
	Kwasure	4,000	6.69
	Garuji	693	1.16
Zugurma	Patiko	4,000	6.69
	Muliya	3,500	5.85
	Faje	4,200	7.02
Kemeji	Tenebu	3,000	5.02
	Nanu shugaba	6,000	10.03
	Bezira	2,800	4.68
Dekala	Gulbi	2,000	3.34
	Benya	3,580	5.98
	Bezhi	2,500	4.18
Total		*59,823*	*100*

Source: GEF (2009)

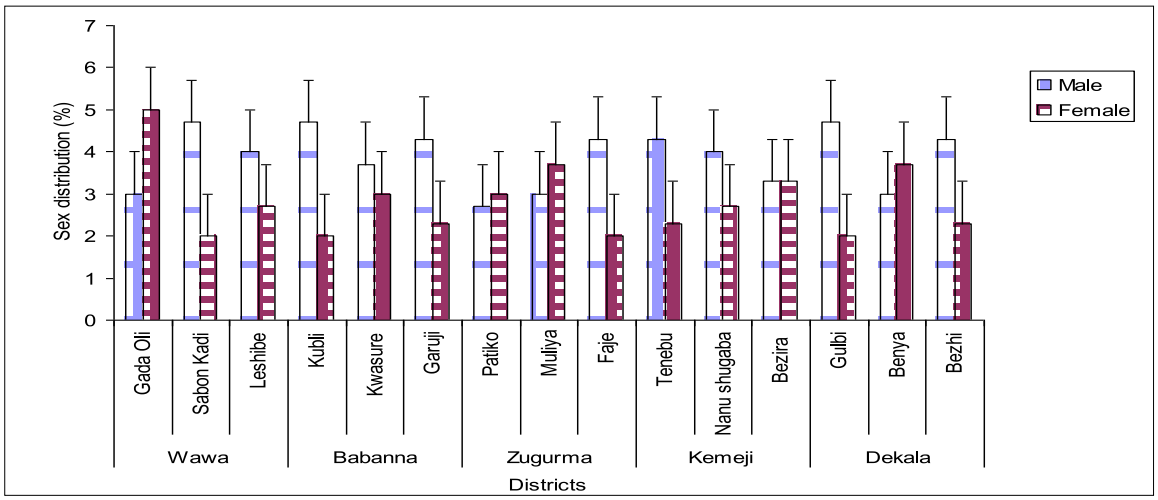

Fig 1, Sex Distribution of the Respondents.

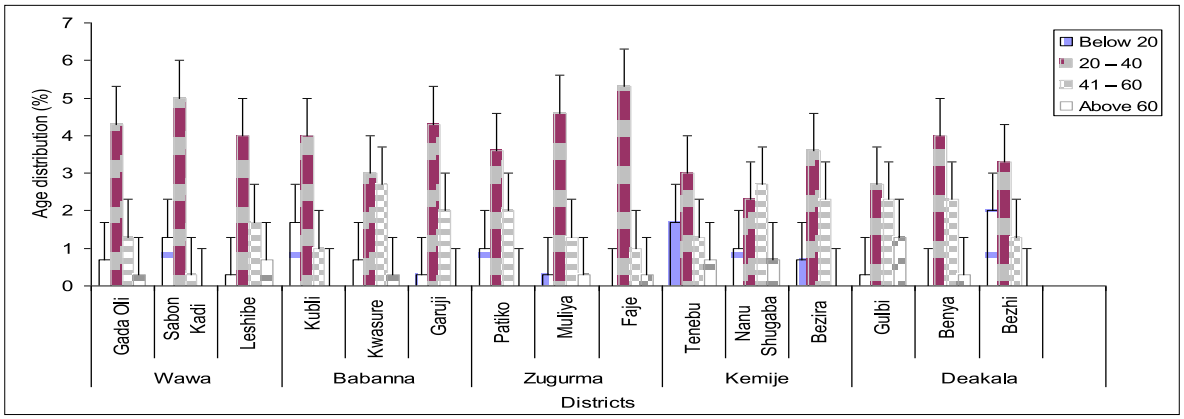

Fig 2, Age distribution of the respondents (%)

Table 2: Education Status of the Respondents in Kainji Lake National Park

Distr	Villages	No Formal Edu	%	Pry Edu	%	Sec Edu	%	Ter Edu	%
Wawa	Gada Oli	8	1.3	18	3.0	10	1.7	2	0.3
	Sabon- kadi	6	1.0	16	2.7	16	2.7	2	0.3
	Leshibe	2	0.3	22	3.7	10	1.7	6	1.0
Babanna	Kubli	12	2.0	10	1.7	8	1.3	10	1.6
	Kwasure	10	1.7	16	2.7	14	2.3	0	0
	Garuji	6	1.0	12	2.0	18	3.0	4	0.6
Zugurma	Patiko	4	0.7	12	2.0	16	2.7	8	1.3
	Muliya	10	1.7	16	2.7	12	2.0	4	0.6
	Faje	2	0.3	18	3.0	14	2.3	6	1.0
Kemije	Tenebu	6	1.0	14	2.3	18	3.0	2	0.3
	Nanu Shugaba	8	1.3	22	3.7	6	1.0	4	0.6
	Bezira	12	2.0	16	2.7	12	2.0	0	0
Deakala	Gulbi	2	0.3	24	4.0	12	2.0	2	0.3
	Benya	0	0	18	3.0	22	3.7	0	0
	Bezhi	6	1.0	28	4.0	2	0.3	4	0.6
		94	15.6	262	43.2	190	32.7	54	8.5

Source: Field Survey, 2021

Table 3: Occupation distribution of the respondents in Kainji Lake National Park

Districts	Villages	Farming	%	Fishing	%	Civil Servant	%	Others	%
Wawa	Gada Oli	34	5.7	24	4.0	8	1.3	18	3.0
	Sabon- kadi	38	6.3	14	2.3	4	0.7	16	2.7
	Leshibe	32	5.3	8	1.3	2	0.3	10	1.7
Babanna	Kubli	32	5.3	18	3.0	0	0	24	4.0
	Kwasure	38	6.3	12	2.0	2	0 .3	14	2.3
	Garuji	30	5.0	8	1.3	4	0.7	12	2.0
Zugurma	Patiko	32	5.3	16	2.7	2	0.3	8	1.3
	Muliya	38	6.3	12	2.0	0	0	14	2.3
	Faje	32	5.3	10	1.7	4	0.7	16	2.7
Kemije	Tenebu	34	5.7	18	3.0	0	0	8	1.3
	Nanu Shugaba	34	5.7	28	4.0	6	1.0	16	2.7
	Bezira	36	6.0	22	3.7	2	1.0	18	3.0
Deakala	Gulbi	38	6.3	24	4.0	6	1.0	12	2.0
	Benya	28	4.7	20	3.3	2	0.3	8	1.3
	Bezhi	30	5.0	14	2.3	10	1.7	22	3.7
		506	49.5	248	24.6	52	5.1	216	21.1

Source: Field Survey, 2021

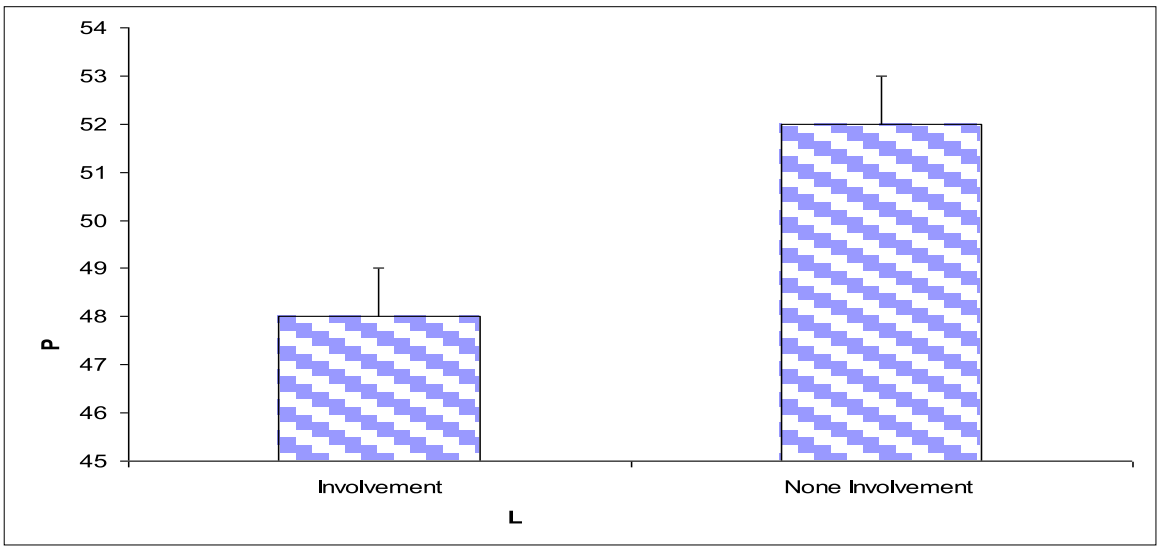

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Table 4: Causes of Conflict in Kainji Lake National Park

Districts	Villages	Defrt	%	Farmi	%	Overgraz	%	Poachn	%
Wawa	Gada Olli	8	1.3	4	0.7	6	1.0	22	3.6
	Sabon- kadi	6	1.0	0	0	10	1.7	24	4.0
	Leshibe	16	2.7	2	0.3	4	0.7	18	3.0
Babanna	Kubli	14	2.3	6	1.0	6	1.0	14	2.3
	Kwasure	10	1.7	6	1.0	2	0.3	22	3.7
	Garuji	8	1.3	0	0	10	1.7	22	3.7
Zugurma	Patiko	16	2.7	4	0.7	12	2.0	8	1.3
	Muliya	10	1.7	6	1.0	0	0	24	4.0
	Faje	2	0.3	10	1.7	12	2.0	16	2.7
Kemije	Tenebu	18	3.0	6	1.0	4	0.7	12	2.0
	Nanu Shugaba	22	3.7	6	1.0	2	0.3	10	1.7
	Bezira	26	4.3	2	0.3	2	0.3	10	1.7
Deakala	Gulbi	12	2.0	4	0.7	4	0.7	20	3.3
	Benya	18	3.0	0	0	8	1.3	14	2.3
	Bezhi	24	4.0	10	1.6	2	0.3	4	0.7
		210	35	66	11	84	14	240	40

Source: Field Survey, 2021

Table 5: Evidence of Conflict in Kainji lake National Park

Districts	Villages	Conflict	%	No Conflict	%
Wawa	Gada Olli	36	6.0	4	0.7
	Sabon-kadi	26	4.3	14	2.3
	Leshibe	32	5.4	8	1.3
Babanna	Kubli	32	5.4	8	1.3
	Kwasure	32	5.4	8	1.3
	Garuji	36	6.0	4	0.6
Zugurma	Patiko	36	6.0	4	0.6
	Muliya	34	5.7	6	1.0
	Faje	34	5.7	6	1.0
Kemije	Tenebu	28	4.6	12	2.0
	Nanu- Shugaba	32	5.4	8	1.3
	Bezira	36	6.0	4	0.7
Deakala	Gulbi	30	5.0	10	1.7
	Benya	26	4.3	14	2.3
	Bezhi	32	5.4	8	1.3
		482	80.6	118	19.4

***Source**: Field Survey, 2021*

Table 6: Analysis of Variance for Causes of Conflicts in Kainji Lake National Park.

Source of variation	Sum of Squares	df	mean square	F	Sig
Between groups	49.06	4	12.26	1.07	0.42
Within groups	114.66	14	11.46		
Total	163.72	18			

Significant at p≤0.05

Table 7: Analysis of Variance for Evidence of Conflicts in Kainji Lake National Park

Source of variation	Sum of Squares	df	mean square	F	Sig
Between groups	36.27	1	23.07	1.16	0.04
Within groups	282.66	14	18.26		
Total	318.93	15			

Significant at p≤0.05

Table 8: Impact of Conservation conflict on Kainji Lake National Park

Effects	Frequency (n=600)	Percentage (%)
Forest degradation	150	25.0
Decrease wildlife population	230	38.3
Tourism potentials loss	120	20.0
Wildlife habitat loss	45	7.5
Soil erosion	35	5.8
Climate change	20	3.3

Source: Field work, 2021

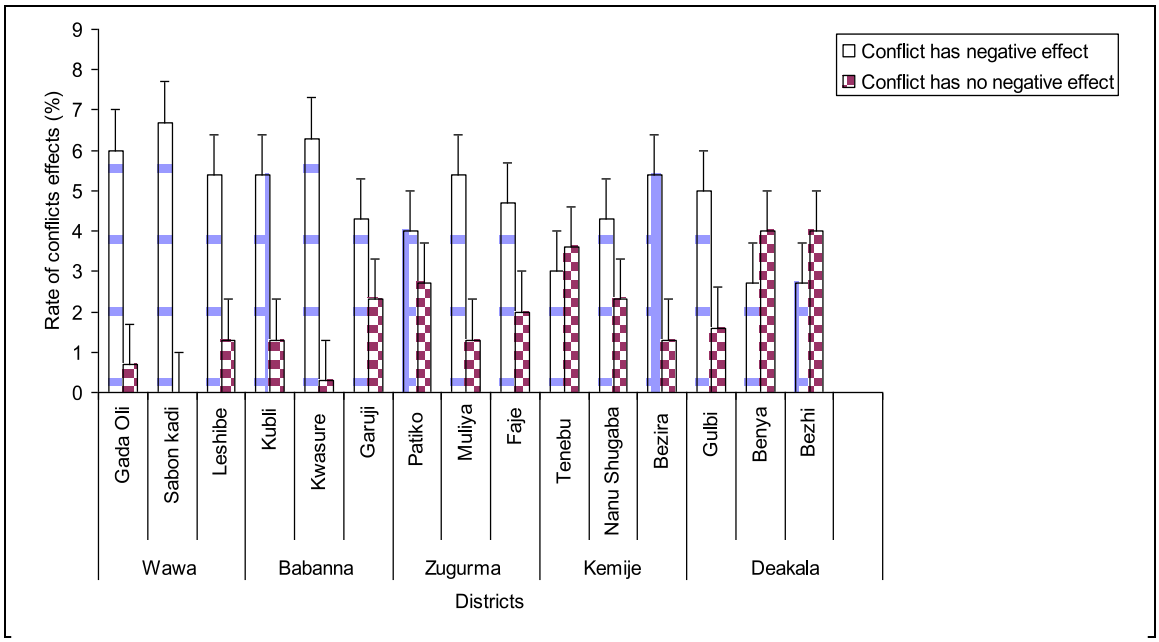

Fig 17, Conflicts effects on lives socio-economic activities

Park

Table 9: Measures for Conflict Resolution in Kainji Lake National Park

Management strategies	Frequency (n = 600)	Percentage (%)
Rural livelihood programs	262	43.7
Awareness campaign	132	22.0
Tree enrichment planting	67	11.2
People's involvement in policy making	113	18.8
Enforcement of regulations	26	4.3

Source: Field Survey, 2021