



FSN-FB 0003

## A SURVEY OF FISH FAUNA IN LAKE KAINJI, NEW BUSSA, NIGER STATE

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This paper was prepared for presentation at the 25<sup>th</sup> Annual International Conference and Exhibition in Administrative Staff College of Nigeria (ASCON), Topo-Badagry, Lagos, Nigeria, 25<sup>th</sup> – 29<sup>th</sup> October, 2010.

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### ABSTRACT

*The survey of the fish fauna in lake Kainji, Niger State and Kebbi state was carried out for a period of three months from August to October 2003 using fishermen's catches. Forty two species fish were identified and these were from the families Osteoglossidae, Gymnarchidae, Mormyridae, Characidae, Citharinidae, Distichodontidae, Cyprinidae, Bagridae, Schilbeidae, Clariidae, Malapteruridae, Mochokidae, Channidae, Centropomidae, Cichlidae and Clupeidae. In terms of relative abundance, the family Bagridae has the highest species diversity of 20%, while Osteoglossidae, Citharinidae, Malapteruridae, Mochokidae, Centropomidae and Gymnarchidae had lowest species diversity of 2.5%. The study provides a biogenic history of fish species diversity within this period of the year in the last two decades. The significance of the study is to provide information towards a sustainable exploitation strategy in the community based management of the fisheries of the lake.*

**Keywords:** Survey, Fish fauna, Kainji, Lake, species

### INTRODUCTION

The Kainji Lake is a man-made lake impounded in 1968 after damming of the River Niger at Kainji. It is in the Guinea Savannah vegetation zone of north-western Nigeria. (Abiodun, 2002).

The survey of the fish fauna of lake Kainji provides biogenic history of fish species diversity within the period of the year in the last two decades. It is against this context that a survey of the fish fauna is carried out in the lake. According to Ita (1986), Nigerian inland water mass is estimated at about 12.5 million hectares. These are said to be capable of producing over 512,000 metric tonnes of fish annually. The inland bodies are currently producing less than 50% of their estimated fishery potential.

The study is meant to survey the different fish species currently found in the lake and to determine their relative abundance. And establish which ones are threatened by over fishing and which ones are no longer in the lake so as to determine the sustainable exploitation.

### MATERIALS AND METHODS

The study was carried out in Kainji lake. The data collection lasted for ten months from January to October 2007, sampling once a week in three sampling sites. Karyah, Yuna and Monai

The study depended on the fish caught by the fishermen at the three landing sites. The various fishing gears used by the fishermen included hooks and line, gill nets and traps. The identification of the fish species was done by using West

African fresh water fishes by Holden and Reed (1990).

The fisher folks provided the Hausa names of the fish species. After identification, each of the fish species was counted and recorded.

The total length and standard length were then measured and recorded for every sample obtained. Weight was also taken. Kainji Lake is located between Longitude 9° 50" and 10° 55" East and Latitude 4° 20' and 4° 45' North. It has a maximum length of 137 km, a maximum width of 25 km, mean depth of 11 m and volume of 13.97 km<sup>2</sup> annual draw down of water level 10-11m, catchments area of 1.6x106km<sup>2</sup> and a mean average water temperature of 27.85°C after the construction.

The species richness or diversity index was calculated using the formula below:

$$\frac{x}{n} \times 100,$$

Where x = number of each species  
n = total number of species.

## RESULTS

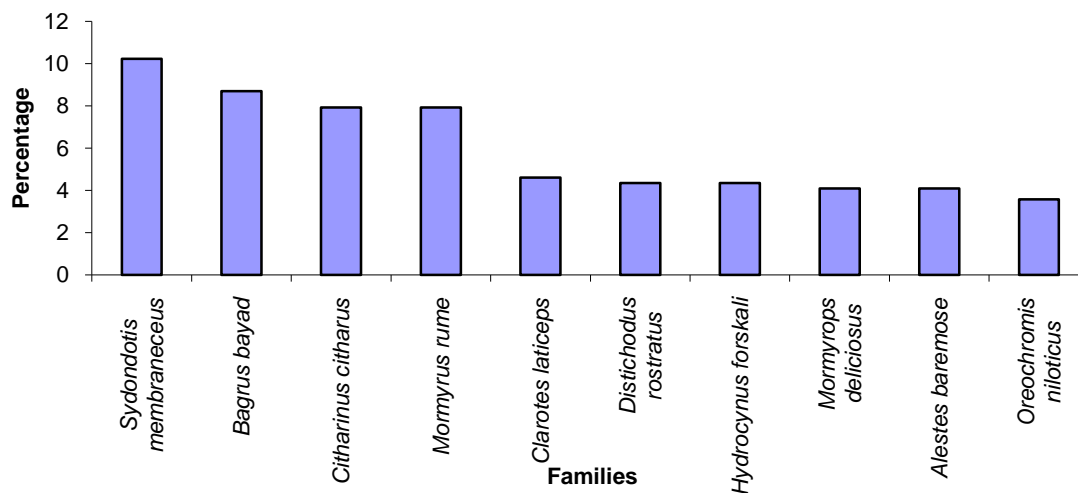
The following fish species were identified in the study area: *Heterotis niloticus*, *Mormyrus rume*, *Mormyrops deliciosus*, *Mormyrus macrophthalmus*, *Hyperopisus bebe*, *occidentalis*, *Gnathenamus abadii*, *Mormyrops oudoti*, *Gymnarchus niloticus*, *Hydrocynus forskalii*, *Brycinus macrolepidotus*, *Alestes baremose*, *Hydrocynus brevis*, and *Brycinus leuciscus*. Others include: *Citharinus citharus*, *Distichodus rostratus*, *Distichodus engycephalus*, *Distichodus brevipinnis*, *Labeo senegalensis*, *Labeo*

*coubie*, *Bagrus bayad macropterus*, *Chrysichthys auratus longifilis*, *Bagrus docmac niger*, *Clarotes laticeps*, *Auchenoglanis occidentalis*, *Clarotes macrocephalus*, *Chrysichthys nigrodigitatus*, *Auchenoglanis biscutatus*, *Siluranodon auritus*, *Schilbe mystus*, *Clarias anguillaris*, *Clarias gariepinus*, *Malapterurus electricus*, *Hemisynodontis membraneus*, *Synodontis budgetii*, *Synodontis clarias*, *Synodontis schall*, *Lates niloticus*, *Parachanna obscura*, *Oreochromis niloticus*, *Sarotherodon galilaeus*, *Pelmatochromis guntheri guntheri*.

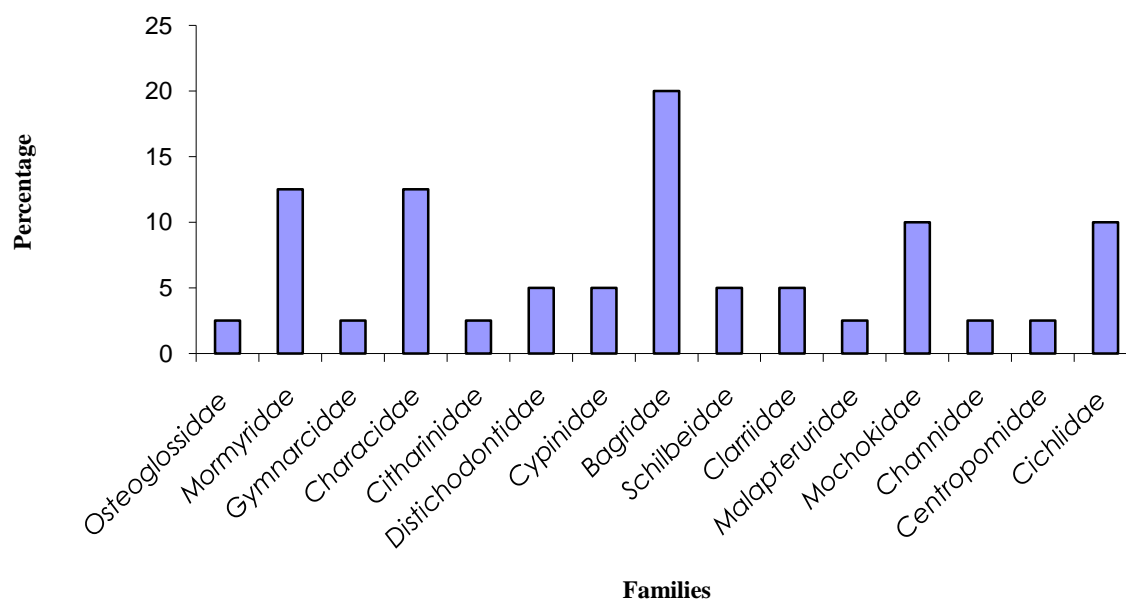
In terms of species distribution in the lake during the in the study area, *Synodontis membraneus* was the highest with 10.23% followed by *Bagrus bayad* with 8.69% then *Citharinus citharus* and *Mormyrus rume* each with 7.932% came third. While *Gymnarchus niloticus*, *Mormyrops oudoti* *Gnathenamus abadii*, *Brycinus leuciscus*, *Distichodus engycephalus*, *Chrysichthys nigrodigitatus*, *Clarotes macrocephalus*, *Clarias anguillaris*, *Channa obscurus* and *Pelmatochromis guentheri* are the least with 0.26% each (Fig. 1).

However, Fig. 2 shows that the family Bagridae has the highest species diversity with 20.0% followed by *Mormyridae* and *Characidae* with 12.5% while *Osteoglossidae*, *Citharinidae*, *Gymnarchidae* *Malapteruridae*, *Channidae* and *Centropomidae* has lowest species diversity.

Fig. 3 shows that gill net recorded the highest catch of 69%, while traps and hook and line recorded 18% and 13.0%.



**Fig.1: Percentage abundance of fish species**



**Fig. 2: Percentage abundance of fish species in each Family in the study**

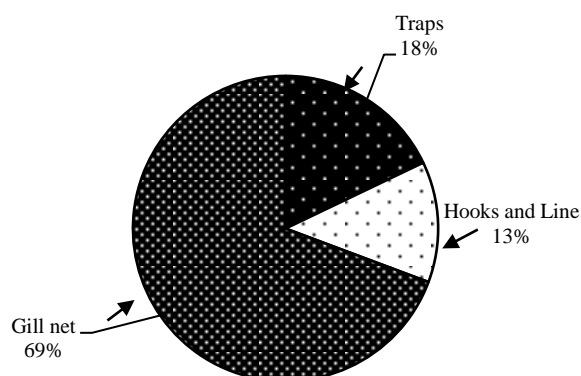


Fig. 3: Pie chart showing the percentage of fish catch by gears used

## DISCUSSION

The result showed that 40 fish species in 15 families were identified. The family Bagridae has the highest species representation of eight. The families Mormyridae and Characidae with five species each follow this. The families Mochokidae and Cichlidae have four species each. These findings are similar to other works conducted by other workers on other water bodies.

Analysis of successional trend based on the old catch records revealed that during the first year after impoundment (1968/69) the catch was dominated by six major families namely: Citharinidae, Schilbeidae, Centropomidae, Mochokidae, Characidae, and Cyprinidae. By 1970 the Characidae became the most dominant followed by Schilbeidae and Mochokidae. These three families sustained their dominance up to 1975. With the inclusion of shore sets in the sampling routine in 1976, fish families such as Cichlidae, Cyprinidae and Bagridae were reflected in the catch in greater abundance.

It can be concluded that the drought years (1972 and 1973) and drought relief years (1974 and 1975) had a substantial impact on dynamics of the fish population in Kainji Lake.

Other species showing a substantial increase in abundance for 1996 were: *Alestes nurse*, *Hydrocynus forskahli*, *Bagrus bayad*, *Auchenoglanis occidentalis*, *Chrysichthys nigrodigitatus*, *Distichodus rostratus*, *Lates niloticus*, *Labeo senegalensis*, *Labeo coubie*, *Synodontis membranaceus*, and *Clarias anguillaris*. Ekeanyanwu (1980) identified 7 fish genera in River Dalimi, Jos. Ita *et. al.* (1982) identified 17 fish species in Bakolori reservoir. Oguzie (1982) identified 7 fish species in Gubi reservoir Bauchi State. Anthony *et al.* (1986) identified 4 fish species in Auree reservoir, Plateau State. Zakari (1989) identified 28 fish species from 13 families in Dadin Kowa reservoir, Bauchi State now Gombe State. Dan-Kishiya (1991) identified 31 fish species in lake Geriyo, Adamawa State. In river Benue, Yola banks, Adamawa State, 28 fish species were identified (Usman, 1991).

As regards the relative abundance of the 40 species of fish identified, *Synodontis membranaceus* was the most dominant species constituting 10.23% of the total. This was followed by *Bagrus bayad* with 8.69% then *Citharinus citharus* and *Mormyrus rume* with 7.92% each. Other dominant species found during sampling period include *Clarotes laticeps*, *Distichodus rostratus*, *Hydrocynus*

*forskalii*, *Mormyrops deliciosus* and *Oreochromis niloticus*. However, in Dadin kowa reservoir; *Alestes nurse*, *Synodontis Clarias*, *Schilbe mystus*, *Bagrus bayad*, *macropterus* and *Clarias* species were the dominant fish species (Zakari, 1989), while in Bakolori reservoir, *Labeo Synodontis* and *Clarias* species constitute the most important fish species (Ita *et al.*, 1982). These showed slight difference.

With 40 fish species representing 15 families identified in the lake within the period of study, the lake may be said to be rich in fish species.

From the foregoing, it could be said that fish fauna of the lake is yet to be exhausted in terms of identification. This is due to the fact that months taken for the study is a limiting factor itself in exhausting such study. This will serve as a base line material for future research as regards fish fauna population dynamics that need to be fully exploited by the federal and Niger State Governments.

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