

BIOLOGICAL AND SOCIOECONOMIC VIABILITY OF RECREATIONAL FISHERIES OF TWO NIGERIAN LAKES

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Abstract

Many developed nations have accessed the diverse benefits of recreational fisheries in their this is not yet so in developing countries, this study explored the viability of recreational fisheries in two Nigerian Lakes.

Biological resources were sampled for twelve (12) months on Lakes Asejire and Oyan all in the forest belt of Nigeria. Two sectional questionnaire forms designed separately were administered to users (152 fisherfolks and 202 residents of immediate communities of the lakes) and expected visitors (275 residents of major cities near the lakes). Data were analysed using descriptive statistics, t-test and analysis of variance (ANOVA) on SPSS 17 for windows.

On Lake Asejire game species accounted for 30.57% and 31.05% at Oyan. Species include *Chrysichthys nigrodigitatus*, *Hepsetus odoe*, *Hydrocinus spp*, *Lates niloticus*, *Clarias gariepinus*. Season was significant on weight ($p < 0.05$). Education was significant to willingness to tolerate recreationists ($p < 0.05$), age and fishing experience had significant influence on rendering of assistance to recreationists ($p < 0.05$). Economic and infrastructural development were reasons for desiring recreational fisheries. Willingness to visit was high, activities desired were boat cruising (40%), fishing (23%), swimming 23% and sight seeing (19%). 88.9% showed willingness to pay above NGN500 for entrance, sex was significant on amount to pay while education was significant on time of visit.

The relative abundance of game species is equivalent to the required 1:3 ratio recommended for carnivore/forage ratio in angling ponds. This and the positive disposition of resource users and the willingness to pay are strong indications of success.

Key words: recreational fisheries, socioeconomic, viability, tolerance, game species

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Introduction

Recreation and tourism is a sector of the economy that many developed nations have accessed to improve the wellbeing of their populace while few developing nations do same to increase their economic base [1, 2], this is however not yet so in many developing countries[3]. This study explored the biological and socioeconomic viability of recreational fisheries in two Nigerian Lakes.

Methodology

Respondents were purposively selected for the exercise. Questionnaire forms were designed for fishermen, residents of the immediate locality of the water bodies and guest at strategic hotels in the urban centres nearest to the lakes. Two sectional questionnaire forms designed separately were administered to users, (one hundred and fifty-two fisher folks and two hundred and two residents of the immediate communities of the lakes) and visitors (two hundred and seventy-five visitors to major cities near the lakes). While the forms were administered directly to fishermen by the authors and their assistants, those for the visitors were distributed in the hotel rooms and collections were made by attendants after the visitors checked out. The forms were collected back on weekly basis. Biological resources were sampled for twelve (12) months on Lakes Asejire and Oyan all in the forest belt of Nigeria. Data were analysed using descriptive statistics, t-test and analysis of variance (ANOVA) on SPSS 17 for windows.

Results and discussion

Table 1: Age range of fishermen at the two locations

Location	Population	AGE RANGE IN YEARS						Total
		15 – 20	21 – 30	31 – 40	41 – 50	51 - 60	>60	
Asejire Lake	Number	4	37	27	21	10	3	102
	%	3.92	36.27	26.47	20.59	9.80	2.94	99.99
Oyan Lake	Number	1	10	12	12	15	0	50
	%	2	20	24	24	30	-	100
Total	Total	5	47	39	33	25	3	152
	%	3.29	30.92	25.66	21.71	16.45	1.97	

The age range of fishermen was between 15 and 65, the modal age was 21 - 30years (30.92%). Ages 21-30 and 31 – 40 fell within highest age frequencies at 24% unlike Asejire where the frequency was highest (36.27%) for age 21 – 30 (Table 1). The frequency of the age range increased from 3.92% (15 – 20 years range) to 36.27% (21 – 31 years range) after which there was a gradual decline. The implication is that young people are engage in the profession. This age group are fast at adopting innovation, could learn faster and are more social.

Table 2: Educational level of fishermen

Location	Population	EDUCATIONAL LEVEL IN YEARS				Total
		Primary	Secondary	Tertiary	Non formal education	
Asejire Lake	Number	24	48	27	3	102
	%	23.53	47.06	26.47	2.94	100
Oyan Lake	Number	15	18	10	7	50
	%	30	36	20	14	100
Total	Total	39	66	37	10	152
	%	25.65	43.42	24.34	6.58	99.99

Highest educational level was university first degree; modal level of education (43.42%) was secondary school. Social arrangements and education have been found to be closely associated with positive interactions in multi resource use and could enhance tolerance between different groups of interest sharing similar resources (4, 5).

Table 3: FISHERMEN'S FISHING EXPERIENCE

Population	FISHING EXPERIENCE IN YEARS				Total
	1-5	6-10	11-15	>15	
Number	13	23	45	71	152
%	8.55	15.13	29.61	46.71	100

Majority of the fishermen had above fifteen years experience, the result shows that new entrants join the fisheries regularly; the resource is not strictly closed to entrant. This in line with observation that local people have free access to fisheries in that they decide how fishing takes place and the intensity of the activities that are involved (6).

Table 4: Effect of age, education and fishing experience on level of interaction with recreationists

Activities	Age		Education		Experience	
	F	Sig	F	Sig	F	Sig
Greetings	1.626	0.157	1.885	0.135	3.647	0.014*
Attention	1.044	0.394	2.145	0.097	2.317	0.078
Give required Information	1.163	0.330	2.086	0.105	1.644	0.182
Give general Assistance	1.480	0.200	2.956	0.034	2.243	0.086
Allow to cruise on your boat	5.371	0.000*	10.354	0.000*	10.073	0.000*

Years of fishing experience has significant influence on whether or not fishermen will offer welcome greetings to visitors. Age, education and experience had significant influence on willingness to allow visitors to cruise ($p < 0.05$).

Table 5: Age range of residents and visitors to cities near the lakes

Age	Residents		Visitors	
	Number	%	Number	%
13-20	26	12.87		
21-30	54	26.73	127	46.37
31-40	56	27.72	64	20.25
41-50	34	16.83	47	15.45
51-60	22	10.89	28	10.3
>61	10	4.95	9	3.64

The age ranges of respondents in this study were 20 – 70 for visitors while those of residents were 13 – 70 years. The age of majority of the residents was between 31 and 40 years (Table 5). Many residents (80%) were aware that recreational fisheries could be introduced to the lakes. All agreed there is need to take part in recreation, 96% of them identified activities related to recreational fisheries as fishing, beach watching, swimming in open waters and cruising but showed preference for sight seeing as the activity they most preferred. Many of the residents wanted recreational activities on the lake because it will bring development and boost their commercial activities.

Most visitors that responded were males (68%) they fell mainly within the age range of 21 – 30 years; majority had university education (90.91%). Their main purpose of visit was for business buying of agricultural produce.

Table 6: Recreational fisheries desired by residents and visitors

Age	Residents		Visitors	
	Number	%	Number	%
Swimming	20	9.90	58	21.09
Sight seeing	97	48.02	52	18.91
Boat cruising	33	16.33	107	38.91
Fishing	52	25.74	58	21.09
Total	202	99.99	275	100.00

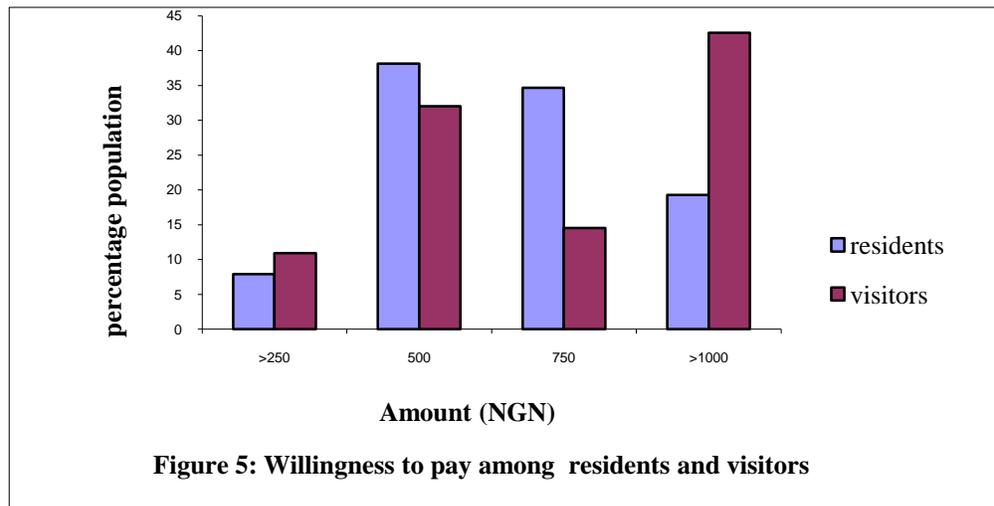
Recreational activities desired by visitors were boat cruising (38.91%), fishing (21.09%), swimming 21.09% and sight seeing (18.91%) (Table 6). Records show that these are the activities that were usually sort by outdoor recreationists [1].

Table 7: Willingness to pay for Recreational Activities

Amount	Residents		Visitors	
	Number	%	Number	%
>250	16	7.92	30	10.91
500	77	38.12	88	32.00
750	70	34.65	40	14.54
>1000	39	19.30	117	42.55
Total	202	99.99	275	100.00

Eighty-eight respondents representing (32%) showed willingness to pay >NGN500 while one hundred and seventeen (42.55%) were willing to pay >NGN1000 as participation fee. Willingness to pay was not as high among the residents (Table 7). Gender was significant on amount to pay ($p < 0.05$). This may not be unconnected with the level of family income (7). Participation in recreational activities has been linked to a range of socio-economic and socio-demographic factors such as family type, occupation, educational status and household income. With the latter, this may be due to costs associated with necessary equipment, clothing and club membership fees. Other factors are lower levels of awareness and knowledge of what constitutes a healthy lifestyle, including diet and exercise and educational achievement (8).

Visitors indicated willingness to visit at different times of the day, morning (34.63%), afternoon (27.27%) and evening (34.63%). They preferred dry seasons (53.46%) to wet season (23.16%), some however wish to visit any season of the year (23.38%) of the year. Education was found to be significant on time of visit ($p < 0.05$).



Biological resources

Game species identified at Asejire include *Chrysichthys nigrodigitatus*, *Hepsetus odoe*, *Hydrocinus spp*, *Alestes macrolepidotus*, *Lates niloticus* they accounting for 30.57% biomass and 47.54% by number of the total fish population sampled. Dominant game species among these were *Chrysichthys spp* (57.87%), *Clarias gariepinus*, *Alestes nurse* and *Hepsetus spp* constituting 31.05% biomass and 48.58% number.

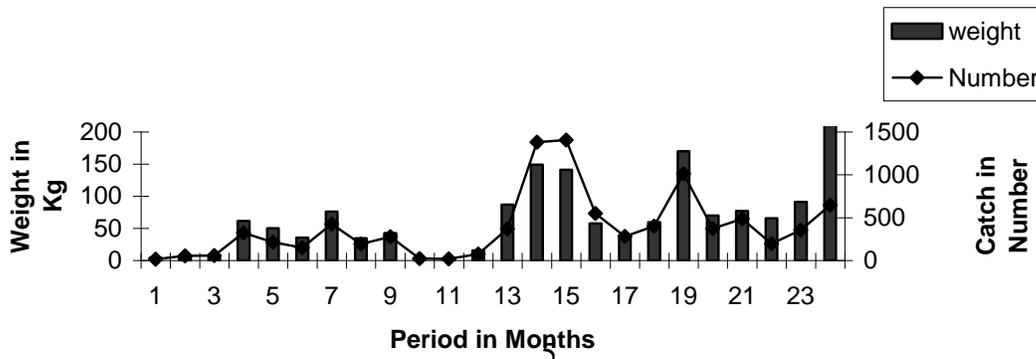


Figure 5: Catch in Weight and Number of Game Species during the Assessment Period - Asejire

Dominant game species at Oyan Lake were *Chrysichthys spp*, *Clarias gariepinus*, *Alestes nurse* and *Hepsetus spp* constituting 31.05% biomass and 48.58% number. Season was significant on weight ($p < 0.05$). Large sizes were more during the rains when food is more abundant and visibility is poor, most species fall victims of fishermen's gears during this period.

Additional recreational resources available in the area were shade, serenity and nature were provided by the forest vegetation. Added to these were the game views provided by wild animals that come for water at the upper section of the dam provided additional scenery.

The fisheries resources at Asejire are diverse and provide varieties of organisms for angling. Professionals and beginners of different grades can derive satisfaction from the diversities in size and forms. The 31.29% relative abundance of game species is equivalent to the required 1:3 ratio recommended for carnivore/forage ratio in angling ponds (9 and 10). Though recreational fishes were more abundant and susceptible to gear during the rains, the activities could be spread through the year. There is need to map out areas for different activities and users from the on set to prevent conflict (11). Ornamental species were more abundant in Lake Eleyele during wet seasons; however, harvesting may not necessarily be limited to the rain seasons. The revelation from this study is that resources of Lakes Asejire and Eleyele can be developed for angling and ornamental fish collection respectively. Such recommendation was made for Upper Ogun River, Nigeria (12).

Conclusion

The benefits associated with recreational fisheries summarised as exercise, recreation, solace, mental relaxation, appreciation of nature, understanding (protecting) the environment and supreme quality – food which are difficult to prioritise as need changes (13) could be realised if the potentials (which are indeed enormous) could be tapped especially in the developing countries.

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