

A Survey of the Fishes of Lower Usuma Reservoir, Bwari, F.C.T. Abuja, Nigeria

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Abstract: A survey of the fishes of Lower Usuma Reservoir was conducted from July, 2009 – June, 2010. A total of 2492 fishes belonging to 11 species and 6 families were identified from the fishermen catches using mainly gillnets, castnets, dragnets, fish traps as well as hook and lines of various sizes. The family Cichlidae was the most dominant by number and weight representing 72.79% and 34.72% respectively of the total catch. This was followed by the family Cyprinidae (22.75%) in number while, all the other families represent 4.46% of the catches by number. The numerical abundance showed *Tilapia zilli*, *Oreochromis niloticus* and *Barbus occidentalis* to dominate representing 40.41, 29.82 and 17.94% respectively. *Barilius niloticus* were common in the reservoir while, all the remaining species were very rare. Seasonally there were more catches during the rainy months (64.25%) while the dry months had 35.75% of all the catches. The dominance of primary and secondary consumers is an indication that the Reservoir is stabilised with high fish production potential under adequate management.

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Key words: Survey, Fishes, Usuma Reservoir, Management.

1. Introduction

The occurrence of large number of inland or freshwater Reservoirs, Lakes, River and other aquatic habitats such as swamps and flood plains, of different sizes and forms, and containing a wide variety of fish populations, have provided mankind with the opportunity to exploit fish for food, income and livelihoods in general for many centuries. Fish, fishing and fisheries are an integral part of the culture and economy of many peoples and countries in Africa, with significant historical linkages which provided an important back- drop to more recent fisheries development programmes pursued by various governments. For example in Nigeria and other countries of the lake Chad basin, archaeological research has revealed that the local economy over 2000 years ago centred on an integrated system of farming and fishing on the influent Rivers, Reservoirs and flood plains. Today, the Chad basin produces over 100,000 tonnes of fish valued at US\$50M and constructive to the livelihoods of thousand of people (Neiland, 2005). Inland fisheries are a valuable and an integral component of the lives of many people throughout Africa, and have an important contribution to make to sustainable development, including economic growth and poverty reduction. How ever, there are concerns that inland fisheries in Africa are increasingly under threat. Capture fisheries contributed up to 70.08% of the world's total fisheries production in the year 2002, and inland capture fisheries accounts for about 9.3% of this (FAO, 2004). In

Africa, captured fisheries from inland waters accounted for 24.0% of world level in 2002 (FAO, 2004). Reporting of global inland fisheries production continues to present problems owing to the lack of reliable information on catch quantities and species composition. According to the FAO (2000), 80% of the catch in inland waters is not identified by species. It is base on the above that this study was undertaking to survey the fish species composition in the Reservoir for effective management by the F.C.T in particular and the Nigerian government in general.

2. Materials and methods

2.1 Study Area

Lower Usuma Reservoir is located in Bwari Area Council of FCT, Abuja. Abuja is located in the centre of Nigeria with a land area of 8,000 Square Kilometers. It lies between the Latitude of 8^o25 and 9^o25N and Longitude 6^o45 and 7^o45E. The Reservoir was constructed in 1987 and since then it has been the main source of drinking water for the city. The reservoir has a maximum capacity of 100 million m³. The main Dam is 1,300 meters long with a saddle dam of 350 meters long. The maximum depth of the Reservoir and saddle is 45 meters and 10 meters respectively (F.C.D.A.2006)

2.2 Fish Sampling

Fish were sampled monthly by assessing the fishermen catches throughout the sampling period. The fishing gears used by the

fishermen were Cast nets, Drag nets, Fish traps, Gill nets as well as Hooks and lines. All the fishes collected were taken to the biology laboratory in University of Abuja mini campus for identification in boxes containing ice blocks on each sampling day. The key for the identification of West African freshwater fishes (Holden and Reed, 1972) as well as the key to fresh water fishes of Nigeria (Olaosebikan and Raji, 2004) were used in identifying the species. The species were counted; Simple percentages and tables were used in analyzing the data.

2.3 Species Abundance

The number in each species was ascertained to determine species abundance.

Abundance score of the species were estimated following the criteria of Allison *et al.* (1997), as follows: 1-50 Rare; 51-100 Few; 101-200 Common; 201-400 Abundant and >400 Dominant.

3. Results

A total of 2492 fishes belonging to 11 species and 6 families were identified during the sampling period. The family Cichlidae was the most dominant family by number (72.79%) and weight (34.72%). This was followed by the family Cyprinidae with 22.75% while, Clariidae, Bagridae, Mormyridae and Mochokidae had 1.85%, 1.20%, 0.80% and 0.60% respectively (Table 1).

Table 1: Fish species composition by number and weight sampled in Lower Usuma Reservoir from July, 2009 – June, 2010

Family/Species	No	%	Weight (Kg)	%	Abundance score
Cichlidae					
<i>T. zilli</i>	1007	40.41	32.66	19.49	D
<i>O. niloticus</i>	743	29.82	25.13	15.00	D
<i>T.mariae</i>	64	2.57	0.40	0.24	R
Subtotal	1,814	72.79	58.19	34.72	
Cyprinidae					
<i>B. occidentalis</i>	447	17.94	6.87	4.10	D
<i>B. niloticus</i>	120	4.82	2.48	1.48	C
Subtotal	567	22.75	9.35	5.58	
Clariidae					
<i>C.gariepinus</i>	34	1.36	1.24	0.74	R
<i>H.bidorsalis</i>	12	0.48	48.31	28.66	R
Subtotal	46	1.85	49.55	29.57	
Bagridae					
<i>A. occidentalis</i>	30	1.20	25.21	15.04	R
Mormyridae					
<i>M. hesselquisti</i>	20	0.80	2.94	1.76	R
Mochokidae					
<i>S.batensoda</i>	12	0.48	0.34	0.20	R
<i>S.couretti</i>	3	0.12	22.00	13.13	R
Subtotal	15	0.60	22.34	13.33	
GRAND TOTAL	2,492		167.58		

The percentage composition of fish species identified in the Reservoir showed *Tilapia zilli*, *Oreochromis niloticus* and *Barbus occidentalis* as the dominant species representing 40.41%, 29.82% and 17.94% respectively of

the total catch (2492) throughout the sampling period. This was followed by *Barilius niloticus* (4.82%), *Tilapia mariae* (2.57%), *Clarias gariepinus* (1.36%), and *Auchenoglanis occidentalis* (1.20%). While the remaining

species *Heterobranchus bidorsalis* and *Synodontis batensoda* each was represented with 0.48% while *Synodontis couretti* was the least with 0.12%.

In terms of diversity, the family cichlidae was the most diversified having 3-species representation dominated by *T. zilli*. This was followed by the families Cyprinidae, Clariidae and Mochokidae each represented by 2-species each while, Bagridae and Mormyridae were represented by a species each.

4. Discussion

At the end of the study period, 11 fish species belonging to 6 families were identified. The diversity of species in the present study compared favorably with other findings in different water bodies all over the world. Boulenger (1916) published a list of African fresh water fishes to include 976 species, referable to 185 genera and 43 families. Mustapha (2009) identified 18 species belonging to 14 genera and 9 families in Oyun Reservoir with a surface area of $6.9 \times 10^5 \text{m}^2$ in Offa, Kwara State. Komolafe and Arawomo (2008) identified 4 families comprising of 7 species in Osinmo Reservoir, Osun State. Fapohunda and Godstates (2007) recorded 14 species belonging to 7 families in Owena Reservoir, Ondo State. Ozcan and Balik (2008) identified 15 species belonging to 6 families in Kermer Reservoir, Turkey.

The family Cichlidae was the most dominant family (72.79%) in the present study. The dominance of members of the family Cichlidae in the present study could be attributed to the high prolific breeding nature of members of the family Cichlidae and this compares favourably with that of Opa Reservoir, Osinmo Reservoir and other African Reservoirs were cichlids are known to dominate (Komolafe and Arawomo, 2003; 2008 and Balogun, 1986; 2001; 2005). The study of Olaniran (2000) and Mustapha (2009) all confirmed the dominance of Cichlidae in Nigerian waters.

In terms of diversity of species, the family Cichlidae was the most diversified in the present study with 3-species representations (*T. zilli*, *O. niloticus*, and *T. mariae*) and dominated by *T. zilli* and *O. niloticus*. This was attributed to good parental care of members of the family cichlidae which gives a considerable advantage in the colonization of their chosen habitat. The Cichlids were the most diversified (4-species) and dominated by *T. zillii* in Osinmo Reservoir, Osun State (Komolafe and Arawomo, 2008). The fish family Cichlidae was the most diversified in

Kangimi Lake with 5-species representation but dominated by *Hemichromis fasciatus* (Balogun, 2001 and 2005). Holden and Read (1972) had showed *Sarotherodon* and *Tilapia* as the most abundant in West African water bodies. The study by Mustapha (2009) also confirmed the dominance of *T. zillii* in some Nigerian reservoirs such as Eleiyele, (Olaniran, 2003), Osinmo (Komolafe and Arawomo, 2008).

5. Conclusion

The present research though preliminary will serve as a base material for further researches in the field of fish population dynamics as the Reservoir condition keep on improving.

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